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The gmutils Packages Bundle [*]

Many thanks to my TEX Guru Marcin Woliński for his TEXnical support.

For documentation please refer to the file(s)
gmutils.{gmd,pdf}.

```
⟨*master⟩
```

(A handful of meta-settings skipped)

```
⟨/master⟩
⟨*ins⟩
```

\supposedJobname

```
\def\supposedJobname{%
        gmutils%
}
```

```
\let\xA\expandafter
\let\nX\noexpand
\long\def\firstofone#1{#1}
```

```
\long\def\@firstoftwo #1#2{#1}
\long\def\@secondoftwo #1#2{#2} % in LaTeX they are short. Which is bad.
```

```
\unless\ifnum\strcmp {\jobname} {\supposedJobname} =0
```

If we want to generate files from this file, we should call

`xelatex --jobname=`⟨*sth. else*⟩ `gmutils.gmd`

Then the `\strcmp` primitive expands to some nonzero value and the conditional turns true.

```
\NeedsTeXFormat{LaTeX2e}[1996/12/01]
```

\gmBundleName

```
\def\gmBundleName{%
    gmutils%
}
```

\currentBundle

```
\def\currentBundle{%
    utilsbundle%
}
```

```
\edef\batchfile{\gmBundleName .gmd}
```

---

[*] This file has version number v0.996 dated 2011/10/12.

```
\input docstrip.tex
```

\NOO

```
\def\NOO{\FromDir\gmBundleFile .gmd}
```

Note it's `\def` so the BundleName expands to its current value.

```
\let\skiplines\relax
\let\endskiplines\relax
\askforoverwritefalse
```

\MetaPrefixS
\perCentS

```
\def\MetaPrefixS{\MetaPrefix\space}
\def\perCentS{\perCent\space}
```

```
\begingroup
\endlinechar=\newlinechar
\catcode\newlinechar=12\relax%

\catcode`\^=12\relax%
\catcode`\ =0\relax % Tifinagh Letter Yay
\catcode`\\=12 relax %
 catcode` ⁄=12 relax %
 firstofone{ endgroup %
     def preamBeginningLeaf{%

       RCSInfo
       MetaPrefixS This is file ‶ outFileName″ generated with the DocStrip utility.
       MetaPrefixS
       ReferenceLines %
       MetaPrefix %
     }% of \preamBeginningLeaf

     def copyRightLeaf{Copyright © }%
     def licenseNoteLeaf{%
       This program is subject to the LaTeX Project Public License.
       MetaPrefixS See http://www.ctan.org/tex-archive/help/Catalogue/licenses.lppl.html
       MetaPrefixS for the details of that license.
       MetaPrefix
       MetaPrefixS LPPL status: "author-maintained".
       MetaPrefix %
     }% of \licenseNoteLeaf

     def preamEndingLeaf{%
       gmBundleFile.{gmd,pdf} gobble{ or \file{Natror-OperaOmnia.{%gmd,pdf}}}.
       MetaPrefixS  %
     }% of \preamEndingLeaf

     def providesStatement{%

       \NeedsTeXFormat{LaTeX2e}
       \Provides gmFileKind{ gmOutName}
       space space space space[ gmFileDate space  gmFileVersion space gmFileInfo space  (GM)]

     }%
}% of \firstofone of changed catcodes.
```

\beforeDot

```
\def\beforeDot#1.#2\empty{#1}
```

\firstoftwo
\secondoftwo

```
\def\firstoftwo#1#2{#1}
\def\secondoftwo#1#2{#2}
```

To gobble the default heading lines put by DocStrip:

```
\Name\def{ds@heading}#1{}
```

\csnameIf

```
\def\csnameIf#1{%
  \ifcsname#1\endcsname
    \csname#1\xA\endcsname
  \fi
}
```

\writeto
\FromDir
\writefrom
\FromDir
\WritePreamble

```
\def\writeto#1{\edef\destdir{#1}}
\def\FromDir{}
\def\writefrom#1{\def\FromDir{#1/}}

\def\WritePreamble#1{%
  \xA\ifx\csname pre@\@stripstring#1\endcsname\empty
  \else
    \edef\outFileName{\@stripstring#1}%
    \edef\gmOutName{%
      \xA\beforeDot\outFileName\empty
    }% of \gmOutName

    \edef\gmOutTitle{%
      \xA\xA\xA\detokenize\xA\xA\xA{%
        \csname \gmOutName Title\endcsname}%
    }% of \gmOutTitle

    \edef\gmOutYears{%
      \csnameIf {\gmOutName Years}%
    }%
    \edef\gmOutThanks{%
      \ifcsname \gmOutName Thanks\endcsname
        \xA\xA\xA\detokenize\xA\xA\xA{%
          \csname \gmOutName Thanks\endcsname
        }%
      \fi
    }%
    \edefInfo{Date}% \gmFileDate
    \edefInfo{Version}% \gmFileVersion
    \edefInfo{Info}% \gmFileInfo

    \StreamPut#1{\csname pre@\@stripstring#1\endcsname}%
  \fi}
```

First we look for the info at the leaf-level, then at standalone level, then at the bundle level. If we don't find it, it'll be empty.

\edefInfo

```
\def\edefInfo#1{%
  \Name\edef{gmFile#1}{%
    \ifcsname \gmOutName Leaf#1\endcsname % e.g. gmbaseLeafVersion
      \xA\xA\xA\detokenize\xA\xA\xA{%
        \csname \gmOutName Leaf#1\endcsname
      }%
    \else
      \ifcsname \gmOutName #1\endcsname % e.g. gmbaseVersion
    \xA\xA\xA\detokenize\xA\xA\xA{%
     \csname \gmOutName #1\endcsname
    }%
   \else
    \ifcsname \gmBundleFile #1\endcsname % e.g. gmutilsVersion
     \xA\xA\xA\detokenize\xA\xA\xA{%
      \csname \gmBundleFile #1\endcsname
     }%
    \fi
   \fi
  \fi
 }% of edefined macro
}% of \edefInfo
```

```
\let\gmOutName\relax
\let\gmOutTitle\relax
\let\gmOutYears\relax
\let\gmFileDate\relax
\let\gmFileVersion\relax
\let\gmFileInfo\relax
\let\gmOutThanks\relax
\let\gmBundleFile\relax
\let\gmFileKind\relax
```

```
\declarepreamble\gmdLeaf
\preamBeginningLeaf
```

```
\copyRightLeaf \gmOutYears
by Grzegorz 'Natror' Murzynowski
natror (at) gmail (dot) com
```

```
\licenseNoteLeaf
```

```
For documentation please refer to the file(s)
\preamEndingLeaf
\providesStatement
\endpreamble
```

```
\keepsilent
```

We declare all the preambles later and use the `\empty` Docstrip preamble.

```
\errorcontextlines=1000
```

```
\@makeother\^^A
\@makeother\^^B
\@makeother\^^C
\@makeother\^^V
```

`\gmfile`

```
\def\gmfile
#1% file name
#2% DocStrip directive(s)
#3% file extension
{%
 \file{gm#1.#3}{\from{\gmBundleFile/\NOO}{#2}}%
}
```

`\pack`

```
\def\pack#1{\gmfile{#1}{#1}{sty}}
```

```
\begingroup\catcode`\ =9
\catcode`\^^I=9\relax
\catcode`\^^M=9\relax
\firstofone{\endgroup
```

\gmBundleFile

```
  \def\gmBundleFile{gmutils}

  \generate{

    \usepreamble\gmdLeaf
```

\gmFileKind

```
    \def\gmFileKind{    Package     }

    \writeto{    gmutils     }

    \pack{    base         }% gmbase
    \pack{    utils         }% gmutils
    \pack{    command    }% gmcommand
    \pack{    ampulex    }% gmampulex
    \pack{    envir         }% gmenvir
    \pack{    relsize         }% gmrelsize
    \pack{    meta         }% gmmeta
    \pack{    logos         }% gmlogos
    \pack{    notonlypream}% gmnotonlypream
    \pack{    mw        }% gmmw
    \pack{    typos         }% gmtypos
    \pack{    parts         }% gmparts
    \pack{    url              }% gmurl
    \pack{    RCS              }% gmRCS
    }
}% of changed catcodes' \firstofone

\Msg{*************************************************************}
\Msg{ }
\Msg{  To finish the installation you have to move}
\Msg{   the generated files into a directory searched by TeX.}
\Msg{ }
\Msg{  To type-set the documentation, run the file '\NOO'}
\Msg{  twice through LaTeX and maybe MakeIndex it.  }
\Msg{ }
\Msg{*************************************************************}

\csname fi\endcsname % probably for the directive's clause
\csname endinput\expandafter\endcsname %
\fi % of unless job name other than name of this file, which indicates the DocStrip pass.

⟨/ins⟩
```

Contents

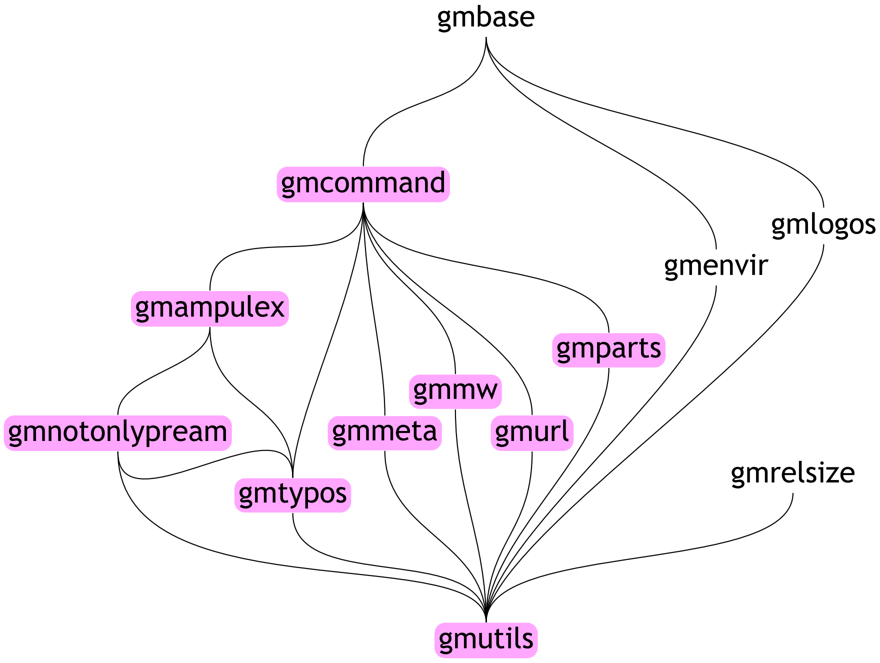
Intro

The **gmutils** package bundle provides some macros that are analogous to the standard LaTeX ones but extend their functionality, such as `\@ifnextcat`, `\addtomacro` or `\begin(*)`. The others are just conveniences I like to use in all my TeX works, such as `\afterfi`, `\pk` or `\cs`.

I wouldn't say they are only for the package writers but I assume some nonzero (LA)TeX-awareness of the user.

Brave New gmutils and its inner dependencies

For details just read the code part (where you'll find some comments) or intros to the particular packages. Here let's give a short description of what you could expect of them.



— **gmbase**: basic, low-level macros such as `\@ifnextcat` and other tests for peeping next token, including such that respect blank space; conditionals in an argument form robust to open `\if`'s and `\fi`'s. Also some expandable tests comparing strings of detokenised or not detokenised tokens (use of `\strcmp`); test whether a token is of a given kind (`\dimen`, `\skip`, `\count` &c.).

- **gmenvir**: a modification of `\begin` and `\end` to fully expand and detokenise environment's name, so that the comparisons are fully compatible with `\csname…\endcsname`.
- **gmcommand**: probably the most important package of mine, providing a brand new implementation of the ancient (pre-`expl3`) idea of a command to declare LaTeX commands with many different optional arguments. This package implements `\DeclareCommand`, `\DeclareEnvironment` (you can use `#1…#9` also in the end-defs!). For the details see the package's intro, where all the arg. specifiers are described.
- **gmlogos**: a couple of TeX-related logos, with a trial of improving the position of »A« in LaTeX. (Presented at BachoTeX 2007).
- **gmrelsize**: some macros taken from the **relsize** package not to load all of them, and some new added, namely `\largerr` and `\smallerr`.
- **gmampulex**: modification of macros including those having parameters without total redefinition of them: you give the start tokens, the end tokens and the replacement. Use with care.
- **gmnotonlypream**: a modification of the `\@onlypreamble` declaration to provide a bit more informative error message and removal of many comands from the "only preamble" list that are useful also in the document.
- **gmurl**: some fixes to the **url** package not to use math mode but `\scantokens` which allows to get proper kerning.
- **gmparts**: in/exclude parts of one and the same file just as if you'd do with `\include` and `\includeonly` (in fact, you use *the* `\includeonly` to get some parts excluded).
- **gmtypos**: macros written while typesetting real books for money. Most of them do conform Polish typesetting standards of the 1960's, which I like best, or refined advice of leading (contemporary) Polish typographers (e.g. `\ATfootnotes`).
- **gmmw**: compatibilising the sectioning commands of my favourite MWCLS classes with the standard ones.
- **gmmeta**: a couple of macros for description of macros.

Installation

Unpack the \jobname-tds.zip archive (this is an archive that conforms the TDS standard, see CTAN/tds/tds.pdf) in some texmf directory or just put the gmutils.sty somewhere in the texmf/\:tex/\:latex branch. Creating a texmf/\:tex/\:latex/\:gm directory may be advisable if you consider using other packages written by me.

Then you should refresh your TeX distribution's files' database most probably.

Contents of the gmutils.zip archive

The distribution of the **gmutils** package consists of the following three files and a TDS-compliant archive.

gmutils.gmd
README
gmutils.pdf
gmutils.tds.zip

Compiling of the documentation

The last of the above files (the .pdf, i.e., *this file*) is a documentation compiled from the .gmd file by running LaTeX on the gmutils.gmd file twice (`xelatex gmutils.gmd` in the directory you wish the documentation to be in), then MakeIndex on the \jobname.idx file, and then LaTeX on \jobname.\gmdExt once more.

MakeIndex shell commands:

```
makeindex -r gmutils
makeindex -r -s gmglo.ist -o gmutils.gls gmutils.glo
```

The `-r` switch is to forbid MakeIndex to make implicit ranges since the (code line) numbers will be hyperlinks.

Compiling the documentation requires the packages: **gmdoc** (**gmdoc.sty** and **gmdocc.cls**), **gmverb.sty**, the **gmutils** bundle, **gmiflink.sty** and also some standard packages: **hyperref.sty**, **color.sty**, **geometry.sty**, **multicol.sty**, **lmodern.sty**, **fontenc.sty** that should be installed on your computer by default.

Moreover, you should put the **gmglo.ist** file, a MakeIndex style for the changes' history, into some **texmf/makeindex** (sub)directory.

Then you should refresh your TEX distribution's files' database most probably.

If you had not installed the **mwcls** classes (available on CTAN and present in TEX Live e.g.), the result of your compilation might differ a bit from the **.pdf** provided in this **.zip** archive in formatting: If you had not installed **mwcls**, the standard **article.cls** class would be used.

777 ⟨*base⟩

`% &utils&command&envir` doesn't make sense since **gmbase** is loaded by them all and sets it properly.

781 `\RequirePackage {expl3, xparse} %` because it's used anyway: by **fontspec**, and thus we avoid name collisions.

```
784 \ifx\XeTeXversion\relax
785   \let\XeTeXversion\@undefined%
```
If someone earlier used `% \@ifundefined{XeTeXversion}` to test whether the engine is XƎTEX, then `% \XeTeXversion` *is* defined in the sense of ε-TEX tests. In that case we `\let` it to something really undefined. Well, we might keep sticking to `\@ifundefined`, but it's a macro and it eats its arguments, freezing their catcodes, which is not what we want in line 12481.

```
792 \fi
```

```
795 \ifdefined\XeTeXversion
796 \XeTeXinputencoding utf-8 %
```
we use Unicode dashes later in this file.

797 `\fi%` and if we are not in XƎTEX, we skip them thanks to XƎTEX-test.

799 ⟨/base⟩
800 ⟨*utils⟩

Options

\Name

```
804 \unless\ifdefined\Name
805   \def\Name#1#2{\expandafter#1\csname#2\endcsname}
806 \fi
```

```
809 \unless\ifcsname ifgmu@quiet\endcsname
810 \Name\newif {ifgmu@quiet}%
```
it has to be at least (at highest) in **gmcommand** since is used by it and not always entire **gmutils** is loaded.

```
813 \fi
```

```
815 \RequirePackage{xkeyval}
```

```
817 \RequirePackage{gmbase}
```

```
⟨/utils⟩
```

The gmbase package[1]

This is the lowest-level package that defines such things as `\gmu@ifempty`, a handful of “if next” tests &c.

```
⟨*base⟩
```

A couple of abbreviations

```
\unless\ifdefined\strcmp
  \let\strcmp\pdfstrcmp
\fi
```

`\@xa` `\@nx`

```
\let\@xa\expandafter
\let\@nx\noexpand
```

`\@xanx`

```
\def\@xanx{\@xa\@nx}
```

`\@xadef` `\@xa` `\@csn`

```
\long\def\@xadef#1{\@xa\def\@xa#1\@xa}
\long\def\@csn#1{\csname #1\endcsname}
```

Note that it differs from LaTeX’s `\@nameuse` in `\long`ness.

`\Name`

```
\long\def\Name#1#2{\@xa#1\csname #2\endcsname}
```

`\@xau`

```
\long\def\@xau#1{\unexpanded\@xa{#1}}
```

Note that there’s only one `\expandafter`: after `\unexpanded`. It’s because `\unexpanded` expands expandable tokens and gobbles `\relax`es while looking for an opening brace or `\bgroup`.

Note also that (since v0.991) this is a 1-parameter macro so doesn’t expand subsequent tokens until meets a *⟨balanced text⟩* but just takes first single token or *⟨text⟩*.

`\gmu@firstandspace`

```
\def\gmu@firstandspace#1{#1 }
```

`\strip@bslash`

```
\long\def\strip@bslash#1{%
  \gmu@ifempty{#1}{}{%
    \gmu@if {cat}{\@nx~\@nx#1}% this is specially for an active backslash (have
            you ever met it?). Thanks to this special case the inner macro declared for
            an active \ by \DeclareCommand is \\\ not \\csname\endcsname\.
    {\string#1}% if #1 is active
    {%
```

`%%      \@xa\ifnum\@xa\escapechar\@xa=\@xa` %` looks great, but what if `#1` is `92` (while normal `\escapechar`)? or `\1`?

`%%      \if\bslash`

```
      \@xa\@xa\@xa\ifnum\@xa\@xa\@xa\escapechar
        \@xa\@xa\@xa=\@xa\@xa\@xa`\@xa\gmu@firstandspace
        \string#1\@xa\@gobble
      \else\@xa\@firstofone \fi
      {\string#1}%
    }% if #1 is not active
```

---

[1] This file has version number v0.996 dated 2011/10/12.

```
  }% of if #1 not empty
}
```

\bslash@or@ac

```
\long\def\bslash@or@ac#1{%
```

If `#1` is a CS or a name, we make it beginning with a backslash. Otherwise we keep it only `\string`ed.

```
  \ifcat\@nx~\@nx#1%
  \else
    \bslash
  \fi
  \strip@bslash{#1}%
}
```

\@xanxcs

```
\long\def\@xanxcs #1{%
```

`\noexpand` indefferent to whether the argument is a name or an active char.

```
  \ifcat\@nx~\@nx#1%
    \@nx#1%
  \else
    \@xa\@nx\csname #1\endcsname
  \fi
}
```

\@xanxcssimple

```
\long\def\@xanxcssimple #1{%
```

`\noexpand` indefferent to whether the argument is a name or an active char.

```
    \@xa\@nx\csname #1\endcsname
}
```

Meaning of a csname protected with `\unexpanded`

\@xaucs

```
\long\def\@xaucs#1{%
  \unexpanded\@xa\@xa\@xa{\csname #1\endcsname}%
}
```

\@xanxtri

```
\long\def\@xanxtri#1{%
```

`\noexpand` indifferent to whether the argument is a name, an active char or a CS. Warning. It applies `\string` to the first token of `#1` so doesn't expand it if it's a macro.

```
  \ifcat\@nx~\@nx#1%
    \@nx#1%
  \else
    \@xa\@nx\csname \strip@bslash{#1}\endcsname
  \fi
}
```

\pdef

```
\def\pdef{\protected\def}
```

\lpdef

```
\def\lpdef{\long\protected\def}
\let\pldef\lpdef
```

\gmu@ifdefinable

```
\long\def\gmu@ifdefinable
#1% a CS #2 (implicit) what if definable (ifx undefined or relax) #3 (implicit) what if
       not definable (ifx not undefined nor relax)
{%
  \ifx #1\@undefined
```

```
    \@xa \@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
  {\@firstoftwo}%
  {\ifx #1\relax
      \@xa\@firstoftwo
    \else
      \@xa \@secondoftwo
    \fi
  }%
}
```

\pedef

```
\def\pedef{\protected\edef}
```

\pxdef

```
\def\pxdef{\protected\xdef}
```

And this one is defined, I know, but it's not `\long` with the standard definition and I want to be able to `\gobble` a `\par` sometimes.

\gobble
\@gobble
\gobbletwo

```
\long\def\gobble#1{}
\let\@gobble\gobble
\let\gobbletwo\@gobbletwo % it's a LaTeX's \long macro (in File d: ltdefns.dtx,
          Date: 2004/09/18 Version v1.3g l. 939)
```

\@gobbleeight

```
\long\def\@gobbleeight#1#2#3#4#5#6#7#8{}
```

```
\long\pdef\provide#1{%
  \ifdefined#1%
    \ifx\relax#1\afterfifi{\def#1}%
    \else\afterfifi{\gmu@gobdef}%
    \fi
  \else\afterfi{\def#1}%
  \fi}
```

```
\long\def\gmu@gobdef#1#{%
  \def\gmu@tempa{}% it's a junk \def-assignment to absorb possible prefixes.
  \@gobble
}
```

```
\def\pprovide{\protected\provide}
```

Note that both `\provide` and `\pprovide` may be prefixed with `\global`, `\outer`, `\long` and `\protected` because the prefixes stick to `\def` because all before it is expandable. If the condition(s) is false (`#1` is defined) then the prefixes are absorbed by a junk assignment.

Note moreover that unlike LaTeX's `\providecommand`, our `\(p)provide` allow any parameters string just like `\def` (because they just *expand* to `\def`).

```
\long\def\@nameedef#1#2{%
  \@xa\edef\csname#1\endcsname{#2}}
```

`\ifs` as a four-argument LaTeX command robust to unbalanced `\ifs` and `\fis`

```
\pdef\gmu@DefSymbol#1{%
  \unless\ifdefined#1%
    \def#1{#1}%
  \fi
}
```

`\newdef`

```
\newcommand\newdef % sort of newcommand that accepts prefixes.
[1]%
{%
  \gmu@ifdefinable #1%
  {\pdef #1}
  {%
    \PackageError {gmbase} {\@nx#1 already defined.}{}%
    \gmu@gobdef
  }%
}
```

```
\protected\newdef \pnew {%
  \protected\newdef
}
```

```
%% |\pdef\globalize#1{\global#1=#1} % doesn't make sense general enough (2010/11/03)
```

```
\long\def\gmu@if #1#2{%
```

2011/10/11, 15.23 (GM) we move the special case of `\ifincsname` to a separate macro as used exactly once and only in a very special and personal macro.

```
  \csname if#1\endcsname #2%
    \@xa\@firstoftwo
  \else\@xa\@secondoftwo
  \fi
}
```

A little `\expandafter` tip: to get the effect of `\expandafter\ifx`⟨*stuff*⟩ write `\gmu@if {x\expandafter\expandafter}`, where `x` stands for any conditional primitive suffix.

```
\long\def\gmu@notif#1#2{%
```

We leave the name `\gmu@unlessif` for analogon of `\gmu@if` prefixed with `\unless`, which works slightly different than reversion of `#3` and `#4` (if the tail of `#2` remains after test, it becomes part of true branch for unprefixed and part of false branch for `\unless`-prefixed version). (2010/7/25)

```
  \gmu@if {#1}{#2}%
  \@secondoftwo\@firstoftwo
}
```

And simplified versions of the testing macros, for the switches, because I many times forgot to add the empty `#2` (which of course lead to a disaster at best (at worst—to a perfidious bug that remains hidden for years)).

```
\def\gmu@ifsw #1{\gmu@if {#1}{}}
\def\gmu@notsw #1{\gmu@notif {#1}{}}
```

```
\def \gmu@ifincsname
```

(implicit) `#1` what if in,
(implicit) `#2` what if not in.

```
{%
  \ifincsname
    \@xa\@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
}
```

```
\long\def\gmu@unless #1#2{%
  \@xa\unless \csname if#1\endcsname  #2%
    \@xa\@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
}
```

For a special case of downright nesting of conditionals let's provide a shorthand. But wait a minute. This special case, which from TeXnical point of view is a tree growing downright, is just a `cases` special form from usual languages. Therefore let's name it `case(s)`.

It has one inconvenience: the last (innermost) false branch (the last case) also has to be preceded with `\gmu@EatDownright` (or just *be* this macro).

```
\lpdef\@iwru@EC#1#2#3{%
  \@iwrum{#1»{#2}« »#3«}%
  \gmu@passbraced{#1{#2}}{#3}%
}
```

```
\long\def\gmu@generalCASE
#1% Testing macro (\gmu@if etc.
#2% #1 of the testing macro
#3% #2 of the testing macro
#4% #3 of the testing macro (what if test satisfied)
     (#4 of the testing macro will always be empty)
{%
  #1{#2}{#3}%
  {%
    \gmu@EatCases{#4}}{}%
}
```

If the condition is satisfied, `#3` is executed after eating all the stuff succeding it up to a delimiter CS`\gmu@ESAC`.

```
\long\def\gmu@EatCases
#1%
#2\gmu@ESAC
{#1}
```

```
\let\gmu@lastCASE\gmu@EatCases
```

```
\def\gmu@CASE {\gmu@generalCASE \gmu@if }
\def\gmu@CASEnot {\gmu@generalCASE \gmu@notif }
\def\gmu@CASExany {\gmu@generalCASE \gmu@ifxany }
\def\gmu@CASExnone {\gmu@generalCASE \gmu@ifxnone }
```

```
\long\def\gmu@reserved@firstofmany#1#2\gmu&nil{#1}
```

An expandable test whether argument is a single token or not. Beware: it expands to an open if.

```
\long\def\ifsingletoken#1{%
```

`%% \gmu &nil %` such a strange delimiter to make it work both in letter and other `@` scopes etc. (`&` seems to me recatcoded rather seldom)

```
  \ifnum \strcmp{\unexpanded{#1}}%
    {\@xau{\gmu@reserved@firstofmany #1\blekotnizza@ \di \broccoli
        \gmu&nil}%
    }% of right text of \strcmp
    =\z@
}
```

The conditional of this macro turns true if `#1` was a single token (of catcode $\neq 1, 2$) or such a token in curly braces (remember that the braces are stripped also from delimited argument if it consists only of braced text).

Note that single (unbalanced) tokens of catcodes 1 or 2 cannot be passed this macro.

The conditional turns false when `#1` (possibly after stripping braces) is of at least 2 tokens or is empty or is a blank space.

The last segment of last disjunction may be a bit confusing. But this macro is intended for determining whether we should pass `#1` in braces or not and passing a blank in braces seems reasonable.

A macro that applies `\string` to its argument if it's not braced. To be expanded by `\detokenize`.

```
\long\def\gmu@predetokstring #1{%
  \gmu@if {num}
  {%
```

After a couple of hours of debug I reached the proper test which is given below. The goal is to (expandably!) check whether `#1` is braced and/or begins with a blank space. In any of those cases we don't hit it('s first token) with `\string`.

`\@firstofone` strips outermost pair of braces if any and gobbles the lading blank(s) if any so the detokenised strings will differ.

```
    \strcmp
    {\detokenize{#1x}}%
    {\detokenize\@xa{\@firstofone #1x}}=\z@
  }% of test
  {\@xa{\string#1}}
  {{#1}}%
}
```

A test for comparison of CS es as macro delimiters (stronger than `\ifx`). Beware: it expands to an open if. And it has to, to be usable in `\gmu@if`.

```
\long\def\ifstrings#1#2{%
  \ifnum\strcmp
  {\detokenize\gmu@predetokstring{#1x}}%
  {\detokenize\gmu@predetokstring{#2x}}=\z@
```

We hit both texts with `\unexpanded` in case they are more than one token. Note `\string` is not the same as `\detokenize` because the latter adds a space after a letter CS.

Moreover, a char is added to both texts to assure that `\string` has sth. to hit not the closing brace (which would lead to a disaster).

```
}
```

As you see, it expands to an open if, but that's OK as far as we use it only via macros, e.g.

```
\gmu@if {strings}{\while\until}…
```

Thanks to this test defining CSes that are intended only as atoms (symbols) ceases to be necessary. Which is quite an advantage, if we wish to use symbol CSes such as `\while`, `\until` or `\SameAs` (in `\DeclareCommand`) that with this test may still be available for `\newcommand`.

And another, slightly different: turns true iff the arguments are equal after (stringing and) possible stripping bslash(es), e.g. `par` and `\par` (well, *any* esccape char that is currently in charge).

```
\long\def\ifstribs#1#2{%
  \ifnum\strcmp{\strip@bslash{#1}}{\strip@bslash{#2}}=\z@
}
```

And a test with a database flavour: for tokens that are defined it's `\ifx`. For tokens `\ifx`-equal `\@undefined`—it's `\ifstrings` (in relational databases any usual comparison of two NULLs returns null so there's a distant resemblance):

```
\long\def\ifStrX#1#2{%
  \gmu@CASEnot {x}{#1#2}%
  {\iffalse}% if tokens are x-unequal, all is clear.

  \gmu@CASEnot x {\@undefined#1}
  {\iftrue}%
```

some (i.e. *both*) tokens are-x `\@undefined` or `\relax`, then

```
  \gmu@CASE {strings}{#1#2}%
    {\iftrue}%
  \gmu@lastCASE
  {\iffalse}%
  \gmu@ESAC
}
```

`\firstofone` and the queer `\catcodes`

Remember that once a macro's argument has been read, its `\catcodes` are assigned forever and ever. That's what is `\firstofone` for. It allows you to change the `\catcodes` locally for a definition *outside* the changed `\catcodes`' group. Just see the below usage of this macro 'with TEX's eyes', as my TEX Guru taught me.

```
\long\def\firstofone#1{#1}

\long\def\bracefirstofone#1{{#1}}

\long\pdef\scantwo#1#2{
  \begingroup\endlinechar\m@ne
  \@xa\endgroup\scantokens{#1#2}%
}

\long\def\@firstofthree#1#2#3{#1}
\long\def\@secondofthree#1#2#3{#2}
\long\def\@thirdofthree#1#2#3{#3}
\long\def\@twoofthree#1#2#3{#1#2}
\long\def\@secondoffive#1#2#3#4#5{#2}
```

In some `\if[cat?]` test I needed to look only at the first token of a tokens' string (first letter of a word usually) and to drop the rest of it. So I define a macro that expands to the first token (or `{`⟨*text*⟩`}`) of its argument.

```
\long\def\@firstofmany#1#2\@nil{#1}
```

```
\long\def\@secondofmany#1#2#3\@nil{#2}
```

```
\long\def\@allbutfirstof#1#2\@nil{#2}
```

```
\long\def\@firstthensecond #1#2{#1#2} % Note this macro strips braces if present.
\long\def\@secondthenfirst #1#2{#2#1} % Note as above.
```

`\afterfi` and pals

It happens from time to time that you have some sequence of macros in an `\if…` and you would like to expand `\fi` before expanding them (e.g., when the macros should take some tokens next to `\fi…` as their arguments. If you know how many macros are there, you may type a couple of `\expandafter`s and not to care how terrible it looks. But if you don't know how many tokens will there be, you seem to be in a real trouble. There's the Knuthian trick with `\next`. And here another, revealed to me by my TEX Guru.

I think the situations when the Knuthian (the former) trick is not available are rather seldom, but they are imaginable at least: the `\next` trick involves an assignment so it won't work e.g. in `\edef`.

But `\afterfi` and pals are sensitive to `\fi`s that may occur in macros' arguments so probably the safest and expandable way is the `\expandafter\@(first|second)oftwo` trick.

```
\def\longafterfi{%
  \long\def\afterfi##1##2\fi{\fi##1}}
\longafterfi
```

And two more of that family:

```
\long\def\afterfifi#1#2\fi#3\fi{\fi\fi#1}
\long\def\afteriffifi#1#2\fi#3\fi{\fi#1}
```

Notice the refined elegance of those macros, that cover both 'then' and 'else' cases thanks to `#2` that is discarded.

```
\long\def\afterififfififi#1#2\fi#3\fi#4\fi{\fi#1}
\long\def\afteriffififi#1#2\fi#3\fi#4\fi{\fi\fi#1}
\long\def\afterfififi#1#2\fi#3\fi#4\fi{\fi\fi\fi#1}
```

`\foone`

The next command, `\foone`, is intended as two-argument for shortening of the `\begingroup…\firstofone{\endgroup…}` hack.

```
\long\def\foone#1{\begingroup#1\relax\egfirstofone}
\long\def\egfirstofone#1{\endgroup#1}
```

```
\def\fooatletter{\foone\makeatletter}
```

\@emptify
\emptify

```
\newcommand*\@emptify[1]{\let#1=\@empty}
\gmu@ifdefinable\emptify{\let\emptify\@emptify}
```

Note the two following commands are in fact one-argument.

\g@emptify
\gemptify

```
\newcommand*\g@emptify{\global\@emptify}
\gmu@ifdefinable\gemptify{\let\gemptify\g@emptify}
```

\@relaxen
\relaxen

```
\newcommand\@relaxen[1]{\let#1=\relax}
\gmu@ifdefinable\relaxen{\let\relaxen\@relaxen}
```

Note the two following commands are in fact one-argument.

\g@relaxen
\grelaxen

```
\newcommand*\g@relaxen{\global\@relaxen}
\gmu@ifdefinable\grelaxen{\let\grelaxen\g@relaxen}
```

\@ifempty, \IfAmong, \IfIntersect \@ifinmeaning

After a short deliberation I make the `\IfAmong`…`\among` and `\IfIntersect` macros' names apeless since they are intended for the macro and class writers, at the same level of abstraction as `\DeclareCommand`.

```
\long\def\gmu@ifempty#1{%
        % #1 the token(s) we test, it may be just {},
        % #2 the stuff executed if #1 is empty (is {}),
        % #3 the stuff executed if #1 consists of at least one token.
    %%   \def\gmu@ifempty@resa{#1}%
    %%   \ifx\gmu@ifempty@resa\@empty
```

```
  \ifnum\strcmp{\detokenize{#1}}{}=\z@
```

Note that now (2010/6/23) it's expandable thanks to `\strcmp` and therefore it's no longer `\protected`. Another argument for `strcmp` is that it detokenizes its text so its robust to `#` es. But it expands all the macros which is not what we intended so we `\detokenize{#1}` anyway.

```
    \@xa\@firstoftwo
  \else\@xa\@secondoftwo
  \fi
}
```

```
\long\pdef\@ifnonempty#1#2#3{\gmu@ifempty{#1}{#3}{#2}}
```

```
\long\def\gmu@ifexempty #1{%
  \ifnum \strcmp{#1}{}=\z@
    \@xa\@firstoftwo
  \else\@xa\@secondoftwo
  \fi
}
```

```
\long\pdef\IfAmong
#1% the token(s) whose presence we check,
\among % delimiter of #1
#2% the list of tokens in which we search #1, #3 (implicit) the 'if found' stuff,
     #4 (implicit) the 'if not found' stuff.
{% Note this command has to be used with care since it recognizes the token(s) due
     to fitting a delimited macro, so it distinguishes any two different tokens even if
     they are \ifx-equal.
```

```
  \long\def\gmu@among@##1#1##2\gmu@among@{%
    \gmu@ifempty{##2}\@secondoftwo\@firstoftwo}%
  \gmu@among@#2#1\gmu@among@
}
```

\ifgmu@ifquant

```
\newif\ifgmu@ifquant
```

```
\long\pdef\gmu@ifxany
#1% a single token to be \ifx ed with each of #2
#2% counterpart to the above—a sequence of tokens to check #1 against. It may contain
     anything including groups since checking is preceded by an assignment.
```

```
{%
```

```
%%   \gmu@ifempty{#1}{\PackageError{gmbase}{We don't consider this
%%  case}{}}%
```

```
  \gmu@ifempty{#2}{\@secondoftwo}{%
```

we wrap the iteration over `#2`'s tokens in `\gmu@ifempty` because we expect many empty `#2`'s in `\DeclareCommand`'s `\loop` arguments (such as `Q` and `U`)

```
    \gmu@ifquantfalse
    \let\gmu@ifxa@aasiter\@@gmu@ifxa@aasiter
    \edef\gmu@ifxa@aas{% edef and unexpanded to protect agains #6 token(s) in #1.
      \unexpanded{%
        \ifx #1\gmu@ifxa@token
          \gmu@ifquanttrue
```

We are happy we found what we looked for but anyway we have to iterate to let all the possible groups to the drain.

```
          \let\gmu@ifxa@aas\gmu@ifxa@drainer
        \else
          \ifx \gmu@ifxa@Limit\gmu@ifxa@token
            \emptify \gmu@ifxa@aasiter
          \fi
        \fi
        \gmu@ifxa@aasiter
      }% of \unexpanded
    }% of \gmu@ifxa@aas

    \gmu@ifxa@aasiter #2\gmu@ifa@PreLimit\gmu@ifxa@Limit
    \gmu@if {gmu@ifquant}{}%
  }% of if #2 nonempty
}

\def\gmu@ifxa@drainer{%
  \ifx\gmu@ifxa@Limit\gmu@ifxa@token
    \emptify\gmu@ifxa@aasiter
  \fi
  \gmu@ifxa@aasiter
}

\gmu@DefSymbol \gmu@ifa@PreLimit
\gmu@DefSymbol \gmu@ifxa@Limit

\def\@@gmu@ifxa@aasiter{%
```

It's a pattern CS to restore `\gmu@ifxa@aasiter` in each `\gmu@ifxany`.

```
  \afterassignment\gmu@ifxa@aas
  \let\gmu@ifxa@token= }% thanks to this space it'll look also at spaces (cat 10) and = chars.
```

\gmu@ifxnone

```
\long\pdef\gmu@ifxnone
#1% token to be checked against
#2% list of tokens to not find #1 at
{%
  \gmu@ifxany{#1}{#2}\@secondoftwo\@firstoftwo
}
```

```
%% \long\pdef\gmu@ifNXany
%% #1% a single token to be noexpanded and \if ed with each of
%% % #2 noexpanded
%% #2% counterpart to the above—a sequence of tokens to check #1
%% % against. It may contain anything including groups since checking is
%% % preceded by an assignment.
%% %
%% {%
%%  \gmu@ifempty{#2}{\@secondoftwo}{%
%%   % we wrap the iteration over #2's tokens in \gmu@ifempty because
%%   % we expect many empty #2's in \DeclareCommand's \loop
%%   % arguments (such as Q and U)
%%   \gmu@ifquantfalse
%%   \let\gmu@ifNXa@aasiter\@@gmu@ifNXa@aasiter
%%   %
%%   \edef\gmu@ifNXa@aas{% edef and unexpanded to protect agains
%%    % #$_6$ token(s) in #1.
%%    \unexpanded{%
%%     \if \@nx#1\@nx\gmu@ifNXa@token
%%      % an „honest" char token, i.e., not an active char neither a
%%      % CS, when \let to a CS, keeps its catcode for
%%      % \ifcat. An active char however, when let to a CS,
%%      % loses its 13 and ifcat-is \relax (a CS). Therefore for
%%      % active chars and CS es we use \ifx.
%%      %
%%      % This is useless: we cannot determine that a CS let
%%      \ifnum
%%       \numexpr
%%        \ifcat \@nx#1\relax 0\else 1\fi *%
%%        \ifcat\@nx#1~0\else1\fi
%%        +\ifcat \@nx\gmu@ifNXa@token\relax 0\else 1\fi
%%       >\z@
%%       % if at least one of compared tokens is not a CS neither
%%       % an active char
%%
%%
%%      \fi
%%      \gmu@ifquanttrue
%% % We are happy we found what we looked for but anyway we have to
%% % iterate to let all the possible groups to the drain.
%%      \let\gmu@ifNXa@aas\gmu@ifNXa@drainer
%%     \else
%%      \ifx \gmu@ifNXa@Limit\gmu@ifNXa@token
%%       \emptify \gmu@ifNXa@aasiter
%%      \fi
%%     \fi
%%     \gmu@ifNXa@aasiter
%%    }% of \unexpanded
%%   }% of \gmu@ifxa@aas
%%   %
%%   \gmu@ifNXa@aasiter #2\gmu@ifa@PreLimit\gmu@ifNXa@Limit
%%   \gmu@if {gmu@ifquant}{}%
%%  }% of if #2 nonempty
%% }
%%
%%
%% \def\gmu@ifNXa@drainer {%
%%   \ifx\gmu@ifNXa@Limit\gmu@ifNXa@token
%%     \emptify\gmu@ifNXa@aasiter
%%   \fi
%%   \gmu@ifNXa@aasiter
%%  }
%%
%%
%%  \gmu@DefSymbol\gmu@ifNXa@Limit
%%
%%
%%  \def\@@gmu@ifNXa@aasiter{%
%%  % It's a pattern CS to restore \gmu@ifNXa@aasiter in each \gmu@ifNXany.
%%   \afterassignment\gmu@ifNXa@aas
%%   \let\gmu@ifNXa@token= }% thanks to this space it'll look also at
%%  % spaces (cat 10) and = chars.
%%
%%
%%  %
%%  \long\pdef\gmu@ifNXnone
%%  #1% token to be checked against
%%  #2% list of tokens to not find #1 at
%%  {%
%%   \gmu@ifNXany{#1}{#2}\@secondoftwo\@firstoftwo
%%  }
%%
```

We need a macro that iterates over every token/text on a list. LaTeX's `\@for` iterates over a list separated with commas so it's not the case. Our macro is much simpler.

```
\long\def\gmu@foreach#1\gmu@foreach@delim#2{%
```

We define the iterator that takes one item from the list, checks it against

```
  \long\def\gmu@forer##1{%
    \gmu@if {strings} {\gmu@foreach@delim {##1}}%
    {}% if we've met the delimiter, we stop.
    {% otherwise we wrap #1 in a macro to make it available to #2
      \edefU\gmu@forarg{##1}%
      #2% we execute #2 and probably continue iteration (unless the loop isn't broken with the next macro).
      \gmu@forer
    }%
  }% of forer.
```

So we apply the defined iterator

```
  \gmu@forer#1\gmu@foreach@delim
}
```

A macro to break the loop:

```
\long\def\gmu@foreach@break
#1\gmu@foreach@delim{}
```

The "if strings" or "if stribs" test performed with small quantifier. It's not as robust and all-purpose as `\gmu@ifxany` because for obvious reasons we cannot use `\futurelet`.

Note however that thanks to the nature of the test we don't need the sentinel CS to be defined.

And this is expandable

```
\long\def\gmu@ifsXXany
#1% kind of test (strings or stribs so far)
#2% token to be checked against #3
#3% the list of tokens to be iterated over
      #4 (implicit) what if found
      #5 (implicit) what if not found
{%
  \gmu@ifsXXany@{#1}{#2}#3\gmu@ifsXXany@end
  \@firstoftwo\@secondoftwo
}
```

```
\long\def\gmu@ifsXXany@
#1% kind of test
#2% left side of comparison
#3% right side of comparison
{%
  \gmu@if {#1}{#2#3}%
  \gmu@ifsXXany@found
  {% else
    \gmu@if {#1}{#3\gmu@ifsXXany@end}%
    \@secondoftwo
    {\gmu@ifsXXany@{#1}{#2}}% if we didn’t meet the sentinel, we iterate
  }%
}
```

```
\long\def\gmu@ifsXXany@found
#1\gmu@ifsXXany@end
{\@firstoftwo}
```

\gmu@ifstrany

```
\def\gmu@ifstrany{\gmu@ifsXXany {strings}}
```

```
\def\gmu@ifsbany{\gmu@ifsXXany {stribs}}
```

```
\def\gmu@ifStrXany{\gmu@ifsXXany {StrX}}
```

And the counterparts:

```
\long\def\gmu@ifstrnone#1#2#3#4{%
  \gmu@ifstrany{#1}{#2}{#4}{#3}%
}
```

```
\long\def\gmu@ifsbnone#1#2#3#4{%
  \gmu@ifsbany{#1}{#2}{#4}{#3}%
}
```

```
\long\def\gmu@ifStrXnone#1#2#3#4{%
  \gmu@ifStrXany{#1}{#2}{#4}{#3}%
}
```

And their downright versions:

```
\lpdef\gmu@CASEstrany {\gmu@generalCASE \gmu@ifstrany }
```

```
\lpdef\gmu@CASEstrnone {\gmu@generalCASE \gmu@ifstrnone }
```

```
\lpdef\gmu@CASEsbany {\gmu@generalCASE \gmu@ifsbany }
```

```
\lpdef\gmu@CASEsbnone {\gmu@generalCASE \gmu@ifsbnone }
```

Note that `\gmu@ifsXXany` iterate hash by hash, so don't distinguish a CS`\par` from a `\stringed` sequence of other chars `\par` passed them in braces. To avoid such a case we provide a degrouper with which we may prepare the text for token-by-token `\gmu@ifsXXany` test:

`\degroup@toks`

```
\newtoks\degroup@toks
```

```
\long\pdef\gmu@degroup
#1% text to be degrouped
{\degroup@toks={}%
  \gmu@degroup@iter#1\gmu@degroup@end
}
```

```
\long\def\gmu@degroup@afterlet{%
  \gmu@if x{\degroup@lettoken\bgroup}%
  {\degroup@drainanditer}%
  {\gmu@if x{\degroup@lettoken\egroup}%
    {\degroup@drainanditer}%
    {\degroup@addanditer}%
  }%
}
```

```
\def\gmu@degroup@iter{%
  \futurelet\degroup@lettoken\gmu@degroup@afterlet}
```

```
\def\degroup@drainanditer{%
  \afterassignment\gmu@degroup@iter
  \let\gmu@drain=
}
```

```
\def\degroup@addanditer{%
  \gmu@if x{\degroup@lettoken\gmu@letspace}%
  {\addtotoks\degroup@toks{ }%
    \degroup@drainanditer
  }{%
    \degroup@addanditer@i
  }%
}
```

```
\long\def\degroup@addanditer@i
#1{%
  \gmu@if {strings}{#1\gmu@degroup@end}%
  {}% we've reached the end of iteration
  {% it's sth. to add
    \addtotoks\degroup@toks{#1}%
    \gmu@degroup@iter
  }%
}
```

```
\pdef\IfIntersect
```

This is a 4-argument command (not expandable) that checks whether the list of tokens `%` `#1` and `#2` have nonempty intersection in the sense of `\ifx` and if so it executes `#3` or `#4` otherwise:

`#1` first list to match,
`#2` second list to match,
`#3` if match (nonempty intersection),

#4 if not match (empty intersection).

```
{\gmu@ifintersect \gmu@ifxany}
```

```
\lpdef\gmu@ifintersect
#1% an iterating test (\gmu@ifxany, \gmu@ifstrany or \gmu@ifsbany so far)
#2% one list to match
#3% another list to match #4 (implicit) what if intersect
      #5 (implicit) what if don't
{%
  \let\IfIntersect@next\@secondoftwo
  \gmu@foreach #2\gmu@foreach@delim{%
    \@xa #1\gmu@forarg{#3}%
    {\let\IfIntersect@next\@firstoftwo
      \gmu@foreach@break
    }{}%
  }% of \gmu@foreach's #2.
  \IfIntersect@next
}
```

```
\pdef\gmu@ifstrintersect
{\gmu@ifintersect\gmu@ifstrany}
```

```
\pdef\gmu@ifsbintersect
{\gmu@ifintersect\gmu@ifsbany}
```

A somewhat generalised `\expandafter`:

\@XAtoks

```
\newtoks\@XAtoks
```

```
\long\pdef\@XA#1{%
  \@XAtoks={#1}%
  \@xa\the\@xa\@XAtoks}
```

```
\long\pdef\@ifinmeaning#1\of#2{%
        % #1 the token(s) whose presence we check,
        % #2 the macro in whose meaning we search #1 (the first token of this argument is expanded one level with \expandafter),
        % #3 the 'if found' stuff,
        % #4 the 'if not found' stuff.
  \@XA{\IfAmong#1\among}\@xa{#2}}
```

```
\gmu@DefSymbol\defNoHash
\gmu@DefSymbol\defHashy
\gmu@DefSymbol\boolean
```

```
\def\gmu@geteschar{%
```

A macro that edefines detokenised char of the charcode `\escapechar`

```
  \edef\gmu@xiieschar{%
    \gmu@CASE {num} {\escapechar <\z@}
    {}%
    \gmu@CASE {num}{\escapechar <32 }
    {\@xa \@firstofmany \string \blekotnizza\@nil}% not firstthreeofmany!!!!
```

```
    \gmu@CASE {num} {\escapechar=32 }
    { }% space cannot be "first of...".
    \gmu@lastCASE
    {\@xa \@firstofmany \string \blekotnizza \@nil}%
    \gmu@ESAC
  }%
}
```

```
\long\def\gmu@IfBooleanMacro#1{%
```

this macro should provide a yes-no answer (`\@firstoftwo`/`\@secondoftwo`).

```
  \gmu@ifedetokens{\meaning#1}{macro:->true}%
  {\@firstoftwo}%
  {\gmu@ifedetokens{\meaning#1}{macro:->false}%
    {\@firstoftwo}%
    {\@secondoftwo}%
  }%
}
```

```
\pdef\IfIs
#1% a CS
#2% \dimen, \long, \toks, \skip, \count, \dimexpr, \numexpr, \glueexpr, \newif
      for \iffalse and \iftrue, \if or \conditional for any Boolean test/switch,
      \def for a macro.
```

This test tells us in particular what kind of assignment may be applied to `#1`. Therefore it turns true for `#1` being e.g. primitive TEX's skip registers and `#2==\skip`.

```
{%
  \@tempswafalse
  \gmu@CASE x{\defNoHash#2}%
  {% case "def no hash" (hashless macro)
    \@tempswatrue
    \edef\gmu@IfIs@resa{%
      \pdef\@nx\gmu@IfIs@resa
      ####1\detokenize{macro:->}%
      ####2\@nx\@nil{\@ifnonempty{####2}}%
```

And we prepare applying thus defined macro to `#1`:

```
      \unexpanded{\@xa\gmu@IfIs@resa\meaning#1}%
      \detokenize{macro:->}\@nx\@nil
    }% of \edef
  }% of case hasless macro ("def no hash")
```

if not hashless

```
  \gmu@CASE x {\defHashy#2}%
  {%
```

case hashy macro

```
    \@tempswatrue
    \edef\gmu@IfIs@resa{%
      \pdef\@nx\gmu@IfIs@resa
      ####1\detokenize{macro:}####2\xiihash1####3->%
      ####4\@nx\@nil{\@ifnonempty{####4}}%
```

And we prepare applying thus defined macro to `#1`:

```
      \unexpanded{\@xa\gmu@IfIs@resa\meaning#1}%
      \detokenize{macro:}\xiihash1->\@nx\@nil
```

```
  }% of \edef
}% of case hashy macro
```

```
\gmu@CASE x {#2\boolean}
{% case Boolean
  \@tempswatrue
  \def\gmu@IfIs@resa{\gmu@IfBooleanMacro#1}%
}% of case Boolean
```

```
\gmu@CASEstrany #2{\dimexpr \numexpr \glueexpr }%
{% case ε-TeX expression
  \@tempswatrue
  \def\gmu@IfIs@resa{% if should be a macro expanding to expression contents
    \IfIsExpression #1#2}%
}% of case expression
```

The subsequent part of this huge test refers to `\meaning`s. We want to make it robust to possible (although rather seldom) changes of `\escapechar`. Therefore define an aux macro that expands to detokenised escape char.

Assume that letters, icluding »e«, will not be used as the escape char:

```
\gmu@geteschar
```

Now `\gmu@xiieschar` carries the detokenised escape char (is empty if `\escapechar` $<$ 0).

```
\gmu@CASE x {\dimen#2}%
{% Case dimen. Let's check if it's special (inner TeX's) or normal.
  \gmu@ifxany#1{\prevdepth \pagegoal \pagetotal \pagestretch
    \pagefilstretch \pagefillstretch \pagefilllstretch
    \pageshrink \pagedepth
    \hfuzz \vfuzz \overfullrule \emergencystretch \hsize \vsize
    \maxdepth \splitmaxdepth \boxmaxdepth \lineskiplimit
    \delimitershortfall \nulldelimiterspace \scriptspace
    \mathsurround \predisplaysize \displaywidth
    \displayindent \parindent \hangindent \hoffset \voffset
  }%
  {\@tempswatrue\let\gmu@IfIs@resa\@firstoftwo}%
  {% subcase normal dimen
    \def\gmu@IfIs@resa{%
      \gmu@ifexempty {\gmu@xiieschar}%
      {%
        \pdef\gmu@IfIs@resa####1####2####3####4####5####6\@nil{%
          \gmu@if {}
          {1%
            \if d####1\else0\fi
            \if i####2\else0\fi
            \if m####3\else0\fi
            \if e####4\else0\fi
            \if n####5\else0\fi
            1}%
        }% of inner \gmu@IfIs@resa…
      }% …if eschar negative
      {%
```

```
             \pdef\gmu@IfIs@resa####1####2####3####4####5####6####7\@nil{%
             %
          \gmu@if {} {1%
            \if \gmu@xiieschar ####1\else0\fi
            \if d####2\else0\fi
            \if i####3\else0\fi
            \if m####4\else0\fi
            \if e####5\else0\fi
            \if n####6\else0\fi
            1%
          }%
        }% of inner \gmu@IfIs@resa…
      }% …when eschar nonnegative
    }% of outer \gmu@IfIs@resa
  }% of if special dimen or not
}% of case dimen

\gmu@CASE x {\count#2}%
{% case count
  \gmu@ifxany#1{\spacefactor \prevgraf \deadcycles
    \insertpenalties
    \pretolerance \tolerance \hbadness \vbadness \linepenalty
    \hyphenpenalty \exhyphenpenalty \binoppenalty \relpenalty
    \clubpenalty \widowpenalty \displaywidowpenalty
    \brokenpenalty \predisplaypenalty \postdisplaypenalty
    \interlinepenalty \floatingpenalty \outputpenalty
    \doublehyphendemerits \finalhyphendemerits \adjdemerits
    \looseness \pausing \holdinginserts \tracingonline
    \tracingmacros \tracingstats \tracingparagraphs
    \tracingpages \tracingoutput \tracinglostchars
    \tracingcommands \tracingrestores \language \uchyph
    \lefthyphenmin \righthyphenmin \globaldefs
    \defaulthyphenchar \defaultskewchar \escapechar \endlinechar
    \newlinechar \maxdeadcycles \hangafter \fam \mag
    \delimiterfactor \time \day \month \year \showboxbreadth
    \showboxdepth \errorcontextlines
    \lastlinefit
  }%
  {% if special count register then:
    \@tempswatrue\let\gmu@IfIs@resa\@firstoftwo}%
  {%
```

if normal count register then

```
    \def\gmu@IfIs@resa{%
      \gmu@ifexempty \gmu@xiieschar
      {\pdef\gmu@IfIs@resa####1####2####3####4####5####6\@nil{%
          \gmu@if {} {1%
            \if c####1\else0\fi
            \if o####2\else0\fi
            \if u####3\else0\fi
            \if n####4\else0\fi
            \if t####5\else0\fi
            1%
           }% of test
        }% of inner \gmu@IfIs@resa…
      }% … when eschar is negative

      {% eschar not empty (nonnegative)
             \pdef\gmu@IfIs@resa####1####2####3####4####5####6####7\@nil{%
             %
          \gmu@if {} {1%
            \if \gmu@xiieschar####1\else0\fi
            \if c####2\else0\fi
            \if o####3\else0\fi
            \if u####4\else0\fi
            \if n####5\else0\fi
            \if t####6\else0\fi
            1%
          }% of test
        }% of inner \gmu@IfIs@resa…
      }% … when eschar nonnegative
    }% of outer \gmu@IfIs@resa
  }% of if normal count register
}% of case count

\gmu@CASE x {\skip#2}%
{% case skip
  \gmu@ifxany#1{%
    \baselineskip \lineskip \parskip \abovedisplayskip
    \abovedisplayshortskip \belowdisplayskip
    \belowdisplayshortskip \leftskip \rightskip \topskip
    \splittopskip \tabskip \spaceskip \xspaceskip \parfillskip
  }%
  {% if special skip
    \@tempswatrue\let\gmu@IfIs@resa\@firstoftwo}%
  {% not special skip
    \def\gmu@IfIs@resa{%
      \gmu@ifexempty \gmu@xiieschar
      {\pdef\gmu@IfIs@resa####1####2####3####4####5\@nil{%
          \gmu@if {} {1%
            \if s####1\else0\fi
            \if k####2\else0\fi
            \if i####3\else0\fi
            \if p####4\else0\fi
            1%
          }%
        }% of inner \gmu@IfIs@resa…
      }% …when eschar nonnegative

      {\pdef\gmu@IfIs@resa####1####2####3####4####5####6\@nil{%
          \gmu@if {} {1%
            \if \gmu@xiieschar ####1\else0\fi
            \if s####2\else0\fi
            \if k####3\else0\fi
            \if i####4\else0\fi
```

```
            \if p####5\else0\fi
            1%
          }%
        }% of inner \gmu@IfIs@resa…
      }% …when eschar nonnegative
    }% of outer \gmu@IfIs@resa
  }% of if skip but not special
}% of case skip

\gmu@CASE x {\toks#2}
{% case toks
  \gmu@ifxany#1{%
    \output \everypar \everymath \everydisplay \everyhbox
    \everyvbox \everyjob \everycr \errhelp \everyeof}%
  {% subcase special toks
    \@tempswatrue\let\gmu@IfIs@resa\@firstoftwo}%
  {% subcase normal toks
    \def\gmu@IfIs@resa{%
      \gmu@ifexempty \gmu@xiieschar
      {\pdef\gmu@IfIs@resa####1####2####3####4####5\@nil{%
          \gmu@if {} {1%
            \if t####1\else0\fi
            \if o####2\else0\fi
            \if k####3\else0\fi
            \if s####4\else0\fi
            1%
            }%
          }% of inner \gmu@IfIs@resa…
        }% …when eschar negative
      {\pdef\gmu@IfIs@resa####1####2####3####4####5####6\@nil{%
          \gmu@if {} {1%
            \if \gmu@xiieschar ####1\else0\fi
            \if t####2\else0\fi
            \if o####3\else0\fi
            \if k####4\else0\fi
            \if s####5\else0\fi
            1%
            }%
          }% of inner \gmu@IfIs@resa…
        }% …when eschar nonnegative
    }% of outer \gmu@IfIs@resa
  }% of if toks but not special
}% of case toks

\gmu@CASE x {\long#2}%
```

if a macro is `\long`, then these detokens open its meaning despite of possible `\outer`.

```
{% case long macro
  \def\gmu@IfIs@resa{%
    \gmu@ifexempty \gmu@xiieschar
    {\pdef\gmu@IfIs@resa####1####2####3####4####5\@nil{%
        \gmu@if {} {1%
          \if l####1\else0\fi
          \if o####2\else0\fi
```

```
     \if n####3\else0\fi
     \if g####4\else0\fi
     1%
    }%
   }% of inner \gmu@IfIs@resa…
  }% …when eschar negative
  {\pdef\gmu@IfIs@resa####1####2####3####4####5####6\@nil{%
    \gmu@if {} {1%
     \ifnum \gmu@xiieschar ####1\else0\fi
     \if l####2\else0\fi
     \if o####3\else0\fi
     \if n####4\else0\fi
     \if g####5\else0\fi
     1%
    }%
   }% of inner \gmu@IfIs@resa…
  }% …when eschar nonnegative
 }% of outer \gmu@IfIs@resa
}% of case \long Note that we also can put here a test whether the meaning begins with macro which would mean that a macro is short.
\gmu@CASE x {\newif#2}%
{% case \newif (Boolean switch)
 \def\gmu@IfIs@resa{%
  \gmu@ifexempty \gmu@xiieschar
  {\pdef\gmu@IfIs@resa####1####2####3%
   ####4####5####6####7####8\@nil{%
    \gmu@unless {} {0% lazy disjunction
     \gmu@if {} {1% lazy conjunction
      \if i####1\else0\fi
      \if f####2\else0\fi
      \if f####3\else0\fi
      \if a####4\else0\fi
      \if l####5\else0\fi
      \if s####6\else0\fi
      \if e####7\else0\fi
      1%
     }%
     {}{0}%
     \gmu@if {} {1% lazy conjunction
      \if i####1\else0\fi
      \if f####2\else0\fi
      \if t####3\else0\fi
      \if r####4\else0\fi
      \if u####5\else0\fi
      \if e####6\else0\fi
      \if \relax####7\else0\fi
      1%
     }%
     {}{0}%
     0%
    }%
   }% of inner \gmu@IfIs@resa…
  }% …when eschar nonnegative
```

```
    {\pdef\gmu@IfIs@resa####1####2####3%
      ####4####5####6####7####8####9\@nil{%
        \gmu@unless {} {0%
          \gmu@if {} {1%
            \if \gmu@xiieschar ####1\else0\fi
            \if i####2\else0\fi
            \if f####3\else0\fi
            \if f####4\else0\fi
            \if a####5\else0\fi
            \if l####6\else0\fi
            \if s####7\else0\fi
            \if e####8\else0\fi
            1%
          }%
          {}{0}%
          \gmu@if {} {1%
            \if \gmu@xiieschar ####1\else0\fi
            \if i####2\else0\fi
            \if f####3\else0\fi
            \if t####4\else0\fi
            \if r####5\else0\fi
            \if u####6\else0\fi
            \if e####7\else0\fi
            \if \relax####8\else0\fi
            1%
          }%
          {}{0}%
          0%
        }%
      }% of inner \gmu@IfIs@resa…
    }% …when eschar nonnegative
  }% of outer \gmu@IfIs@resa
}% of case \newif (Boolean switch)

\gmu@CASE {x\@xa\@xa} {\csname if\endcsname#2}%
{% case \if test
  \def\gmu@IfIs@resa{%
    \gmu@ifexempty \gmu@xiieschar
    {\pdef\gmu@IfIs@resa####1####2####3\@nil{%
        \gmu@if {} {1%
          \if i####1\else0\fi
          \if f####2\else0\fi
          1%
        }%
      }% of inner \gmu@IfIs@resa…
    }% …when eschar negative

    {\pdef\gmu@IfIs@resa####1####2####3####4\@nil{%
        \gmu@if {} {1%
          \if \gmu@xiieschar ####1\else0\fi
          \if i####2\else0\fi
          \if f####3\else0\fi
          1%
        }%
```

```
          }% of inner \gmu@IfIs@resa…
        }% …when eschar nonnegative
      }% of outer \gmu@IfIs@resa
  }% of case \if

  \gmu@lastCASE %
  {false}{}{}%
  \gmu@ESAC
```

For the cases 1–n we just launch their auxiliary macro:

```
  \if@tempswa
    \@xa\gmu@IfIs@resa
  \else
```

For the other cases their auxiliary macro defines “inner `@resa`” (protected) which perform the test on the meaning of `#1`.

```
      \gmu@IfIs@resa
```

now (new) `\gmu@IfIs@resa` it’s defined as delimited with `#2` and `\@nil` (if `#1` may be one of kinds checked letter by letter).

```
      \edef\gmu@IfIs@resb{%
      \gmu@IfIs@resa\meaning#1%
      \relax\relax\relax\relax\relax\relax\relax\relax % to provide something for gobbling tests.
      \@xa\detokenize\@xa{\string#2}\@nx\@nil}%
    \@xa\gmu@IfIs@resb
  \fi
}% of \IfIs

\unless\ifdefined\@tempskipa\newskip\@tempskipa\fi
\unless\ifdefined\@tempmuskipa\newmuskip\@tempmuskipa\fi

\long\def\IfIsExpression
#1% the stuff to be examined
#2% \dimexpr, \glueexpr, \numexpr or \muexpr
{%
  \ifx#2\numexpr\let\next\@tempcnta\fi
  \ifx#2\glueexpr\let\next\@tempskipa\fi
  \ifx#2\dimexpr\let\next\@tempdima\fi
  \ifx#2\muexpr\let\next\@tempmuskipa\fi
  \afterassignment\gmu@testtopenalty
  \next=#2#1\penalty
}

\def\gmu@testtopenalty#1\penalty{%
  \gmu@ifempty{#1}}
```

Global Boolean switches

The `\newgif` declaration’s effect is used even in the LaTeX 2ε source by redefining some particular user defined ifs (UD-ifs henceforth) step by step. The goal is to make the UD-if’s assignment global. I needed it at least twice during **gmdoc** writing so I make it a macro. It’s an almost verbatim copy of LaTeX’s `\newif` modulo the letter g and the `\global` prefix. (File d: **ltdefns.dtx** Date: 2004/02/20 Version v1.3g, lines 139–150)

`\newgif`

```
\pdef\newgif#1{%
```

```
 {\escapechar\m@ne
   \global\let#1\iffalse
   \@gif#1\iftrue
   \@gif#1\iffalse
 }}
```

'Almost' is also in the detail that in this case, which deals with `\global` assignments, we don't have to bother with storing and restoring the value of `\escapechar`: we can do all the work inside a group.

```
\def\@gif#1#2{%
 \protected\@xa\gdef\csname\@xa\@gobbletwo\string#1%
 g% the letter g for '\global'.
 \@xa\@gobbletwo\string#2\endcsname
 {\global\let#1#2}}
```

```
\pdef\newif#1{% We not only make \newif \protected but also make it to define
          \protected assignments so that premature expansion doesn't affect \if…\fi
          nesting.
 \count@\escapechar \escapechar\m@ne
 \let#1\iffalse
 \@if#1\iftrue
 \@if#1\iffalse
 \escapechar\count@}
```

```
\def\@if#1#2{%
 \protected \@xa\def\csname\@xa\@gobbletwo\string#1%
 \@xa\@gobbletwo\string#2\endcsname
 {\let#1#2}}
```

```
\pdef\hidden@iffalse{\iffalse}
\pdef\hidden@iftrue{\iftrue}
```

After `\newgif\iffoo` you may type `{\foogtrue}` and the `\iffoo` switch becomes globally equal `\iftrue`. Simili modo `\foogfalse`. Note the letter *g* added to underline globalness of the assignment.

If for any reason, no matter how queer ;-) may it be, you need *both* global and local switchers of your `\if…`, declare it both with `\newif` and `\newgif`.

Note that it's just a shorthand. `\global\if`⟨*switch*⟩(`true`|`false`) *does* work as expected.

There's a trouble with `\refstepcounter`: defining `\@currentlabel` is local. So let's `\def` a `\global` version of `\refstepcounter`.

Warning. I use it because of very special reasons in **gmdoc** and in general it is probably not a good idea to make `\refstepcounter` global since it is contrary to the original LaTeX approach.

`\grefstepcounter`

```
\pdef\grefstepcounter#1{%
 {\let\protected@edef=\protected@xdef\refstepcounter{#1}}}
```

Naïve first try `\globaldefs=\tw@` raised an error `unknown command \reserved@e`. The matter was to globalize `\protected@edef` of `\@currentlabel`.

Thanks to using the true `\refstepcounter` inside, it observes the change made to `\refstepcounter` by **hyperref**.

2008/08/10 I spent all the night debugging `\penalty 10000` that was added after a hypertarget in vertical mode. I didn't dare to touch **hyperref**'s guts, so I worked it around with ensuring every `\grefstepcounter` to be in hmode:

```
\pdef\hgrefstepcounter#1{%
  \ifhmode\leavevmode\fi\grefstepcounter{#1}}
```

By the way I read some lines from *The TEX book* and was reminded that `\unskip` strips any last skip, whether horizontal or vertical. And I use `\unskip` mostly to replace a blank space with some fixed skip. Therefore define

```
\pdef\hunskip{\ifhmode\unskip\fi}
```

Note the two macros defined above are `\protected`. I think it's a good idea to make `\protected` all the macros that contain assignments. There is one more thing with `\ifhmode`: it can be different at the point of `\edef` and at the point of execution.

Another shorthand. It may decrease a number of `\expandafter`s e.g.

`\glet`

```
\def\glet{\global\let}
```

And for use in the very document,

`\addtomacro`

```
\lpdef\addtomacro
#1% macro (has to be parameterless)
#2% stuff to be added
{\edef #1{\@xau #1\unexpanded{#2}}}
```

We use unexpanded edef to allow `#` tokens in `#2`. Note that LATEX's `\g@addto@macro` uses analogous trick from the pre-ε-TEX era (scratch toks register and `\edef`).

Note that `\addtomacro` loses the possible prefixes of the previous version of `#1` but may be prefixed on its own (anyway, what's the use of `\long` for a macro with no parameters? And who on Earth uses `\outer`?).

Note moreover it works fine also for `#1`'s that are `\protected` because `\expandafter` hits first and always works.

A `\global` version:

```
\pdef\gaddtomacro{\global\addtomacro}
```

2008/08/09 I need to prepend something not add at the end—so

```
\long\def\prependtomacro#1#2{%
  \edef#1{\unexpanded{#2}\@xa\unexpanded\@xa{#1}}}
```

Note that `\prependtomacro` can be prefixed.

`\addtotoks`

```
\lpdef\addtotoks#1#2{%
  #1=\@xa{\the#1#2}}
```

`\gmu@prependtoks@aux`

```
\newtoks\gmu@prependtoks@aux
```

```
\lpdef\gmu@prependtotoks@ambig
#1% scope
#2% toks register
#3% text of prependement
{%
  \iffalse {\fi % hack to balance braces in definition
    \@XA{%
      #1#2=\bgroup#3%
    }% during execution, this brace closes the \@XA's argument…
    \the#2}% and this one closes the text opened by \bgroup, i.e., the text of \toks
          assignment.
}
```

`\prependtotoks`

```
\lpdef\prependtotoks
```

the ”looocal” version (2010/11/10)

```
#1% toks register
#2% text to be prepended
{\gmu@prependtotoks@ambig {}{#1}{#2}}%
```

```
\lpdef\gprependtotoks
```

the ”global” version (2010/11/10)

```
#1% toks register
#2% text to be prepended
{\gmu@prependtotoks@ambig \global{#1}{#2}}%
```

Adding an element to a list iterated by by `\@for`

`\addto@forlist`

```
\long\def\addto@forlist
#1% a comma-separated list
#2% the element(s) added
{\ifx#1\@empty
    \@xa\@gobble
  \else\@xa\@firstofone
  \fi
  {\addtomacro#1{,}}%
  \addtomacro#1{#2}%
}
```

```
\lpdef\eaddtomacro
#1% a macro
#2% stuff to be added (will be fully expanded)
{\edef#1{\@xau#1#2}}
```

`\gm@ifundefined`—a test that doesn’t create any hash entry unlike `\@ifundefined`

I define it under another name not redefine `\@ifundefined` because I can imagine an odd case when something works thanks to `\@ifundefined`’s ‘relaxation’ effect.

```
\long\def\gmu@ifundefined #1{% not \protected because expandable.
```

```
  \gmu@CASEnot {csname} {#1\endcsname}% defined…
  {\@firstoftwo}%
  \gmu@CASE  {x\@xa\@xa} {\csname #1\endcsname\relax}% but only as \relax—then 2nd argument.
  {\@firstoftwo}%
```

defined and not `\relax`—then 3rd argument.

```
  \gmu@lastCASE
  {\@secondoftwo}%
  \gmu@ESAC
}
```

```
\long\def\gmu@ifdefined #1#2#3{%
  \gmu@ifundefined {#1}{#3}{#2}}
```

While `\gmu@if(un)defined` are intended for csnames and any macros present in their `#1` are expanded, the next two are intended for `#1` being a single CS or an active char. It’s the active char’s case why we write all *da capo*.

```
\long\def \gmu@ifCSdefined#1{%
```

```
  \gmu@CASEnot {defined} {#1}
  {\@secondoftwo}%
  \gmu@CASE x {\relax #1}
  {\@secondoftwo}%
  \gmu@EatCases
  {\@firstoftwo}%
  \gmu@ESAC
}
```

```
\long\def\CSNameIf
#1% the name to check and probably execute
```

2 stuff when the CS#1 defined

3 stuff when the CS#1 not defined

```
{%
  \ifcsname #1\endcsname
    \@xa\@twoofthree
  \else\@xa\@thirdofthree
  \fi
  {\csname #1\endcsname}%
}
```

Some 'other' and active stuff

Here I define a couple of macros expanding to special chars made 'other'. It's important the CS are expandable and therefore they can occur e.g. inside `\csname…\endcsname` unlike e.g. CS'es `\chardefed`.

\subs

```
\foone{\catcode`\_=8 }
{\let\subs=_}
```

\sups

```
\foone{\catcode`\^=7 }
{\let\sups=^}
```

```
\foone{\@makeother\_}
{\def\xiiunder{_}}
```

```
\let\all@unders\xiiunder
\foone{\catcode`\_=8 }
{\addtomacro\all@unders{_}}
\foone{\catcode`\_=11 }
{\addtomacro\all@unders{_}}
\foone{\catcode`\_=13 }
{\addtomacro\all@unders{_}}
```

Now `\all@unders` bears underscores of categories 8, 11, 12 and 13.

```
\foone{\@makeother\^^M}{\def\xiiM{
  }}%
```

```
\def\all@stars{*}
\foone{\catcode`\*=11 }
{\addtomacro\all@stars{*}}
\foone{\catcode`\*=13 }
{\addtomacro\all@stars{*}}
```

And `\all@stars` bears stars of categories 11, 12 and 13.

```
\def\all@spaces{ }
\foone{\@makeother\ }{%
\addtomacro\all@spaces{ }%
}
\foone{\obeyspaces}{%
\addtomacro\all@spaces{ }%
}
```

```
\foone\obeylines{%
  \def\two@Ms{
  }}
\foone{\@makeother\^^M}{%
  \addtomacro\two@Ms{
  }}
```

```
\edef\spaces@and@Ms{\@xau{\all@spaces}\@xau{\two@Ms}}
```

```
\ifdefined\XeTeXversion
  \chardef\_="005F
\fi
```

```
\foone{\@makeother\`}%
{\def\backquote{`}}
```

```
\foone{\catcode`\[=1 \@makeother\{
  \catcode`\]=2 \@makeother\}}%
[%
  \def\xiilbrace[{]%
  \def\xiirbrace[}]%
]% of \firstofone
```

Note that LaTeX's `\@charlb` and `\@charrb` are of catcode 11 ('letter'), cf. The LaTeX 2_ε Source file k, lines 129–130.

Now, let's define such a smart _ (underscore) which will be usual $\_{}_8$ in the math mode and $\_{}_{12}$ ('other') outside math.

```
\foone{\catcode`\_=\active}
{%
```

\smartunder

```
  \pdef\smartunder{%
    \catcode`\_=\active
    \def_{%
      \ifincsname\xiiunder
      \else
        \ifmmode\subs
        \else\xiiunder %
        \fi
      \fi}}}%
```

We define it as `\_` not just as `\xiiunder` because some font encodings don't have _ at the `\char`_` position.

```
\foone{\catcode`\!=0
  \@makeother\\}
```

\xiibackslash

```
{!newcommand*!xiibackslash{\}}
```

\bslash

```
\let\bslash=\xiibackslash
```

```
\foone{\@makeother\%}
{\def\xiipercent{%}}
```

```
\foone{\@makeother\&}%
{\def\xiiand{&}}
```

```
\foone{\@makeother\ }%
{\def\xiispace{ }}
```

```
\foone{\@makeother\#}%
{\def\xiihash{#}}
```

We introduce `\visiblespace` from Will Robertson's **xltxtra** if available. It's not sufficient `\@ifpackageloaded{xltxtra}` since `\xxt@visiblespace` is defined only unless `no-verb` option is set. 2008/08/06 I recognised the difference between `\xiispace` which has to be plain 'other' char (used in `\xiistring`) and something visible to be printed in any font.

```
\AtBeginDocument{%
  \ifdefined\xxt@visiblespace
    \let\visiblespace\xxt@visiblespace
    \def\xxt@visiblespace@fallback{{%
        \fontspec{Latin Modern Mono}\textvisiblespace}}%
  \else
    \let\visiblespace\xiispace
  \fi}
```

```
\foone\obeyspaces{\def\gmu@activespace{ }}
```

```
\foone\obeylines{\def\activeM{^^M}}
```

```
\pdef\makeblanksignored{%
  \catcode`\^^M=9\relax
  \catcode`\^^I=9\relax
  \catcode`\ =9\relax}
```

```
\pdef\fooblanksignored{%
  \foone{\makeblanksignored}%
}
```

`\@ifnextcat`, `\@ifnextac`, catcode-independent `\gm@ifstar`, `\@ifnextnotgroup`, `\@ifnextgroup`

As you guess, we `\def` `\@ifnextcat` à la `\@ifnextchar`, see LaTeX 2ε source dated 2003/12/01, file d, lines 253–271. The difference is in the kind of test used: while `\@ifnextchar` does `\ifx`, `\@ifnextcat` does `\ifcat` which means it looks not at the meaning of a token(s) but at their `\catcode`(s). As you (should) remember from *The TEX book*, the former test doesn't expand macros while the latter does. But in `\@ifnextcat` the peeked token is protected against expanding by `\noexpand`. Note that the first parameter is not protected and therefore it shall be expanded if it's expandable. Because an assignment is involved, you can't test whether the next token is an active char. But you can test if the next token is $\{_1$ or $\}_2$: `\@ifnextcat\bgroup`…, `\@ifnextcat\egroup`….

```
\long\pdef\edefU#1#2{%
```

This is to allow passing the hashes.

```
  \edef#1{\unexpanded{#2}}%
}
```

```
\long\pdef\xdefU#1#2{%
```

This is to allow passing the hashes.

```
  \xdef#1{\unexpanded{#2}}%
}
```

```
\long\pdef\@ifnextcat#1#2#3{%
  \edefU\reserved@d{#1}%
  \edefU\reserved@a{#2}%
  \edefU\reserved@b{#3}%
  \futurelet\@let@token\@ifncat}
```

```
\def\@ifncat{%
  \ifx\@let@token\@sptoken
    \let\reserved@c\@xifncat
  \else
    \ifcat\reserved@d\@nx\@let@token
      \let\reserved@c\reserved@a
    \else
      \let\reserved@c\reserved@b
    \fi
  \fi
  \reserved@c}
```

```
{\def\:{\let\@sptoken= } \global\: % this makes \@sptoken a space token.
```

```
\def\:{\@xifncat} \@xa\gdef\: {\futurelet\@let@token\@ifncat}}
```

Note the trick to get a macro with no parameter and requiring a space after it. We do it inside a group not to spoil the general meaning of `\:` (which we extend later).

The next command provides the real `\if` test for the next token. *It* should be called `\@ifnextchar` but that name is assigned for the future `\ifx` text, as we know. Therefore we call it `\@ifnextif`.

Having `\@ifnextcat` defined, let's apply it immediately. Similar thing does probably the **xspace** package.

```
\pdef\spifletter{\@ifnextcat a{\space}{}}
```

```
\long\pdef\@ifnextif#1#2#3{%
```

(the future token in `\noexpand`ed, unlike `#1`)

```
  \def\reserved@d{#1}%
  \def\reserved@a{#2}%
  \def\reserved@b{#3}%
  \futurelet\@let@token\@ifnif}
```

`\@ifnif`

```
\def\@ifnif{%
  \ifx\@let@token\@sptoken
    \let\reserved@c\@xifnif
  \else
    \if\reserved@d\@nx\@let@token
      \let\reserved@c\reserved@a
    \else % #1 of \@ifnextif is not \if-equivalent the future token. But this may
          be because the future token is active so it would be \if-equivalent if not
          passed through \futurelet. Let's manage this case.
      \begingroup
      \edef\gmu@tempa{%
        \lccode`\@nx~=`\reserved@d
      }\gmu@tempa
      \lowercase{\endgroup
        \ifx~}\@let@token
2798          \let\reserved@c\reserved@a
2799        \else
2800          \let\reserved@c\reserved@b
2801        \fi
2802      \fi
2803    \fi
2804    \reserved@c}
```

```
2807 {\def\:{\let\@sptoken= } \: % this makes \@sptoken a space token.
2809 \def\:{\@xifnif} \@xa\gdef\: {\futurelet\@let@token\@ifnif}}
```

But how to peek at the next token to check whether it's an active char? First, we look with `\@ifnextcat` whether there stands a group opener. We do that to avoid taking a whole `{…}` as the argument of the next macro, that doesn't use `\futurelet` but takes the next token as an argument, tests it and puts back intact.

```
2820 \long\pdef\@ifnextac#1#2{%
2821   \@ifnextnotgroup
2822   {\gmu@ifnac{#1}{#2}}%
2823   {#2}}
```

```
2825 \long\def\gmu@ifnac#1#2#3{%
2826   \ifcat\@nx~\@nx#3%
2827     \@xa\@firstoftwo
2828   \else\@xa\@secondoftwo
2829   \fi{#1#3}{#2#3}}
```

Yes, it won't work for an active char `\let` to $\{_1$, but it *will* work for an active char `\let` to a char of catcode $\neq 1$. (Is there anybody on Earth who'd make an active char working as `\bgroup` not just recatcode it to $_1$?)

Having defined such tools, let's redefine `\gmu@ifstar` to make it work with whatever catcode ⋆ may be. make a version of `\gmu@ifstar` that would work with $\star_{11}$.

```
2843 \pdef\gmu@lowstar{%
2844   \iffontchar\font"22C6 \char"22C6 \else\gmu@lowstarfake\fi
2845 }% we could define it to be expandable (with ^^^^22c6) but the only goal of it would be allowing this low star in \csname…\endcsname. But it would be misleading (not everyone can easily distinguish * from ⋆) so IMHO it's better to raise an error should such an active occur in a \csname. This macro is intended to be \let to an active star only in verbatims. For usual text there's
```

Commands around making star low (via `\activeation`) are defined in line 13111 because they use `\DeclareCommand`.

```
2858 \def\gmu@tempa{⋆}
2859 \foone{\catcode`\⋆=\active}
2860 {\def\gmu@tempb{⋆}% it's defined in line ?? to make ⋆ defined (when it was undefined, % \newcommand's \gm@ifstar test turned true, the next undefined token was gobbled and raised an error).
2864   \let⋆=\gmu@lowstar}
```

```
2867 \edef\gmu@tempa{%
2868   \long\pdef\@nx\gmu@ifstar##1##2{%
2871     \@nx\@ifnextif\gmu@tempa%
2872     {\@nx\@firstoftwo{##1}}% it's a bit hacky but O.K.: if the condition is not satisfied, the following brace is taken
```

```
    {%
      \@nx\@ifnextchar\@xa\@nx\gmu@tempb
      {\@nx\@firstoftwo{##1}}% and again, if the condition is not satisfied, the second brace is taken.
      {##2}%
    }% of if not ⋆12
  }% of \gmu@ifstar.
}\gmu@tempa
```

A test whether we can pick a single token. We have to check whether we are not next to `{` and whether we are not next to `}`.

```
\long\pdef\@ifnextnotgroup#1#2{% This macro checks whether the next token is able to be picked or is it a braced list of tokens or is it a group closer so there's no token to be picked.
  \@ifnextcat\bgroup{#2}{%
    \@ifnextcat\egroup{#2}%
    {#1}}}
```

```
\long\pdef\@ifnextgroup#1#2{% Note this macro turns true both before a group opener and before a group closer.
  \@ifnextnotgroup{#2}{#1}}
```

now let's apply this to sth. useful (used in **gmverse** and in some typesetting, e.g. for prof. JSB.

```
\pdef\ignoreactiveM{%
  \@ifnextgroup{}{\gmu@checkM}%
}
```

```
\foone\obeylines{% we know it's a single token since we use this macro only in \@ifnextgroup's 'else'.
  \long\pdef\gmu@checkM#1{%
    \ifx
    #1\@xa\ignoreactiveM%
    \else\@xa#1\fi %
  }%
}
```

Now, define a test that checks whether the next token is a genuine space, $_{10}$ that is. First define a CS let such a space. The assignment needs a little trick (*The TEX book* appendix D) since `\let`'s syntax includes one optional space after `=`.

```
\let\gmu@reserveda\⋆%
\def\⋆{%
  \let\⋆\gmu@reserveda
  \let\gmu@letspace= }%
\⋆ %
```

The TEX book chapter 8, 10th double bend says, if we read thoroughly (or meet this perversity in our daily TEXing), that a blank line (`^^M^^M` of catcode 5, the two subsequent chars of catcode 5 (preceded with sth. else)) are transformed in `\par`—a blank space (cat. 10) folloowed by `\par`. This strange case we *don't* want to treat as 'next is space', as TEX itself doesn't (a letter CS gobbles such a space).

```
\lpdef\gmu@peep@next #1{%
```

This macro performs `\futurelet` to `\@let@token`, checks if we are in this strange case of a blank space before `\par` (and fixes `\@let@token` if so), moreover, if `\@let@token` turns out to be undefined or `\relax`, it grabs the next token (thus surely single and not `\outer`) and passes as the contents of `\@def@token` (which is un-defined each time).

Therefore `#1` for it may be branched with `\ifdefined\@def@token`.

```
  \let\@def@token\@undefined
  \edefU\gmu@peepnext@inner {%
    \gmu@CASE x {\@let@token\gmu@letspace}%
    {\@ifnextchar\par
      {#1}
      {\let\@let@token= \gmu@letspace % note = and blank space
        \@XA{#1}\space
      }%
    }% of if \futurelet detected a blank space

    \gmu@CASE {AnyClause} % if any of the conditions below:
    {{ x {\@let@token\@undefined}
        x {\@let@token\relax}}} % it's arg of disjunction then we grab the next token into the \@def@token macro.
    {\gmu@peep@hash{#1}}%
    \gmu@lastCASE
    {#1}%
    \gmu@ESAC
  }%
  \futurelet\@let@token\gmu@peepnext@inner
}

\lpdef\gmu@peep@hash
#1% stuff that probably tests #2 somehow
#2% a single token, which we are sure is undefined or \relax (and thus not \outer neither a blank space)
{%
  \def\@def@token{#2}%
  #1%
  #2%
}

\lpdef\gmu@ifpeeped
#1% kind of comparison
#2% stuff to compare
{%
  \gmu@if {defined} {\@def@token}
  {\@XA{\gmu@if {#1}}\@xa{\@def@token #2}}
  {\gmu@if {#1} {\@let@token #2}}%
}
```

`\@ifnextspace`

```
\long\pdef\@ifnextspace
#1% if yes
#2% if not
{%
```

Note that this macro doesn't gobble space(s)

```
  \gmu@peep@next
  {\gmu@if x {\@let@token\gmu@letspace}{#1}{#2}}%
}
```

First use of this macro is for an active `-` that expands to `---` if followed by a space. Another to make dot checking whether is followed by `~` without gobbling the space if it occurs instead.

The next—in the **gmdoc** bundle not to gobble spaces following `%`, which is crucial for determining whether there is a DocStrip directive or not. But this is done with a wrapper for both `\@ifnextspace` and `\@ifnextchar`:

“if next char” that respects spaces

`\@ifnextcharRS`

```
\long\pdef\@ifnextcharRS
#1% a single token (will be \ifxed)
#2% what if yes
#3% what if not
{%
  \gmu@peep@next
  {\gmu@if {defined} {\@def@token}
    {\@XA{\gmu@if {StrX}}\@xa {\@def@token #1}}% of the special “null” case
```

```
    {\gmu@if x {\@let@token #1}}%
    {#2}{#3}%
  }% of \gmu@peep@next
}
```

“if next any” that respects spaces

`\@ifnextanyRS`

```
\long\pdef\@ifnextanyRS
#1% list of tokens (any balanced text, will be \let token after token
#2% what if next is one of listed #1
#3% what if not
{\gmu@peep@next
  {\gmu@if {defined} {\@def@token}
    {\@xa \gmu@ifStrXany \@def@token }
```

otherwise we are next to a defined and not `\relax` token so

```
    {\gmu@ifxany {\@let@token}}%
    {#1}{#2}{#3}%
  }% of peep
}
```

Some (quite large) chunks of commented out code were here till v0.240.

```
\long\def\gmu@ifnextStrXany
```

We call this macro only in the true branch of `\ifx\@let@token#1`

```
#1% outer macro’s tested list of tokens
#2% “if found” branch
#3% “if not found” branch
{\gmu@notif {AnyClause}
  {{ x {\@let@token\@undefined} x {\@let@token\relax}}}%
  {#2}%
```

Some (i.e. *both*) `\@undefined` or `\relax`, then we compare strings

```
  {\gmu@futureifany {#2}{#3}{#1}}%
}
```

```
\long\def\gmu@futureifany
```

As above.

```
#1% what if OK
#2% what if not OK
#3% list of tokens
#4% token ot be checked against #3 (and put back on the input) Note we use this macro
      only where we know #4 is either undefined or \relax.
{\gmu@ifstrany #4 {#3}{#1}{#2}#4}
```

“if next any” that ignores space(s)

\@ifnextanyIS

```
\long\pdef\@ifnextanyIS
#1% list of tokens (any balanced text, will be \let token after token
#2% what if next is one of listed in #1
#3% what if not
{%
  \edefU\gmu@ifna@afterlet{%
    \gmu@if x{\@let@token\gmu@letspace}%
    {% if next is blank space, we drop it and retry:
      \edefU\gmu@ifna@resa{\@ifnextanyIS{#1}{#2}{#3}}%
      \afterassignment\gmu@ifna@resa
      \let\gmu@drain=
    }%
    {% else we perform \gmu@ifnextanyIS
      \gmu@ifxany{\@let@token}{#1}{%
        \gmu@ifnextStrXany {#1}{#2}{#3}%
      }%
      {#3}%
    }%
  }% of the after-let macro
  \futurelet\@let@token\gmu@ifna@afterlet
}% of \@ifnextanyIS
```

\@ifnextnoneRS

```
\long\pdef\@ifnextnoneRS
#1% list of tokens (any balanced text, will be \let token after token
#2% what if next is one of listed #1
#3% what if not
{%
  \@ifnextanyRS{#1}{#3}{#2}%
}
```

If-next-group respecting spaces

```
\long\pdef\@ifnextgroupRS #1#2{%
```

Note that this macro doesn’t gobble space(s)

```
  \gmu@peep@next
  {\gmu@if x{\@let@token\bgroup}{#1}%
    {\gmu@if x{\@let@token\egroup}{#1}{#2}}%
  }%
}
```

```
\long\pdef\@ifnextnotgroupRS#1#2{%
  \@ifnextgroupRS{#2}{#1}}
```

What seems worth noticing is that my if-nexts don’t use `\reserved@(a|…|d)` and set `\@let@token` properly.

Now a test if the next token is an active line end. I use it in **gmdoc** and later in this package for active long dashes.

```
3133 \foone\obeylines{%
3134   \long\pdef\@ifnextMac#1#2{%
3135     \@ifnextchar^^M{#1}{#2}}}
```

Standard `\string` command returns a string of 'other' chars except for the space, for which it returns $_{10}$. In **gmdoc** I needed the spaces in macros' and environments' names to be always $_{12}$, so I define

```
\xiistring  3145 \long\def\xiistring#1{%
            3146   \if\@nx#1\xiispace
            3147     \xiispace
            3148   \else
            3149     \afterfi{\string#1}% to make the same error as bare \string would cause in
                            case of empty #1.
            3151   \fi}
```

The next macro is applied to a `\detokenized` nonempty string to convert the spaces into 'other'.

```
3155 \def\@xiispaces#1 #2\@nil{%
3156   #1%
3157   \ifx\@xiispaces#2\@xiispaces
3158   \else
3159   \xiispace
3160   \afterfi{\@xiispaces#2\@nil}%
3161   \fi}
```

```
3163 \long\pdef\xiiEdetoke
3164 #1% a scratch CS
3165 #2% stuff to be fully expanded and turned to catcode 12 including spaces.
3167 {%
3168   \edef#1{#2}%
3169   \edef#1{%
3170     \@xa\@xa\@xa\@xiispaces
3171     \@xa\detokenize\@xa{#1} \@nil}%
3172 }
```

```
3175 \long\def\@ifEUnextchar#1#2#3{%
```

'if Edefed Unexpanded next char'

```
3177   \let\reserved@d=#1%
3178  \edefU\reserved@a{#2}%
3179  \edefU\reserved@b{#3}%
3180  \futurelet\@let@token\@ifnch}
```

Storing and restoring the catcodes of specials

```
\gmu@storespecials    3187 \newcommand\gmu@storespecials[1][]{% we provide a possibility of adding stuff.
                                For usage see line ??.
                      3189   \def\do##1{\catcode`\@nx##1=\the\catcode`##1\relax}%
\gmu@restorespecials  3190   \edef\gmu@restorespecials{%
                      3191     \dospecials\do\^^M}#1}
```

```
3193 \pdef\gmu@septify{% restoring the standard catcodes of specials. The name is the
                 opposite of 'sanitize' :-) . It restores also the original catcode of ^^M.
```

```
3196   \def\do{\relax\catcode`}%
3197   \do\ 10\do\\0\do\{1\do\}2\do\$3\do\&4%
3198   \do\#6\do\^7\do\_8\do\%14\do\~13\do\^^M5\relax
 %% \let\do\@makeother
 %% \do0\do1\do2\do3\do4\do5\do6\do7\do8\do9\relax
3201 }
```

Storing and restoring the meanings of CSes

First a Boolean switch of globalness of assignments and its verifier.

\ifgmu@SMglobal

```
3208 \newif\ifgmu@SMglobal
```

```
3210 \pdef\SMglobal{\gmu@SMglobaltrue}
```

```
3212 \def\MakePrivateLetters{\makeatletter}
```

The subsequent commands are defined in such a way that you can ‘prefix’ them with `\SMglobal` to get global (re)storing.

A command to store the current meaning of a CS in another macro to temporarily redefine the CS and be able to set its original meaning back (when grouping is not recommended):

\StoreMacro

```
3224 \pdef\StoreMacro{%
3225   \begingroup\MakePrivateLetters
3226   \gmu@ifstar\egStore@MacroSt\egStore@Macro}
```

The unstarred version takes a CS and the starred version a text, which is intended for special control sequences. For storing environments there is a special command in line 3455.

```
3231 \lpdef\egStore@Macro#1{\endgroup\Store@Macro{#1}}
3232 \lpdef\egStore@MacroSt#1{\endgroup\Store@MacroSt{#1}}
```

```
3234 \pdef\StoreMacro@nocat
```

It’s version of `\StoreMacro` to be used in arguments of other macros, where recatcoding wouldn’t change anything anyway.

```
3237 {%
3238   \gmu@ifstar \Store@MacroSt \Store@Macro
3239 }
```

```
3242 \def\gmu@storeprefix{/gmu/store}
```

```
3245 \lpdef\Store@Macro#1{%
3246   \escapechar92
3247   \ifgmu@SMglobal\afterfi\global\fi
3248   \@xa\let\csname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname#1%
3249   \global\gmu@SMglobalfalse
3250 }
```

```
3253 \lpdef\Store@MacroSt#1{%
3254   \edef\gmu@smtempa{%
3255     \ifgmu@SMglobal\@xa\global\fi
3256     \let\@xa\@nx\csname\gmu@storeprefix/\bslash@or@ac{%
          #1}\@xa\endcsname%  we add backslash because to ensure compatibility
          between \(Re)StoreMacro and \(Re)StoreMacro⋆, that is. to allow
          writing e.g. \StoreMacro\kitten and then \RestoreMacro*{kitten} to
          restore the meaning of \kitten.
    \ifcsname #1\endcsname % If the argument CS is undefined, we undefine the
          storage macro too.
      \@xa\@nx\csname#1\endcsname
    \else\@nx\@undefined
    \fi
    \global\gmu@SMglobalfalse}% we wish the globality to be just once.

  \gmu@smtempa
}
```

We make the `\StoreMacro` command a three-step to allow usage of the most inner macro also in the next command.

The starred version, `\StoreMacro*` works with csnames (without the backslash). It's first used to store the meanings of robust commands, when you may need to store not only `\foo`, but also `\csname foo \endcsname`.

The next command iterates over a list of CSes and stores each of them. The CS'es may be separated with commas but they don't have to.

`\StoreMacros`

```
\lpdef\StoreMacros{\begingroup\MakePrivateLetters\egStore@Macros}

\lpdef\egStore@Macros#1{\endgroup
  \Store@Macros{#1}%
}

\lpdef\Store@Macros #1{%
  \gmu@setsetSMglobal
  \let\gml@StoreCS\Store@Macro
  \gml@storemacros#1.}

\def\gmu@setsetSMglobal{%
  \ifgmu@SMglobal
    \let\gmu@setSMglobal\gmu@SMglobaltrue
  \else
    \let\gmu@setSMglobal\gmu@SMglobalfalse
  \fi}
```

And the inner iterating macro:

```
\lpdef\gml@storemacros#1{%
  \def\gmu@storemacros@resa{\@nx#1}% My TEX Guru's trick to deal with \fi and
        such, i.e., to hide #1 from TEX when it is processing a test's branch without
        expanding.
  \if\gmu@storemacros@resa.% a dot finishes storing.
    \global\gmu@SMglobalfalse
  \else
    \if\gmu@storemacros@resa,% The list this macro is put before may contain
          commas and that's O.K., we just continue the work.
      \afterfifi\gml@storemacros
    \else% what is else this shall be stored.
      \gml@StoreCS{#1}% we use a particular CS to may \let it both to the storing
            macro as above and to the restoring one as below.
      \afterfifi{\gmu@setSMglobal\gml@storemacros}%
    \fi
  \fi
}
```

And for the restoring

\RestoreMacro

```
\lpdef\RestoreMacro{%
       \begingroup\MakePrivateLetters\gmu@ifstar\egRestore@MacroSt\egRestore@Macr
\lpdef\egRestore@Macro#1{\endgroup\Restore@Macro{#1}}
\lpdef\egRestore@MacroSt#1{\endgroup\Restore@MacroSt{#1}}

\lpdef\Restore@Macro#1{%
  \escapechar92
  \gmu@ifstored#1{%
    \ifgmu@SMglobal\afterfi\global\fi
    \@xa\let\@xa#1\csname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname
    \global\gmu@SMglobalfalse}%
  {\unless\ifgmu@quiet
      \PackageWarning{gmutils}{\@nx#1 is not stored, I do nothing with
        it}%
    \fi
  }%
}

\long\def\gmu@ifstored#1#2#3{%
  \gmu@ifundefined{\gmu@storeprefix/%
    \bslash@or@ac{#1}}{#3}{#2}%
}

\lpdef\gmu@storeifnotyet#1{%
  \gmu@if {} {\relax\@nx#1}% we check if it's a CS
  {\gmu@ifstored{#1}{}{\StoreMacro@nocat#1}}%
  {}%
}

\lpdef\Restore@MacroSt#1{%
  \gmu@ifundefined{\gmu@storeprefix/\bslash@or@ac{#1}}%
  {\unless\ifgmu@quiet
    \PackageWarning{gmutils}{\bslash#1 is not stored. I~do nothing}%
    \fi}%
  {\edef\gmu@smtempa{%
      \ifgmu@SMglobal\global\fi
      \@nx\let\@xa\@nx\csname#1\endcsname
      \@xa\@nx\csname\gmu@storeprefix/\bslash@or@ac{#1}\endcsname}% cf. the
           commentary in line 3256.
    \gmu@smtempa}%
  \global\gmu@SMglobalfalse
}
```

\RestoreMacros

```
\lpdef\RestoreMacros{%
  \begingroup\MakePrivateLetters
  \egRestore@Macros}

\lpdef\egRestore@Macros#1{\endgroup
  \Restore@Macros{#1}%
}

\lpdef\Restore@Macros #1{%
  \gmu@setsetSMglobal
3387   \let\gml@StoreCS\Restore@Macro% we direct the core CS towards restoring and
            call the same iterating macro as in line 3297.
3390   \gml@storemacros#1.}
```

As you see, the `\RestoreMacros` command uses the same iterating macro inside, it only changes the meaning of the core macro.

```
3395 \pdef\ResetMacro{% restore possibly to \@undefined
3397
          \begingroup\MakePrivateLetters\gmu@ifstar\egReset@MacroSt\egReset@Macro}

3399 \lpdef\egReset@Macro#1{\endgroup\Reset@Macro{#1}}
3400 \lpdef\egReset@MacroSt#1{\endgroup\Reset@MacroSt{#1}}

3402 \lpdef\Reset@Macro#1{%
3403   \escapechar92
3404   \ifgmu@SMglobal\@xa\global\fi
3405   \ifcsname  \gmu@storeprefix/\bslash@or@ac{#1}\endcsname
3406     \@xa\let\@xa#1\csname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname
3407   \else
3408     \let#1\@undefined
3409   \fi
3410   \global\gmu@SMglobalfalse
3411 }%

3414 \lpdef\Reset@MacroSt#1{%
3415   \ifcsname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname
3416     \ifgmu@SMglobal\@xa\global\fi
3417     \@xa\let\csname#1\@xa\endcsname
3418     \csname\gmu@storeprefix/\bslash@or@ac{#1}\endcsname % cf. the commen-
              tary in line 3256.
3420   \else
3421     \@xa\let\csname#1\endcsname\@undefined
3422   \fi
3423   \global\gmu@SMglobalfalse
3424 }
```

\ResetMacros

```
3427 \lpdef\ResetMacros{\begingroup\MakePrivateLetters\Reset@Macros}

3429 \lpdef\Reset@Macros#1{\endgroup
3430   \gmu@setsetSMglobal
3431   \let\gml@StoreCS\Reset@Macro% we direct the core CS towards restoring and call
            the same iterating macro as in line 3297.
3434   \gml@storemacros#1.}
```

As you see, the `\ResetMacros` command uses the same iterating macro inside, it only changes the meaning of the core macro.

And to restore *and* use immediately:

```
3441 \pdef\StoredMacro{\begingroup\MakePrivateLetters\Stored@Macro}
3442 \lpdef\Stored@Macro#1{\endgroup\Restore@Macro#1#1}
```

To be able to call a stored CS without restoring it.

```
3445 \long\def\storedcsname#1{%
3446   \ifcsname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname
3447     \afterfi{%
3448       \csname \gmu@storeprefix/\bslash@or@ac{#1}\endcsname}%
```

```
  \else \@xa \@undefined
  \fi
}
```

2008/08/03 we need to store also an environment.

```
\pdef\StoreEnvironment#1{%
  \Store@MacroSt{#1}\Store@MacroSt{end#1}}
```

```
\pdef\RestoreEnvironment#1{%
  \Restore@MacroSt{#1}\Restore@MacroSt{end#1}}
```

It happened (see the definition of `\@docinclude` in **gmdoc.sty**) that I needed to `\relax` a bunch of macros and restore them after some time. Because the macros were rather numerous and I wanted the code more readable, I wanted to `\do` them. After a proper defining of `\do` of course. So here is this proper definition of `\do`, provided as a macro (a declaration).

`\StoringAndRelaxingDo`

```
\pdef\StoringAndRelaxingDo{%
  \gmu@SMdo@setscope
  \long\def\do##1{%
    \gmu@SMdo@scope
    \@xa\let\csname \gmu@storeprefix/\bslash@or@ac{##1}\endcsname##1%
    \gmu@SMdo@scope\let##1\relax}}
```

```
\pdef\gmu@SMdo@setscope{%
  \ifgmu@SMglobal\let\gmu@SMdo@scope\global
  \else\let\gmu@SMdo@scope\relax
  \fi
  \global\gmu@SMglobalfalse
}
```

And here is the counter-definition for restore.

`\RestoringDo`

```
\lpdef\RestoringDo{%
  \gmu@SMdo@setscope
  \long\def\do##1{%
    \gmu@SMdo@scope
    \@xa\let\@xa##1\csname
    \gmu@storeprefix/\bslash@or@ac{##1}\endcsname}%
}
```

Note that both `\StoringAndRelaxingDo` and `\RestoringDo` are sensitive to the `\SMglobal` ‘prefix’.

(Preliminary:)

```
\pdef\gmu@MakeScopePrefix
#1% CS to be let \global or \relax
#2% a sequence of tokens
{%
  \let#1\relax
  \gmu@ifxany{\global}{#2}%
  {\let#1\global}{}%
}
```

And to store a cs as explicitly named cs, i.e. to `\let` one csname another (`\n@melet` not `\@namelet` because the latter is defined in Till Tantau’s **beamer** class another way) (both arguments should be text):

```
\lpdef\gmu@namelet
#1% scope prefix (to be honest, any sequence of tokens that may be passed as an argument: \gmu@ifxany will parse it)
#2% left side of the assignment
#3% right side of the assignment
{%
  \gmu@MakeScopePrefix\gmu@namelet@scpref{#1}%
  \gmu@if {csname} {#3\endcsname}%
  {%
    \@xa\gmu@namelet@scpref\@xa\let\csname#2\@xa\endcsname
    \csname#3\endcsname}%
  {%
    \@xa\gmu@namelet@scpref
    \@xa\let\csname#2\endcsname\@undefined}%
}
```

```
\pdef\n@melet{\gmu@namelet\relax}
```

```
\pdef\gn@melet{\gmu@namelet\global}
```

```
\long\pdef\tri@let
#1% scope prefix(es)
#2% left side
#3% right side of the assignment
{%
  \gmu@MakeScopePrefix\gmu@tri@let@scpref{#1}%
```

both s.o.a. can be names, CS es or active chars.

```
  \ifcat\@nx~\@nx#2%
    \def\next{\gmu@tri@let@scpref\let#2}%
  \else \edef\next{\gmu@tri@let@scpref\let\@xanxtri{#2}}%
  \fi
```

Thus the left argument of the assignment is handled and   of the assignment prepared.

```
  \ifcat\@nx~\@nx#3%
    \next#3%
  \else
    \edef\next{%
      \@xau\next
      \ifcsname \strip@bslash{#3}\endcsname
      \@xanxtri{#3}%
      \else\@nx\@undefined
      \fi
    }% of next's edef
    \next
  \fi
}%
```

```
\long\pdef\envirlet#1#2{% for \letting environments.
  \n@melet{#1}{#2}%
  \n@melet{end#1}{end#2}%
}
```

```
\long\pdef\glenvirlet#1#2{% for \letting environments.
  \gn@melet{#1}{#2}%
  \gn@melet{end#1}{end#2}%
}
```

`\@ifprevenvir` are defined in **gmenvir**

Setting for XƎTEX

```
\def\@ifXeTeX{% two-argument command
  \ifdefined\XeTeXversion
      \unless\ifx\XeTeXversion\relax\afterfifi\@firstoftwo\else\afterfifi\@secon
  \else\afterfi\@secondoftwo\fi
}
```

\ifgmuXeTeX

```
\newif\ifgmuXeTeX
\@ifXeTeX{\gmuXeTeXtrue}{}%
```

`\XeTeXthree` is defined with `\DeclareCommand` so occurs yet in **gmcommand**.

```
\@ifXeTeX{%
  \pdef\textbullet{%
    \iffontchar\font"2022 \char"2022 \else\ensuremath{\bullet}\fi}%
  \pprovide\glyphname#1{%
    \XeTeXglyph \numexpr\XeTeXglyphindex "#1"\relax\relax}% since XƎTEX
          ... \numexpr is redundant.
}
{\def\textbullet{\ensuremath{\bullet}}}

\def\if@XeTeX {\@ifXeTeX {\iftrue}{\iffalse}}
```

Expandable turning stuff all into 'other'

A shorthand. Note that it takes an undelimited argument not requires ⟨*balanced text*⟩.

```
\long\def\detoken@xa#1{\detokenize\@xa{#1}}
```

The next macro originates from the ancient era when I didn't know about ε-TEX's `\detokenize`. A try to redefine it to `\detokenize\@xa{#1}` resulted in error so (v0.991) I leave it and use as is.

Note however it acts different than `\detoken@xa` for a macro with parameters: while `\detoken@xa` produces and 'extra }' error, `\all@other` expands to the detokenised meaning.

\all@other

```
 \long\def\all@other#1{\@xa\gmu@gobmacro\meaning#1}
```

The `\gmu@gobmacro` macro above is applied to gobble the `\meaning`'s beginning, `long macro:->` all 'other' that is.

\gmu@gobmacro

```
 \edef\gmu@tempa{%
   \def\@nx\gmu@gobmacro##1\@xa\@gobble\string\macro:##2->{}}
 \gmu@tempa
```

Show must go on

For the heavy debugs I was doing while preparing **gmdoc**, as a last resort I used `\showlists`. But this command alone was usually too little: usually it needed setting `\showboxdepth` and `\showboxbreadth` to some positive values. So,

```
\def\gmshowlists{%
```

```
  \tracingonline=1
  \showboxdepth=1 \showboxbreadth=1000000 \showlists}
```

```
\def\gmshowbox{%
  \tracingonline=1
  \showboxdepth=10000 \showboxbreadth=10000 \showbox}
```

```
\def\gmtracingoutput{%
  \tracingoutput\@ne
  \tracingonline=\@ne
  \showboxdepth=1
  \showboxbreadth=1000000
}
```

\ifgmu@debug@msgs

```
\newif\ifgmu@debug@msgs
```

```
\def\gmtron{%
  \tracingonline=\@M
  \tracingmacros=\@M
  \tracingassigns=\@M
  \tracingcommands=\@m
  \gmu@debug@msgstrue
  \let\let\let
}
```

```
\def\gmtroff{%
  \tracingonline=\m@ne
  \tracingmacros\m@ne
  \tracingassigns=\m@ne
  \tracingcommands=\m@ne
  \tracingoutput=\m@ne
  \gmu@debug@msgsfalse
  \let\let\let
}
```

\nameshow

```
\newcommand\nameshow[1]{%
  \ifcsname #1\endcsname
    \@xa\show\csname#1\endcsname
  \else \show\@undefined
  \fi}
```

\nameshowthe

```
\newcommand\nameshowthe[1]{%
  \ifcsname #1\endcsname
    \@xa\showthe\csname#1\endcsname
  \else \showthe\@undefined
  \fi}
```

Note that to get proper `\showthe\my@dimen14` in the ‘other’ `@`’s scope you write `\nameshowthe{my@dimen}14`.

\namemeaning

```
\newcommand\namemeaning[1]{%
  \ifcsname #1\endcsname
    \@xa\typeout{\@xa\meaning\csname#1\endcsname}%
    \show\relax
  \else \typeout{\meaning\@undefined}\show\relax
  \fi}
```

Note that to get proper `\showthe\my@dimen14` in the ‘other’ `@`’s scope you write `\nameshowthe{my@dimen}14`.

Second class document class

Probably the only use of it is loading **gmdocc.cls** ‘as second class’. This command takes first argument optional, options of the class, and second mandatory, the class name. I use it in an article about **gmdoc**.

`\ifSecondClass`

```
\def\secondclass{%
  \newif\ifSecondClass
  \SecondClasstrue
  \@fileswithoptions\@clsextension}% [outeroff,gmeometric]{gmdocc} it’s loading gmdocc.cls with all the bells and whistles except the error message.
```

`\@parindent`

```
\AtBeginDocument{%
  \unless\ifdefined\@parindent
    \newskip\@parindent
    \@parindent=\parindent
  \fi
}
```

```
\def\balsmiley#1 {}% to balance parentheses and brackets in smileys. ;-) \balsmiley(
      % ;-) .
```

```
\long\def\scantnoline#1{% ‘rescan tokens without adding line at the end’
  {\endlinechar\m@ne\scantokens{#1}}}
```

```
\pdef\getprevdepth{% to pass last depth through a group (e.g. \end{envir.})
  \endgraf
  \xdef\setprevdepth{\prevdepth=\the\prevdepth\relax}%
}
```

```
\pdef\getprevdepthlocal{%
  \endgraf
  \edef\setprevdepth{\prevdepth=\the\prevdepth\relax}%
}
```

Storing the catcode of line end

```
\def\StoreCatM{%
  \protected\edef\RestoreCatM{%
    \catcode`\@nx\^^M=\the\catcode`\^^M\relax}%
}
```

```
\pdef\RestoreCatM{\PackageE{gmutils}{first store the catcode of
    ^\empty^\empty M with \string\StoreCatM.}%
}
```

`\resizegraphics`

```
\RequirePackage{graphicx}
```

```
\pdef\resizegraphics#1#2#3{% 2009/11/17 works bad with a file whose name contains spaces so I return \XeTeXpicfile
  \resizebox{#1}{#2}{%
    \edef\gmu@tempa{\@nx\csname XeTeX\@nx\@ifendswithpdf{%
        \@xa\string\csname#3\endcsname}{pdf}{pic}file\@nx\endcsname}%
    \gmu@tempa "#3"\relax}}
```

```
\edef\gmu@tempa{%
```

```
  \def\@nx\@ifendswithpdf##1{%
    \unexpanded{%
      \ifnum
      \if\relax\gmu@pdfdetector}##1%
    \detokenize{pdf}\unexpanded{\relax0\else1\fi}% we expand to 1 if #1 ends
        with lowercase 'pdf' of cat. 12
    \unexpanded{\if\relax\gmu@PDFdetector}##1%
    \detokenize{PDF}\unexpanded{\relax0\else1\fi}% we expand to 1 if #1 ends
        with uppercase 'PDF' of cat. 12
    >0
    \unexpanded{\@xa\@firstoftwo\else\@xa\@secondoftwo\fi}%
  }% of \@ifendswithpdf

  \def\@nx\gmu@pdfdetector##1\detokenize{pdf}{}%
  \def\@nx\gmu@PDFdetector##1\detokenize{PDF}{}%
}\gmu@tempa
```

Paragraph with last or first line centered: `\lastcentered` declaration and `lastcentered` environment

```
\def\lastcentered{%
  \lastlinefit\z@
  \parindent0sp\relax
  \leftskip\dimexpr1\leftskip\relax plus 1fil\relax
  \rightskip\dimexpr1\rightskip\relax plus -1fil\relax
  \parfillskip0sp plus 2fil\relax
}

\def\endlastcentered{\par\@endpetrue}

\def\firstcentered{%
  \lastlinefit\z@
  \parfillskip 0sp\relax
  \rightskip0sp plus 1fil\relax
  \leftskip0sp plus -1fil\relax
  \parindent 0sp
  \addtotoks\everypar{\hskip0sp plus 2fil\relax}%
}

\let\endfirstcentered\endlastcentered

\def\gmu@measurewd#1{%
  \edef\gmu@tempa{\the\fontcharwd\font`#1}%
  \settowidth{\@tempdimb}{% to preserve kerning
    \char`#1\char`#1\char`#1\char`#1\char`#1\char`#1%
    \char`#1\char`#1\char`#1\char`#1\char`#1\char`#1%
    \char`#1\char`#1\char`#1\char`#1\char`#1\char`#1%
    \char`#1\char`#1\char`#1}%
  \edef\gmu@tempb{\the\dimexpr(\@tempdimb-\gmu@tempa)/20}%
}

\def\@xa@three#1#2{% reverses expansion of three tokens, two given as arguments.
      (third may be {)
  \@xa\@xa\@xa \@xa\@xa\@xa \@xa #1%
  \@xa\@xa\@xa #2%
  \@xa }
```

```
\def\@xa@four#1#2#3{% reverses expansion of four tokens, three given as arguments.
          (fourth may be {})
  \@xa\@xa\@xa\@xa \@xa\@xa \@xa
  \@xa\@xa\@xa\@xa \@xa\@xa\@xa\@xa #1%
  \@xa\@xa\@xa\@xa \@xa\@xa \@xa #2
  \@xa\@xa\@xa #3%
  \@xa }
```

Comparison of detokenised strings

A (not expandable) macro that checks whether current environment is as given in `#1`. Why is this macro `\long`?—you may ask. It's `\long` to allow environments such as `\string%` `\par`.

```
\long\pdef\@ifenvir#1{%
      % #1 enquired environment name which will be confronted with \@currenvir
      % #2 what if true (if the names are equivalent[2])
      % #3 what if false
  \gmu@ifedetokens{\@currenvir}{#1}%
}
```

```
\pdef\@ifjobname#1{\gmu@ifedetokens{\jobname}{#1}}
```

(2010/09/23, v0.993:) since `\gmu@ifedetokens` turned to be expandable, we make this macro `\protected`

2010/09/23 introduced as a common part of the three then four then… of the below.

```
\long\def\gmu@ifstrcmp
#1% wrapper for left side of comparison
#2% wrapper for right side of comparison
#3% left side of comparison (list of tokens)
#4% right —”—
{%
  \ifnum\strcmp{#1{#3}}{#2{#4}}=\z@
    \@xa\@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
}
```

```
\def\gmu@ifdetokens
```

test if two list of tokens agree when decategorised (without expansion)
implicit `#1`: left tokens
implicit `#2`: right tokens
(implicit `#3`: if agree)
(implicit `#4`: if disagree

```
{%
  \gmu@ifstrcmp\detokenize\detokenize
}% of \gmu@ifdetokens
```

```
\def\gmu@ifutokens
```

test if two list of tokens agree when decategorised (without expansion)

---

[2] The names are checked whether they produce the same `\csname`. They don't have to have the same catcodes.

```
{%
  \gmu@ifstrcmp\unexpanded\unexpanded
}
```

```
\def\gmu@ifedetokens{%
```

basically a wrapper for the basic IMHO use of `\strcmp`. Won't work the same in some extremely perverse cases I can imagine. But with `\@firstofones` won't work either, only another way.

```
  \gmu@ifstrcmp \@firstofone \@firstofone
}
```

And the `\protected` versions of those macros.

```
\@XA{\pdef\gmu@pifdetokens}\@xa{\gmu@ifdetokens}
```

```
\@XA{\pdef\gmu@pifutokens}\@xa{\gmu@ifutokens}
```

```
\@XA{\pdef\gmu@pifedetokens}\@xa{\gmu@ifedetokens}
```

(2010/09/23, v0.993:) redefined deeply and made expandable thanks to `\strcmp`. Also renamed from `\gmu@ifedetokens`(the `\gmu` prefix added)

```
%%  \lpdef\@ifedetokens#1#2{%
%%   %
%%   % #1 first list of tokens to be expanded and detokenized
%%   % #2 second list
%%   % #3 if agree
%%   % #4 else
%%   %
%%   \edef\gmu@edetoka{#1}% to get #1 fully expanded.
%%   \edef\gmu@edetokb{\@xa\detokenize\@xa{\gmu@edetoka}}% with our
%%   % brave new \begin, \@currenvir is fully expanded,
%%   % remember?
%%   \edef\gmu@edetoka{#2}% to get #2 fully expanded.
%%   \edef\gmu@edetokc{\@xa\detokenize\@xa{\gmu@edetoka}}%
%%   \ifx\gmu@edetokb\gmu@edetokc\@xa\@firstoftwo
%%   \else\@xa\@secondoftwo
%%   \fi
%%  }
```

Hashes for meta-defining macros

In this section we use an expandable loop described in The ε-TeX Manual p. 9. In the **gmampulex** package we construct a more general definer for such loops.

```
\def\gmu@HHashes#1#2{% this is a fully expandable loop analogous to that of The
        ε-TeX Manual p. 9.
  \ifnum#1<#2 %
  ################\number#1
  \expandafter\gmu@HHashes
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi}% of \gmu@HHashes.
```

```
\def\gmu@Hashes#1#2{% this is a fully expandable loop analogous to that of The ε-
        TeX Manual p. 9. expanding in an \edef to ####1…####⟨h.$2-1$⟩ (quadruple
        hashes' sequence)
```

```
  \ifnum#1<#2 %
  ########\number#1
  \expandafter\gmu@HHashes
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi}% of \gmu@hashes.
```

```
\def\gmu@hashes#1#2{%
```

this is a loop analogous to that of The ε-TEX Manual p. 9., that expands to a sequence of double hashes $\langle \#\mathit{1}\rangle$–$\langle \#2-1\rangle$, useful in edefing a definition of macros.

```
  \ifnum#1<#2%
  ####\number#1
  \expandafter\gmu@hashes
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi
}% of \gmu@hashes.
```

```
\def\gmu@HHashesbraced#1#2{%
  \ifnum#1<#2%
  {################\number#1}%
  \expandafter\gmu@HHashesbraced
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi}% of \gmu@hashesbraced.
```

```
\def\gmu@Hashesbraced#1#2{%
  \ifnum#1<#2%
  {########\number#1}%
  \expandafter\gmu@HHashesbraced
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi}% of \gmu@hashesbraced.
```

```
\def\gmu@hashesbraced#1#2{%
  \ifnum#1<#2%
  {####\number#1}%
  \expandafter\gmu@hashesbraced
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi
}% of \gmu@hashesbraced.
```

```
\def\gmu@hashesOut#1#2{%
  \ifnum#1<#2%
  \space\space\space\space
  »\@nx\unexpanded{####\number#1}«%
  \expandafter\gmu@hashesOut
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi
}% of \gmu@hashesbraced.
```

```
\def\gmu@hashesOutU#1#2{%
  \ifnum#1<#2%
  \space\space\space\space
  »\@nx\unexpanded{####\number#1}«%
  \expandafter\gmu@hashesOut
  \expandafter{\number\numexpr#1+1\expandafter}%
  \expandafter{\number#2\expandafter}%
  \fi
}% of \gmu@hashesbraced.
```

```
\@tempcnta=1
\@whilenum\@tempcnta<11\do{% 2010/4/15
  \@nameedef{gmu@hashes@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@hashes1\@tempcnta}%
  \@nameedef{gmu@Hashes@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@Hashes1\@tempcnta}%
  \@nameedef{gmu@HHashes@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@HHashes1\@tempcnta}%
  \@nameedef{gmu@hashesbraced@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@hashesbraced1\@tempcnta}%
  \@nameedef{gmu@Hashesbraced@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@Hashesbraced1\@tempcnta}%
  \@nameedef{gmu@HHashesbraced@\the\numexpr\@tempcnta-1\relax}%
  {\gmu@HHashesbraced1\@tempcnta}%
  \edef\gmu@eloops@resa{%
    \long\def\@xanxcs{%
      gmu@TOhashes@\romannumeral\numexpr\@tempcnta-1\relax}%
      \gmu@hashes1\@tempcnta{%
        \@nx\TypeOut{%
          \gmu@hashesOut %
          1 \@tempcnta}%
      }% of \gmu@TOhashes@viii etc.
```

```
    }% of temporary macro
```

```
    \gmu@eloops@resa
```

Generates nine pairs of macros `\gmu@TOhashes@i`, `\gmu@TOUhashes@i`, `\gmu@TOhashes@ii`, `\gmu@TOUhashes@ii` etc. that print (type out) their arguments on the terminal, unexpanded

```
    \advance\@tempcnta\@ne
}% of \@whilenum
```

The standard `\obeyspaces` declaration just changes the space's `\catcode` to $_{13}$ (‘active’). Usually it is fairly enough because no one ‘normal’ redefines the active space. But we are *not* normal and we do *not* do usual things and therefore we want a declaration that not only will `\active`ate the space but also will (re)define it as the `\ ` primitive. So define `\gmobeyspaces` that obeys this requirement.

(This definition is repeated in gmverb.)

\gmobeyspaces

```
\foone{\catcode`\ \active}%
{\newcommand*\gmobeyspaces{\let \ \catcode`\ \active}}
```

And a macro to forbid hyphenation of the next word:

\nohy
\yeshy

```
\newcommand*\nohy{\leavevmode\kern0sp\relax}
\newcommand*\yeshy{\leavevmode\penalty\@M\hskip\z@skip}
```

In both of the above definitions '0sp' not `\z@` to allow their writing to and reading from files where @ is 'other'.

```
\long\pdef\gmu@EdefCurrnames#1{%
  \xiiEdetoke\gmu@EdefCurrnames@resa{#1}%
  \@xa  \gmu@EdefCurrnames@ \gmu@EdefCurrnames@resa.tex.\@nil
```

if no extension is present, `tex` is assumed. This couple of macros won't work well for files with dots in their names.

```
}

\pdef\gmu@EdefCurrnames@ #1.#2.#3\@nil{%
  \def\@currname{#1}%
  \def\@currext{#2}%
}

\def\NamedInput@prepare#1{% we wrap in a macro to use also in \DocInput
  \@pushfilename
  \gmu@EdefCurrnames {#1}%
}

\let\NamedInput@finish=\@popfilename

\pdef\NamedInput#1{% useful e.g. in error handling
  \NamedInput@prepare {#1}%
  \@@input #1\relax
  \NamedInput@finish
}

\def\gmu@ifdim
#1% dimen specification
#2% comparison
#3% dimen specification
{%
  \ifnum0\ifx#2≤1\fi\ifx#2≥1\fi\ifx#2≠1\fi=\@ne
    \afterfi\unless
  \fi
  \ifdim#1\ifx#2≤>\fi\ifx#2≥<\fi\ifx#2≠=\fi
    \ifx#2>>\fi\ifx#2<<\fi\ifx#2==\fi
    \dimexpr(#3)*1\relax% parentheses are for closing all possible ε-TEXpressions
          not to gobble that \relax by them but only by the outermost \dimexpr to
          avoid premature expansion of the following \expandafter. (2010/6/14)
    \@xa\@firstoftwo
  \else\@xa\@secondoftwo
  \fi
}

\def\gmu@ifskip
#1% glue specification
#2% comparison for natural part
#3% comparison for stretch part
#4% comparison for shrink part
#5% glue specification #6 (implicit) what if all conditions satisfied
      #7 (implicit) what if any condition unsatisfied.
{\ifnum
    0\gmu@ifdim{1\glueexpr#1}#2{1\glueexpr#5}10%
    \gmu@ifdim{\gluestretch\glueexpr#1}#3{\gluestretch\glueexpr#5}10%
    \gmu@ifdim{\glueshrink\glueexpr#1}#4{\glueshrink\glueexpr#5}10=111
    \@xa\@firstoftwo
  \else\@xa\@secondoftwo
  \fi
}% of \gmu@ifskip.
```

```
\def\gmu@ifbox
```

We provide an expandable macro for comparing boxes' dimensions. We handle the registers' numbers not any boxes just to allow expandability.

```
#1% a box register number (e.g. \copy\z@)
#2% comparison for heights
#3% comparison for depths
#4% comparison for widths
#5% a box register number
{%
  \gmu@ifskip
  {\glueexpr (\ht#1 plus \dp#1 minus\wd#1 )*1\relax}%
  #2#3#4%
  {\glueexpr (\ht#5 plus \dp#5 minus\wd#5 )*1\relax}%
}
```

```
\def\greater@dim#1#2{%
  \ifdim\dimexpr#1>\dimexpr(#2)*1\relax
    #1%
  \else #2%
  \fi
}
```

Removal of an element from a comma-separated list macro (such as used in the LaTeX's `\@for` loops). The removed element becomes macro-meaning of `#3`.

```
\long\pdef\gmu@removeelement
#1% element to be removed
#2% macro carrying a comma-separated list
#3% CS to carry removed element.
{%
  \let#3\@undefined%
  \def\gmu@removeelement@resa##1,#1,##2\@nil{%
    \gmu@ifempty{##2}%
    {\edefU#2{##1}}%
    {\edefU#2{##1,##2}%
      \def#3{#1}%
      \@xa\gmu@removeelement@resa#2\@nil
    }%
```

If `##2` is not empty, then we know `#1` was in the list so we have to remove its copy from the end of the list.

```
  }% of \gmu@removeelement@resa
  \@xa\gmu@removeelement@resa\@xa,#2,#1,\@nil
```

We gobble the beginning comma

```
  \@xa\@xa\@xa\ifx\@xa\@firstofmany#2\relax\@nil,%
    \edef#2{\unexpanded
```

```
      \@xa\@xa\@xa{\@xa\@gobble#2}}%
  \fi
}
```

A macro for edefs of csnames: expands to a csname hit by `\noexpand`.

```
\long\def\@nxcsn#1{%
  \@xa\@nx\csname #1\endcsname}
```

```
\def\@listbegvskipping{%
  \@topsepadd=\topsep
  \ifvmode
    \advance\@topsepadd by\partopsep
  \fi
  \par
  \addvspace\@topsepadd
}
```

Remember that proper vskips at the end of an environment will be put by `\@endparenv`

```
\def\foolc#1#2{%
  \begingroup\lccode`#1=`#2\relax
  \lcfirstofone
}
```

```
\long\def\lcfirstofone#1{%
  \lowercase{\endgroup#1}%
}
```

Just to make it `\long`

```
\long\def\PackageWarning#1#2{%
  \GenericWarning{%
    (#1)\@spaces\@spaces\@spaces\@spaces
  }{%
    Package #1 Warning: #2%
  }%
}
```

long version of `\typeout` (`\par` occurs quite often)

```
\long\def\TypeOut#1{%
  \edef\TO@resa{#1}%
  \edef\TO@resa{\@xa\detokenize\@xa{\TO@resa}}%
  \typeout{\TO@resa}}
```

```
\long\def\ShowOut#1{%
  \TypeOut{#1}%
  \show\TO@resa
}
```

A definition that makes its `#1` a stringed version of itself if in `\csname…\endcsname`

```
\long\pdef\incsdef
#1% a CS or active char
#2% parameters string
#3% definition's body
{%
  \def#1#2{\gmu@ifincsname {\string#1}{#3}}%
}
```

Deducing whether hash was braced

Since not built-in TeX's test can distinguish `{`$_1$ from `\bgroup`, there seemed not to be a way to deduce whether the stuff we are passed as an argument was braced or not.

In general it still seems so to me, but in the case of undelimited arguments a partial solution seems to exist: count the tokens and assume they were braced if they are they and don't bother if they are just one.

In fact, this partial solution seems quite satisfactory to avoid bracing single tokens when passing them further as arguments.

`\c@gmu@TokensCount`

```
\gmu@DefSymbol\gmu@CountTokens@end
\newcount\c@gmu@TokensCount
```

```
\lpdef\gmu@CountTokens
```

`%%  #1%` upper bound? No.

Imposing numeric upper bound doesn't make sense since anyway we have to `\let` each token to balance the braces and/or not to bother with possibly unbalanced ifs:

If we'd stop at reaching the bound, we could throw the tail of tokens to nonexistence by putting a macro with a parameter delimited with the counting's sentinel. But that wouldn't work for unbalanced braces. On the other hand, wrapping the tail in an `\iffalse`, would release us from bothering with unbalanced braces, but in such case unbalanced ifs could occur so both ways are not satisfactory.

Note moreover that `{`$_1$ is indistinguishable from `\bgroup` so we can't count braces' nesting to put as many as needed.

Counting groups and opening a junk box with this many groups is absurd because would lead to execution of all those tokens and that's what we cannot allow. BTW it'd be prone to unbalanced ifs, too.

```
#1% the tokens to be counted.
{%
  \c@gmu@TokensCount=\m@ne
  \let\gmu@CountToken@token\@undefined
  \gmu@CountToken@iter
  #1\gmu@CountTokens@end
}
```

```
\def\gmu@CountToken@iter{%
  \gmu@if x{\gmu@CountToken@token\gmu@CountTokens@end}%
  {}% we've reached the end of iteration
  {%
```

We increase the counter and throw the iterator after next assignment

```
    \advance\c@gmu@TokensCount\@ne
    \afterassignment\gmu@CountToken@iter
    \let\gmu@CountToken@token=
  }%
}%
```

Now we are ready to define a brace-wrapper:

```
\long\def\gmu@passbraced
```

This macro checks whether its `#2` was a balanced text (in explicit braces) or a `\bgroup` token. Well, actually it checks whether `#2` consists of not one token (0 or > 1) and if so, wraps it in braces before putting it right next to `#1`.

```
#1% the stuff to be put before #2
```

```
#2% the stuff we check and pass unbraced if single or braced otherwise
{%
  \gmu@CountTokens{#2}%
  \gmu@if {num}{\c@gmu@TokensCount=\@ne}%
```

If we have only one token, we have to check whether it's space or not: the 'blank space' token could never become a hash without braces.

```
  {\gmu@if x{#2 }% if #2 is single token of blank space then we don't consider it single since it can't be an argument to a macro if without braces.
    \@secondoftwo\@firstoftwo
  }%
```

Otherwise (not one token, incl. the possibility of 0 tokens)

```
  \@secondoftwo
  {#1#2}{#1{{#2}}}%
}% of \gmu@passbraced Note that this works also for #2 being empty: it will be considered not single and passed in braces.
```

```
\long\def\gmu@passbracedNotSp
```

This macro works as the above except it doesn't embrace a blank.

```
#1% the stuff to be put before #2
#2% the stuff we check and pass unbraced if single or braced otherwise
{%
  \gmu@CountTokens{#2}%
  \gmu@if {num}{\c@gmu@TokensCount=\@ne}%
  {#1{#2}}%
  {#1{{#2}}}%
}% of \gmu@passbracedNotSp
```

```
\long\def\MeaningOrUnex#1{%
  \gmu@if {singletoken}{{#1}}%
  {\meaning#1}{\unexpanded{#1}}%
}
```

```
\pldef\@iwru#1{%
```

as simple as possible not to put much output on the terminal if tracing is on.

```
  \immediate \write \@unused {l.\the\inputlineno:\space #1}%
}
```

```
\pldef\@iwruJ{\@iwru{^^J}}
```

```
\pldef\@iwrum#1{%
  \@iwru{»\unexpanded{#1}« is »\MeaningOrUnex{#1}«}%
}
```

```
\pldef\@iwruU #1{\@iwru{\unexpanded{#1}}}
```

```
\pldef\@iwruif#1{%
  \gmu@if {gmu@debug@msgs}{}
  {\@iwru{#1}}{}%
}
```

```
\long\pdef\IgnInfo
#1% package name
#2% description
```

```
#3% stuff we announce as ignored
{%
  \PackageInfo{#1}{Item »\unexpanded{#3}« (\MeaningOrUnex{#3})
       ignored^^J%
      #2}%
}
```

```
\pldef\@iwma{%
```

(Added 2010/10/19)
Note it takes a *text* not an argument.

```
  \immediate \write \@mainaux
}
```

```
\def\stepnummacro
#1% a macro that expands to some numerical stuff
#2%
{\edef#1{\the\numexpr #1+#2}}
```

An expandable macro that expands to `\numexpr` containing conversion of given sequence of switches to a binary number, presented in its Horner's schema.

`\boolstobin`

```
\def\boolstobin
#1% a sequence of Boolean switches' names without »if«
{%
  \numexpr \boolstobin@iter 0 #1 {}\gmu@delim %
}
```

```
\def\boolstobin@iter
#1% expression so far
#2% the name of current switch (without »if«)
#3% tail of switches
\gmu@delim
{%
  \gmu@ifempty{#3}%
  {#1\relax}% \relax to close the num expression
  {\boolstobin@iter
    {(#1)*2+\csname if#2\endcsname 1\else 0\fi}%
    #3\gmu@delim
  }%
}
```

```
\long\def\condstobin
#1% a sequence of conditionals' names without »if« followed by the condition
{%
  \numexpr \condstobin@iter 0 #1 {}{}\gmu@delim %
}
```

```
\long\def\condstobin@iter
#1% expression so far
#2% the name of current conditional (without »if«)
#3% the condition for #2
#4% tail of switches
\gmu@delim
{%
  \gmu@ifempty{#3}%
4542   {#1\relax}% \relax to close the num expression
4543   {\condstobin@iter
4544     {(#1)*2+\csname if#2\endcsname #31\else 0\fi}%
4545     #4\gmu@delim
4546   }%
4547 }
```

```
4562 \long\def\gmu@ifQUANT@iter
```

(it's left-to-right and lazy)

```
4565 #1% the (binary) value that terminates calculation: 0 for AND and 1 for OR (it has to
         be a single token due to \expandafter in line 4583)
4568 #2% the (binary) value so far;
4569 #3% the name of current conditional (without »if«)
4570 #4% the condition for #2
4571 #5% tail of condition(al)s
4572 \gmu@delim
4573 {%
4574   \gmu@ifempty{#5}%
```

if `#5` is empty, we expand to the most recent (previous) value.

```
4576   {#2}%
4577   {% or else we check whether #2 is terminating
4578     \gmu@if {num}{#2=#1 }% with a space and expand to it and finish calculation if
              so…
4580     {#1}%
```

or iterate. This case happens where the value so far is `#1`, so the future of the conjunction doesn't depend on it.

```
4583     {\@xa\gmu@ifQUANT@iter \@xa #1%
4584       \the\numexpr %
```

`%%  1 *  %` `\numexpr` is used here to get the full expansion in one step. No need of superposing with identity.

```
4586       (\gmu@if {#3}{#4 } {1} {0}) +\z@\relax
4587       #5\gmu@delim
4588     }%
4589   }%
4590 }% of \gmu@ifQUANT@iter.
```

Disjunction of conditions (finite Existential Quantifier). First as a pseudo-conditional. It expands to an open `\if` but that's OK if we use it only inside macros or with `\gmu@if`.

```
4598 \long\def \ifAnyClause
4599 #1{%
4600    \ifnum
4601       \gmu@ifQUANT@iter
4602       1% for the Existential Quantifier 1 terminates calculation (an(y) example has
              just been found)
4604       0% To make any calculation sense we assume 0 at the beginning (i.e., "we haven't
              found an example yet")
4606       #1
4607       {false}{} {false} {}% the sentinel(s)
4608       \gmu@delim % the delimiter
```

```
        =\@ne % right side of \ifnum
}
```

```
\long\def\gmu@OR
#1% as above


%% #2% (impl.) True branch
%% #3% (impl.) False branch

{%
   \ifAnyClause {#1}%
      \@xa\@firstoftwo
   \else
      \@xa\@secondoftwo
   \fi
}
```

Now the dual, i.e., conjunction of conditions. First as a pseudo-conditional (as above)

```
\long\def\ifAllClauses
#1% a sequence of pairs {⟨conditionals' name without »if«⟩}{⟨the condition⟩}. (Don't
      delimit the conditions, it's been taken care of!) (it has to be braced).
```

```
{%
  \ifnum
      \gmu@ifQUANT@iter
      0% for the General Quantifier 0 terminates calculation (when a counter-example
            has just been found)
      1% To make any calculation sense we assume 1 at the beginning
      #1
      {true}{} {true} {}% the sentinel(s)
      \gmu@delim % the delimiter
      =\@ne % right side of \ifnum
}
```

```
\long\def\gmu@AND
#1%
{%
   \ifAllClauses {#1}%
      \@xa\@firstoftwo
   \else
      \@xa\@secondoftwo
   \fi
}
```

A shorthand: as `\Name` but with the second parameter delimited with a space (for less tokens)

```
\long\def\sName    #1#2    {\@xa#1\csname #2\endcsname}
```

and a version that detokenises its `#2`

```
\long\def\sdName    #1#2    {\@xa#1\csname \detokenize{#2}\endcsname}
```

```
\long\def\dName #1#2{\@xa #1\csname \detokenize{#2}\endcsname}
```

```
\long\def\@sN    #1    {\csname #1\endcsname}
\long\def\@sdN    #1    {\csname \detokenize{#1}\endcsname}
```

Some typesetting macros

A centered overlap

```
\pdef\clap #1{\hbox to \z@{\hss #1\hss}}
```

```
\pdef\hsizecline #1{\hbox to\hsize{\hss #1\hss}}
```

because `\centerline` uses `\textwidth` which is not always what we want.

```
\long\def\gmu@extreme
```

Note it's expandable and expands to the smallest (for `#2` being `<`) or largest (for `#2` being `>`) number/dimen of `#3` and `#4`. May be used recursively (tree-way).

```
#1% kind of test (num or dim)
#2% inequality sign: < for minimum, > for maximum.
#3% left side of comparison
#4% right side of comparison
```

But *in fact* this macro eats a sequence of numexprs or dimexprs that must be terminated by `\relax` (or sth. `\ifx`-equal) and expands to the extreme value of that sequence.

```
{%
  \gmu@if {x\@xa\@xa}{\@firstofmany#4\@nil\relax} % this complicated test is
        to allow arguments beginning with some \if⟨…⟩ as in \possvfil e.g.
  {#3}%
  {%
    \gmu@if {#1} {\csname #1expr\endcsname#3\relax
      #2\csname #1expr\endcsname #4\relax }
    {\gmu@extreme {#1}#2{#3}}%
    {\gmu@extreme {#1}#2{#4}}%
  }%
}% of \gmu@extreme
```

Two expandable macros that expect a sequence of undelimited num(expr)s terminated with `\relax` and expand to the biggest or the smallest one.

```
\def\gmu@maxnum{\gmu@extreme {num}>}
\def\gmu@minnum{\gmu@extreme {num}<}
```

And the same for dim(expr)s:

```
\def\gmu@maxdim{\gmu@extreme {dim}>}
\def\gmu@mindim{\gmu@extreme {dim}<}
```

And if we wish to assign the larger/smaller value in an iteration:

```
\pdef\gmu@fitto
#1% scope (nothing, \relax or \global.
#2% left side of the assignment (must be a dimen able to be ”passive”)
#3% the comparison (if #2#3#4 then reassign #2)
#4% right side of the assignment—any correct text for \dimexpr.
{%
  \gmu@if {dim}{#2#3\dimexpr (#4)+\z@\relax\relax}%
  {#1#2=\dimexpr (#4)+\z@\relax}%
  {}%
}
```

```
\pdef\gmu@g@enlargeto
#1% #2 of the above
```

```
#2% #4 of the above
{\gmu@fitto\global{#1}<{#2}}
```

Let’s define three auxiliary macros analogous to `\dywiz` from **polski.sty**: a shorthands for `\discretionary` that’ll stick to the word not spoiling its hyphenability and that’ll won’t allow a line break just before nor just after themselves. The `\discretionary` TeX primitive has three arguments: `#1` ‘before break’, `#2` ‘after break’, `#3` ‘without break’, remember?

`\discre`

```
\pdef\discre#1#2#3{\leavevmode\kern\z@
  \discretionary{#1}{#2}{#3}\penalty\@M\hskip\z@skip}
```

`\discret`

```
\pdef\discret#1{\discre{#1}{#1}{#1}}
```

A discretionary hyphen that allows other (automatic) break-points in the word.

```
\pdef\gmu@flexhyphen{%
  \discre{% before break
    \ifnum\hyphenchar\font>\z@
      \char\hyphenchar\font
    \fi
  }% end of before break
  {}% after break
  {}% without break
}
```

A tiny little macro that acts like `\-` outside the math mode and has its original meaning inside math.

```
\def\:{%
  \ifmmode\afterfi{\mskip\medmuskip}%
  \else\afterfi{\discre{\null}{}{}}% \null to get \hyphenpenalty not \exhyphenpenalty.
  \fi
}
```

```
\lpdef\hboxreflected#1{%
  \hbox{%
    \reflectbox{#1}%
  }%
}
```

```
\pdef\gmu@ifSystemX{% the ‘If file exists” test is NOT expandable since it involves opening some streams. Therefore we define this macro as protected.
  \IfFileExists{/etc/passwd}%
}
```

```
\def\hrule@zero{\hrule height\z@ width\z@ depth\z@}
\def\vrule@zero{\vrule height\z@ width\z@ depth\z@}
```

```
\def\do#1#2{% (2010/10/11) Define \gmu@iflast⟨sth.⟩ as a two-argument expandable macro-conditional.
  \Name  \def{gmu@iflast#1}{%
    \ifnum #2=\lastnodetype
      \@xa\@firstoftwo
    \else
      \@xa\@secondoftwo
    \fi
  }%
}
```

```
\do {glue}{11}    \do{skip}{11}
\do{kern}{12}
\do {penalty}{13}
```

```
\def\gmu@dimratio
#1% numerator dim(en/expr)
#2% denominator dim(en/expr)
{\strip@pt
  \dimexpr  1pt *
  \numexpr\dimexpr (#1)*1\relax\relax /
  \numexpr \dimexpr (#2)*1\relax \relax
  \relax
}
```

2010/10/21

```
\def\MakeFalseIfDefined #1{%
  \ifcsname if#1\endcsname
    \csn{#1false}%
  \fi
}
```

```
\def\MakeTrueIfDefined #1{%
  \ifcsname if#1\endcsname
    \csn{#1true}%
  \fi
}
```

2010/10/28

```
\def\gmu@pageremain{\dimexpr
  \ifdim\pagegoal=\maxdimen \textheight \else \pagegoal \fi
  -\pagetotal
  \relax
}
```

Absolute values of dimens & nums

Strictly for use in the “absoluters”

```
\def\gmu@GobbleMinus #1{\if-#1\else#1\fi}
```

```
\def\gmu@absExpr
#1% ε-TEX's expression primitive, num or dim so far (2010/12/17, 11.46)
#2% expression of respective kind
{%
  \@xa\gmu@GobbleMinus\the #1#2\endexpr
}
```

```
\def\gmu@absdim {\gmu@absExpr \dimexpr }
\def\gmu@absnum {\gmu@absExpr \numexpr }
```

2010/10/29

```
\pdef\gmu@SetPagegoal #1{%
```

This macro is LaTeX-specific in the sense that it assumes resetting of `\pagegoal` by `\output` at the beginning of a new page and excludes that case.

```
  \gmu@if {dim} {\pagegoal=\maxdimen}%
  {}% in this case we do nothing, as explained above
  {\pagegoal = \dimexpr (#1)\relax}%
}
```

2010/11/10

```
\pdef\gmu@SetPagegoalGlobal #1{%
```

This macro is LaTeX-specific in the sense that it assumes resetting of `\pagegoal` by `\output` at the beginning of a new page and excludes that case.

```
  \gmu@if {dim} {\pagegoal=\maxdimen}%
  {}% in this case we do nothing, as explained above
  {\global\pagegoal = \dimexpr (#1)\relax}%
}
```

```
\pdef\gmu@AdvancePagegoal #1{% the arg. should be a proper stuff for a subdimexpr (i.a., no spurious \relaxes are allowed).
```

```
  \gmu@SetPagegoal {\pagegoal +#1}%
}
```

```
\def\pagegoalortextheight{% as in the name:
```

(Note that „it's alive, it's alive!!!" but behaves as a dimen (except left side of assignments)). In particular, it's a subject to `\the` and thus can fully expand to a "dead" dimen spec. in one step.

```
  \dimexpr
    \ifdim \pagegoal=\maxdimen
      \textheight
    \else \pagegoal
    \fi
  \relax
}
```

```
\def\gmu@totalht #1{% the arg. should be a box register.
  \dimexpr \ht #1+\dp#1\relax
}
```

```
\def\vbadness@M {%
   \unless\ifnum\vbadness=\@M
      \edef\gmu@VeryBadBadness {\the\vbadness }%
      \vbadness\@M
   \fi
}
```

```
\def\vbadness@Restore {%
   \ifdefined \gmu@VeryBadBadness
      \vbadness \gmu@VeryBadBadness \relax
   \else
      \PackageError{gmbase}{You try to gm-restore \vbadness\space where
         it is not gm-stored}{}%
   \fi
}
```

For proper indentation of ε-TeX's expressions let's introduce an alias of `\relax`

```
\relaxen\endexpr
```

2010/11/22 the same for TeX's (primitive) rules:

```
\relaxen\endrule
```

2010/11/22

```
\def\gmu@ifpageodd {%
```

```
%% #1% (implicit) what if page number is odd
%% #2% (implicit) what if page number is even
```

```
  \ifodd \c@page
    \@xa\@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
}
```

2010/12/08, 15.14

```
\gmu@DefSymbol\gmu@Fake
```

```
\def\gmu@FakeLoaded
#1% extension
#2% name
{\ifcsname  ver@#2.#1\endcsname
    \@xa\ifx\csname ver@#2.#1\endcsname \relax
      \@xa\@xa\@xa \@firstofone
    \else
       \@xa\@xa\@xa \@gobble
    \fi
  \else
    \@xa\@firstofone
  \fi
  {\Name\def {ver@#2.#1}{\gmu@Fake }}%
}
```

```
\def\gmu@FakeUnloaded
#1% extension
#2% name
{\ifcsname  ver@#2.#1\endcsname
    \@xa\ifx\csname ver@#2.#1\endcsname\gmu@Fake
      \Name\let {ver@#2.#1}\@undefined
    \fi
  \fi
}
```

And an immediate use of the above. Because the **polski** package recatcodes a bunch of chars that are Polish diacritics in some ancient TeX encoding but in Unicode include the guillemots &al. that should rather remain "other".

```
\pdef\LoadPackagePolski {%
  \gmu@FakeLoaded \@pkgextension {inputenc}%
  \RequirePackage {polski}%
  \gmu@FakeUnloaded \@pkgextension {inputenc}%
}
```

```
\def\hrule@zero{\hrule height\z@ width\z@ depth\z@}
```

Combining accents (in XeTeX only)

Added 2011/07/13, 11.56. Useful as delimiters of macros' arguments robust to writes. First used in `\addcontentsline` of a nonstandard toc.

```
\pdef \protected@nil {}
\let\protected@empty\protected@nil
```

```
\ifgmuXeTeX
```

2011/02/03, 12.53 definitions of the macros for combinig accents have been moved here from my personal package since they are needed in **gmdoc** (to typeset typewriter `Ŭ` (absent in TeX Gyre Cursor) but used as one of argument types in `\DeclareCommand`).

```
  \def\gmu@nobound
```

typesets a char with the bound ##2 stripped off.

```
  #1% a char
  #2% bound number
  {%
    \gmu@unless {}
    {0%
      \gmu@if {num}{#2=\@ne }{0}{}%
      \gmu@if {num}{#2=13 }   {0}{}%
      1}
    {}
    {%
      \leavevmode
      \kern -\glyphbound #1 1%
    }%
    #1%
    \gmu@unless {}
    {0%
      \gmu@if {num}{#2=\thr@@ }{0}{}%
      \gmu@if {num}{#2=13 }{0}{}%
      1}
    {}
    {%
      \kern -\glyphbound #1 3%
    }%
  }
```

```
  \def\glyphbound
  #1% char (name)
  #2% number of the bound
  {%
    \XeTeXglyphbounds #2 \XeTeXglyphindex "#1"
  }
```

```
  \def\gmu@halfcomb
  #1% the "basic" char
  #2% the accent char
  #3% emergency [fontspec] font spec
  {%
    #1\kern-\gmu@halfwd #1%
    \clap{%
      \gmu@unless {fontchar}{\font `#2 }
      {#3}{}%
      #2}%
    \kern\gmu@halfwd #1%
  }
```

```
  \def\gmu@halfwd#1{0,45\fontcharwd\font`#1 }
```

```
  \def\gmu@llapcomb
  #1% the “basic” char
  #2% the accent char
  #3% emergency [fontspec] font spec
  {%
    \gmu@nobound #13%
    \llap{%
      \gmu@unless {fontchar}{\font `#2 }
      {#3}{}%
      #2}%
    \kern \XeTeXglyphbounds 3 \XeTeXglyphindex "#1"
  }
```

```
\fi % of if XeTeX
```

```
\pdef\@rmfromreset
```

Added 2011/06/01, 10.57 (GM)

```
#1% counter to be freed, e.g., figure,
#2% counter from whose power we free #1, e.g., chapter.
{%
  {%
    \def\@elt ##1{%
      \gmu@ifdetokens{#1}{##1}%
      {}% then we remove the element, otherwise
      {\@nx\@elt {##1}}%
    }%
    \Name\xdef{cl@#2}{\csname cl@#2\endcsname}%
  }%
}
```

2011/08/12, 13.06 (GM)

```
\long\def \gmu@iflist {%
```

`#1` (implicit) what if in a list environment `#2` (implicit) what if not in a list env.

```
  \ifnum \@listdepth>\z@
    \@xa\@firstoftwo
  \else
    \@xa\@secondoftwo
  \fi
}
```

2011/10/05, 16.17 (GM)

```
\foone {\@makeother \^^I }{%
  \def\xiitab{^^I}%
}
```

```
\foone {\catcode 9=\active } {%
```

Totally perverse, but seems to be useful with DocStrip.

```
  \def\gmu@maketabtab {%
    \def ^^I{\xiitab}%
  }%
}
```

```
⟨/base⟩
⟨*utils⟩
```

The (gmutils package) options

```
quiet  \DeclareOptionX{quiet}{\gmu@quiettrue
         \PassOptionsToPackage{quiet}{gmtypos}%
       }
```

The packages of this bundle may be loaded as options of the **gmutils** package. Here is how we provide it.

We define a requirer:

```
\def\gmu@PackOptionX
#1% name of a package with or without leading “gm”.
{%
```

So we declare an OptionX that by default loads this package thanks to a special CS having been defined to load it or do nothing.

```
#1    \DeclareOptionX{#1}[on]{%
```

```
%%    \ifcsname gmu@Require@#1\endcsname
%%        \PackageError{gmutils}{Value clash for the ***#1*** package
option}{}%
%%    \fi
```

```
    \lowercase{\@xa\if\@gobble ##1\relax}% “off” given as the value
    \@namedef{gmu@Require@#1}{}%
    \else % “on”
    \afterfi{%
      \@namedef{gmu@Require@#1}{%
        \IfFileExists{gm#1.sty}%
        {\RequirePackage{gm#1}}% if there’s a gm package, we load it, else we load
        {\RequirePackage{#1}}%
      }% of namedef
    }% of afterfi
    \fi
  }% of \DeclareOptionX
  \IfFileExists{gm#1.sty}%
gm#1  {\DeclareOptionX{gm#1}[on]{%
      \ExecuteOptionsX{#1=####1}%
    }%
  }% of if yes. Else:
```

```
  {}%
}
⟨/utils⟩
```

`\DeclareCommand` and `\DeclareEnvironment`—the gmcommand package[3]

```
⟨utils⟩     \gmu@PackOptionX{command}
⟨*command⟩
```

(2010/07/26, v0.993:) Incompatibilities with earlier versions: because of making all the specifiers “case-insensitive”, i.e. aliasing the uppercases as lowercase, the `S` spec. ceased to be a **S**ingle-token-catcher and became a **S**tar-token-catcher.

Moreover, the parameters for *all* the one-parameter specifiers became optional (not only for the lowercase as earlier).

Moreover, catcher names of CS specifiers are now created by `\string`ing the CS and stripping its backslash (earlier: by crude detokenising it).

```
\RequirePackage{gmbase} % we require the low-level macros.
```

```
\unless\ifcsname ifgmu@quiet\endcsname
\Name\newif {ifgmu@quiet}% it has to be at least (at highest) in gmcommand since
        is used by it and not always entire gmutils is loaded.
```

(2010/09/06, v0.993:) moved here from **gmutils.sty** (a bug fix)

```
\fi
```

The code of this section is based on the **xparse** package version 0.17 dated 1999/09/10, the version available in TEX Live 2007-13, in Ubuntu packages at least. Originally considered a stub ‘im Erwartung’ (Schönberg) for the LATEX3 bundle, it evolved to quite a nice tool I think.

After a short deliberation I rename the command to `\DeclareCommand` which is much shorter than original `\DeclareDocumentCommand` and more adequate at least in my case: I don’t only use this powerful tool for ‘document’ commands.

`\DeclareCommand`*⟨a CS⟩⟨prefs.⟩*`{`*⟨args’ spec⟩*`}{`*⟨body, using #1…#2⟩*`}`

The *⟨prefs.⟩* may be any (incl. empty) subset of

`\global\protected\outer\long\relax!lL.qQiIwW\sphack`

first for for effect analogous to that of prefixing `\def` of a macro, `\relax` for the case when `\DeclareCommand` is used automatically, `!Ll` aliases for `\long`, `.qQ` to suppress placing of the diagnostic message in the definition `iIwW\sphack` to make the command **I**nvisible (with `\@bsphack`—`\@esphack`).

(One more possible all-command prefix, `\envhack`, used to inform the machine the command will be used as an environment, is placed automatically when `\DeclareEnvironment` is used. You may use it however at your own risk if you read the code of this package and want to hack it.)

In the *⟨body⟩* you use single `#`es as a refernce to the parameters specified in *⟨args’ spec⟩*, `##` (double hashes) as the parameters of macros defined by your command and so on.

The *⟨args’ spec⟩* consists of the specifier tokens optionally preceded by a `>{`*⟨prefixex⟩*`}` sign and prefixes. Anything else is ignored, so you can write e.g., `#1…#9` for better readability if you like.

---

[3] This file has version number v0.996 dated 2011/10/12.

Before we go further with details, a word about general idea. `\DeclareCommand` defines a `\protected` macro named *⟨a CS⟩* that takes no arguments and expands to a bunch of *argument catchers*. The notion of an "argument catcher" seems crucial for understanding how does this machinery work. Each specifier, that is a possibly-prefixed-specifier-token, is translated to proper argument catcher in *⟨a CS⟩*'es meaning. Then each of those catchers (postpones remaining list of catchers and) tries to catch the bunny, i.e., for the optional arguments performs respective `\@ifnext`… test and takes an argument if present and adds it to a dedicated toks (or adds the default value if suitable argument is absent (except for mandatory arguments that are scanned for anyway and whose absence results with an error)).

The *⟨body⟩* becomes body of a macro with undelimited parameters of the number corresponding to the number of non-ignored *⟨args' spec⟩*'s specifiers.

Moreover, `\DeclareCommand` defines a macro carrying as its meaning the (parsed and simplified) specifiers' sequence to allow e.g. repeating it in another `\DeclareCommand` thanks to `\SameAs` special specifier.

The *⟨prefixes⟩* are:

- `P` or any of `p!lL\long\par` to make subsequent argument `\long` (some arguments are *always* `\long` which will be remarked);
- `\@xa`, `\expandafter` for one-level expansion of (the first token of) the first and all possible further specifier's argument(s) before actual declaring;
- `\@nx@xa`, `\@nxxa`, `\nxxa` to leave first specifier's argument intact and one-level expand the second;
- `\@xa@nx`, `\@xanx`, `\xanx` reverse of the above;
- `\@xaeacher`, `\xaeacher`, `\xaEacher`, `\xaE` for one-level expansion of the "eacher" token of the interating specifiers `\loop`, `U|u` and/or `W|w` (see the description of those specifiers);
- `\GroteNegere`, `\GrossIgnore`, `\GroteN`, `\GrossI` to ignore *all* the specifiers starting from this prefix and stopping at (any of) the following prefixes:
- `\GroteNegereStop`, `\GrossIgnoreStop`, `\GroteNStop`, `\GrossIStop`
- `\GroteLang`, `\GrossLong`, `\GroteL`, `\GrossL` to make all the specifiers following this prefix `\long` up to the (any of) following prefixes:
- `\GroteLangStop`, `\GrossLongStop`, `\GroteLStop`, `\GrossLStop`

The accepted argument specifiers are (case of the single letters doesn't matter):

- `m|M` for mandatory argument (braced or not) (undelimited macro parameter in the sense of Chapter 20 of *The TeX book*),
- `(o|O|\NoValue)[`*⟨default⟩*`]` for a LaTeX's optional argument (in square brackets) with default value *⟨default⟩* (which is passed as `#`*⟨n⟩* if the argument is missing),
- `(s|S|\NoValue)[`*⟨default⟩*`]` for optional star of the catcode any of $\{11, 12, 13\}$ (if is present, it becomes respective `#`*⟨n⟩*, or else `\NoValue` is at the `#`*⟨n⟩* (unlike in **xparse**!).
- `(t|T|\NoValue){`*⟨list⟩*`}[`*⟨default⟩*`]` for a single **T**oken, checks whether on the respective position there's an unbraced token one of *⟨list⟩* and returns it on `#`*⟨n⟩* if present or `{`*⟨default⟩*`}` if absent. The `{`*⟨default⟩*`}` is a braced optional. If absent, `\NoValue` is the default.

  Almost like in **xparse**, `s` is almost a shorthand for `T{*}`, but *unlike* in **xparse**, in the parsed arguments you get `*` or `\NoValue` as `#`*⟨n⟩*. You can now declare

  ```
  \DeclareCommand\mimbla{T{+-}m}{%
   \leavevmode
   \ifx#1+\raise\fi
   \ifx#1-\lower\fi
   \ifx#1\NoValue\@tempdima=\fi
   7pt \hbox{#2}%
   }
  ```

and after `\mimbla+{raised} \mimbla-{lowered} \mimbla {untouched}` get:
raised
lowered untouched

This example is rather silly but shows that you spend only one `#` for two symbols while in **xparse** you would spend two. What if you wanted 10 options for the optional symbol? Here it's no problem. And with any number k of tokens on the list the next `#` is always $n+1$ not $n+k+1$.

- (`ť`|`Ť`|`\NoValue`)`{`⟨*list*⟩`}`[⟨*default*⟩] as above only respecting blank spaces
- (`q`|`Q`|`\NoValue`)`{`⟨*list*⟩`}`[⟨*default*⟩] as 'se**Q**uence', a sequence of symbols from ⟨*list*⟩; for the fundamental usage see line 7796. More clearly, the catcher specified with `Q{`⟨*tokens*⟩`}` catches a word over the alphabet ⟨*tokens*⟩ ∪   where   is ignored and shall not be passed in the respective `#`⟨*n*⟩.
- (`d`|`D`|`\NoValue`)[⟨*default*⟩] the **D**ecimal (expansion of an integer) argument, equivalent to `Q{+-0123456789}`. If no ⟨*default*⟩ is given, `0` is assumed.
- (`ď`|`Ď`|`\drs`)[⟨*default*⟩] (d/D-haček): decimal integer respecting space (`ď` and `Ď` are made available only in XeTeX). Works as the above only doesn't ignore/gobble spaces.:

```
 \DeclareCommand \foo{ D }{\romannumeral #1\relax}
 \DeclareCommand \fóó{ Ď }{\romannumeral #1\relax}

 :\foo 17 17 :\quad :\fóó 17 17 :
```

results in:

:mdccxvii: :xvii 17 :

`\DCcoordinate`
`\DCnocoordinate`

- (`c`|`C`|`\NoValue`)[⟨*default*⟩] for an optional argument in parentheses. Historically it comes from the 'coordinate' argument and may serve as such: if you declare `\DCcoordinate`, then its catcher will be redefined to check for presence of a comma and pass the argument as `{{`⟨*before comma*⟩`}{`⟨*after comma*⟩`}}` if comma present. `\NoValue` is passed if absent. By default `\DCnocoordinate` is executed that defines the `c` type argument as just another optional in parentheses.
- (`b`|`B`|`\NoValue`)[⟨*default*⟩] for for an *optional argument in curly braces*. That's strange for anyone acquainted with LaTeX and contrary to its basic convention, but practised by Til Tantau in the **beamer** class. If missing, `\NoValue` is passed as `#`⟨*n*⟩ and therefore all the tests `\If`[`No`]`Value`(`T`|`F`|`TF`) apply.
- `K{`⟨*#-string*⟩`}`[`{`⟨*replacement*⟩`}`] for a *mandatory* **K**nuthian delimited or undelimited macro parameters. This concept comes from Stephen Hicks' suggestion at BachoTeX 2009 of implementing arguments delimited with `#{`. So, in the mandatory first argument to `K` you give an arbitrary parameters string as described in Chapter 20 of *The TeX book*. If you don't provide the replacement, only `#1` of those parameters will be passed to the core macro of your command as `#`⟨*n*⟩. In both arguments you use single `#` char.
- (`g`|`G`|`\NoValue`)`{`⟨*pair of tokens*⟩`}`[⟨*default*⟩] a **G**eneral catcher of an optional. For instance, to declare an optional in angles (used e.g. in Till Tantau's **beamer** class), declare `G{<>}`. Again, if the second argument is absent, `\NoValue` is assumed.
- (`a`|`A`|`\NoValue`)[⟨*default*⟩] (for 'angles'): a shorthand for `G{<>}`
- `=`[`{`⟨*assignment-stuff*⟩`}`] a pseudo-argument that in fact *interrupts* parsing arguments to execute an assignment to ⟨*assignment-stuff*⟩. The default ⟨*assignment-stuff*⟩ is `\@tempcnta`. For example,

```
 \DeclareCommand\llf{=}{{\lastlinefit\@tempcnta\par}}
```

defines `\llf` to be a command that expects a value for a numerical assignment, assigns it to (`\@tempcnta` and then to) the `\lastlinefit` special register and executes `\par` with that setting inside a group.

Actually, ⟨*assignment-stuff*⟩ may be empty `{}` and then each time our command is used the left side of the assignment has to be given explicitly and may even be different each time.
I call it "pseudo-argument" because it doesn't add anything to the arguments' list (toks).
This pseudo-argument type should be considered experimental.

— `\loop(\any|\none){`⟨*list to match for/against iteration*⟩`}`
`[(\drop|\lost)](\any|\none){`⟨*list of dropped*⟩`}`
`[(\count|\ubound)][`⟨*decimal*⟩`]`
`[(\default|\Default)][{`⟨*default*⟩`}]`
`[(\eacher|\Eacher)][{`⟨*eacher*⟩`}]` for a catcher that iterates *while* (for ⟨*"direction"*⟩ being one of `\any`, `W`, `w`, `\W`, `\w`) or *until* (for ⟨*"direction"*⟩ being one of `\none`, `U`, `u`, `\U`, `\u`) it meets tokens listed on ⟨*list to match for/against iteration*⟩.
During this iteration the catcher drops the tokens listed on ⟨*list of dropped*⟩ if `\any` precedes that list or adds *only* those if the list is preceded with `\none`.
The number of iterations may be upper-bound with ⟨*decimal*⟩, therefore you may write `\count` or `\ubound` before it for readability.
⟨*default*⟩ is almost self-explaining: we have only explain when applies and what if absent. So, it applies when the parsed sequence of tokens/texts is empty—then ⟨*default*⟩ substitutes that emptiness. By default, i.e., when you specify no ⟨*default*⟩, `\NoValue` is assumed.
⟨*eacher*⟩ is a token (or a list of tokens) added before each token/text caught. An example is given at the `u|U` specifier's description.

— `w|W` a shorthand for `\loop w`: a catcher iterating **W**hile.

— `u|U` a shorthand for `\loop u`: a catcher iterating **U**ntil. Let's

```
\def\EmergencyFont#1{%
   \ifcat a\noexpand#1%
     \iffontchar\font`#1
        #1%
     \else{\fontspec{FreeSerif}#1}%
     \fi
   \fi
}

\DeclareCommand\foo{
   u{\par\<\bgroup} \eacher{\EmergencyFont}
   w{\<} \count 1
 }{#1}
```

and then

```
\fontspec{HerculanumLTStd} \foo Pójdź, kińże tę chmurość w~głąb flaszy{}
```

(the Herculanum STD font hasn't Polish diacritics) results in

P Ó J D ź K I ń ż E T ę C H M U R O ś ć W G ł ą B F L A

— `\lostwax{`⟨*list to match against iteration*⟩`}`
`[\drop](\any|\none){`⟨*list of dropped*⟩`}`
`[[(\count|\ubound)]`⟨*decimal*⟩`]`
`[(\default|\Default)][{`⟨*default*⟩`}]`
`[(\eacher|\Eacher)][{`⟨*eacher*⟩`}]`
`[\lost|\Lost]{`⟨*lost-list*⟩`}[[\count|\ubound]`⟨*decimal*⟩`]`
`[\endlost|\EndLost]` for a catcher that iterates *until* as the one specified with `u|U` and *loses* (drops) its delimiter(s) as specified in the `\lost` part of specification, i.e., the ones present on ⟨*lost-list*⟩, or *any* delimiter (cf. `\grab@lostwax`).

— `\SameAs`⟨*command*⟩ “mimetic” specifier (cf. Réné Girard, James Alison: »mimetic desire«;-))). Repeats current specifiers of ⟨*command*⟩.

Note that you could limit acceptable values of a mandatory or an optional-in-brackets argument to a list inside definition of the command, using `\IfAmong…\among…` defined in line 1438.

The `S/T`, `s` and `Q` arguments are always ‘long’, they allow `\par` as their value that is. They have to be unbraced to be parsed so there’s no danger of “runaway argument”.

`\long!lL` By default, all the `c`, `C`, `o`, `O`, `m`, `b` and `B` are ‘short’, they don’t allow `\par` in them that is. Note however that `\par` is allowed in the default values. If you wish to allow `\par` for all the arguments, you can say `\DeclareCommand\mycommand!…` — the optional `!` makes all the arguments ‘long’. Instead of `!` you can use `L` or `l` for ‘long’ or just `\long` itself.

In the arguments specification string you can write `>`[`{`]⟨*prefix*⟩[`}`] to make subsequent argument ‘long’ or ignored:

`Pp!lL\long\par` Any of `Pp!lL\long\par` to make a particular argument ‘long’, allowing `\par` in it that
`iI` is, and/or any of `iI` to make the argument ignored (just gobbled).

(Note that also the `c` and `C` arguments may be made ‘long’. That’s because I use them not as coordinates but as just another kind of optional argument.

The concept of ignored arguments came to my head when I was declaring a command with three braced optionals and put optional stars only to distinguish the braced optionals.

For example, after

```
\DeclareCommand\GLBTQKi{%
   G{&&}{\#1 default}
   >LB{\#2 default}
   >iT{*\ht}
   Q{0123456789}{0}
   K{#1\par#2\par}{{\text{#1}\over\text{#2}}}
```

and you get `\GLBTQKi` 4-argument with:
`&#1&` `G{&&}` optional short in a pair of `&` with `\NoValue` as the default,
`{#2}` `>{L}B` optional long in curly braces,
⟨*ign.*⟩ `>{i}T{*\ht}` star or `\ht` control sequence,
`#3` `Q{0123456789}{0}` optional sequence of decimal digits with default 0,
`#4` `K{#1\par#2\par}{{\text{#1}\over\text{#2}}}` mandatory sequence of two arguments both delimited with `\par`, that will be passed the inner macro as `{\text{%` `#1}\over\text{#2}}`.

`\IfLong` The arguments may be tested inside the command with `\IfLong{#`⟨*n*⟩`}{`⟨*what if long*⟩`}{`⟨*what if short*⟩`}`. The test looks for `\par` at any level of nesting (`{\par}`—`\par` in braces will not hide) since it uses the `\gmu@ifxany` test that iterates token by token not hash by hash.

`\global\outer` If you wish to define your command `\global`ly, you can specify `\DeclareCommand%` `\mycommand\global`. If you wish to forbid usage of your command in arguments of macros, add the `\outer` prefix. As with original TeX’s `\def` and like, the prefixes are allowed in any order and in any number only here they come between the command’s name and the arguments specification. You can also add `\long`, as we mentioned above, and, for the symmetry, also `\protected`, although the latter is *always* added since the command is not expandable.

Handling of white spaces with optionals seems to me too complicated compared to the estimated weight of the problem and I haven’t faced it so far so I don’t provide anything. But!—but there are some commands that should be invisible in the typeset text, such as indexing commands and font declarations. For those there is a working LaTeX mechanism `iIwW\sphack` of `\@bsphack`—`\@esphack` and to use it I provide yet another 'prefix': if you type `W` or `w` (for 'white') or `I` or `i` (for 'invisible') or, if you prefer a prefix-like, `\sphack`[4] between the CS to be defined and arguments spec, `\@bsphack` and `\@esphack` will be added in proper places.

The original inner macros of the ancient **xparse** had names like `\@dc@o` etc. According to my TEX Guru's advice I changed them to `\ArgumentCatcher@`*⟨letter(s)⟩* to make the error messages less confusing. Well, I don't know if they are but `\ArgumentCatcher@PO` looks better than `\@dc@PO` doesn't it?

`\IfDCMessages` `\DCMessagesfalse` `\DCMessagestrue` Talking of messages, there's a Boolean switch `\IfDCMessages`. Its default setting is `\DCMessagesfalse` but if you set `\DCMessagestrue`, every `\command` created with my `\DeclareCommand` will issue a message "Parsing arguments for `\command`" at the beginning of its execution.

`.qQ` If you are positive that no such message will ever be useful, you can suppress the very placing of it in the command's definition with an optional argument to `\Declarecommand` with all other 'prefixes', `.` or `q` or `Q` for 'quiet'.

To sum up, `\DeclareCommand` takes the following arguments:

- `#1` `>{P}m` the command to be defined (can be even `\par` if you really wish),
- `#2` `Q{\long\global\outer\protected!lL.qQiIwW\sphack}{}` optional ε-TEX's prefix (es) and/or symbols for making all the arguments long (`!`, `l` or `L`) and/or to suppress placing of the diagnostic message in the definition (`.`, `q`, `Q`) and/or for placing `\@sphack`—`\@esphack` (`i`, `I`, `w`, `W`, `\sphack`),
- `#3` `>{P}m` the arguments specification (can contain `\par` as you see),
- `#4` `>{P}m` the definition body. You refer to the arguments with `#`*⟨n⟩* and can test their presence and absence with `\If[No]Value(T|F|TF){#`*⟨n⟩*`}` and if the argument was specified with the `>P` prefix (allows `\par` in itself), you can test it with `\IfLong{#`*⟨n⟩*`}{`*⟨if long⟩*`}{`*⟨if short⟩*`}`. You are also provided the `\IfAmong`…`\among` and `\IfIntersect` tests defined earlier in this package to process the arguments, especially of the `S`/`T` and `Q` type.

`\DeclareEnvironment` There is also the `\DeclareEnvironment` command to define environments with sophisticated optionals. It takes the arguments analogous to those of `\DeclareCommand`.

The `iIwW\sphack` specifier however acts different: it doesn't add `\@bsphack` nor `\@esphack` but only `\@ignoretrue` to the end macro so the spaces following `\end{myenvir}` will be ignored. (I tried the space hack but it's problematic ("bad space factor" error) if an environment begins in the vertical mode and ends in horizontal.

So the arguments to `\DeclareEnvironment` are:

- `#1` `>{P}m` the environment's name; you may wonder why it allows `\par`; it's to allow environments like `\string\par`—I met such an environment once.
- `#2` `Q{\long\outer\global\protected!lL.qQiIwW\sphack}{}` to prefix the command (note that `\outer` prefix will actually not work since the command is called with `\csname`), make all the arguments 'long' (`\long`, `!`, `l` or `L`), not to place the message issuer in the command (`.`, `q`, `Q`) or to make the environment ignores spaces following its end (`iIwW\sphack`).
- `#3` `>{P}m` the arguments specification (both for the begin and for the end macros)
- `#4` `>{P}m` the begin definition,
- `#5` `>{P}m` the end definition; it can use the same parameters (`#`*⟨n⟩*'s) as the begin definition. Note however that there is only one specification of the arguments and both begin and end have to have 9 parameters in total at most.

```
\unless\ifdefined\@temptokenb
```

---

[4] I don't define the `\sphack` control sequence and don't assume it's defined. I use it only as a marker and my use of it doesn't create an entry in the hash table.

`\@temptokenb`

```
\newtoks\@temptokenb
\fi
```

`\if@dc@alllong@`

```
\newif\if@dc@alllong@ % for an option of all arguments long (it's stronger than
     GroteLang defined later (the latter is \let it).
```

`\if@dc@quiet@`

```
\newif\if@dc@quiet@ % for suppressing the message of using of declared command.
```

`\ifDCMessages`

```
\newif\ifDCMessages % a global switch to suppress the message about parsing.
```

`\@dc@arguments`

```
\newtoks\@dc@arguments % the register for storing parsed \\command {#1}…{⟨n⟩}.
```

`\c@dc@catchernum` `\c@dc@argnum`

```
\newcount\c@dc@catchernum
\newcount\c@dc@argnum
```

`\if@dc@ignore@` `\if@dc@GroteNegere@` `\if@dc@GroteLang@`

```
\newif\if@dc@ignore@
\newif\if@dc@GroteNegere@ % for "gross" ignoring
\newif\if@dc@GroteLang@ % for "gross" longness
```

`\if@dc@long@`

```
\newif\if@dc@long@
```

`\if@dc@BareSpace@`

```
\newif\if@dc@BareSpace@
```

```
%% \gmu@DefSymbol\BareSpace % no need: the test checks bebackslashed strings.
```

```
\def\@dc@long@letter{%
\if@dc@long@ P\fi
}
```

`\if@dc@xadefault`

```
\newif\if@dc@xadefault
```

This is a switch whether a default value of an argument should be one-expanded (`\expandaftered`) before adding it to the catchers toks. This switch may be set true in a prefix and to make it safe it has to be set false after parsing of each argument. That's why it's set false in so many places. Maybe in the future we'll add analogous switch whether to `\edef` default value, then they both will have to be switched in the same places.

And three swith macros for the specifiers with two defaults.

```
\def\@nx@xa{\@nx\@xa}
\def\@xa@nx{\@xa\@nx}
\def\@xa@xa{\@xa\@xa}
```

`\if@dc@xadefault@i@` `\if@dc@xadefault@ii@` `\if@dc@xaeacher@`

```
\newif\if@dc@xadefault@i@
\newif\if@dc@xadefault@ii@
\newif\if@dc@xaeacher@
```

```
\def\@dc@falsify@xadefaults{%
  \@dc@xadefaultfalse
  \@dc@xadefault@i@false
  \@dc@xadefault@ii@false
}
```

```
\lpdef\DeclareCommand#1#2#3{% 7604.
```

`#1` command to be defined,
`#2` arguments specification,
`#3` definition body.

`\@dc@alllong@true`

```
\@dc@alllong@true
  \@dc@ResetParseAuxilia
  \@dc@ParseNextSpecifier #2%
  \@dc@buckstopshere% it's the sentinel of parsing. Doesn't have to be defined since the test performs a strings comparison.
  \protected\edef#1{%
    \@nx\@dc@    {\the\toks@}%
    \@xanxcs{\@dc@InnerName{#1}}%
    \@nx #1%
  }%
  \edef\gmu@DeclareCommand@resa{%
    \long\def\@xanxcs{\@dc@InnerName{#1}}%
    \@xau\@dc@innerhashes{%
      \unexpanded{#3}}%
  }% of resa
  \gmu@DeclareCommand@resa
}% of the 'draft' \DeclareCommand.
```

```
\long\def\@dc@
  #1% the argument catchers in a pair of braces (their arguments may contain \par so the macro is long).
  #2% \\thecommand\
  #3% \thecommand
  {%
  \ifx\protect\@typeset@protect
    \@xa\@firstofone
  \else
    \protect#3\@xa\@gobble
  \fi
  {\@dc@arguments{#2}#1\the\@dc@arguments}%
}
```

\@dc@ParsedSpecs

```
\newtoks \@dc@ParsedSpecs
```

```
\def\@dc@ResetParseAuxilia{%
  \@dc@ParsedSpecs={}%
  \c@dc@catchernum\z@ % the count of catchers
  \c@dc@argnum\z@ % the count of arguments (inner arity) (it may be smaller than the above if we ignore some arguments)

  \toks@{}% in this register we will store the created sequence of argument catchers.
```

And for the M̊ specifiers:

```
  \@dc@Mmode@false
  \emptify\@dc@innerhashes % in this macro we will store the sequence of #1#2....

  \@dc@GroteNegere@false
  \let\if@dc@GroteLang@\if@dc@alllong@
}
```

\if@dc@Mmode@

```
\newif \if@dc@Mmode@
\def\@dc@Ms@num {\z@}%

\def\@dc@Ms@init{%
  \@dc@Mmode@true
  \def\@dc@Ms@num {\z@}%
```

We memorise the state of longness and ignorance at the beginning of `M`|`m`’s collection (encoded as a numexpr consisting of binary vector of the (standard conversion to $\{0,1\}$) of the switches `\if@dc@long@` and `\if@dc@ignore@`).

```
  \edef\@dc@Ms@initial@listate{%
    \@dc@Ms@listate
  }% of edef
}
```

```
\def\@dc@Ms@listate{%
  \boolstobin{{@dc@long@}{@dc@ignore@}}%
}
```

```
\def\@dc@Ms@shipout {%
```

This macro adds the number of collected `M`|`m`'s after the catcher and ends the `M`-mode:

```
  \gmu@if {num} {\@dc@Ms@num>\z@}%
  {\@xa\dc@addtoParsed@\@xa{\@dc@Ms@num}%
    \def\@dc@Ms@num{\z@}%
    \@dc@Mmode@false
   }%
   {}%
}
```

```
\def\@dc@ResetStepAuxilia {%
```

We set the local ignorance switch to its “gross” value

```
  \let\if@dc@ignore@ =\if@dc@GroteNegere@
  \let\if@dc@long@ = \if@dc@GroteLang@
```

and reset the expandaftering switches

```
  \@dc@falsify@xadefaults
  \@dc@BareSpace@false
}
```

```
\def\@dc@argtypes{%
  =\gobblespace \loop \lostwax \SameAs \Scope
  AaBbCcDdGgKkMmOo%
  QqSs*TtUuWw%
  \drs
}
```

```
\def\@dc@drses{\drs} % decimal respecting space
```

```
\@ifXeTeX
{\addtomacro\@dc@argtypes{ďĎŤťŬŭÔô}%
  \addtomacro\@dc@drses{ďĎ}%
}
{}
```

```
\def\@dc@ParseSpecifier #1{% The main inner macro parsing argument specifiers in \DeclareCommand.
```

`%%  \@dc@ResetStepAuxilia %` putting it here is *wrong* andd leads to disaster

```
  \gmu@CASE {stribs}{{#1}\@dc@buckstopshere}%
```

If we meet the sentinel we stop.

```
  {%
```

There could have been caught some `M`|`m`'s in the previous steps and they are not put immediately, so now we shipout their number, if any:

```
5972  \@dc@Ms@shipout
```

And edefine the macro carrying the inner hashes:

```
5975    \edef\@dc@innerhashes {%
5976      \gmu@hashes 1{\numexpr\c@dc@argnum +\@ne}%
5977    }%
5978  }%
```

Else we check if we've met the prefixer

```
5982  \gmu@CASE {stribs}{{#1}>}%
5983  {%
```

`%% \@dc@ResetStepAuxilia %` No! the prefix-switches are reset at `\@dc@ParseNextSpecifier` and here we may be after previous prefix.

```
5986    \grab@prefix }%
```

Else we check if `#1` is a known arg specifier…

```
5990  \@XA{%
5991    \gmu@CASEsbnone{#1}}\@xa{%
```

Here is the list of arg specifiers (arg types) recognised by `\DeclareCommand`.

Anything else (if not parsed as a specifier's parameter or prefix) is just ignored. For instance, you may write `#1`…`#9` to make your code more readable.

```
6000    \@dc@argtypes
6001  }%
```

…and ignore it and iterate further if not…

```
6004  {\IgnInfo{gmcommand}{while parsing arg specifiers}{#1}%
6005    \@dc@ParseNextSpecifier }%
```

…or else (`#1` is known and not stop and not prefixer) we check if it's the `\SameAs` special specifier.

If so, then we apply special parser `\@dc@SameAs` (quite simple in fact).

```
6013  \gmu@CASE {stribs}{{#1}\SameAs}%
```

In this case we just expand the specifiers of "`\SameAs` arguments"

```
6016  {\@dc@SameAs}%
```

Here `#1` is not stop neither prefixer nor the special specifier `\SameAs`, so we add its catcher possibly with »P« for longness, and possibly prefixed with ignorance.

If we parsed sth. else than `M|m`, we possibly ship the `m`'s collected formerly:

```
6024  \gmu@ifsbnone {#1}{Mm}%
6025  {\@dc@Ms@shipout }%
6026  {}%
```

But only if not in the `M`-mode (about special treatment of `M|m`'s see line 6095).

```
6031  \gmu@if {@dc@Mmode@}{}%
6032  {}%
6033  {%
```

Now. If we parse the assignment pseudo-argument, we don't want to add anything to the arguments' toks register so we apply general mechanism of ignoring an argument. The same for the pseudo-argument that causes ignoring spaces.

```
    \gmu@ifsbany{#1}{=\gobblespace}{\@dc@ignore@true}{}%
```

and add the catcher of `#1` type.
The catcher's CS is `\ArgumentCatcher@`[`P`]⟨*arg. type*⟩:

```
    \gmu@ifsw {@dc@BareSpace@}%
    {\@dc@addtoparsed@BareSpace }
    {}%
    \gmu@ifsw {@dc@long@}%
    {\@dc@addtospecs@bare{>P}}
    {}%
    \gmu@ifsw {@dc@ignore@}%
    {\@dc@addtoparsed@Ignore   }%
    {}%
    \@dc@addtospecs@bare {#1}%
    \@xa\addtotoks\@xa\toks@\@xa{%
      \csname ArgumentCatcher@\@dc@long@letter
      \strip@bslash{#1}%
      \endcsname
    }% of toks' text.
```

Now we step the counters of catchers and argums (they'll be unequal if some argument is ignored or if there are multiple subsequent `m`'s) and probably add `#`⟨*n*⟩ tokens to respective toks.

```
    \advance\c@dc@catchernum\@ne
  }% of if not M-mode
```

But we step the number of arguments (of the inner macro) also in the `M`-mode:

```
  \gmu@notif {@dc@ignore@}{}%
  {\@dc@addinnerhash }%
  {}% (empty "not-else" branch of ignoring)
```

(the ignorance switch will be reset at the beginning of next step of parsing, just like other step-local switches).

Now we parse the parameter(s) of `#1` where we should (usually the default value)
The `M`|`m` catcher(s) are treated specially, for legacy and performance reasons: when we meet an `m` or `M`, we set our parser to the `M`-mode if not yet, to look if it's not a beginning of a longer sequence of such specifiers.

```
  \gmu@CASEsbany {#1}{Mm}%
```

If so, we process it appropriately:

```
  {\@dc@process@ms}%
```

The `K` catcher also requires special treatment since the parameters are not just passed to it but a particular macro is defined with use of them.

```
  \gmu@CASEsbany {#1}{Kk}%
  {\@dc@define@K}%
```

Else (not mandatory(s) neither Knuthian) we check if parameterless, one- or two-parameter.

```
  \gmu@CASEsbany {#1}{\gobblespace}%
```

For the parameterless specifiers we did all and we just continue parsing.

```
  {\@dc@ParseNextSpecifier}%
```

Now the one-parameter specifiers (the parameter is optional, although (necessarily) in curly braces). For these we look for the parameter and provide the default if not provided by the user.

```
  \gmu@CASEsbany{#1}{=\Scope AaBbCcDdOoSs*}%
  {\grab@optparam{#1}}%
  \@XA{\gmu@CASEsbany{#1}}\@xa{\@dc@drses}%
  {\grab@optparam{#1}}%
```

For the loop catchers, `Uu` so far, maybe `Qq` in the future:

```
  \gmu@CASEsbany{#1}{UuŬŭWw\lostwax}%
  {\@dc@grab@Loop #1}% putting the specifier's letter as #1 for the grabber sup-
          presses adding it to the parsed specifiers' list.
```

Else we've met a specifier with first parameter mandatory and second optional (the latter has to be in curly braces):

```
  \gmu@lastCASE
  {%
    \grab@twoparams{#1}}%
  \gmu@ESAC
}% of \@dc@ParseSpecifier

\def\@dc@addtoparsed@Ignore{%
  \addtotoks\toks@{\@dc@ignorearg}%
  \@dc@addtospecs@bare{>i}%
}

\def\@dc@addinnerhash{%
  \advance\c@dc@argnum\@ne
}

\def\@dc@addtoparsed@BareSpace{%
  \addtotoks\toks@{\@dc@BareSpaceArg }%
  \@dc@addtospecs@bare{>\BareSpace }%
}

\def\@dc@process@ms{%
  \gmu@if {@dc@Mmode@}{}%
```

If in `M`-mode, we compare current state of ignorance and longness with their initial values

```
  {\gmu@if {num}{\@dc@Ms@initial@listate=\@dc@Ms@listate}%
```

If the state hasn't changed, we look if the optional number of m's is provided and proceed in any case appropriately.

```
    {\@dc@process@ms@grabnum }% of if the state has'nt been changed
```

Else, i.e. when we have an `M|m` specifier but of another longness or ignorance, we ship the `m`'s collected so far and *close* the `M`-mode…

```
    {\@dc@Ms@shipout
```

…and *reparse* this `M|m` without changing current ignorance and longness, to let the new instance of parser add now closed number of `m`'s and the new catcher.

Remember however that we've increased number of arguments so now we set it back:

```
      \advance\c@dc@argnum\m@ne
```

```
6186        \@dc@ParseSpecifier m%
```

Note it's not `Next`, which means we don't reset the switches. And first of all, it's not `process@ms`, because we have to add new catcher etc.

```
6190      }% of if the state has been changed
```

```
6192    }% of if M-mode
```

If we are not in `M`-mode but have parsed an `M|m`, now we set us to be in the mode and look for (optional) number of m's.

```
6196    {\@dc@Ms@init
```

(This macro sets the number of `m`'s found to 1 and turns the switch `\if@dc@Mmode@` true).

```
6201    \@dc@process@ms@grabnum
6202    }% of not if M-mode.
6203 }% of dc@process@ms
```

We peep the next char and if it looks as an argument

```
6209 \def \@dc@process@ms@grabnum {%
6210    \@ifnextanyIS {\bgroup \@ne \tw@ \thr@@ 123456789}%
6211    {%
6212      \@dc@process@ms@fin}%
6213    {%
6214      \@dc@process@ms@fin \@ne}%
6215 }
```

```
6217 \def \@dc@process@ms@fin #1{%
6218    \edef\@dc@processms@hash {\the\numexpr#1}%
6219    \edef\@dc@processms@left {\the\numexpr 9-\c@dc@argnum+\@ne}%
```

+1 because we've increased the `#`es number in line 6080.

```
6223    \gmu@AND {%
6224      {num} {\@dc@processms@hash >\z@}
6225      {num} {\@dc@processms@hash <\numexpr
6226        \@dc@processms@left+1 \relax }%
6227    }%
6228    {\stepnummacro \@dc@Ms@num \@dc@processms@hash
```

And we add proper number of `#`es

```
6231      \edef\@dc@hashgoal {%
6232        \the\numexpr\c@dc@argnum +%
6233        \@dc@processms@hash-1}% minus 1 because one has (one has already been
                 added in line 6080).
```

```
6236      \@whilenum \c@dc@argnum<\@dc@hashgoal \do{%
6237        \@dc@addinnerhash
6238      }%
6240      \@dc@ParseNextSpecifier
6241    }% of if all conds. satisfied
6242    {% some of the conds. not satisfied
6243      \PackageError{gmcommand}{%
6244        The argument to the M or m specifier, if any, has to be ^^J%
6245        a number between 1 and \@dc@processms@left ^^J%
```

```
      (there is/are \the\c@dc@argnum\space arg(s) declared
      already).^^J%
      I ignore this m/M.}%
    {}%
    \gmu@passbraced  \@dc@ParseNextSpecifier {#1}%
  }%
}% of \@dc@process@ms
```

```
\def\@dc@ParseNextSpecifier{%
  \@dc@ResetStepAuxilia
  \@dc@ParseSpecifier
}
```

```
\lpdef\@dc@AddAndParse#1{%
  \dc@addtoParsed@{#1}%
  \@dc@falsify@xadefaults
  \@dc@ParseNextSpecifier
}
```

The eating M's uses the same concept of a “while” iterator as the `\loop` catcher but we prefer to define here a simplified version for this particular purpose.

```
\def\grab@optparam #1{% arg specifier
  \@ifnextchar\bgroup{\@dc@AddAndParse}%
  {%
```

If the default is not provided in the command's declaration, then we check whether it's provided particularly for this specifier or put `\NoValue`.

```
    \edef\@dc@tempa{%
      \gmu@if {csname}%
      {@dc@optparam@deft@\strip@bslash{#1}\endcsname}%
      {\@xaucs {@dc@optparam@deft@\strip@bslash{#1}}}%
      {\@nx \NoValue}%
    }%
    \@xa\@dc@AddAndParse\@xa{\@dc@tempa}%
  }%
}
```

Default default values for some argument types:

The declaring macro may be used with any-case version of the specifier, because both the upper- and lowercase defaults are defined, however this works only for letter specifiers. The caseness of CS specifiers is not modified.

```
\long\def\@dc@DeclareDefault #1#2{%
  \uppercase{%
    \Name\edefU{\strip@bslash{\@dc@optparam@deft@}\strip@bslash{#1}}{%
         #2}}%
  \lowercase{%
    \Name\edefU{@dc@optparam@deft@\strip@bslash{#1}}{#2}}%
}
```

The default default of “**d**ecimal” argument is 0.

```
\@dc@DeclareDefault D{0}
\@dc@DeclareDefault d{0}
```

```
\@ifXeTeX {%
```

```
  \@dc@DeclareDefault Ď{0}%
}
{}
```

The default default delimiter of the “Scope” argument’s parsing is a star of any catcode of $\{11, 12, 13\}$

```
\@xa\@dc@DeclareDefault \@xa\Scope\@xa{\all@stars}
```

```
\@dc@DeclareDefault = {\@tempcnta}
```

The “se**Q**uence” and “**U**ntil” arguments have `\NoValue` as the default default values (which hasn’t to be announced so explicitly since it’s the default setting):

```
\@dc@DeclareDefault Q {\NoValue}
```

```
\@ifXeTeX {%
  \@dc@DeclareDefault Ô{\NoValue}%
}
{}
```

```
\@dc@DeclareDefault U {\NoValue}
```

```
\long\def\@dc@maybe@expandafter #1{%
  \gmu@if {@dc@xadefault}{}%
  {\gmu@ifutokens{#1}{\NoValue}%
    {\@secondoftwo}{\@firstoftwo}%
  }% if we are to expandafter #1.
  {\@secondoftwo}% if we don’t expandafter #1
}
```

```
\long\def\dc@addtotoks@ #1{%
  \@dc@maybe@expandafter {#1}%
  {\toks@\@xa\@xa\@xa{\@xa\the\@xa\toks@\@xa{#1}}}%
  {\toks@\@xa{\the\toks@{#1}}}%
}
```

```
\long\def\@dc@addtospecs #1{%
  \@dc@maybe@expandafter {#1}%
  {\@xa \addtotoks \@xa\@dc@ParsedSpecs\@xa{\@xa{#1}}%
  }%
  {\addtotoks\@dc@ParsedSpecs{{#1}}}%
}
```

```
\long\def\dc@addtoParsed@ #1{%
  \dc@addtotoks@{#1}%
  \@dc@addtospecs{#1}%
}
```

```
\long\def\@dc@addtospecs@bare #1{%
```

note it also doesn’t respect `xadefault` switch.

```
  \addtotoks\@dc@ParsedSpecs{#1}%
}
```

```
\long\def\@dc@addtotoks@bare #1{%
  \addtotoks\toks@ {#1}%
}
```

```
\long\def\@dc@addtoParsed@bare #1{%
```

note it also doesn't respect `xadefault` switch.

```
6378   \@dc@addtotoks@bare {#1}%
6379   \@dc@addtospecs@bare {#1}%
6380 }
```

```
6383 \long\def\grab@twoparams
6384 #1% the specifier
6385 #2% first parameter, which is mandatory
6386 {% default default (when default is absent)
6387   \if@dc@xadefault@i@\@dc@xadefaulttrue\fi
6388   \dc@addtoParsed@{#2}%
6389   \if@dc@xadefault@ii@
6390     \@dc@falsify@xadefaults\@dc@xadefaulttrue
6391   \fi
6392   \grab@optparam{#1}%
6393 }
```

```
6396 \long\def\@dc@addargum#1{%
6397   \addtotoks\@dc@arguments{#1}%
6398 \@iwruif {@@@@@@ @dc@arguments: »\the\@dc@arguments«}%
6399 }
```

```
6401 \Store@Macro\@dc@addargum
```

```
6403 \pdef\@dc@ignorearg{%
6404   \long\def\@dc@addargum##1{%
6405     \Restore@Macro\@dc@addargum}%
6406 }
```

```
6408 \StoreMacro@nocat\gmu@passbraced
```

```
6410 \pdef\@dc@BareSpaceArg{%
6412   \let \gmu@passbraced \gmu@passbracedNotSp
6413   \def\@dc@addargum {%
6414     \Restore@Macro\@dc@addargum
```

`%%    \Restore@Macro\@dc@Loop@CareOfSpace`

```
6416     \Restore@Macro\gmu@passbraced
6417     \@dc@addargum
6418   }%
6419 }
```

Parsing of Knuthian parameters string is easier to implement with full-feature `\DeclareCommand` so we postpone it till line 7867

```
6425 \def\grab@prefix@CASE{% just a shorthand
6426   \@xa\gmu@CASEsbany\gmu@forarg
6427 }
```

```
6429 \long\def\grab@prefix #1{%
```

(2010/07/26, v0.993:) made for-eaching to make it behave as expected, i.e. that latter settings prævalent over the former

`%% \@dc@ResetStepAuxilia %` No! We want allow many subsequent prefixes, they make no harm.

```
6440   \gmu@foreach#1\gmu@foreach@delim {%
6442     \grab@prefix@CASE
```

```
    {\long!lL\par Pp}%
    {\@dc@long@true}%
    \grab@prefix@CASE
    {Ii}%
    {\@dc@ignore@true}%
    \grab@prefix@CASE
    {\@xa\expandafter}%
    {\@dc@xadefaulttrue}%
    \grab@prefix@CASE
    {\@xa \@xa@nx \@xa@xa \expandafter \@xanx \xanx \xaxa}%
    {\@dc@xadefault@i@true}%
    \grab@prefix@CASE
    {\@xa \@nx@xa \@xa@xa \expandafter \@nxxa \nxxa}%
    {\@dc@xadefault@ii@true}%
    \grab@prefix@CASE
    {\@xaeacher \xaeacher \xaEacher \xaE }%
    {\@dc@xadefault@ii@true}%
    \grab@prefix@CASE
    {\GroteNegere \GrossIgnore \GroteN \GrossI}
    {\@dc@GroteNegere@true
      \@dc@ignore@true}%
    \grab@prefix@CASE
    {\GroteNegereStop\GrossIgnoreStop
      \GroteNStop\GrossIStop}
    {\@dc@GroteNegere@false
      \@dc@ignore@false}%
    \grab@prefix@CASE
    {\GroteLang\GrossLong\GroteL\GrossL}
    {\@dc@GroteLang@true
      \@dc@long@true}%
    \grab@prefix@CASE
    {\GroteLangStop\GrossLangStop
      \GroteLStop\GrossLStop}%
    {%
      \let\if@dc@GroteLang@=\if@dc@alllong@
      \let\if@dc@long@=\if@dc@alllong@
    }%
    \grab@prefix@CASE
    {\BareSpace}
    {\@dc@BareSpace@true}
    \gmu@EatCases
    {\IgnInfo{gmcommand}{while parsing arg specifiers}{#1}}%
    \gmu@ESAC
  }% of for each
    \@dc@ParseSpecifier %
```

Note that here (unlike in all other places) is `\@dc@ParseSpecifier` not `\@dc@ParseNextSpecifier`. The difference between them is in that the former doesn't reset the switches (which we've just set here).

```
}% of \grab@prefix
```

```
\long\def\dc@DefParseNext#1{%
```

This is to allow hashes in the defaults.

```
  \edefU\@dc@parse@next{#1}%
}
```

```
\def\@dc@Alias
#1% \lowercase or \firstofone
#2% left side of the assignment
#3% right side of the assignment
#4% Lower or empty
{%
  \gmu@if {csname}%
  {ArgumentCatcher@\strip@bslash #3\endcsname}%
  {#1{%
      \@xa\let\csname\strip@bslash\ArgumentCatcher@
      \strip@bslash #2\@xa\endcsname}%
    \csname ArgumentCatcher@\strip@bslash #3\endcsname
  }{\PackageError{gmutils/gmcommand}{%
      You're trying to #4Alias the »\unexpanded{#3}« catcher^^J%
      but it is not defined!}{}%
  }%
}
```

To provide lowercase parallels of a specifier

```
\def\@dc@LowerAliases #1{%
```

To provide lowercase aliases of the catchers:

```
  \@dc@Alias \lowercase {#1}{#1}{Lower}%
  \@dc@Alias \lowercase {\P#1}{\P#1}{Lower}% we provide »P« as a CS to avoid lowercase'ing it.
}
```

```
\def\@dc@AliasCatcher
#1% left side of the assignment
#2% right side of the assignment
{%
  \@dc@Alias \firstofone {#1}{#2}{}%
}
```

```
\def\@dc@AliasPLower
#1% specifier to alias
{\@dc@AliasCatcher {P#1}{#1}%
  \@dc@LowerAliases{#1}%
}
```

Parsing of a braced optional. Note the test is `\ifcat` so *any* begin-group character will turn it true.

Note that although this parser issues an error when brace contains `\par`, its default may still contain `\par`.

```
\long\def\ArgumentCatcher@B
#1% default value
#2% tail of args catchers.
\@dc@arguments % delimiter
{%
  \@ifnextcat\bgroup
```

If we are before a begin-group token, we store the tail of parsers in an auxiliary macro and launch inner catcher of a mandatory argument.

```
6584   {\dc@DefParseNext{#2}\ArgumentCatcher@m@i }%
6585   {\@dc@addargum {{#1}}#2\@dc@arguments }%
6586 }
```

Analogously to the previous catcher only the mandatory catcher is long.

```
6591 \long\def\ArgumentCatcher@PB
6592 #1% default value
6593 #2% tail of args catchers.
6594 \@dc@arguments % delimiter
6595 {\@ifnextcat\bgroup
6596   {\dc@DefParseNext{#2}\ArgumentCatcher@Pm@i }%
6597   {\@dc@addargum {{#1}}#2\@dc@arguments }%
6598 }

6600 \@dc@LowerAliases B

6603 \long\def\ArgumentCatcher@T@ % parsing of a single Token continued:
6605 #1% kind of test (strings or StrX so far (2010/12/28, 7.24))
6606 #2% the list to search #4 on,
6607 #3% the default value,
6608 #4% the tail of args parsers,
6609 #5% the token we search in #1 (it's an unbraced single token as we checked in line
         6628).
6611 {%
6612   #1 #5{#2}%
6613   {\@dc@addargum {{#5}}#4\@dc@arguments}%
6614   {\@dc@addargum {{#3}}#4\@dc@arguments#5}%
6615 }

6617 \long\def\ArgumentCatcher@T % parsing of a  single Token. It's always long since
         we look for a single unbraced token so there is no danger of "runaway argument".
```

This catcher uses the `StrX` test so is very subtle: it applies `\ifx` first and if the compared tokens are both CS es and `\ifx`-equal then `\ifstrings` is applied.

```
6624 #1% the list we search optional token on,
6625 #2% the default value,
6626 #3% the tail of args parser.
6627 \@dc@arguments{%
6628   \@ifnextnotgroup
6630   {\ArgumentCatcher@T@ \gmu@ifStrXany {#1}{#2}{#3}}%
6631   {\@dc@addargum {{#2}}#3\@dc@arguments}% if we parse an opening or closing
           brace, then we are sure it's not any expected Single.
6634 }

6636 \@dc@AliasPLower T

6639 \long\def\ArgumentCatcher@Ť #1#2#3% as in …@T
6640 {% one-token catcher that respects space.
6641   \ArgumentCatcher@Loop
6642   {StrX}{\any}{#1}{\any}{}{1}{#2}{% empty eacher
6643   }{#3}%
6644 }

6646 \@dc@AliasPLower Ť
```

This is incompatibility of this version (v0.993) with other versions.

```
%%  \let\ArgumentCatcher@PS\ArgumentCatcher@S % as above: we always act ‘long’ with single tokens.
%%  \let\ArgumentCatcher@T\ArgumentCatcher@S % we allow T (for Token) as
%%  % an alias of S.
%%  \let\ArgumentCatcher@PT\ArgumentCatcher@S
```

```
\edef\ArgumentCatcher@S
#1% default value
{%
  \@nx\ArgumentCatcher@T {\@xa\@nx\all@stars}{#1}}% the s arg spec is a shorthand for T{⋆}. Except the star may be of any category from {11, 12, 13}.
```

```
\@dc@AliasPLower S
\@dc@AliasCatcher ⋆ S
```

`\if@debugacro@`

```
\newif\if@debugacro@
```

`\ArgumentCatcher@Loop`

```
\long\def\ArgumentCatcher@Loop  % Now we introduce a general iterating catcher.
```

The two parsers: “while” (`Q`) and ”until” (`U`) are special cases of it.

Moreover, clever tripling it generalises also `GBbOoCc` specifiers (with some inner macros relaxed for the first instance).

`#1%` kind of test (`StrX` or `str` or anything else for what `\gmu@if`⟨*??*⟩`any`/`none` is defined)

The catcher has four parameters that interact with one another:

`#2%` “sign” of match for iteration: `\any` or `\none` token. `\any{`⟨*#3*⟩`}` means that considering `{`⟨*#3*⟩`}` as set of tokens T_3 for each token x, x satisfies the condition iff $x \in T_3$.

In case of `#2` and `#3` that means such x will be tried to be appended to the list, while in case of `#4` and `#5` such x will be thrown “down the drain”.

If `#3` is empty, `#2==\any` means that *no* token will be appended to the list while `\none` means that *every* one will be. (Consider phrases “any thing belonging to the empty set” and “thing not belonging to the empyt set”.)

Simili modo, when `#5` is empty, `#4==\any` means *no* token will be dropped while `\none` means that *every* one will be.

`#3%` list of tokens `\@let@token` will be matched against with `#1` test and sustain iteration or stop catching.

We assure in line **??** that when we condition iteration on presence of next token on `#2` list, i.e. `#1` is `\any`, we appended the “drainers” list to `#2` so we won’t stop at them.

`#4%` test for “drainers” (allowed values as for `#1`)

`#5%` list of “drainers”: if `\@let@token` satisfies the `#3` test, we throw it down the drain, otherwise we add it to the argument.

The “iterate or stop” matching precedes the ”add or throw” matching so if we meet a stopping token, surely it will not be added to the argument.

`#6%` upper bound of number of items (may be empty or negative to turn counting of items off).

For a moment I was tempted to try implement *any* loop condition, but that seems not to make sense, since during argument catching tokens are not executed so hardly any tests except matching items against a list or counting them seem to be reasonable.

This catcher is always `\long` but it'd be not the only danger of iterating beyond end of file: another would be allowing all three: `#1`, `#2`, `#4` empty at the same time, but we check that in the defaults' parser (line ??).

```
#7% default value (if empty sequence is parsed), \NoValue by default.
#8% an "eacher"—stuff to be put before each token/text added to the argument. Empty
     by default. If #7 is empty and used (empty sequence parsed), #8 is not put before
     it.
#9% the tail of args parser
\@dc@arguments % delimiter
{%
  \dc@DefParseNext{#9}%
  \emptify\@dc@seQuence
  \c@dc@Loop@bound=\numexpr(\gmu@ifempty{#6}{-1}{#6})*1\relax
```

Since `#6` is empty by default, the counter is set to -1 by default (l. ??)

```
  \gmu@if {num}{\c@dc@Loop@bound<\z@}%
```

We look at the sign of the bound and if it's $-$ we oppose the bound and make the decreasement step $= 0$

```
  {\c@dc@Loop@bound=-\c@dc@Loop@bound
    \let\@dc@Loop@countby\z@
  }%
```

Otherwise we make the decreasement step -1.

```
  {\let\@dc@Loop@countby\m@ne}%
  \gmu@ifempty{#3}%
  {\gmu@if {strings}{\none #2}%
    {\@dc@Loop@iteralltrue}% it's an additional switch for better performance in
          a special case: when we wish only count the items and iterate over anything
    {%
```

Here we'd look for presence of the next token on an empty list, what cannot be. Therefore we stop. In this case the value of switch is irrelevant.

```
      \Store@Macro\ArgumentCatcher@Loop@defcheck
      \def\ArgumentCatcher@Loop@defcheck{%
        \Restore@Macro\ArgumentCatcher@Loop@defcheck
        \ArgumentCatcher@Loop@shipout}%
    }% of if #2 str-is \any
  }% of if #3 empty
  {\@dc@Loop@iterallfalse}% when #2 nonempty, we have to perform matching.
```

We prepare shortcuts for adding/rejecting all analogously:

```
  \gmu@ifempty{#5}%
  {\gmu@if {strings} {\none #4}%
    {\@dc@Loop@addallfalse\@dc@Loop@drainalltrue}%
    {\@dc@Loop@addalltrue\@dc@Loop@drainallfalse}%
  }% of if #5 empty
  {\@dc@Loop@addallfalse\@dc@Loop@drainallfalse}% when #4 nonempty, we
        have to perform matching.
  \edef\ArgumentCatcher@Loop@afterpeep{%
```

This is the macro that'll be executed after the main `\futurelet`, We define it here since nothing in this sequence of tokens changes during catching, only the meaning of `\@let@token`.

```
6792     \gmu@if {@dc@Loop@iterall}{}%
```

If we iterate over anything, we just unbrace further stuff (that determines what is to be added and what discarded) and discard the “else” branch of iteration test.

```
6798     {\firstoftwo}%
```

Otherwise (iteration over a proper subset of all possible tokens) we prepare proper test:

```
6803     {\unexpanded{%
6804         \@dc@Loop@test
6805         {#1}#2{#3}% if the next token StrX-is/is not on #2, then…
6807       }% of \unexpanded
6808     }% of if we don’t iterate over all (of preparation of iteration test)
```

Now what to do in the iteration step:

```
6812     {\gmu@if {@dc@Loop@addall}{}%
```

If we add anything then we prepare bare adder:

```
6816       {\@nx \ArgumentCatcher@Loop@add}%
```

If we add not everything, then maybe we should *discard* everything?

```
6821       {\gmu@if {@dc@Loop@drainall}{}%
```

If indeed, we prepare a bare discarder

```
6825         {\@nx \ArgumentCatcher@Loop@drain}%
```

Otherwise (we neither add anything nor discard anything) we prepare proper test. It has to be braced since it’s multitoken

```
6830         {\unexpanded{%
6831             \@dc@Loop@test
6832             {#1}#4{#5}% if the next token satisfies #4-direction StrX/str match
                        against #5, then we discard it, otherwise we add it.
6835             \ArgumentCatcher@Loop@drain
6836             \ArgumentCatcher@Loop@add
6837           }% of \unexpanded
6838         }% of not drain all
6839       }% of if not add all
6840     }%
```

And what we do if we iterate over a proper subset of items and the test test of line 6805 turned false. We wrap it in curly braces to let it be gobbled if we iterate over all.

```
6846     {\gmu@if {@dc@Loop@iterall}{}%
6847       {}%
6848       {\@nx \ArgumentCatcher@Loop@shipout}%
6849     }%
6850     \unexpanded{{#7}{#8}}%
6851   }% of \ArgumentCatcher@Loop@afterpeep
```

```
6854   \ArgumentCatcher@Loop@defcheck {#7}{#8}%
6855   \ArgumentCatcher@Loop@check
6856 }% of \ArgumentCatcher@Loop
```

\c@dc@Loop@bound

```
6858 \newcount\c@dc@Loop@bound
```

\if@dc@Loop@iterall

```
6860 \newif\if@dc@Loop@iterall
```

`\if@dc@Loop@addall`
`\if@dc@Loop@drainall`

```
\newif\if@dc@Loop@addall
\newif\if@dc@Loop@drainall
```

```
\long\def\@dc@Loop@test
#1% kind of test (StrX or str so far (2010/12/28, 7.51))
#2% \any or \none
#3% list of tokens to match against
#4% what if OK
#5% what if not OK.
{% remember we are in the argument of \gmu@peep@next so we are after peep.
```

```
 \gmu@if {defined}{\@def@token}
 {\csname gmu@if#1\strip@bslash #2\@xa\endcsname
   \@def@token }%
 {\csname
```

we construct csname of the quantifier-test. Depending on `#1` it will apply `\ifx` or `\if` with `\noexpand`s.

```
     gmu@if%
     \gmu@ifdetokens {#1}{str}%
     {NX}%
     {x}%
     \strip@bslash #2%
   \endcsname
   \@let@token }%
 {#3}{#4}{#5}%
}
```

```
\@dc@AliasCatcher {PLoop} {Loop}
```

```
\long\def\ArgumentCatcher@Loop@defcheck
#1% default,
#2% "eacher"
{%
  \edefU\ArgumentCatcher@Loop@check{%
    \gmu@if {num}{\c@dc@Loop@bound>\z@}
```

If we haven't reached maximum allowed number of parsed items, we peep the next token, i.e. we perform `\futurelet` and if `\@let@token` is undefined or `\relax` then we pass it inside `\@def@token` so that string comparisons may look at it.

```
    {\advance \c@dc@Loop@bound \@dc@Loop@countby
      \gmu@peep@next
      \ArgumentCatcher@Loop@afterpeep }
```

Otherwise we finish catching and send the argument to the arguments' toks.

```
    {\ArgumentCatcher@Loop@shipout {#1}{#2}}% of if num bound reached
  }% of \ArgumentCatcher@Loop@check
}% of \ArgumentCatcher@Loop@defcheck
```

```
\lpdef\@dc@Loop@CareOfSpace
#1% a macro with all the arguments except last
{\gmu@ifpeeped x \gmu@letspace
  {\edef\@dc@Loop@careofspace@aas{%
      \unexpanded{#1{ }}%
    }% edef unexpanded to allow # tokens in #1
    \afterassignment\@dc@Loop@careofspace@aas
    \let\gmu@drain= }% after = is a space.
  {#1}% next not space, so just #1 and let it process the next token its way.
}
```

```
\StoreMacro@nocat\@dc@Loop@CareOfSpace
```

```
\lpdef\@dc@Loop@CareOfSpace@NoBraces
#1% a macro with all the arguments except last
{%
\gmu@ifpeeped x \gmu@letspace
  {\edef\@dc@Loop@careofspace@aas{%
      \unexpanded{#1 }% note the space
    }% edef unexpanded to allow # tokens in #1
    \afterassignment\@dc@Loop@careofspace@aas
    \let\gmu@drain= }% after = is a space.
  {#1}% next not space, so just #1 and let it process the next token its way.
}
```

```
%% \lpdef\@dc@Loop@CareOfGroup
%% #1% as for the previous macro
%% {\gmu@if x{\@let@token\bgroup}%
%%   {\gmu@passbraced{#1}}% if next bgroup
%%   {#1}% not \bgroup, so we get it normally
%% }% of \@dc@Loop@CareOfGroup
```

No need of the above (commented out): `\gmu@passbraced` does that.

```
\lpdef\@dc@Loop@CareOfSpaceAndGroup
#1% as in the previous macro
{\@iwruif {Care of both: @let@token: »\meaning\@let@token«}%
  \@dc@Loop@CareOfSpace{%
    \gmu@passbraced{#1}%
  }%
}% of “take care of both”
```

```
\long\def\ArgumentCatcher@Loop@add
#1% default
#2% eacher
```

At this level we pass both default and eacher for symmetry of the macro(s) at higher level.

```
{\@dc@Loop@CareOfSpaceAndGroup
  {\ArgumentCatcher@Loop@add@{#2}}%
}
```

```
\long\def\ArgumentCatcher@Loop@add@
```

But here we can limit ourselves to what we really need.

```
#1% eacher
#2% token/text to be added
{\addtomacro\@dc@seQuence{#1#2}%
  \@iwruif {@@@@@@ Q-add: »\the\@dc@arguments«}%
  \ArgumentCatcher@Loop@check
}% of \ArgumentCatcher@Loop@add@
```

```
\long\def\ArgumentCatcher@Loop@drain
#1% default
```

```
#2% eacher
```

At this level we pass both default and eacher for symmetry of the macro(s) at higher level.

```
{%
  \@iwruif{@@@@@@ Q-drain: »\the\@dc@arguments«}%
  \@dc@Loop@CareOfSpaceAndGroup
  {\@xa\ArgumentCatcher@Loop@check\@gobble}%
}
```

```
\long\def\ArgumentCatcher@Loop@shipout
#1% default
#2% eacher
```

This macro needs both of these parameters.

```
{%
  \gmu@if x{\@dc@seQuence\@empty}%
  {\def\@dc@seQuence{#1}%
```

Thus we put the default value to the temporary macro. Now, it's nonempty, we prepend to it the "eacher":

```
    \gmu@if x{\@dc@seQuence\@empty}%
    {}{\prependtomacro\@dc@seQuence{#2}}%
  }%
  {}% if \@dc@seQuence is nonempty, we don't modify it.
  \@xa\@dc@addargum\@xa{\@xa{\@dc@seQuence}}%
  \@iwruif {@@@@@@ Q-finish: »\the\@dc@arguments«}%
  \@dc@parse@next\@dc@arguments
}% of \ArgumentCatcher@Loop@shipout
```

```
\long\def\ArgumentCatcher@Q
#1% list
#2% default (\NoValue by default, as in previous versions).
{%
  \ArgumentCatcher@Loop
  {StrX}%
  \any
  { #1}% note the space before #1—settheory sum of #1 and drainers.
  \any
  { }% we ignore spaces—it's a legacy setting, maybe we'll optionise it in the future
  \m@ne % we allow any number of tokens
  {#2}% default, by default \NoValue, as defined in line ??
  {}% empty eacher
}%
```

```
\@dc@AliasPLower Q
```

```
\@ifXeTeX {%
  \long\def\ArgumentCatcher@Ô
  #1% list
  #2% default (\NoValue by default, as in previous versions).
  {%
    \@dc@BareSpaceArg
    \ArgumentCatcher@Loop
    {str}%
    \any
    { #1}% note the space before #1—settheory sum of #1 and drainers.
    \any
    { }% we ignore spaces—it’s a legacy setting, maybe we’ll optionise it in the future
    \m@ne % we allow any number of tokens
    {#2}% default, by default \NoValue, as defined in line ??
    {}% empty eacher
  }%

  \@dc@AliasPLower Ô

}{}% of if XƎTEX

\def\ArgumentCatcher@D{% decimal argument (useful for dates e.g.)
  \ArgumentCatcher@Q
  {-+0123456789}%
```

the default value will be delivered by the defaults’ catcher

```
}

\@dc@AliasPLower D

\@ifXeTeX
{%
  \def\ArgumentCatcher@Ď
```

The difference between `D` and `Ď` catchers is that the latter stops at a blank while the former doesn’t.

```
  #1% default value, 0 by default
  {% decimal argument
    \ArgumentCatcher@Loop
    {StrX}%
    \any
    {-+0123456789}%
    \any
    {}%
    \m@ne
    {#1}%
    {}%
  }%

\@dc@AliasPLower Ď

}{}% of if XƎTEX

\def\ArgumentCatcher@U {%
  \ArgumentCatcher@Loop {StrX}%
}
```

Yes, because *de facto* we pass it *all* the arguments of catcher `Loop`.

```
\@dc@AliasPLower U

\@dc@AliasCatcher W {U}

\@dc@AliasPLower W

\@dc@AliasCatcher {lostwax} U % The \lostwax catcher is a normal “until” catcher.
        It’s parsing of the specifier’s parameters that makes it different.
```

```
\long\def\ArgumentCatcher@item
#1% “sign” of matching
#2% list to match against
#3% default value
#4% eacher (which in this case will be applied to the (one) item)
{%
  \ArgumentCatcher@Loop
  {StrX}%
  #1%
  {#2}%
  \none {}% we add all that matches
  1 % at most one item
  {#3}%
  {#4}%
}

\if@XeTeX

  \def\ArgumentCatcher@Ŭ{%
    \@dc@BareSpaceArg
    \ArgumentCatcher@Loop {StrX}%
  }

  \@dc@AliasPLower Ŭ

\fi
```

TODO: edef prefixing.

```
\long\def\ArgumentCatcher@genM
#1% the letter »P« (for long catcher) or nothing (for the short version)
#2% number of undelimited parametrs to catch (arabic)
#3% tail of parsers
\@dc@arguments{%
  \dc@DefParseNext{#3}%
  \csname ArgumentCatcher@#1m@%
  \romannumeral#2%
  \endcsname
}
```

They both have to be long for the tail of parser that can contain `\par`. It’s the *inner* catchers …`@`(`P`)`m@ii`…that are short or long.

```
\def\ArgumentCatcher@M{\ArgumentCatcher@genM {}}
\def\ArgumentCatcher@PM{\ArgumentCatcher@genM P}

\@dc@AliasCatcher {m} {M}
\@dc@AliasCatcher {Pm} {PM}
```

We allow specifying mandatory arguments also as (`M`|`m`)`{`⟨*num*⟩`}` and such a specifier is passed to the carrier macro.

```
\@dc@AliasCatcher {ms} {M}
\@dc@AliasCatcher {Pms} {PM}

\@tempcnta=\@ne
\@whilenum\@tempcnta<9\do{%
  \edef\gmu@tempa{%
```

The short catchers of mandatories:

```
    \def\@xanxcs{%
      ArgumentCatcher@m@\romannumeral\@tempcnta}%
    \gmu@hashes1{\numexpr\@tempcnta+1}%
    {\@nx\@dc@addargum{%
        \gmu@hashesbraced 1{\numexpr\@tempcnta+1}}%
      \@nx\@dc@parse@next\@nx\@dc@arguments
    }% of \ArgumentCatcher@m@⟨rom.num⟩.
```

And the long ones:

```
    \long \def\@xanxcs{%
      ArgumentCatcher@Pm@\romannumeral\@tempcnta}%
    \gmu@hashes1{\numexpr\@tempcnta+1}%
    {\@nx\@dc@addargum{%
        \gmu@hashesbraced 1{\numexpr\@tempcnta+1}}%
      \@nx\@dc@parse@next\@nx\@dc@arguments
    }% of \ArgumentCatcher@Pm@⟨rom.num⟩.

  }% of \edef.
  \gmu@tempa
  \advance\@tempcnta1\relax
}% of the loop.
```

The loop above defines 8 pairs of macros as we see thanks to the code below:

```
\if 1 1
\@tempcnta\@ne
\@whilenum\@tempcnta<9\do{%
  \typeout{\bslash  ArgumentCatcher@m@\romannumeral\@tempcnta: ^^J%
    \Name\meaning{ArgumentCatcher@m@\romannumeral\@tempcnta}^^J}%
  \typeout{\bslash  ArgumentCatcher@Pm@\romannumeral\@tempcnta : ^^J%
    \Name\meaning
    {ArgumentCatcher@Pm@\romannumeral\@tempcnta}^^J^^J^^J%
  }%
  \advance\@tempcnta\@ne
}
%%  \show\ArgumentCatcher@Pm@viii
\fi
```

The code above produces on the terminal (without the blank between 1's of course):

```
\ArgumentCatcher@m@i:
macro:#1->\@dc@addargum {{#1}}\@dc@parse@next \@dc@arguments

\ArgumentCatcher@Pm@i:
macro:#1->\@dc@addargum {{#1}}\@dc@parse@next \@dc@arguments

\ArgumentCatcher@m@ii:
macro:#1#2->\@dc@addargum {{#1}{#2}}\@dc@parse@next \@dc@arguments

\ArgumentCatcher@Pm@ii:
macro:#1#2->\@dc@addargum {{#1}{#2}}\@dc@parse@next \@dc@arguments

\ArgumentCatcher@m@iii:
macro:#1#2#3->\@dc@addargum {{#1}{#2}{#3}}\@dc@parse@next \@dc@arguments
```

```
\ArgumentCatcher@Pm@iii:
macro:#1#2#3->\@dc@addargum {{#1}{#2}{#3}}\@dc@parse@next
     \@dc@arguments

\ArgumentCatcher@m@iv:
macro:#1#2#3#4->\@dc@addargum {{#1}{#2}{#3}{#4}}\@dc@parse@next
     \@dc@arguments

\ArgumentCatcher@Pm@iv:
macro:#1#2#3#4->\@dc@addargum {{#1}{#2}{#3}{#4}}\@dc@parse@next
     \@dc@arguments

\ArgumentCatcher@m@v:
macro:#1#2#3#4#5->\@dc@addargum {{#1}{#2}{#3}{#4}{#5}}\@dc@parse@next
     \@dc@argu
ments

\ArgumentCatcher@Pm@v:
macro:#1#2#3#4#5->\@dc@addargum {{#1}{#2}{#3}{#4}{#5}}\@dc@parse@next
     \@dc@argu
ments

\ArgumentCatcher@m@vi:
macro:#1#2#3#4#5#6->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}}\@dc@parse@next \@d
c@arguments

\ArgumentCatcher@Pm@vi:
macro:#1#2#3#4#5#6->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}}\@dc@parse@next \@d
c@arguments

\ArgumentCatcher@m@vii:
macro:#1#2#3#4#5#6#7->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}{#7}}\@dc@parse@ne
xt \@dc@arguments

\ArgumentCatcher@Pm@vii:
macro:#1#2#3#4#5#6#7->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}{#7}}\@dc@parse@ne
xt \@dc@arguments

\ArgumentCatcher@m@viii:
macro:#1#2#3#4#5#6#7#8->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}{#7}{#8}}\@dc@pa
rse@next \@dc@arguments

\ArgumentCatcher@Pm@viii:
macro:#1#2#3#4#5#6#7#8->\@dc@addargum
     {{#1}{#2}{#3}{#4}{#5}{#6}{#7}{#8}}\@dc@pa
rse@next \@dc@arguments
```

```
\def\ArgumentCatcher@m@ix
```

And it doesn't need to be long and launch inner short macro because there's nothing more to catch.

```
#1#2#3#4#5#6#7#8#9{%
  \@dc@addargum{%
```

```
    {#1}{#2}{#3}{#4}{#5}{#6}{#7}{#8}{#9}}%
  \the \@dc@arguments
}
```

```
\long\def\ArgumentCatcher@Pm@ix
#1#2#3#4#5#6#7#8#9{%
  \@dc@addargum{%
    {#1}{#2}{#3}{#4}{#5}{#6}{#7}{#8}{#9}}%
  \the \@dc@arguments
}
```

```
\long\def\ArgumentCatcher@K % a Knuthian delimited or undelimited arguments
              parsed and passed to the command's body in a digest (Knuthian replacement)
#1% the particular Knuthian macro
#2% the tail of args parser.
\@dc@arguments % tail delimiter
{\dc@DefParseNext{#2}#1}
```

```
\@dc@AliasPLower K
```

```
\long\def\gmu@twostring#1#2{\string#1\string#2}
```

```
\long\def\ArgumentCatcher@G@longorshort
#1% longness prefix (\long or nothing)
#2% left and right delimiters
#3% default value
#4% the tail of args parser.
\@dc@arguments % tail delimiter
{%
  \edef\@dc@Gname{ArgumentCatcher@G\gmu@twostring#2}%
  \gmu@if {csname}{\@dc@Gname \endcsname}%
```

If catcher for this particular pair of delimiters is defined, we don't repeat definition (we assume nobody else would define such a csname).

```
  {}%
```

If it's undefined, we define: `\ArgumentCatcher@G`⟨*stringed delimiters*⟩

```
  {#1\Name\def{\@dc@Gname \@xa}%
    \@dc@Gparams#2{\@dc@addargum{{##2}}##1\@dc@arguments}%
  }%
  \@xa\@ifEUnextchar\@firstoftwo#2%
  {\def\dc@parse@next{#4}% we hide possible \pars.
    \csname \@dc@Gname \endcsname\dc@parse@next}%
  {\@dc@addargum{{#3}}#4\@dc@arguments}%
}
```

```
\long\def\@dc@Gparams#1#2{##1#1##2#2}
```

This macro expands to parameters string with `#1` delimited with first argument and `#2` delimited with second. In fact it's intended to pass `#1` further (it will always be braced) and to catch an argument put in a pair of tokens given `\@` dc@Gparams as the arguments.

```
\lpdef\ArgumentCatcher@G % short general catcher
#1% left and right delimiters
#2% default value
{\ArgumentCatcher@G@longorshort{}{#1}{#2}}
```

```
\lpdef\ArgumentCatcher@PG % long general catcher
```

```
#1% left and right delimiter
#2% default value
{\ArgumentCatcher@G@longorshort{\long}{#1}{#2}}
```

Now the “canonical” catchers as special cases of `G`:

```
\def\@dc@DefAsGeneral
#1% specifier
#2% delimiters
{\Name\lpdef{ArgumentCatcher@\strip@bslash{#1}}%
  ##1% default value
  {\ArgumentCatcher@G{#2}{##1}}%
```

And the long version:

```
  \Name\lpdef{ArgumentCatcher@P\strip@bslash{#1}}%
  ##1% default value
  {\ArgumentCatcher@PG{#2}{##1}}% »P« was missing. Fixed 2011/03/22, 16.14.

  \gmu@if {cat}{a\@nx#1}%
  {\@dc@LowerAliases #1}{}%
}

\@dc@DefAsGeneral A{<>}

\@dc@DefAsGeneral O{[]}
```

For legacy reasons we treat the `()` argument differently: the ancient **xparse** processed a parenthesised argument to a pair of braces splitting it on a comma. We leave this as a possibility with the `\DCcoordinate` declaration:

```
\def\DCnocoordinate{\@dc@DefAsGeneral C{()}}
\DCnocoordinate

\edefU\DCcoordinate{%
  \long\def\ArgumentCatcher@C
  #1% default value
  #2% tail of parsers
  \@dc@arguments % tail’s delimiter
  {%
    \@ifEUnextchar(%
    {\dc@DefParseNext{#2}\ArgumentCatcher@c@}%
    {\@dc@addargum{{#1}}#2\@dc@arguments}%
  }%
  \let\ArgumentCatcher@c\ArgumentCatcher@C
  \let\ArgumentCatcher@Pc\ArgumentCatcher@PC
  \long\def\ArgumentCatcher@PC#1#2\@dc@arguments{%
    \@ifEUnextchar(%
    {\dc@DefParseNext{#2}\ArgumentCatcher@Pc@}%
    {\@dc@addargum{{#1}}#2\@dc@arguments}%
  }%
  \def\ArgumentCatcher@c@(#1){%
    \gmu@ifxany,{#1}%
    {\@xa\@dc@addargum\@dc@commasep#1\@dc@commasep}%
    {\@dc@addargum{{#1}}}\@dc@parse@next\@dc@arguments
  }%

  \def\@dc@commasep#1,#2\@dc@commasep{{{#1}{#2}}}%
  \long\def\ArgumentCatcher@Pc@(#1){%
    \gmu@ifxany,{#1}%
    {\@xa\@dc@addargum\@dc@commasep#1\@dc@commasep}%
    {\@dc@addargum{{#1}}}\@dc@parse@next\@dc@arguments
  }%
}
```

2010/7/21 A scope prefix argument

```
\def\@dc@Scope@shipout#1{%
```

The arg. is the default value (if argument not provided).

```
  \ifx\@dc@seQuence\@empty\def\@dc@seQuence{#1}\fi
  \@xa  \gmu@ifxany\@xa \global\@xa{\@dc@seQuence}%
  {\@dc@addargum{{\global}}}%
  {\@dc@addargum{{\relax}}}%
  \@dc@parse@next\@dc@arguments
}
```

```
\def\ArgumentCatcher@Scope
#1% the separator(s)
{\let\@dc@seQuence@shipout@@\@dc@seQuence@shipout
  \let\@dc@seQuence@shipout\@dc@Scope@shipout
  \ArgumentCatcher@Q{\global\relax}{\relax}%
  \let\@dc@seQuence@shipout\@dc@seQuence@shipout@@
  \@dc@ignorearg
  \ArgumentCatcher@T{#1}{\NoValue}%
}
```

```
\@dc@AliasCatcher {PScope} \Scope
```

[End of Argument Specifiers' Definitions]

```
\long\def\gmuIfNoValueTF#1{%
```

```
  \@xa\ifx\@xa\NoValue\@firstofmany#1\@empty\@nil \afterfi\@firstoftwo
  \else\afterfi\@secondoftwo
  \fi}
```

```
\long\def\gmuIfNoValueT#1#2{\gmuIfNoValueTF{#1}{#2}\@empty}
```

```
\long\def\gmuIfNoValueF#1#2{\gmuIfNoValueTF{#1}\@empty{#2}}
```

```
\long\def\gmuIfValueTF#1#2#3{\gmuIfNoValueTF{#1}{#3}{#2}}
```

```
\long\def\gmuPutIfValue#1{\gmuIfValueT{#1}{#1}}
```

\gmuIfValueT

```
\let\gmuIfValueT\gmuIfNoValueF
```

\gmuIfValueF

```
\let\gmuIfValueF\gmuIfNoValueT
```

```
\long\pdef\IfLong#1{%
        % #1 the argument to check for \par,
        % #2 what if \par found,
        % #3 what if \par not found.
  \edef\gmu@IfLong@resa{\detokenize{#1}}%
  \edef\gmu@IfLong@resa{%
    \IfAmong\string\par\@nx\among{\gmu@IfLong@resa}}%
  \gmu@IfLong@resa}
```

= (`\afterassignment`) pseudo-argument

```
\long\@namedef{ArgumentCatcher@=}%
#1% register used in the assignment
#2% the tail of args parser.
\@dc@arguments{%
  \dc@DefParseNext{%
    \@dc@addargum\NoValue  % to make ignoring mechanism work
    #2\@dc@arguments}%
  \afterassignment\@dc@parse@next
  #1}% optional space and = is left at user's discretion. In fact, #1 may be empty and
        then each time our command is used the left side of the assignment has to be
        given explicitly and may even be different each time.
```

```
\n@melet{ArgumentCatcher@P=}{ArgumentCatcher@=}
```

`\gobblespace` pseudo-argument: useful between optional and Knuthian-type arguments and after all parsing. Equivalent `>iT{\somedummymacro}`. At first I wanted mark it `\ignorespaces` but the gobbling doesn't expand macros: it doesnt't use `\ignorespaces` but `\@ifnextchar`'s space trick.

```
\long\def\ArgumentCatcher@gobblespace
{\ArgumentCatcher@T {\dc@gobblespace@dummy}{\NoValue}}
```

```
\let\ArgumentCatcher@Pgobblespace\ArgumentCatcher@gobblespace
```

```
\def\dc@gobblespace@dummy{\dc@gobblespace@dummy}
```

```
\let\gobblespace\dc@gobblespace@dummy
```

end of catchers' definitions

```
\errorcontextlines=100
```

```
\long\def\@dc@InnerName#1{%
  \bslash@or@ac{#1}%
  \bslash
}%
```

```
\long\def\@dc@InnerEndName #1{% version for the end-macros of environments
  \bslash end\strip@bslash{#1}%
}%
```

Name of the CS carrying the command's specifiers sequence and arity of the inner macro.

(2010/07/26, v0.993:) This strikingly simple idea of storing the specifiers' sequence in a macro came to my head only after some three years of developing `\DeclareCommand`

```
\long\edef\@dc@SpecsArName#1{%
  Specs \string& arity of
  \@nx\bslash@or@ac{#1}%
}%
```

```
\pdef\@dc@messages {%
  \gmu@notif {@dc@quiet@}{}%
  {%
    \gmu@if {DCMessages}{}%
    {\PackageInfo{gmcommand}{^^J%
        Parsing arguments for \dc@innername^^J%
        [specified as:
        \unexpanded
        \@xa\@xa\@xa \@xa\@xa\@xa \@xa{%
          \@xa\@xa\@xa\@secondofmany
```

not `\@secondofthree` because first use of this definition is for `\DeclareCommand` not having its specifiers' carrier.

```
          \csname \@dc@specsname\endcsname {}{}\@nil }%
        \space ]^^J%
        [in file: \@currname.\@currext\space ]}% of info message
      }% of if DC messages
      {}% of if not DCMessages
    }% of if not @dc@quiet@
    {}% of if not not @dc@quiet@
}% of \@dc@messages
```

(2010/07/15, v0.993:) added to modify naming of the inner macro of a `\DeclareCommand` ed commands: preceding the names with a backslash is OK for the letter CS'es, but it may cause a collision for the active chars. Therefore we both precede the name *and* succede it with a bslash

```
\edefU\@dc@DCbody {%
{%
  \edef\dc@innername {\@dc@InnerName #1}% we'll use it in K-type arg. catcher
        and to allow #1 == \par ( \PackageWarning is short and \typeout too!).
        And in \lostwax.
```

We define the name of the macro carrying specs and inner arity:

`\gmu@if` `\dc@innername`

```
  \edef\@dc@specsname  {\@dc@SpecsArName{#1}}%
  \gmu@ifCSdefined {#1}%
  {\gmu@if{DCMessages}{}%
    {\PackageWarning{gmcommand}{%
        ^^J%
        Redefining command \dc@innername\space
        with \string\DeclareCommand}%
    }%
    {}%
  }%
  {\gmu@if {DCMessages}{}%
    {\PackageInfo{gmcommand}{^^J%
        \string\DeclareCommand-ing \dc@innername\space (new)^^J}%
    }%
    {}%
  }%
```

First we parse the declaration options to know whether all the arguments are to be long and whether we should suppress the message "Parsing arguments for…".

```
  \@dc@alllong@false
  \@dc@quiet@false
```

Now we collect the prefixes.

```
  \emptify\@dc@Specs@tempa
  \gmu@ifsbintersect{#2}{\long!lL}{%
    \addtomacro\@dc@Specs@tempa{\long}%
    \@dc@alllong@true}%
  {}%
```

```
\gmu@ifsbintersect{#2}{.qQ\quiet}{%
  \addtomacro\@dc@Specs@tempa{\quiet}%
  \@dc@quiet@true}%
{}%
\gmu@ifsbintersect{#2}{iIwW\sphack}%
{% if ‘invisibility’ is specified:
  \addtomacro\@dc@Specs@tempa{\sphack}%
  \def\@dc@bsphack@{\@nx\@bsphack}%
  \def\@dc@esphack@{\@nx\@esphack}%
}%
{\emptify\@dc@bsphack@
  \emptify\@dc@esphack@}% if ‘invisibility’ is not specified.
\gmu@ifsbany\envhack{#2}%
{% but if we define an environment:
  \addtomacro\@dc@Specs@tempa{\envhack}%
  \emptify\@dc@bsphack@
  \emptify\@dc@esphack@
  \edef\@dc@setThrowArgs{%
    \dc@ThrowArgs{\string#1}}% if our command is used as an environment, we throw the args to the end in a toks register (primary version defined a macro but that failed for #es).
}%
{% and if we don’t define an environment:
  \emptify\@dc@setThrowArgs
}%
\relaxen\@dc@global@
\relaxen\@dc@outer@
\gmu@ifsbany\outer{#2}%
{\addtomacro\@dc@Specs@tempa{\outer}%
  \let\@dc@outer@\outer}%
{}%
\gmu@ifsbany\global{#2}{%
```

We store the information about globalness of definition for the future but in an inactive form (globalness seems to me something very local)

```
  \addtomacro\@dc@Specs@tempa {\IAmDeclaredGlobally}%
  \let\@dc@global@\global}%
{}%
```

Now the possible prefixes are processed.

We add the (distilled version of) them to the storage macro as its first item:

```
\@xa\Name \@xa\edefU
\@xa\@dc@specsname
\@xa{\@xa{\@dc@Specs@tempa}}%
```

We initialise the scratch count and toks registersa and the Boolean switches before parsing of the arguments specifiers.

```
\@dc@ResetParseAuxilia
```

We parse the arguments’ specifiers:

```
\@dc@ParseNextSpecifier #3%
\@dc@buckstopshere % it’s the sentinel of parsing. Since the test performed by \@dc@ParseNextSpecifier is a comparison of (bslash-stripped) strings, this CS doesn’t have to be defined or have any particular meaning.
```

```
  \@xa \Name \@xa \addtomacro \@xa \@dc@specsname
  \@xa {\@xa{\the\@dc@ParsedSpecs}}%
```

We add the inner arity (braced) to the specs-carrying macro

```
  \@xa\Name\@xa\addtomacro\@xa\@dc@specsname
  \@xa{\@xa{\the \c@dc@argnum}}%
```

Now we define the basic macro:

```
  \@dc@outer@\@dc@global@ % possibly the prefixes,
```

Here comes the definition of the coating macro, named the same as the command:

```
  \protected\edef#1{% always \protected ;-)
    \@dc@bsphack@ % perhaps \@bsphack

    \@dc@messages
    \@nx\@dc@{\the\toks@}% in the braces appear the argument catchers.
    \@xanxcs{\dc@innername}%
    \ifx\@dc@outer@\outer
      \@xanxcs{\@xa\gobble\string#1 }% note the blank space after #1! If the command is to be \outer, we can't put it itself, so we put another, whose name is the same plus a space. Anyway, since #1 becomes \protected, this case will never be executed.
    \else \@nx #1%
    \fi
  }% of main coating macro's \edef.

  \edef\gmu@DeclareCommand@resa{%
    \@dc@global@ % perhaps \global
    \long\def\@xanxcs{\@dc@InnerName{#1}}% for a command \command, define \\command\
    \@xau\@dc@innerhashes % it's #1#2#3…
    {% the body of the inner '\\⟨name⟩\' macro:
      \@dc@setThrowArgs
      \unexpanded{#4}%
      \@dc@esphack@}%
  }% of \edef.
  \gmu@DeclareCommand@resa
}% of \DeclareCommand's body.
}

\def\@dc@DCprefixQlist{\global\protected\outer\long
  \relax % for the somewhat perverse case when \@dc@global may be relaxed (in \DeclareEnvironment). If someone might want to redefine a cs let to relax, it anyway comes as the first argument. And \relax is not a proper value for the third argument (args. spec.) so it's all right at this point. (2010/6/10)
  !lL.qQiIwW\sphack\envhack}

\long\def\ShowCommand #1{%
  \@iwruJ
  \@iwru{»\string#1« is »\meaning#1«}%
  \@iwruJ
  \@iwru{»\Name\string{\@dc@InnerName{#1}}« is
    »\Name\meaning{\@dc@InnerName{#1}}«}%
  \@iwruJ
  \@iwru{»\Name\string{\@dc@SpecsArName{#1}}« is
```

```
    »\Name\meaning{\@dc@SpecsArName{#1}}«}%
  \@iwruJ
  \show\show
}
```

\DeclareCommand

```
\@XA{\DeclareCommand\DeclareCommand   % This is the final version by now. Note
         we introduce the ‘prefixes’ at the #2 position only at this point so we have
         yet to prefix every argument specifier separately. Note also we only here
         ‘teach’ \DeclareCommand to pass the name of its main argument in the
         \dc@innername macro.
{
  #1 >Pm        % command to be defined (may be even \par if you really wish),
  #2 >\@xa Q{\@dc@DCprefixQlist}{} % an optional seQuence of ε-TEX’s prefixes
         and/or ! or l or L for ‘all long’ and/or . or q or Q for ‘quiet’ (message
         about calling the command is suppressed) and/or i or I as ‘invisible’ or W or
         w as ‘white’ or \sphack to make the command ‘invisible’ in the leading with
         the \@bsphack… \@esphack. To deal with an ‘invisible’ environment, there
         is one more acceptable value of this argument: \envhack, which suppresses
         placing \@bsphack—\@esphack and places \@ignore@true instead in the end
         macro,
  #3 >Pm % arguments specification (may contain \par),
  #4 >Pm % the definition body; may contain nearly anything including \par and tests
         for presence/absence of arguments
         % \If[No]Value(T|F|TF) and for their longness \IfLong; you refer to the ar-
         guments with #⟨n⟩.
}}\@dc@DCbody
```

Now the inner body of `\DeclareCommand` is full-featured but its specifiers’ carrier is not yet defined. Therefore we repeat its definition with the almost-fullfeatured version.

Now it’s the fixed point.

\DeclareCommand

```
\@XA{\DeclareCommand \DeclareCommand \long
  {m >\@xa Q{\@dc@DCprefixQlist}{} mm}}%
\@dc@DCbody

\long\def\dc@EAName#1{% Env. arguments’ toks’ name It will be passed a stringed
       or bslashless name of a command
  \if\bslash#1\else#1\fi's_args}

\pdef\dc@ThrowArgs#1{%
  \gmu@if{csname}{\dc@EAName{#1}\endcsname}
  {}% if it’s defined, we do nothing (we assume it’s defined by us and is toks register.)
  {% else we define it as a new toks
    \@xa\newtoks\csname\dc@EAName{#1}\endcsname
  }%
  \csname\dc@EAName{#1}\endcsname=%
  \@xa\@xa\@xa{\@xa\@gobble\the\@dc@arguments}%
}%
```

Now we have a convenient tool to implement parsing of a Knuthian argument(s).

Knuthian argument’s default replacement

```
\def\@dc@K@defaultrepl{##1}
```

2009/11/22 inner pair of braces removed (as leading to additional group causing errors).

\@dc@define@K

```
\DeclareCommand\@dc@define@K \long {mb}{%
```

```
%%   \@dc@xadefaultfalse First we add the particular CS to the toks register:
  \edef\gmu@tempa{%
    \unexpanded{\toks@\@xa}%
    {\@nx\the\toks@{%
        \@xanxcs{\dc@innername @K\the\c@dc@catchernum}%
      }%
    }%
```

here we add to the parsers toks list a CS named \⟨*our command*⟩`@K`⟨*num. of catcher*⟩ (the particular Knuthian catcher)

```
  }\gmu@tempa
```

and define this macro:

```
  \edef\gmu@tempa{%
```

And now we define that particular Knuthian catcher.

```
    \def\@xanxcs{\dc@innername @K\the\c@dc@catchernum}%
    \gmu@if {@dc@xadefault@i@}{}%
    {\@xau{#1}}%
    {\unexpanded{#1}}%
    {%
      \@nx\@dc@addargum{{%
          \gmuIfValueTF{#2}{%
            \gmu@if{@dc@xadefault@ii@}{}%
            {\@xau{#2}}%
            {\unexpanded{#2}}%
          }{\@xau{\@dc@K@defaultrepl}}%
        }}% we add the Knuthian replacement to the toks register as #n.
      \@nx \@dc@parse@next \@dc@arguments
    }% and continue parsing.
  }% of \edef. Now we execute this temporary macro, which means we \def\⟨command⟩@K⟨n⟩
  \@dc@global@ % set properly before \@dc@ParseNextSpecifier #3⟨buck⟩.
  \if P\@dc@long@letter\relax\long\fi
  \gmu@tempa
  \@dc@addtospecs {#1}%
  \gmuIfValueTF{#2}{%
    \gmu@if{@dc@xadefault@ii@}{}%
    {\@xa\@dc@addtospecs\@xa{#2}}%
    {\@dc@addtospecs{#2}}%
  }
  {\@xa\@dc@addtospecs\@xa{\@dc@K@defaultrepl}}%
```

Now we clean up and continue construction of arguments parser.

```
 \@dc@ParseNextSpecifier
}% of \@dc@define@K
```

`\@dc@grab@Loop`

```
\DeclareCommand\@dc@grab@Loop \long {%
  #1 T{\any \none Uu\U \u Ǔǔ\Ǔ \ǔ Ww\W \w \lostwax} % the “sign” of matching for adding; use of the letters suppresses adding them to the parsed specifiers’ list, which is crucial for \SameAs copying of specifiers: the “until” and “while” loops don’t shift their arguments.

  #2 >Pm % list of tokens to match for/against iteration

  >i T{\drain \drop \Drain \Drop \lost \Lost}
  #3 T{\any \none }{\any} % the “sign” of matching for draining
  #4 b{} % list of drainers, empty by default
  >i T{\count \ubound}
  #5 D{\m@ne} % upper bound of iterations
  >i T{\default \Default}
  #6 b % default value (\NoValue by default)
  #7 T{\eacher \Eacher \defEacher} % default is \NoValue and that’s no harm
        since we test if #7 == \defEacher.
  #8 B{} % eacher, empty by default
}{%
  \@dc@process@matchsign {#1} {##1}%
  \dc@addtoParsed@{#2}%
  \gmu@if {strings}{\lostwax#1}%
  {\gmu@if {@dc@xadefault}{}%
    {\@xa\edefU\@xa\@dc@LostWaxList\@xa{#2}}%
    {\edefU\@dc@LostWaxList{#2}}%
  }%
  {}%
  \@dc@process@matchsign {#3} {##3}%
  \dc@addtoParsed@{#4}%
  \@xa  \@dc@addtospecs@bare \@xa{\the\numexpr #5}%
  \@dc@addtotoks@bare{{#5}}% to ignore possible expandafter.
  \dc@addtoParsed@ {#6}%
  \gmu@if {strings}{\defEacher#7}
  {%
    \Name\def{\dc@innername/defdEacher/\the\c@dc@argnum}%
    ##1{#8}%
    \Name \dc@addtoParsed@
    {\dc@innername/defdEacher/\the\c@dc@argnum}%
  }
  {\gmu@if {@dc@xaeacher@}{}
    {\@dc@xadefaulttrue}{\@dc@xadefaultfalse}%
    \dc@addtoParsed@ {#8}%
  }%
  \gmu@if {strings}{\lostwax#1}
  {\grab@LostWax}
  {\@dc@ParseNextSpecifier}%
}
```

\grab@LostWax

```
\DeclareCommand\grab@LostWax {
  >iT{\lost \Lost}
  #1 b{\lostwax@NoVal}
  >iT {\count \ubound}
  #2 D{1}
  >iT{\endlost \EndLost}
}{%
```

We build an ignored “while” catcher.

```
  \def\@dc@LostWaxA{>iw}%
  \gmu@ifdetokens {\lostwax@NoVal}{#1}
  {%
```

if no particular value of the “lost wax” is provided, we assume the same as the “until” delimiter(s).

```
    \prependtomacro\@dc@LostWaxA{>\@xa}%
    \addtomacro\@dc@LostWaxA{\@dc@LostWaxList}%
  }%
```

Otherwise first we check whether “lost wax” provided has nonempty intersection with the “until” delimiters.

```
  {%
    \@xa\gmu@ifstrintersect
    \@xa{\@dc@LostWaxList}{#1}
    {\addtomacro\@dc@LostWaxA{{#1}}}%
    {\PackageError{gmutils/gmcommand}{^^J%
       You try to declare a "Lost Wax" catcher^^J%
       with the "Lost" list disjoint with the "Until" list.^^J%
       I assume sum of them}%
     {}%
     \@xa \addtomacro\@xa\@dc@LostWaxA
     \@xa{\@xa{\@dc@LostWaxList #1}}%
   }%
 }%
 \addtomacro\@dc@LostWaxA{ \count #2 \relax}%
 \@xa\@dc@ParseNextSpecifier \@dc@LostWaxA
}% of \grab@LostWax.
```

```
\def\@dc@process@matchsign
#1% the argument
#2% its numeral in human language (for the error message)
{%
  \gmu@CASE {strings} {{#1}\any }
  {\@dc@addtoParsed@bare {\any }}%
  \gmu@CASEsbany {#1} {Ww}
  {\@dc@addtotoks@bare {\any}}%
  \gmu@CASE {strings} {{#1}\none}
  {\@dc@addtoParsed@bare {\none }}%
  \gmu@CASEsbany {#1} {UuŬŭ\lostwax }
  {\@dc@addtotoks@bare {\none }}%
  \gmu@lastCASE
  {\PackageError{gmcommand}{%
      You *have* to declare »\string\any« or »\string\none« ^^J%
      as the #2 argument for the »\string\loop« catcher}{}%
  }%
  \gmu@ESAC
}
```

```
\long\pdef\UnDeclareCommand#1{%
  \let#1\@undefined
  \ifcsname\@dc@InnerName{#1}\endcsname
    \n@melet{\@dc@InnerName{#1}}{@undefined}%
  \fi
  \ifcsname\@dc@SpecsArName{#1}\endcsname
    \n@melet{\@dc@SpecsArName{#1}}{@undefined}%
  \fi
}
```

The `\SameAs` parsing

Implemented 2010/4/14–16. Lets you not to repeat all the complicated specifiers but just write `\SameAs\`⟨*another command*⟩

```
\edef\gmu@tempa{%
  \def\@nx\gmu@ifHashless@##1%
  \detokenize{macro:}##2->##3\@nx\@nil}%
\gmu@tempa
```

This produces `\gmu@ifHashless@#1macro:#2->#3\@nil` with the middle delimiter detokenized

```
{\gmu@if {}{\gmu@ifempty{#2}{1}{0}\gmu@ifempty{#3}{2}{1}}}
```

This expands to 1 if `#1` is a hashless macro (to be honest, if its meaning contains string `macro:->`)

```
\long\edef\gmu@ifHashlessMacro
#1% a CS, name or active char
   %% #2% (implicit) what if hashless
   %% #3% (implicit) what if hashy
{%
  \edef\@nx\gmu@WHL@arg{\@nx\@xanxtri{#1}}%
   %% \unexpanded{\typeout{@@@@@ »\meaning\gmu@WHL@arg«}}%
  \unexpanded{\@xa\@xa\@xa\gmu@ifHashless@
    \@xa\meaning\gmu@WHL@arg}%
  \relax % to ensure that #3 of \gmu@ifHashless@ is nonempty if match for the delimiters is found earlier
  \detokenize{macro:***->}\@nx\@nil % the sentinels
}
```

```
\long\def\gmu@ifDeclared#1{%
```

```
% #1 a CS or csname or an active char,
% #2 true branch,
% #3 false branch
```

```
  \let\gmu@ifDe@next\@secondoftwo
```

The test is three-level: first we check whether the specifiers' carrier is defined, then whether the inner macro is defined, then we check if the outer CS is a hashless macro (it could have been that the outer CS was redefined with sth. else)

```
  \gmu@CASEnot {csname} {\@dc@SpecsArName{#1}\endcsname}%
  {}%
  \gmu@CASEnot {csname}{\@dc@InnerName{#1}\endcsname}%
  {}%
  \gmu@EatCases
  {\gmu@ifHashlessMacro{#1}%
    {\edef\gmu@ifDe@resa{%
        \@nx\gmu@ifxany\@xanxcs{\@dc@InnerName{#1}}%
        {\unexpanded\@xa\@xa\@xa{\gmu@WHL@arg}}%
```

Above: to get the contents of the outer macro we use the macro carrying conversion of possible name into a CS and expand it twice. Then we freeze it with `\unexpanded`.

```
        {\let\@nx\gmu@ifDe@next\@nx\@firstoftwo}% if the inner macro is present
                in the contents of #1, we take the first implicit argument
        {}% otherwise we do nothing (taking the second implicit is already set)
      }% of edef
      \gmu@ifDe@resa
    }% of if a hashless macro
    {}% of if not a hasless macro
  }%
  \gmu@ESAC
  \gmu@ifDe@next
}% of \gmu@ifDeclared
```

```
\long\def\@dc@SameAs#1{%
```

As you see, it's very simple when we took care of storing the specifiers in a special macro: we only take the middle brace of it.

```
  \gmu@ifDeclared {#1}%
  {%
```

7 `\expandafter`s before `\@dc@ParseNextSpecifier` and 3 before `\@secondofthree` to expand the specifiers carrier twice, then get its middle piece of data, which is the specifiers' sequence, and then parse as a part of "our" specifiers.

```
    \@xa\@xa\@xa \@xa\@xa\@xa \@xa
    \@dc@ParseNextSpecifier
    \@xa\@xa\@xa \@secondofthree
    \csname \@dc@SpecsArName{#1}\endcsname
  }%
  {%
    \PackageError{gmcommand}{%
      Command \@nx#1 ^^J%
      is not declared with \DeclareCommand. ^^J%
      I can't repeat its parameters in current command declaration}%
    {}%
  }%
}% of \@dc@SameAs
```

\DeclareCommand
\DCUse

```
\DeclareCommand\DCUse{
  #1  >Pm % the command
}{%
```

TODO: handling longness of the arguments properly. (Now it assumes all the inner arguments are `\long`).

```
  \gmu@ifDeclared{#1}%
```

If `#1` is a `Declared` command, we put its inner macro to the `\@dc@arguments` toks and launch catcher of proper number of undelimited arguments.

```
  {%
    \@dc@arguments\@xa{\@xa
      \csname \@dc@InnerName{#1}\endcsname
    }%
    \csname ArgumentCatcher@Pm@\romannumeral
    \@xa \@xa \@xa \@thirdofthree
    \csname \@dc@SpecsArName{#1}\endcsname % of arity carrier
    \endcsname % of the catcher
  }%
  {\DC@EndNotDeclaredErr{#1}}%
}%

\pdef \DC@EndNotDeclaredErr #1{%
  \PackageError{gmcommand}{%
    Command \bslash end\strip@bslash{#1} ^^J%
    is not declared with \DeclareCommand. ^^J%
    Therefore I can't use its DC-inner macro (because of its nonexistence).^^J}%
  {}%
}
```

\DeclareCommand
\DCUseEnd

```
\DeclareCommand\DCUseEnd{
  #1  >Pm % the command (without “end”)
}{%
  \gmu@ifDeclared{end\strip@bslash{#1}}%
  {%
    \@dc@arguments\@xa{\@xa
      \csname \@dc@InnerEndName{#1}\endcsname
    }%
    \csname ArgumentCatcher@Pm@\romannumeral
    \@xa \@xa \@xa \@thirdofthree
    \csname \@dc@SpecsArName{#1}\endcsname % of arity carrier
    \endcsname % of the catcher
  }%
  {\DC@EndNotDeclaredErr{#1}}%
}%
```

end of `\SameAs` parsing

Immediate uses

\DeclareEnvironment

```
\DeclareCommand\DeclareEnvironment \long
{
  #1--#4  \SameAs \DeclareCommand
```

We repeat the specifiers, but the role of `#4` is slightly different here: here it's the `\begin` part definition.

```
  #5 m % the end definition; it can contain any #⟨n⟩—the arguments of the environment are passed to it, too.
}{%
  \def\gmu@DeclareEnvironment@resa{\envhack}% we add the information we define an environment.
  \gmuIfValueT{#2}%
  {\addtomacro\gmu@DeclareEnvironment@resa{#2}}% we pass all the ‘prefixes’ to % \DeclareCommand

  \@xa\DeclareCommand\csname#1\@xa\endcsname
  \gmu@DeclareEnvironment@resa{#3}{#4}%
```

Now the begin definition is done. Let's get down to the end definition.

```
 \let\@dc@env@endglobal=\@dc@global@ % note this CS was for sure redefined by the last \DeclareCommand (and by nothing else) and that's exactly what we want.
```

(2010/07/15, v0.993:) we make the `\end…` command `\DeclareCommand` ed for the symmetry, for simplifying definition of `\envirlet` in particular

```
  \edef\gmu@DeclareEnvironment@resb{%
    \@nx\@xa
    \@xanxcs{\bslash end#1}%
    \@nx\the
    \@xanxcs{\dc@EAName{#1}}%
  }% of \edef. It reuslts in
```

`\@xa \\end`⟨*name*⟩ `\the\\`⟨*name*⟩`'s_args`

which does not collide with the inner macro of the `\end…` command, since the latter is `\\end…\`.

```
\gmu@if{csname}{\dc@EAName{#1}\endcsname}{\gmu@namelet\global{%
     \dc@EAName{#1}}{@undefined}}{}%
```

We postpone the definition of the `\end…` command after of the end inner macro not to spoil the `\@dc@innerhashes`.

Now the end inner macro

```
  \edef\gmu@DeclareEnvironment@resa{%
    \@dc@global@\long\def % the inner end macro is always \long and perhaps
          defined \global ly.
    \@xanxcs{\bslash end#1}%
    \@xau\@dc@innerhashes % it's #1#2#3…—the inner end macro takes the same
          number of parameters as the begin macro.
    {% the definition body
      \unexpanded{#5}}%
  }% of \edef…@resa.
  \gmu@DeclareEnvironment@resa
```

And now the postponed from above definition of `\end…`

`\@xanxcs`

```
  \edef\gmu@DeclareEnvironment@resc{%
    \DeclareCommand\@xanxcs{end#1}%
    \@dc@env@endglobal
    {}% no parameters
    {\@xau    {\gmu@DeclareEnvironment@resb
        \@ignoretrue}%
    }%
  }%
  \gmu@DeclareEnvironment@resc
}% of \DeclareEnvironment
```

`\NewCommand` `\gmu@ifCSdefined` `\PackageError`

```
\DeclareCommand\NewCommand
{\SameAs\DeclareCommand}
{%
  \gmu@ifCSdefined {#1}
  {\DCUse\DeclareCommand#1{#2}{#3}{#4}}%
  {\PackageError{gmcommand}%
    {Command \@nx#1 already defined \on@line!}%
    {}%
  }%
}
```

`\RenewCommand`

```
\DeclareCommand\RenewCommand
```

\gmu@ifCSdefined \PackageError

```
{\SameAs\DeclareCommand}
{%
  \gmu@ifCSdefined {#1}
  {\DCUse\DeclareCommand#1{#2}{#3}{#4}}%
  {\PackageError{gmcommand}%
    {Command \@nx#1 not yet defined \on@line!}%
    {}%
  }%
}
```

\ProvideCommand \gmu@ifCSdefined

```
\DeclareCommand\ProvideCommand
{\SameAs\DeclareCommand}
{%
  \gmu@ifCSdefined {#1}
  {}
  {\DCUse\DeclareCommand#1{#2}{#3}{#4}}%
}
```

\DeclareCommand \NewEnvironment

```
\DeclareCommand\NewEnvironment
{\SameAs\DeclareEnvironment}
{%
  \gmu@ifdefined{#1}
  {\DCUse\DeclareEnvironment{#1}{#2}{#3}{#4}{#5}}%
  {\PackageError{gmcommand}
    {Environment #1 already defined \on@line!}{}%
  }%
}
```

\RenewEnvironment

```
\DeclareCommand\RenewEnvironment
{\SameAs\DeclareEnvironment}
{%
  \gmu@ifdefined {#1}
  {\DCUse\DeclareEnvironment{#1}{#2}{#3}{#4}{#5}}%
  {\PackageError{gmcommand}
    {Environment #1 not yet defined \on@line!}{}%
  }%
}
```

Setting for XƎTEX

which could not be defined earlier (in **gmbase** because of lack of `\DeclareCommand`.

\XeTeXthree

```
\DeclareCommand\XeTeXthree{o}{%
  \@ifXeTeX{%
    \gmuIfValueT{#1}{\PassOptionsToPackage{#1}{fontspec}}%
    \@ifpackageloaded{gmverb}%
    {%
      \Store@Macro\verb
      \StoreEnvironment{verbatim}%
      \StoreEnvironment{verbatim*}%
    }{}%
    \RequirePackage{xltxtra}%
```

since v 0.4 (2008/07/29) this package redefines `\verb` and `verbatim*`, and quite elegantly provides an option to suppress the redefinitions, but unfortunately that option excludes also a nice definition of `\xxt@visiblespace` which I fancy.

```
8371     \@ifpackageloaded{gmverb}%
8372     {%
8373       \Restore@Macro\verb
8374       \RestoreEnvironment{verbatim}%
8375       \RestoreEnvironment{verbatim*}%
8376     }{}%
8378     \AtBeginDocument{%
8379       \@ifpackageloaded{gmlogos}{%
8380         \Restore@Macro\LaTeX\Restore@MacroSt{LaTeX }% my version of the
                   LaTeX logo has been stored just after defining, in line 10065.
8383         \Restore@Macro\eTeX}%
8384       {}%
8385     }%

8387     \pdef\adddefaultfontfeatures##1{%
8388       \addtomacro\zf@default@options{#1,}}
8389   }% of \@ifXeTeX's first argument,
8390   {}% \@ifXeTeX's second argument,
8391 }% of \XeTeXthree's body.
```

\setspaceskip

```
8394 \DeclareCommand\setspaceskip{%
8395   A{1}% optional factor for all three components
8396   O{\fontdimen2\font}%
8397  >is
8398  O{\fontdimen3\font}%
8399  >is
8400  O{\fontdimen4\font}}
8401 {\spaceskip=\glueexpr\dimexpr#2*#1\relax plus\dimexpr #3*#1\relax
8402   minus\dimexpr#4*#1\relax\relax}

8404 \pdef\unsetspaceskip{%
8405   \spaceskip=\z@skip
8406 }

8409 \def\makestarlow{%
8410   \begingroup\lccode`\~=`\*\lowercase{%
```

*

```
8411     \endgroup\def~{\gmu@lowstar}}% 2009/10/19 \let changed to \def to allow
               redefinitions of \gmu@lowstar.
8413   \catcode`\*=\active
8414   \defLowStarFake
8415 }
```

\defLowStarFake

```
8417 \DeclareCommand\defLowStarFake{%
8418   Q{+-0123456789,.}{0,5}% fraction of fontchar depth of the star glyph
8419 }%
8420 {%
8421   \def\gmu@lowstarfake{%
8422     \leavevmode\vbox{\hbox{*}\kern#1\fontchardp\font`*}%
8423   }%
8424 }

8427 \def\gmu@lowstarfake{*} % useful for next command where normal star is low.
```

The macro given below is taken from the **multicol** package (where its name is `\enough@room`). I put it in this package since I needed it in two totally different works.

\enoughpage

```
8434 \DeclareCommand\enoughpage{%
```

```
  #1  D{\NoValue} % (optional short version (number of \baselineskips)) Before 2010/9/10 the default value was the D-default, i.e., 0, which lead to improper working of this command.
  #2  B{2\baselineskip}% (2) optional (formerly mandatory) long version of required room on a page
  >is
  #3 >PB{} % (3) what if the room is enough
  >is
  #4 >PB{\newpage} % (4) what if there's to little room on a page
}{%
  \gmu@if {num}
  {\numexpr
      \ifdim
```

if the space left is less than we wish then 1, otherwise 0.

```
        \gmu@pageremain
        <%
        \dimexpr
          (\gmuIfValueTF{#1}{#1\baselineskip}{#2})*1%
        \endexpr
```

(2010/06/28, v0.993:) I added |(›...)*1| to assure that || really delimits the dimexpr

```
        1\else 0%
      \fi
      *%
      \ifdim \gmu@pageremain >-1sp
        1% if the room left on current page is nonnegative, then we indeed are on current page so "enough" and "not enough" does make sense: Enough is enough.
      \else 0% otherwise we are on next page (or further) and assume there is enough room for our purpose.
      \fi
      *%
      \ifdim \pagegoal <\maxdimen
        1 % if there are some boxes on current page, so checking room does make sense.
      \else 0% otherwise (no boxes on current page) assume there's enough room
      \fi
    >\z@
  }% of condition
  {\typeout{@@@@@ not enough page \on@line}%
    #4%
  }%
  {#3}%
}
```

```
\long\def\gmu@LC@LetInners
```

Macro letting the inner (executing) and the specs. carrying macros of a `Declared` command.

```
#1% scope prefix (\global or \relax
#2% left side
#3% right side of the assignment
```

```
{%
  \edef\gmu@LC@InnerLeft{\@dc@InnerName{#2}}%
  \edef\gmu@LC@InnerRight{\@dc@InnerName{#3}}%
  \gmu@namelet{#1}{\gmu@LC@InnerLeft}{\gmu@LC@InnerRight}%
```

`\tri@let` put here originally was disastrous since it gobbled the leading bslash

```
  \edef\gmu@LC@InnerLeft{\@dc@SpecsArName{#2}}%
  \edef\gmu@LC@InnerRight{\@dc@SpecsArName{#3}}%
  \gmu@namelet{#1}{\gmu@LC@InnerLeft}{\gmu@LC@InnerRight}%
}
```

```
\long\def\gmu@CL@PrepareArg
#1% left/right
#2% \@xa or \edef, maybe sth. more in the future
#3% a CS, text of a name or an active char
{%
  \Name\let{gmu@CL@#1}\@undefined
  \ifx\@xa#2\Name\edef{gmu@CL@#1}{\@xau{#3}}\fi
  \ifx\edef#2\Name\edef{gmu@CL@#1}{#3}\fi
  \unless\ifcsname gmu@CL@#1\endcsname
    \Name\edef{gmu@CL@#1}{%
      \gmu@if{cat}{\@nx~\@nx#3}%
      {\@nx#3}{\strip@bslash{#3}}%
    }%
  \fi
}
```

`\CommandLet`

```
\DeclareCommand\CommandLet \long {%
  \Scope % (1)
  T{\@xa\edef} % (2) whether left side should be \expandaftered
  m % (3) left side of assignment
  >iT{=} % pro forma
  T{\@xa\edef} % (4) whether right side should be \expandaftered
  m % (5) right side of the asssignment
```

Both arguments may be names. Warning! The first token of a csname will not be expanded (will be `\string` ed).

```
}{%
  \gmu@CL@PrepareArg{left}#2{#3}%
  \gmu@CL@PrepareArg{right}#4{#5}%
  \@xa\gmu@ifDeclared\@xa{\gmu@CL@right}{%
    \edef\gmu@LC@resa{%
      \DeclareCommand %
      \@xa\@xanxtri\@xa{\gmu@CL@left}%
      #1% scope prefix
      {\@nx\SameAs\@xa\@xanxtri\@xa{\gmu@CL@right}}% args. spec
      {}% the body of the command will be \let via letting inners.
    }%
    \gmu@LC@resa
```

Now we have a command #2 Declared with emty body and proper args' parsers and inner macro properly named.

```
    \@XA{\@xa\gmu@LC@LetInners\@xa#1%
    \@xa{\gmu@CL@left}}\@xa{\gmu@CL@right}%
```

No Ampulex for the outer macro is necessary.

```
  }% of if Declared
  {% if not Declared, we just \let:
\if\@nx#3Ꝁ€\typeout{@@@@@ »\@xa\@dc@InnerName\@xa{\gmu@CL@right}« is not
 Declared?: \Name\meaning{\@xa\@dc@InnerName\@xa{\gmu@CL@right}}%
}%
\show\NotDeclared
\fi
    \@XA{\@xa\tri@let\@xa#1%
      \@xa{\gmu@CL@left}}\@xa{\gmu@CL@right}%
  }%
}
```

\envirlet

```
\DeclareCommand\envirlet \long{\Scope mm}{% for \letting environments.
  \CommandLet #1{#2}{#3}%
  \CommandLet #1{end#2}{end#3}%
}
```

A numeric `for` loop as in decent languages:

\@fornum

```
\DeclareCommand\@fornum{%
  m% (1) initial (least) num. value
  m% (2) limit (last iterated over) num. value
  O{1}% (3) step of iteration
  m% (4) body of the loop
}%
{\edef\gmu@fornum@min{\the\numexpr #1}%
  \edef\gmu@fornum@lim{\the\numexpr #2}%
  \let\gmu@fornum@curr\gmu@fornum@min
  \@whilenum\gmu@fornum@curr<\gmu@fornum@lim
  \do{#4%
    \edef\gmu@fornum@curr{%
      \the\numexpr\gmu@fornum@curr+#3}%
  }% of \@whilenum's body.
}% of \@fornum.
```

```
\pdef\StoreCommand{%
  \begingroup
  \MakePrivateLetters
  \@StoreCommand
}
```

```
\long\def\gmu@SC@StorageName
#1% a CS, name or active char
#2% group level
{%
  \gmu@storeprefix/%
  \ifnum\numexpr#2>-1 \the\numexpr(#2)*1\relax\fi
  \bslash@or@ac {#1}%
}%
```

The storing csnames with `#2` ≤ -1 don't contain the number.

```
\def\gmu@SC@setgrouplevel
#1% +|-|\NoValue
```

```
8619 #2% a decimal number
8620 {\edef\gmu@SC@grouplevel{%
8621     \the\numexpr
8622     \gmuIfValueTF{#1}%
8623     {\currentgrouplevel#1#2+1}{#2}%
8624   }% of the grouplevel-carrying macro
8625 }
```

\@StoreCommand

```
8628 \DeclareCommand\@StoreCommand
8629 {%
8630   #1 T{+-}% grouplevel shift indicator
8631   #2  d % group level or shift (the latter relative to the current g.l.)
8632   #3  >Pm% name or CS
8633 }{%
8634   \endgroup % we close the group opened in line 8600.
```

Now. We define a special csname prefixed with `\gmu@storeprefix` and containing current group level. Later, when we refer to the stored command, we'll check subsequent levels, from current upwards.

```
8639   \gmu@SC@setgrouplevel{#1}{#2}%
8641   \edef\gmu@SC@resa{%
8642     \gmu@SC@StorageName{#3}{\gmu@SC@grouplevel}}%
8644   \let\gmu@SC@scope\relax
8645   \ifnum\gmu@SC@grouplevel>\currentgrouplevel
8646     \let\gmu@SC@scope\global
8647   \fi
8648   \@xa\CommandLet\@xa\gmu@SC@scope\@xa{\gmu@SC@resa}{#3}%
8650 }

8653 \pdef\StoreEnvironment{%
8654   \begingroup
8655   \MakePrivateLetters
8656   \@StoreEnvironment
8657 }

8660 \def\@StoreEnvironment#1{%
8661   \@StoreCommand{#1}%
8662   \begingroup
8663   \@StoreCommand{end#1}%
8664 }

8667 \pdef\RestoreEnvironment{%
8668   \begingroup
8669   \MakePrivateLetters
8670   \@RestoreEnvironment
8671 }

8674 \def\@RestoreEnvironment#1{%
8675   \endgroup
8676   \RestoreCommand{#1}%
8677   \RestoreCommand{end#1}%
8678 }

8681 \pdef\UseStored{%
8682   \begingroup
8683   \MakePrivateLetters
```

```
  \@UseStored}
```

\@UseStored

```
\DeclareCommand\@UseStored \long{%
  #1  T{+-}% (1) indicator of grouplevel shift (in distiction from an absolute group
        level)
  #2 d % (2) optional grouplevel or shift (0 by default)
  #3  O{\@gobble}% (3) stuff to be put before the #4 CS, e.g., an assignment. The
        deafult value \@gobble makes the default use of a stored CS to be just an
        execution/expansion of its meaning. Another use of this command, perhaps
        the most useful, is restoring of the previous meaning, as we'll see later.
        Note that #4 after #3 will be put in braces.
  #4  m % (4) a CS or csname to be taken from the storage liquid
}{%
  \endgroup
  \gmu@SC@setgrouplevel{#1}{#2}%
  \edef\gmu@SC@grouplevel{%
    \the\numexpr\gmu@SC@grouplevel+1}% for the first turn of loop
  \loop
    \edef\gmu@SC@grouplevel{%
```

we decrease the group level number

```
      \the\numexpr\gmu@SC@grouplevel-1}%
    \edef\gmu@SC@currname{%
```

define the cs' storage name for that level

```
      \gmu@SC@StorageName{#4}{\gmu@SC@grouplevel}}%
  \ifnum
```

and check the conjunction of conditions: the group level is >=-1…

```
    \unless\ifnum\gmu@SC@grouplevel<-1 1\else 0\fi
```

and the csname remains not defined.

```
    \unless\ifcsname \gmu@SC@currname \endcsname 1\else 0\fi
    =11
  \repeat
```

We repeat until we find defined csname or reach the top level.

```
  \gmu@if{csname}{\gmu@SC@currname\endcsname}%
  {%
    \@XA{#3{#4}}\csname \gmu@SC@currname\endcsname}% first
  {%
    #3{#4}\@undefined}% second
}% of \@UseStored
```

\RestoreCommand

```
\DeclareCommand\RestoreCommand{\Scope d}{%
  \UseStored #2[\CommandLet #1*]%
}
```

\gmu@smashbox

```
\newbox\gmu@smashbox
```

\set@smashbox

```
\DeclareCommand\set@smashbox{%
  \Scope
  T{hv}{h}
}{#1\setbox\gmu@smashbox =\csname #2box\endcsname }%
```

```
\def\smash@box{\smash{\box\gmu@smashbox}}
```

Now, using the iterating catchers, we define a finder of max/min dimen of a given sequence of arguments.

(There's also the `\gmu@comparenum` macro defined in **gmbase** that expands to the smaller or larger numbers (numexprs) of given two.)

`\gmu@boxA` `\gmu@boxB` `\gmu@dima` `\gmu@dimb`

```
\newbox\gmu@boxA
\newbox\gmu@boxB
\newdimen\gmu@dima
\newdimen\gmu@dimb
```

We call this macro `\gmu@extremebox` because in the **gmbase** package we defined `\gmu@maxdim` and `\gmu@mindim` as expandable taking a sequence of dim(expr)s and expanding to the biggest/smallest of them.

`\gmu@extremebox`

```
\DeclareCommand\gmu@extremebox {
  #1  m % a dimen register (will be assigned the extr. value) or a CS(will be defined as \the extreme value)
  #2  T {\min\max}{\max} % kind of extreme
  #3  T {\wd\ht\dp\totalheight}{\wd} % dimension to compare, the last two for total \ht+\dp.
  #4  \lostwax {\global\relax} \eacher{\gmu@dimextreme@step} \lost{%
        \relax}
  #5  T{\global}{} % scope of assignment
}{%
  \gmu@if x {\max#2}
  {\gmu@dimb=-\maxdimen
    \def\gmu@dimextreme@comp{<}%
  }
  {\gmu@dimb=\maxdimen
    \def\gmu@dimextreme@comp{>}%
  }%
  \long  \def\gmu@dimextreme@step ##1{%
    \setbox\gmu@boxA=\hbox{##1}%
    \gmu@dima= \gmu@if x {\totalheight#3}
    {\dimexpr \ht\gmu@boxA +\dp\gmu@boxA\relax}
    {#3\gmu@boxA}%
    \relax
    \gmu@if {dim}
    {\gmu@dimb\gmu@dimextreme@comp \gmu@dima }
    {\gmu@if {dim} {\gmu@dima>\z@}
      {\gmu@dimb=\gmu@dima }
      {}%
    }
    {}%
  }%
  #4%
  \IfIs #1\dimen
  {#5#1=\gmu@dimb}
  {#5\edef #1{\the\gmu@dimb }}%
}%
```

Getting height ;-)

The `\gmu@getht` macro is intended for very high vboxes, i.e., whose height may exceed `\maxdimen`. (In such case TEX's dimens cycle which is not what we want in `<` and `>` comparisons.) So, this macro checks whether a vbox got "too high" and returns `\maxdimen` as substitute of its height. If given box fits within `\maxdimen` or is not a vbox, then its original height is returned.

```
\pdef\gmu@getht
#1% box register
#2% dimen (or glue) register to assign the (substitute) height to
{%
  \setbox\gmu@boxA=\copy#1\relax
  \ifvbox\gmu@boxA
    \vbadness@M
    \setbox\gmu@boxB=\vsplit\gmu@boxA to \maxdimen
    \vbadness@Restore
```

chcemy rzeczywiście pomierzyć, a nie być może odrzucić odstępy, kerny i grzywny.

```
    \setbox\gmu@boxB=\vbox{\splitdiscards }%
    \ifdim \ht\gmu@boxB >\z@
      \setbox \gmu@boxA=\vbox{
        \unvbox\gmu@boxB
        \unvbox\gmu@boxA
      }%
```

`%% \else %` otherwise we leave box A intact for the Test of Śunyata.

```
    \fi
  \else
    \setbox\gmu@boxA=\box\voidb@x
  \fi
  \ifvoid\gmu@boxA
    #2=\ht#1\relax
  \else
    #2=\maxdimen
  \fi
}% of \gmu@getht
```

TODO: if one wraps such a very high vbox in an hbox, then attempt of assignment of its height results with an error "Dimension too large". Can we handle it? *Should* we handle it?

Enlarging and scaling of the font size

`\enlargefsize`

```
\DeclareCommand\enlargefsize{
  #1  m % enlargement (dim(expr)) for font size
  #2  b % enlargement (dim(expr)) for baselineskip (if absent, #1 is used)
}{\edef\gmu@tempa{%
    \@nx\fontsize{\the\dimexpr\f@size pt+#1}%
    {\the\dimexpr 1\baselineskip+ \gmuIfValueTF{#2}{#2}{#1}}%
  }\gmu@tempa\selectfont
}
```

`\scalefsize`

```
\DeclareCommand\scalefsize {
  #1 m % scale for font size
  #2 b % scale for baselineskip (if absent, #1 is used)
  \gobblespace
}{\edef\gmu@tempa{%
    \@nx\fontsize{\the\dimexpr #1\dimexpr\f@size pt\relax}%
    {\the\dimexpr  \gmuIfValueTF{#2}{#2}{#1}\baselineskip}%
  }\gmu@tempa\selectfont
}
```

```
\let\gmu@discretionaryhyphen\- % for the cases when we don't redefine \ but use
        % \
```

A redefinition of `\-` that makes it optional-argument to allow further hyphenation

`\bihyphen`

`\gmu@discretionaryhyphen`

```
\DeclareCommand\bihyphen{
  O{*} % token that'll make the discretionary hyphen \- allow other break-points
}{%
  \DeclareCommand\gmu@discretionaryhyphen{%
    T{#1}%
    G{&&}%
    a
  }{%
    \gmuIfValueT{##2}{%
      \gmu@ifempty{##2}{}{%
        \def\gmu@bihyphen@char{##2}}%
    }%
    \gmuIfValueT{##3}{%
      \gmu@ifempty{##3}{}{%
        \def\gmu@bihyphen@corr{##3}}%
    }%
```

Depending on `#1` we allow (if present, then we take `\discre`) hyphenation of the word's before- and after-parts or forbid it (if absent, then we take `\discretionary`).

```
    \gmuIfValueTF{##1}\discre\discretionary
    {% before break
      \gmuIfValueTF{##2}
      {%
        \gmu@ifempty{##2}{\gmu@bihyphen@char}{##2}%
      }%
      {%
        \ifnum\hyphenchar\font>\z@
          \char\hyphenchar\font
        \fi}%
    }% end of before break
    {% after break
      \gmuIfValueT{##3}{%
        \gmu@ifempty{##3}{\gmu@bihyphen@corr}{##3}%
      }%
    }%
    {% without break
    }% almost as in The TeX book: unlike The TeX book, we allow hyphenchars
         ≥ 255 as we are XeTeX.
  }% of \DeclareCommand\-
  \gmu@storeifnotyet\-% original \- is a TeX's primitive, therefore we should store
        it.
  \CommandLet\-\gmu@discretionaryhyphen
  \CommandLet\@dischyph\gmu@discretionaryhyphen % to override framed.sty
  \pdef\gmu@flexhyphen{\gmu@discretionaryhyphen#1\relax}%
}% of \bihyphen
```

```
\relaxen\gmu@bihyphen@corr
```

\gmshowlists

```
\@ifXeTeX{%
  \DeclareCommand\gmshowlists {
    >iT{\depth}
    Ď{1}%
    >iT{\breadth}
    Ď{10000000}
  }%
```

\gmshowlists

```
}{% not in XeTeX we use legacy D arg. specifiers:
  \DeclareCommand\gmshowlists {
    >iT{\depth}
    D{1}%
    >iT{\breadth}
    D{10000000}
  }%
}
{\tracingonline=\@ne
  \showboxdepth=#1\relax % how many levels of box nesting should be shown
  \showboxbreadth=#2\relax % after how many elements »etc.« will be put
  \showlists
}
```

\gmtracingoutput

```
\DeclareCommand\gmtracingoutput {
  \SameAs\gmshowlists
}
{\tracingonline=\@ne
  \tracingoutput=\@ne
  \showboxdepth=#1\relax % how many levels of box nesting should be shown
  \showboxbreadth=#2\relax % after how many elements »etc.« will be put
}
```

\c@FiBreakPenalty

```
\newcount\c@FiBreakPenalty
```

\AllowFiBreak

```
\DeclareCommand \AllowFiBreak {%
```

The defaults are as in DEK's `\filbreak`.

```
   Q{l}{l}
   = {\c@FiBreakPenalty }
}
{%
   \penalty\@M
   \csname vfi#1\endcsname
   \penalty \c@FiBreakPenalty
   \csname vfi#1neg\endcsname
}
```

\IgnorePars

```
\DeclareCommand \IgnorePars {m Q{\par}} {#1}
```

This command gobbles a sequence of epty lines and explicit `\par` CS es. Unlike primitive `\ignorespaces`, it doesn't expand macros.

`\putpenalty`

```
\DeclareCommand\putpenalty {=}
{%
```

`\gmu@iflastglue`

```
  \gmu@iflastglue
  {\@tempskipa=\lastskip
    \mode@skip -\@tempskipa
    \penalty \@tempcnta
    \mode@skip \@tempskipa
  }%
```

`\gmu@iflastkern`

```
  {\gmu@iflastkern
    {\@temdima=\lastkern
      \kern-\@temdima
      \penalty \@tempcnta
      \kern \@temdima
    }
    {%
      \penalty\@tempcnta
    }%
  }%
}
```

`\gmu@TrashSkip`

```
\newskip \gmu@TrashSkip
```

```
\pdef \mode@skip {%
  \ifvmode \vskip
  \else
    \ifhmode \hskip
    \else
      \ifmmode \mskip
      \else
        \gmu@TrashSkip
      \fi
    \fi
  \fi
}
```

```
⟨/command⟩
```

Ampulex Compressa-like modifications of macros—the gmampulex package[5]

```
⟨utils⟩      \gmu@PackOptionX{ampulex}
⟨*ampulex⟩
```

Ampulex Compressa is a wasp that performs brain surgery on its victim cockroach to lead it to its lair and keep alive for its larva. Well, all we do here with the internal LaTeX macros resembles Ampulex's actions but here is a tool for a replacement of part of macro's definition.

```
\RequirePackage{gmcommand}
```

`\ampulexlet`

```
\DeclareCommand\ampulexlet\long
```

---

[5] This file has version number v0.996 dated 2011/10/12.

```
9108 {Q{\outer\long\global\protected}{} % (1) (optional) prefix (es); allowed is any
          sequence of them in any order, just like for the original TEX's \def.
9111   T{\def\edef\gdef\xdef\pdef}{\def} % (2) (optional) kind of definition; if not
          specified, \def will be used.
9113   m % (3) macro to be let to,
9114   m % (4) macro to provide the definition,
9115   O{} % (5) \def's parameters string; empty by default,
9116   O{} % (6) definition body's parameters to be taken in a one-step expansion of the
          redefined macro; empty by default; the undelimited parameters should be
          double-braced here.
9119   m % (7) start token(s),
9120   m % (8) end token(s)
9121   m % (9) the replacement of #7, #8 and whatever between them.
9122 }{%   For the example of usage see 10288.
```

```
9130   \long\def\gmu@ampulexlet@resa
9131   ##1#7% we put #7 as a delimiter
9132   ##2#8% we put #8 as a delimiter
9133   ##3\gmu@AmpulexDelimiter{%
```

We use a special (undefined) CS`\gmu@AmpulexDelimiter` as the final delimiter because standard LaTeX's `\@nil` isn't probably a good idea since we want to ampulex deep LaTeX's macros and other `\gmu@…` macros too.

```
9139     \gmu@ifempty{##3}%
9140   }%
```

Now `\gmu@ampulexlet@resa` is redefined to produce an open `\gmu@ifempty` depending on whether the start and end token(s) are found in the meaning of `#4`.

Before we proceed, we deal with a difficulty with a special case when `#6` is "`#1`", which occurs because of stripping braces of a single-brace argument.

```
9148   \gmu@ifutokens{#6}{##1}%
9149   {\def\ampulex@Args{{%
9150           ####1}}%
9151   }%
9152   {\edef\ampulex@Args{\@nx\unexpanded{%
9153         \unexpanded{#6}}}}%
9154   \long  \def\gmu@ampulexlet@resc##1{%
9155     \@xa\@xa\@xa\@xa      \@xa\@xa\@xa\gmu@ampulexlet@resa
9156     \@xa\@xa\@xa#4%
9157     \ampulex@Args
9158     ##1% this parameter will be substituted with #7#8 in line 9163 and with emptiness
          in line 9214.
9160     \gmu@AmpulexDelimiter
9161   }%
9163   \gmu@ampulexlet@resc{#7#8}%
```

`%%` `\gmu@ampulexlet@resb` We've just applied the checker and it produces an open `\gmu@ifempty{`⟨*some tokens*⟩`}` if the delimiters are found in the meaning of `#4` so, if ⟨*some tokens*⟩ are none, we issue a warning

```
9168   {%
9169     \PackageWarning{gmampulex}{%
9170       \@nx#4 doesn't contain tokens
9171       \detokenize{#7} nor \detokenize{#8}. You better check if this is
```

```
      what you want to redefine.^^J%
      \@nx#4 is^^J%
      \meaning#4^^J%
    }}%
```

and we proceed if they are really some

```
  {%
```

We define a temporary macro with the parameters delimited with the 'start' and 'end' parameters of `\ampulexdef`. It has to stand a double `\edef`.

```
  \edef\gmu@ampulexlet@resa{%
    \long\def\@nx\gmu@ampulexlet@resa
    ####1\unexpanded{#7}%
    ####2\unexpanded{#8}%
    ####3\@nx\gmu@AmpulexDelimiter{%
      \@nx\unexpanded{####1}%
```

we drop the part between the `#7` and `#8` delimiters (including delimiters)

```
      \unexpanded{\unexpanded{#9}}% we replace the part of the redefined macro's
          meaning with the replacement text.
      \@nx\unexpanded{####3}%
    }% of inner \gmu@ampulexlet@resa
  }% of outer \gmu@ampulexlet@resa
  \gmu@ampulexlet@resa
```

Now `\gmu@ampulexlet@resa` carries the modifier of `#4`'s definition.

```
\unless\ifx\czat#4%
   \edef\gmu@ampulexlet@resb{% double definition for double hashes of expanded
        \unexpanded{#1…}
     #1#2%
     \@nx#3\unexpanded{#5}{%
       \gmu@ampulexlet@resc{}% Here we are sure the tokens sequences #7 and #8
            are in the one-level expansion of #4 so we don't pass them as sentinels
            (which BTW would totally spoil the redefinition, what it did indeed
            2010/6/23).
     }% of #3's definition body
   }% of inner \gmu@ampulexlet@resb
   \gmu@ampulexlet@resb
\else
    \gmu@ifxany#2{\gdef\xdef}{\global}{}%
    #1\edef#3#5{\gmu@ampulexlet@resc{}}%
\fi
  }% of if the delimiters were found in the meaning.
}% of \ampulexlet
```

`\ampulexdef`

```
\DeclareCommand\ampulexdef\long{%
#1  Q{\outer\long\global\protected}{} % (1) as \ampulexlet
#2  T{\def\edef\gdef\xdef\pdef}{\def} % (2) ad \ampulexlet
#3  m % (3) macro to be redefined,
#4  O{} % (4) as \ampulexlet's #5, i.e., \def's parameters string; empty by default,
#5  O{} % (5) as \ampulexlet's #6, i.e., definition body's parameters to be taken in
      a one-step expansion of the redefined macro; empty by default; the undelimited
      parameters should be double-braced here (but not doubled).
#6  m % (6) start token(s),
#7  m % (7) end token(s),
#8  m % (8) the replacement
}{%
  \DCUse\ampulexlet{#1}{#2}{#3}{#3}{#4}{#5}{#6}{#7}{#8}%
}
```

A definer for expandable loops

Now, as an example of use of `\ampulexlet`, we'll build a definer for expandable numerical loops.

```
\def\gmu@ENumLoop#1#2{% this is a fully expandable loop generating #2 − #1 space
      tokens (cf. The ε-TEX Manual p. 9).
  \ifnum#1<#2 %
    \gmu@tempa
    \@xa\gmu@ENumLoop
    \@xa{\number\numexpr#1+1\@xa}%
    \@xa{\number#2\@xa}%
  \fi}% of \gmu@hashes.
```

```
\long\def\defENumLoop
#1% the loop macro's name
#2% the replacement of \gmu@tempa
{%
  \ampulexlet#1\gmu@ENumLoop
  [##1##2][{##1}{##2}]%
  \gmu@tempa\@xa{#2\@xa}%
  \ampulexdef#1%
  [##1##2][{##1}{##2}]%
  \gmu@ENumLoop\@xa{#1\@xa}%
}
```

Let `\GenericInfo` write also to the terminal when `\tracingonline>0`.

```
\edef\GenericInfoToTerminal{%
  \unexpanded{%
    \@XA{\ampulexlet\protected\long\GenericInfo}\csname
    GenericInfo \endcsname[#1#2][{#1}{#2}]%
    \write\m@ne % we replace the token between these with:
    {\write\ifnum\tracingonline>\z@ \@unused\else\m@ne\fi}%
  }%
}
```

```
\ampulexdef\@starttoc[#1][#1]\makeatletter\@input{%
     \makeatletter\NamedInput}
```

```
⟨/ampulex⟩
```

The gmenvir Package[6]

```
⟨utils⟩      \gmu@PackOptionX{envir}
```

---

[6] This file has version number v0.996 dated 2011/10/12.

⟨*envir⟩

The **gmenvir.sty** package provides some improvements of the LaTeX's environments machinery. It provides a starred version of begin with which the CS respective to the argument doesn't have to be defined. This package also improves `\end` by detokenising environment's name (which is equivalent to comparing the names of CS'es not strings of tokens). The package also provides some tests such as `\@ifenvir`.

For details just read the code part.

```
\RequirePackage{gmbase, gmampulex} % the low-level macros
```

Environments redefined

Almost an environment or redefinition of `\begin`

We'll extend the functionality of `\begin`: the non-starred instances shall act as usual and we'll add the starred version. The difference of the latter will be that it won't check whether the 'environment' has been defined so any name will be allowed.

This is intended to structure the source with named groups that don't have to be especially defined and probably don't take any particular action except the scoping.

(If the `\begin*`'s argument is a (defined) environment's name, `\begin*` will act just like `\begin`.)

Original LaTeX's `\begin`:

```
\def\begin#1{%
  \@ifundefined{#1}%
    {\def\reserved@a{\@latex@error{Environment #1 undefined}\@eha}}%
    {\def\reserved@a{\def\@currenvir{#1}%
        \edef\@currenvline{\on@line}%
        \csname #1\endcsname}}%
    \@ignorefalse
    \begingroup\@endpefalse\reserved@a}
```

We provide a stack of environments consisting of triads `{`⟨*env. name*⟩`}{`⟨*group level*⟩`}{%`⟨*beg. line*⟩`}` (2010/6/9)

```
\emptify\@envirstack
```

```
\def\@pushenvir{%
```

```
%% \edef\@currenvir{\@currenvir}% is already expanded.
```

```
  \xdef\@envirstack{%
    {\@xa\detokenize\@xa{\@currenvir}}%
    {\the\currentgrouplevel}%
    {\@currenvline}%
    \@envirstack
  }%
}
```

```
\def\@popenvir #1#2#3{%
  \@XA{\@popenvir@ #1#2#3}\@envirstack\@nil
}
```

```
\def\@popenvir@ #1#2#3#4#5#6#7\@nil{%
  \gdef #1{#4}% #1 carries last envir name
  \gdef #2{#5}% #2 carries last envir level
  \gdef #3{#6}% #3 carries last envir beginnig line
9364   \gdef\@envirstack{#7}% and we update the stack
9365 }
```

\@begnamedgroup

```
9369 \long\def\@begnamedgroup#1{%
9370   \edef\@prevgrouplevel{\the\currentgrouplevel}% added 2009/03/24 to handle special pseudo-environments that don't increase \currentgrouplevel(such as document). Note it's \edefed outside the environment's group.
9374   \@ignorefalse% not to ignore blanks after group
9375   \begingroup\@endpefalse
9376   \edef\@prevenvir{\@currenvir}% Note we \edef it inside the group (for obvious reason), unlike the 'previous' grouplevel.
9378   \edef\@currenvir{#1}% We could do recatcoding through \string or
          % \detokenize but all the name 'other' and 10 could affect a thousand packages so we don't do that and we'll recatcode in a testing macro, see line 9426.
9383   \edef\@currenvline{\on@line}%
9384   \@pushenvir % we put current envir to \@envirstack.
9385   \csname #1\endcsname}% if the argument is a command's name (an environment's e.g.), this command will now be executed. (If the corresponding control sequence hasn't been known to TeX, this line will act as \relax.)
```

Let us make it the starred version of `\begin`.

\begin*
\begin

```
9394 \def\begin{\gmu@ifstar{\@begnamedgroup}{%
9395       \@begnamedgroup@ifcs}}
```

```
9398 \def\@begnamedgroup@ifcs#1{%
9399   \ifcsname#1\endcsname\afterfi{\@begnamedgroup{#1}}%
9400   \else\afterfi{\@latex@error{Environment #1 undefined}\@eha}%
9401   \fi}%
```

`\@ifenvir` and improvement of `\end`

It's very clever and useful that `\end` checks whether its argument is `\ifx`-equivalent `\@currenvir`. However, in standard LaTeX it works not quite as I would expect: Since the idea of environment is to open a group and launch the CS named in the `\begin`'s argument. That last thing is done with `\csname…\endcsname` so the catcodes of chars are irrelevant (until they are `\active`, $_1$, $_2$ etc.). Thus should be also in the `\end`'s test and therefore we ensure the compared texts are both expanded and made all 'other'.

`\gmu@ifedetokens` and `\@ifenvir` are defined in **gmbase**.

```
9423 \long\def\@fourthofmany#1#2#3#4#5\@nil{#4}%
```

```
9426 \lpdef\@ifprevenvir#1{%
       % #1 enquired environment name which will be confronted with \@prevenvir
       % #2 what if true (if the names are equivalent[7])
       % #3 what if false
```

(2010/09/23, v0.993:) to be precise, it's not a change but rather a staus quo action: `\gmu@ifedetokens` suddenly turned to be expandable and un`\protected` so we make *this* macro `\protected`

```
9444   \gmu@ifedetokens
9445   {\@xa\@fourthofmany\@envirstack\relax\relax\relax\relax\@nil}%
9446   {#1}%
9447 }
```

---

[7] The names are checked whether they produce the same `\csname`. They don't have to have the same catcodes.

Note that `\@ifjobname` and `\@ifenvir` are expandable and in an `\edef` they expand to

`\gmu@ifedetokens{`⟨*current jobname*⟩`}{`⟨*arg.1*⟩`}`

and

`\gmu@ifedetokens{`⟨*current envir*⟩`}{`⟨*arg.1*⟩`}`

resp. which may be useful for some TEXvert.

```
\def\@checkend#1{%
  \@ifenvir{#1}%
  {}%
  {\@badend{#1}}%
}
```

Thanks to it you may write `\begin{macrocode*}` with $\star_{12}$ and end it with `\end{%macrocode*}` with $\star_{11}$ (that was the problem that led me to this solution). The error messages looked really funny:

```
! LaTeX Error: \begin{macrocode*} on input line 1844 ended by
     \end{macrocode*}.
```

You might also write also `\end{macrocode\star}` where `\star` is defined as 'other' star or letter star.

```
\ampulexdef\end[#1][#1]\endcsname\@checkend{%
\endcsname
\@xa\gmu@ifempty\@xa{\@envirstack}%
{%
  \PackageError {gmutils/base}%
  {There's no environment to pop!}{Oy vey, gefeelte fish!}%
}%
{\@popenvir\gmu@drain\gmu@drain\gmu@drain }%
\@checkend
}
```

```
\pdef\@endif#1{\@ifenvir{#1}{\end{#1}}{}}
```

```
\pdef\@endifprev#1{\@ifprevenvir{#1}{\end{#1}}{}}
```

\c@EnvirInterruption

```
\newcount\c@EnvirInterruption
```

```
\lpdef\gmu@InterruptEnvir
#1% the contents of interruption.
{%
  \global  \advance\c@EnvirInterruption\@ne
  \Name \@popenvir
  {gmu@InterruptCurrenv \the\c@EnvirInterruption}\gmu@drain\gmu@drain
  \endgroup
  #1%
  \begingroup
  \@XA {\let\@currenvir}%
  \csname gmu@InterruptCurrenv \the\c@EnvirInterruption \endcsname
  \@pushenvir
  \global  \advance\c@EnvirInterruption\m@ne
}
```

⟨/envir⟩

From relsize

```
⟨utils⟩       \gmu@PackOptionX{relsize}
⟨*relsize⟩
```

As file **relsize.sty**, v3.1 dated July 4, 2003 states, LaTeX 2$_\varepsilon$ version of these macros was written by Donald Arseneau `asnd@triumf.ca` and Matt Swift `swift@bu.edu` after the LaTeX 2.09 **smaller.sty** style file written by Bernie Cosell `cosell@WILMA.BBN.COM`.

I take only the basic, non-math mode commands with the assumption that there are the predefined font sizes.

`\relsize` `\smaller` `\larger` `\smallerr` `\largerr`

You declare the font size with `\relsize{`⟨*n*⟩`}` where ⟨*n*⟩ gives the number of steps ("mag-step" = factor of 1.2) to change the size by. E.g., $n = 3$ changes from `\normalsize` to `\LARGE` size. Negative n selects smaller fonts. `\smaller` == `\relsize{-1}`; `\larger` == `\relsize{1}`. `\smallerr`(my addition) == `\relsize{-2}`; `\largerr` guess yourself.

(Since `\DeclareRobustCommand` doesn't issue an error if its argument has been defined and it only informs about redefining, loading **relsize** remains allowed.)

`\relsize`

```
\protected\def\relsize#1{%
  \ifmmode \@nomath\relsize\else
    \begingroup
     \@tempcnta % assign number representing current font size
       \ifx\@currsize\normalsize 4\else   % funny order is to have most ...
        \ifx\@currsize\small 3\else       % ...likely sizes checked first
         \ifx\@currsize\footnotesize 2\else
          \ifx\@currsize\large 5\else
           \ifx\@currsize\Large 6\else
            \ifx\@currsize\LARGE 7\else
             \ifx\@currsize\scriptsize 1\else
              \ifx\@currsize\tiny 0\else
               \ifx\@currsize\huge 8\else
                \ifx\@currsize\Huge 9\else
                4\rs@unknown@warning % unknown state: \normalsize as starting point
     \fi\fi\fi\fi\fi\fi\fi\fi\fi\fi
```

Change the number by the given increment:

```
     \advance\@tempcnta#1\relax
```

watch out for size underflow:

```
      \ifnum\@tempcnta<\z@ \rs@size@warning{small}{%
           \string\tiny}\@tempcnta\z@ \fi
      \@xa\endgroup
      \ifcase\@tempcnta  % set new size based on altered number
         \tiny \or \scriptsize \or \footnotesize \or \small \or
              \normalsize \or
         \large \or \Large \or \LARGE \or \huge \or \Huge \else
         \rs@size@warning{large}{\string\Huge}\Huge
\fi\fi}% end of \relsize.
```

`\rs@size@warning`

```
\providecommand*\rs@size@warning[2]{\PackageWarning{gmutils
     (relsize)}{%
    Size requested is too #1.\MessageBreak Using #2 instead}%
}%
```

\rs@unknown@warning

```
\providecommand*\rs@unknown@warning{\PackageWarning{gmutils
      (relsize)}{Current font size
 is unknown! (Why?!?)\MessageBreak Assuming \string\normalsize}}
```

And a handful of shorthands:

\larger
\smaller
\textlarger
\textsmaller

```
\DeclareRobustCommand*\larger[1][\@ne]{\relsize{+#1}}
\DeclareRobustCommand*\smaller[1][\@ne]{\relsize{-#1}}
\DeclareRobustCommand*\textlarger[2][\@ne]{{\relsize{+#1}#2}}
\DeclareRobustCommand*\textsmaller[2][\@ne]{{\relsize{-#1}#2}}
\protected\def\largerr{\relsize{+2}}
\protected\def\smallerr{\relsize{-2}}
```

We could implement continuous growth: `\larger[2.567]` means predefined fontsize 2 steps up plus .567 of the difference between step 2 and step 3.

```
⟨/relsize⟩
```

The gmmeta package for meta-symbols

```
⟨utils⟩      \gmu@PackOptionX{meta} % provides \bihyphen, \discre, \discret
⟨*meta⟩
\RequirePackage{gmcommand}
```

I fancy also another Knuthian trick for typesetting ⟨*meta-symbols*⟩ in *The TEX book*. So I repeat it here. The inner `\meta` macro is copied verbatim from doc's v2.1b documentation dated 2004/02/09 because it's so beautifully crafted I couldn't resist. I only don't make it `\long`.

> The new implementation fixes this problem by defining `\meta` in a radically different way: we prevent hyphenation by defining a `\language` which has no patterns associated with it and use this to typeset the words within the angle brackets.

```
\pdef\meta#1{%
```

Since the old implementation of `\meta` could be used in math we better ensure that this is possible with the new one as well. So we use `\ensuremath` around `\langle` and `\rangle`. However this is not enough: if `\meta@font@select` below expands to `\itshape` it will fail if used in math mode. For this reason we hide the whole thing inside an `\nfss@text` box in that case.

```
  {\meta@fontsetting\ensuremath\langle}%
  \ifmmode\@xa\nfss@text\fi
  {% this has to be a begin-group because \nfss@text becomes \hbox in math mode.
   \gmu@activespaceblank
    \meta@font@select
```

Need to keep track of what we changed just in case the user changes font inside the argument so we store the font explicitly.

```
    #1\/%
  }%
  {\meta@fontsetting\ensuremath\rangle}%
}% of \meta.
```

```
\pdef\gmu@activespaceblank{%
  \@xa\def\gmu@activespace{\space\ignorespaces}% note the subtle perversity
          of this definition: if we meet more than one subsequent active spaces, then the
          first of them will typeset \space and its \ignorespaces will gobble \space
          of the second and will stop at \ignorespaces and this \ignorespaces will
          gobble the next \space and so on.
}
```

```
\def\meta@fontsetting{\color{red!85!black}}
```

```
\def\meta@font@select{\meta@fontsetting\it}
```

But I define `\meta@font@select` as the brutal and explicit `\it` instead of the original `\itshape` to make it usable e.g. in the **gmdoc**'s `\cs` macro's argument.

The below `\meta`'s drag[8] is a version of *The TeX book*'s one.

\<..>

```
\def\<#1>{\meta{#1}}
```

```
\pdef\metachar#1{\begingroup\metacharfont #1\endgroup}
\def\metacharfont{\meta@fontsetting\rm}
```

Macros for printing macros and filenames

The `\discre` macro is defined in **gmbase**. It works like `\discretionary` but allows hyphenation before and after itself.

```
\pdef\vs{\discre{\visiblespace}{}{\visiblespace}}
```

Then we define a macro that makes the spaces visible even if used in an argument (i.e., in a situation where re`\catcode`ing has no effect).

```
\def\printspaces#1{{\let~=\vs \let\ =\vs \gmu@pswords#1 \@nil}}
\def\gmu@pswords#1 #2\@nil{%
  \ifx\relax#1\relax\else#1\fi

          \ifx\relax#2\relax\else\vs\penalty\hyphenpenalty\gmu@pswords#2\@nil\fi}% n
          that in the recursive call of \gm@pswords the argument string is not
          extended with a sentinel space: it has been already by \printspaces.
```

```
\pdef\sfname#1{\textsf{\printspaces{#1}}}
```

```
\def\gmu@discretionaryslash{\discre{/}{\hbox{}}{/}}% the second
       pseudo-argument nonempty to get \hyphenpenalty not \exhyphenpenalty.
```

```
\pdef\file#1{\gmu@printslashes#1/\gmu@printslashes}
```

```
\def\gmu@printslashes#1/#2\gmu@printslashes{%
  \sfname{#1}%
  \ifx\gmu@printslashes#2\gmu@printslashes
  \else
  \textsf{\gmu@discretionaryslash}%
  \afterfi{\gmu@printslashes#2\gmu@printslashes}\fi}
```

it allows the spaces in the filenames (and prints them as).

The macro defined below I use to format the packages' names.

---

[8] Think of the drags that transform a very nice but rather standard 'auntie' ('Tante' in Deutsch) into a most adorable Queen ;-).

```
\pdef\pk#1{\textsf{#1}}
```

Some (if not all) of the below macros are copied from **doc** and/or **ltxdoc**.

A macro for printing control sequences in arguments of a macro. Robust to avoid writing an explicit \ into a file. It calls `\ttfamily` not `\tt` to be usable in headings which are boldface sometimes.

`\cs`

```
\DeclareCommand\cs{O{\type@bslash\penalty\@M\hskip\z@skip}}{%
      % [#1] O{\bslash} the control sequence's prefix, by default it's \ allowing hy-
         phenation of subsequent word,
      %  #2  m the control sequence or anything to be typeset in typewriter font.
  \begingroup
  \ifdefined\verbatim@specials\verbatim@specials\fi
  \edef\-{\discretionary{%
      \ifdefined\gmv@hyphen\gmv@hyphen
      \else\unexpanded{{\normalfont-}}%
      \fi}{}{}}%
  \def\{{\type@lbrace\yeshy}\def\}{\char`\}}%
  \narrativett
  \edef\narrativett@storedhyphenchar{\the\hyphenchar\font}%
  \hyphenchar\font=%
  \ifdefined\gmv@hyphenchar\gmv@hyphenchar
  \else "A6
  \fi
  \cs@inner{#1}%
}% of \cs
```

```
\let\type@bslash\bslash
```

```
\pdef\cs@inner#1#2{%
  #1#2%
```

`%%    \hyphenchar\font=\narrativett@storedhyphenchar\relax %` we don't restore the value of `\hyphenchar` since this restores it back for the entire paragraph.

```
  \endgroup}
```

```
\def\narrativett{\ttfamily}% such name because I introduce it to distinguish the
            narrative verbatims from the code in gmdoc.
```

```
\long\pdef\env{\cs[]}
```

And for the special sequences like `^^A`:

```
\foone{\@makeother\^}
  {\pdef\hathat{\cs[^^]}}
```

```
\AtBeginDocument{%
  \@ifpackageloaded{gmdoc}{\def\hash{\cs[\#]}}{}}
```

And one for encouraging line breaks e.g., before long verbatim words.

```
\def\possfil{\hfil\penalty1000\hfilneg}
```

```
\def\possvfil{\vfil
  \penalty\numexpr
  \gmu@minnum{\clubpenalty+\widowpenalty}{9999}%
  \relax % eaten by \gmu@maxnum
  \relax % eaten by \numexpr
  \vfilneg}
```

Typesetting arguments and commands

`\arg` We define a conditional and iterating command `\arg` that in math mode does what it used to do was in math and outside math it typesets mandatory, optional and picture (parenthesed) and angled arguments and optional stars. You can write

`\arg[gefilte]⋆<fisch>(mit){baigele}`

to get

`[`⟨*gefilte*⟩`]`[⋆]`{`⟨*fisz*⟩`}``(`⟨*mit*⟩`)``{`⟨*bajgele*⟩`}`

or even

`\verb+\MoltoAdagio⁄arg⋆{Dankgesang}<an>[die Gottheit]+`

(where ⁄ is the escape char in verbatims) to get

`\MoltoAdagio`[⋆]`{`⟨*Dankgesang*⟩`}``<`⟨*an*⟩`>``[`⟨*die Gottheit*⟩`]`

(in der lydischen Tonart).

For more complicated arguments configurations consider using **gmdoc**'s environment `enumargs`.

The five macros below are taken from the **ltxdoc.dtx**.

> `\cmd{\foo}` Prints `\foo` verbatim. It may be used inside moving arguments. `\cs{foo}` also prints `\foo`, for those who prefer that syntax. (This second form may even be used when `\foo` is `\outer`).

```
\long\def\cmd#1{\@xa\cs\@xa{\@xa\cmd@to@cs\string#1}\spifletter}%
```

it has to be un `\protected`! It has so many `\expandafter` s to allow `\cmd\par` and still keep the `\cs` command 'short'.

```
\def\cmd@to@cs#1#2{\char\number`#2\relax}
```

It can be short since it never gets actual control sequence as an argument only a string of 'other' tokens (and maybe spaces).

`\marg{text}` prints `{`⟨*text*⟩`}`, 'mandatory argument'.

`\marg`

```
\pdef\marg#1{{\narrativett\type@lbrace}\arg@wrap{#1}{%
   \narrativett\char`\}}}
```

`\oarg{text}` prints `[`⟨*text*⟩`]`, 'optional argument'. Also `\oarg[text]` does that.

`\oarg`

```
\pdef\oarg{\@ifnextchar[\@oargsq\@oarg}
\pdef\@oarg#1{{\narrativett[}\arg@wrap{#1}{\narrativett]}}
\pdef\@oargsq[#1]{\@oarg{#1}}
```

`\parg{te,xt}` prints `(`⟨*te,xt*⟩`)`, 'picture mode argument'.

`\parg`

```
\pdef\parg{\@ifnextchar(\@pargp\@parg}
\def\@parg#1{{\narrativett(}\arg@wrap{#1}{\narrativett)}}
\def\@pargp(#1){\@parg{#1}}

\pdef\aarg{\@ifnextchar<\@aarga\@aarg}
\def\@aarg#1{{\narrativett<}\arg@wrap{#1}{\narrativett>}}
\def\@aarga<#1>{\@aarg{#1}}

\def\@verbaarga#1#2>{\@aarg{#2}\arg@dc}

\foone{\catcode`>\active}{%
  \def\@verbaargact#1#2>{\@aarg{#2}\arg@dc}%
}
9849 \foone{\@makeother\{\@makeother\}%
9850   \catcode`[=\@ne\catcode`]=\tw@}
9851 [%
9852   \def\@verbmargm#1#2}[% for an argument in curly braces in a verbatim, where the braces are not groupers and not necessary ‘other’. We’ll know by \@ifnextif that the future token is an opening brace. Note this macro has 2nd parameter delimited with ‘other’ closing brace (so may not act correctly when braces are nested (then hide them with special verbatim groupers)).
9858     \marg[#2]%
9859     \arg@dc
9860   ]%
9861 ]% of \foone
```

Now provide the default `\arg@wrap`, for meta-arguments that is.

```
9865 \def\arg@wrap{\meta}
```

`\arg@dc`

```
9869 \DeclareCommand\arg@dc!{%
9872   s % (1)
9873   o % (2)
9874   c % (3)
9875   b % (4)
9876   a % (5)
9877   T{\arg} % (6) just gobbled (for backwards compatibility)
9878 }{% This command iterates while it has arguments and typesets them in brackets, parentheses or curly braces. Note it gobbles subsequent \args and just iterates.
9881   \def\next{0}%
9882   \gmuIfValueT{#1}%
9883   {\metachar[\scanverb{*}\metachar]\def\next{1}}%
9884   \gmuIfValueT{#2}{\@oarg{#2}\def\next{1}}%
9885   \gmuIfValueT{#3}{\@parg{#3}\def\next{1}}%
9886   \gmuIfValueT{#4}{\marg{#4}\def\next{1}}%
9887   \gmuIfValueT{#5}{\aarg{#5}\def\next{1}}%
9888   \@ifnextchar\egroup{\endgroup}{%
9889     \if1\next\@xa\arg@dc
9890     \else % it’s crucial that we look for verbatim braces after we checked there were no #4, otherwise there would be an error.
9893       \def\next{%
9894         \@ifnextif\xiilbrace{\@verbmargm}%
9895         {% not active or other lbrace
9896           \@ifnextif<{% then we look for angles
9897             \ifnum\catcode`>=\active
9898               \@xa\@verbaargact
9899             \else\@xa\@verbaarga
9900             \fi}%
9901           {% and if not angles neither verbatim braces, then
9902             \endgroup  % if we have no more arguments to typeset, we close the group opened in lines 9922 and 9939.
9904             \spifletter
9905           }%
9906         }%
9907       }%
9908       \@xa \next
9909     \fi
```

```
  }% of not egroup
}% of \arg@dc
```

Now define the front-end macro of the `\arg` command:

```
\foone{\obeylines\@makeother\^^C}{%
  \AtBeginDocument{%
    \let\math@arg\arg %
    \pdef\arg{% This is \arg for meta-arguments.
      \ifmmode\math@arg %
      \else\afterfi{%
        \begingroup %
        \ifdefined\@ifQueerEOL\@ifQueerEOL{%
          \def^^M{\unskip\space}% in the ‘queer’ EOLs scope we keep line end
                active in case we have \arg {⟨arg.⟩} ending a line: the next char
                peeper touches line end or, if the line end was 5, gobbles the space
                it turns into so the comment layer would ‘leak’ to the code layer.
        }{}\fi %
        \arg@dc}%
      \fi}% of \arg,
  }% of \AtBeginDocument,
```

And this is arg-typesetting command for verbatim arguments.

```
  \pdef\argv{%
    \begingroup %
    \@makeother\^^C%
    \pdef\arg@wrap##1{%
      \narrativett{##1}%
    }%
    \ifdefined\@ifQueerEOL\@ifQueerEOL{%
        \def^^M{\unskip\space}% in the ‘queer’ EOLs scope we keep line end ac-
              tive… as above
      }{}%
    \fi % of \ifdefined
    \arg@dc}%
}% of \foone.
```

Now you can write

`\arg{mand.\ arg} [opt.\ arg] (pict.\ arg)`
to get `{`*⟨mand. arg⟩*`}[`*⟨opt. arg⟩*`](`*⟨pict. arg⟩*`)`. (Yes, with only one `\arg`!)
And `$\arg(1+i) = \pi/4$` for $\arg(1+i) = \pi/4$.

`\cat`

```
\DeclareCommand\cat{Q{'"0123456789ABCDEF}{0}}{%
  ${}_{\the\numexpr#1}\m@th$\spifletter
}
```

A shorthand for \CS:

```
\pdef\CS{%
  \acro{CS}%
  \@ifnextcat a{ }{}}% we put a space if the next token is 11. It’s the next best
          thing to checking whether the CS consisting of letters is followed by a space.

\pdef\CSs{\CS{}es\@ifnextcat a{ }{}}% for pluralis.
\pdef\CSes{\CS{}es\@ifnextcat a{ }{}}% for pluralis.

⟨/meta⟩
```

The gmlogos package—a couple of TeX-related logos

```
⟨utils⟩      \gmu@PackOptionX{logos}
⟨*logos⟩
```

```
\RequirePackage{gmbase}
```

We'll modify The LaTeX logo now to make it fit better to various fonts.

```
\let\oldLaTeX\LaTeX
\let\oldLaTeXe\LaTeXe
```

```
\pdef\TeX{T\kern-.1667em\lower.5ex\hbox{E}\kern-.125emX\@}
\Store@Macro\TeX
\AtBeginDocument{\Restore@Macro\TeX}
```

```
\lpdef\EofTeX
#1#2% whether put kerns before and after »E« respectively.
#3% we do nothing with it (maybe unbrace) but we want to gobble possible space.
{\if1#1\relax \kern-.1667em \fi
  \lower.5ex\hbox{E}%
  \if1#2\relax \kern-.125em \fi
  #3
}
```

\DeclareLogo

```
\newcommand*\DeclareLogo[3][\relax]{%
       % [#1] is for non-LaTeX spelling and will be used in the PD1 encoding (to
          make pdf bookmarks);
       %  #2  is the command, its name will be the PD1 spelling by default,
       %  #3  is the definition for all the font encodings except PD1.
  \ifx\relax#1\def\gmu@DeclareLogo@resa{\@xa\@gobble\string#2}%
  \else
    \def\gmu@DeclareLogo@resa{#1}%
  \fi
  \edef\gmu@DeclareLogo@resa{%
    \@nx\DeclareTextCommand\@nx#2{PD1}{\gmu@DeclareLogo@resa}}
  \gmu@DeclareLogo@resa
  \DeclareTextCommandDefault#2{#3}%
  \pdef#2{#3}% added for XeTeX.
}
```

\pdef

```
\DeclareLogo\LaTeX{%
  {%
    L%
    \setbox\z@\hbox{\check@mathfonts
      \fontsize\sf@size\z@
      \math@fontsfalse\selectfont
      A}%
    \kern-.57\wd\z@
    \sbox\tw@ T%
    \vbox to\ht\tw@{\copy\z@ \vss}%
    \kern-.2\wd\z@% originally −,15 em for T.
  }%
  {%
    \ifdim\fontdimen1\font=\z@
    \else
      \count\z@=\fontdimen5\font
      \multiply\count\z@ by 64\relax
      \divide\count\z@ by\p@
      \count\tw@=\fontdimen1\font
      \multiply\count\tw@ by\count\z@
      \divide\count\tw@ by 64\relax
      \divide\count\tw@ by\tw@
      \kern-\the\count\tw@ sp\relax
    \fi}%
  \gmlogos@hyphen
  \TeX
}
```

\LaTeXe

```
\DeclareLogo\LaTeXe{\mbox{\m@th \if
    b\expandafter\@car\f@series\@nil\boldmath\fi
    \LaTeX\kern.15em2$_{\textstyle\varepsilon}$}}
```

```
\Store@Macro\LaTeX
\Store@MacroSt{LaTeX }
```

‘(La)TeX’ in my opinion better describes what I work with/in than just ‘LaTeX’.

\LaTeXpar

```
\DeclareLogo[(La)TeX]{\LaTeXpar}{%
  {%
    \setbox\z@\hbox{(}% )
    \leavevmode %
    \copy\z@
    \kern-.2\wd\z@ L%
    \setbox\z@\hbox{\check@mathfonts
      \fontsize\sf@size\z@
      \math@fontsfalse\selectfont
      A}%
    \kern-.57\wd\z@
    \sbox\tw@ T%
    \vbox to\ht\tw@{\box\z@%
      \vss}%
  }%
  \kern-.07em% originally −,15 em for T.
  {% (
    \sbox\z@)%
    \kern-.2\wd\z@\copy\z@
    \kern-.2\wd\z@}\gmlogos@hyphen\TeX
}
```

Here are a few definitions which can usefully be employed when documenting package files: now we can readily refer to AMS-TeX, BibTeX and SliTeX, as well as the usual TeX and LaTeX. There’s even a Plain TeX and a Web.

```
\gmu@ifundefined{AmSTeX}
  {\def\AmSTeX{\leavevmode\hbox{$\mathcal A\kern-.2em\lower.376ex%
        \hbox{$\mathcal M$}\kern-.2em\mathcal S$-\TeX}}}{}
```

\BibTeX

```
\DeclareLogo\BibTeX{{\rmfamily B\kern-.05em%
    \textsc{i{\kern-.025em}b}\kern-.08em% the kern is wrapped in braces for
          my \fakescaps’ sake.
    \TeX}}
```

`\SliTeX`

```
\DeclareLogo\SliTeX{{\rmfamily
      S\kern-.06emL\kern-.18em\raise.32ex\hbox
        {\scshape i}\kern -.03em\TeX}}
```

`\PlainTeX`

```
\DeclareLogo\PlainTeX{\textsc{Plain}\kern2pt\TeX}
```

`\Web`

```
\DeclareLogo\Web{\textsc{Web}}
```

There’s also the (LA)TEX logo got with the `\LaTeXpar` macro provided by **gmutils**. And here *The TEX book*’s logo:

`\TeXbook`

```
\DeclareLogo[The TeX book]\TeXbook{\textsl{The \TeX\space book}}
\let\TB\TeXbook% TUG Boat uses this.
```

`\eTeX`

```
\DeclareLogo[e-TeX]\eTeX{%
  \iffontchar\font"03B5{\itshape ε}\else
  \ensuremath{\varepsilon}\fi-\kern-.125em\TeX}% definition sent by Karl Berry
      from TUG Boat itself.
```

```
\Store@Macro\eTeX
```

`\pdfeTeX`

```
\DeclareLogo[pdfe-TeX]\pdfeTeX{pdf\gmlogos@hyphen\eTeX}
```

`\pdfTeX` `\pdfLaTeX`

```
\DeclareLogo\pdfTeX{pdf\gmlogos@hyphen\TeX}
\DeclareLogo\pdfLaTeX{pdf\gmlogos@hyphen\LaTeX}
```

Before version v0.996 the below was in a conditional but the

`\XeTeX`

```
\gmu@ifundefined{XeTeX}{%
  \DeclareLogo\XeTeX{X\kern-.125em\relax
    \gmu@ifundefined{reflectbox}{%
      \lower.5ex\hbox{E}\kern-.1667em\relax}{%
      \lower.5ex\hbox{\reflectbox{E}}\kern-.1667em\relax}%
    \TeX
  }%
}{}
```

`\XeLaTeX`

```
\gmu@ifundefined{XeLaTeX}{%
  \DeclareLogo\XeLaTeX{X\kern-.125em\relax
    \gmu@ifundefined{reflectbox}{%
      \lower.5ex\hbox{E}\kern-.1667em\relax}{%
      \lower.5ex\hbox{\reflectbox{E}}\kern-.1667em\relax}%
    \LaTeX}}{}
```

As you see, if TEX doesn’t recognise `\reflectbox` (**graphics** isn’t loaded), the first `E` will not be reversed. This version of the command is intended for non-XƎTEX usage. With XƎTEX, you can load the **xltxtra** package (e.g. with the **gmutils** `\XeTeXthree` declaration) and then the reversed `E` you get as the Unicode Latin Letter Reversed E.

`\XeTeXpar`

```
\DeclareLogo\XeTeXpar{%
  \setbox\z@\hbox{(}% )
  \leavevmode
  \copy\z@
  \kern-.2\wd\z@
  \smash{% the “Xe” part is copied from xltxtra
    X\lower0.5ex
   \hbox{\kern-0.15em
     \gmu@ifundefined{XeTeXversion}%
     {\setbox0=\hbox{E}\dimen0=\ht0\advance\dimen0by\dp0%
       \raise\dimen0\hbox{\rotatebox{180}{\box0}}%
     }% of if not in XƎTEX, then in XƎTEX:
     {\ifnum\XeTeXfonttype\font>0
       \ifnum\XeTeXcharglyph"018E>0
         \char"018E\relax
       \else
         \ifdim\fontdimen1\font=0pt
           \reflectbox{E}%
         \else
           \XeTeXuseglyphmetrics=1%
           \setbox0=\hbox{E}\dimen0=\ht0\advance\dimen0by\dp0%
           \raise\dimen0\hbox{\rotatebox{180}{\box0}}%
         \fi
       \fi
     \else
       \setbox0=\hbox{E}\dimen0=\ht0\advance\dimen0by\dp0%
       \raise\dimen0\hbox{\rotatebox{180}{\box0}}%
     \fi}% of reversed E when in XƎTEX
   }% of hbox
 }% of smash
 \setbox\z@\hbox{)}%
 \kern-.2\wd\z@
 \copy\z@
 \kern-0.15em
 \TeX}%
```

\LuaTeX

```
\DeclareLogo[LuaTeX]\LuaTeX{\textsc{Lua}\gmlogos@hyphen\TeX}
```

\ConTeXt

```
\DeclareLogo [ConTeXt]\ConTeXt{Con\gmlogos@hyphen\TeX t}
```

```
\emptify\gmlogos@hyphen
```

```
\def\HyphenateLogo#1{%
  {\let\gmlogos@hyphen\-%
    #1}%
}
```

```
⟨/logos⟩
```

The gmnotonlypream—modification of the ‘only preamble’ clause

```
⟨utils⟩         \gmu@PackOptionX{notonlypream}
⟨*notonlypream⟩
```

```
\RequirePackage{gmampulex}
```

Not only preamble!

Let’s remove some commands from the list to erase at begin document! Primarily that list was intended to save memory not to forbid anything. Nowadays, when memory is cheap, the list of only-preamble commands should be rethought IMHO.

\not@onlypreamble

```
\newcommand\not@onlypreamble[1]{{%
  \def\do##1{\ifx#1##1\else\@nx\do\@nx##1\fi}%
  \xdef\@preamblecmds{\@preamblecmds}}}
```

```
\not@onlypreamble\@preamblecmds
\not@onlypreamble\@ifpackageloaded
\not@onlypreamble\@ifclassloaded
\not@onlypreamble\@ifl@aded
\not@onlypreamble\@pkgextension
```

We use the two below e.g. in `\NamedInput` which we surely want to allow also within `document`.

```
\not@onlypreamble\@pushfilename
\not@onlypreamble\@popfilename
```

```
\not@onlypreamble\@currnamestack
```

And let's make the message of only preamble command's forbidden use informative a bit:

```
\def\gmu@notprerr{ can be used only in preamble (\on@line)}
```

```
\AtBeginDocument{%
  \def\do#1{\@nx\do\@nx#1}%
  \edef\@preamblecmds{%
    \def\@nx\do##1{%
      \def##1{\@nx\gmno@NotprerrMessage##1}\@nx\@eha}}%
    \@preamblecmds}
```

```
\def\gmno@NotprerrMessage#1{%
  \PackageError{gmutils/LaTeX}%
  {\@nx\string#1 \@nx\gmu@notprerr}{}%
}
```

A subtle error raises: the LaTeX standard `\@onlypreamble` and what `\document` does with `\@preamblecmds` makes any two of 'only preamble' CS's `\ifx`-identical inside `document`. And my change makes any two CS's `\ifx`-different. The first it causes a problem with is standard LaTeX's `\nocite` that checks `\ifx\@onlypreamble\document`. So hoping this is a rare problem, we circumvent it. 2008/08/29 a bug is reported by Edd Barrett that with **natbib** an 'extra }' error occurs so we wrap the fix in a conditional.

```
\def\gmu@nocite@ampulex{% we wrap the stuff in a macro to hide an open \if. And
        not to make the begin-input hook too large. the first optional argument is the pa-
        rameters string and the second the argument for one-level expansion of \nocite.
        Both hash strings are doubled to pass the first \def.
  \ampulexdef\nocite[##1][##1]
  \ifx
  {\@onlypreamble\document}%
  \iftrue}
```

```
\AtBeginDocument{\gmu@nocite@ampulex}%
⟨/notonlypream⟩
```

Improvements to mwcls sectioning commands

```
⟨utils⟩       \gmu@PackOptionX{mw}
```

```
⟨*mw⟩
\RequirePackage{gmcommand}
```

That is, ‘Expe-ri-mente’[9] mit MW’s sectioning & `\refstepcounter` to improve **mwcls**’s cooperation with **hyperref**. They shouldn’t make any harm if another class (non-**mwcls**) is loaded.

We `\refstep` sectioning counters even if the sectionings are not numbered, because otherwise

1. pdfTeX cried of multiply defined `\labels`,
2. e.g. in a table of contents the hyperlink `<rozdzia\l\ Kwiaty polskie>` linked not to the chapter’s heading but to the last-before-it change of `\ref`.

NoNumSecs

```
\AtBeginDocument{% because we don’t know when exactly hyperref is loaded and
        maybe after this package.
  \@ifpackageloaded{hyperref}{\newcounter{NoNumSecs}%
    \setcounter{NoNumSecs}{617}% to make \refing to an unnumbered section vis-
        ible (and funny?).
    \def\gmu@hyperrefstepcounter{\refstepcounter{NoNumSecs}}%
    \pdef\gmu@targetheading#1{%
      \hypertarget{#1}{#1}}}% end of then
  {\def\gmu@hyperrefstepcounter{}%
    \def\gmu@targetheading#1{#1}}% end of else
}% of \AtBeginDocument
```

Auxiliary macros for the kernel sectioning macro:

```
\def\gmu@dontnumbersectionsoutofmainmatter{%
  \if@mainmatter\else \HeadingNumberedfalse \fi}
\def\gmu@clearpagesduetoopenright{%
  \if@openright\cleardoublepage\else \clearpage\fi}
```

To avoid `\def`ing of `\mw@sectionxx` if it’s undefined, we redefine `\def` to gobble the definition and restore the original meaning of itself.

Why shouldn’t we change the ontological status of `\mw@sectionxx` (not define if undefined)? Because some macros (in **gmdocc** e.g.) check it to learn whether they are in an **mwcls** or not.

But let’s make a shorthand for this test since we’ll use it three times in this package and maybe also somewhere else.

\@ifnotmw

```
\long\def\@ifnotmw#1#2{\gmu@ifundefined{mw@sectionxx}{#1}{#2}}
```

The kernel of MW’s sectioning commands:

```
\@ifnotmw{}{%
\def\mw@sectionxx#1#2[#3]#4{%
  \edef\mw@HeadingLevel{\csname #1@level\endcsname
        \space}% space delimits level number!
  \ifHeadingNumbered
     \ifnum \mw@HeadingLevel>\c@secnumdepth \HeadingNumberedfalse \fi
```

line below is in `\gmu@ifundefined` to make it work in classes other than **mwbk**

```
     \gmu@ifundefined{if@mainmatter}{}{%
          \gmu@dontnumbersectionsoutofmainmatter}
  \fi
```

```
% \ifHeadingNumbered
%   \refstepcounter{#1}%
```

---

[9] A. Berg, *Wozzeck.*

```
%     \protected@edef\HeadingNumber{\csname the#1\endcsname\relax}%
%   \else
%     \let\HeadingNumber\@empty
%   \fi
```

```
\def\HeadingRHeadText{#2}%
\def\HeadingTOCText{#3}%
\def\HeadingText{#4}%
\def\mw@HeadingType{#1}%
\if\mw@HeadingBreakBefore
  \if@specialpage\else\thispagestyle{closing}\fi
  \gmu@ifundefined{if@openright}{}{\gmu@clearpagesduetoopenright}%
  \if\mw@HeadingBreakAfter
    \thispagestyle{blank}\else
    \thispagestyle{opening}\fi
     \global\@topnum\z@
\fi% of \if\mw@HeadingBreakBefore
```

placement of `\refstep` suggested by me (GM):

```
\ifHeadingNumbered
  \refstepcounter{#1}%
  \protected@edef\HeadingNumber{\csname the#1\endcsname\relax}%
\else
  \let\HeadingNumber\@empty
  \gmu@hyperrefstepcounter % we step an auxiliary counter to make a hyperref's label/target.
\fi% of \ifHeadingNumbered
```

```
\if\mw@HeadingRunIn
  \mw@runinheading
\else
  \if\mw@HeadingWholeWidth
    \if@twocolumn
      \if\mw@HeadingBreakAfter
      \onecolumn
      \mw@normalheading
      \pagebreak\relax
            \if@twoside
              \null
              \thispagestyle{blank}%
              \newpage
            \fi% of \if@twoside
      \twocolumn
      \else
        \@topnewpage[\mw@normalheading]%
      \fi% of \if\mw@HeadingBreakAfter
    \else
      \mw@normalheading
      \if\mw@HeadingBreakAfter\pagebreak\relax\fi
    \fi% of \if@twocolumn
  \else
    \mw@normalheading
    \if\mw@HeadingBreakAfter\pagebreak\relax\fi
  \fi% of \if\mw@HeadingWholeWidth
  \fi% of \if\mw@HeadingRunIn
  }
```

An improvement of MW's `\SetSectionFormatting`

A version of MW's `\SetSectionFormatting` that lets to leave some settings unchanged by leaving the respective argument empty (`{}` or `[]`).

Notice: If we adjust this command for new version of MWCLS, we should name it `\SetSectionFormatting` and add issuing errors if the inner macros are undefined.

`[#1]`	the flags, e.g. `breakbefore`, `breakafter`;
`#2`	the sectioning name, e.g. `chapter`, `part`;
`#3`	preskip;
`#4`	heading type;
`#5`	postskip

```
\relaxen\SetSectionFormatting
```

`\SetSectionFormatting`

```
\newcommand*\SetSectionFormatting[5][\empty]{%
  \ifx\empty#1\relax\else% empty (not \empty!) #1 also launches \else.
    \def\mw@HeadingRunIn{10}\def\mw@HeadingBreakBefore{10}%
    \def\mw@HeadingBreakAfter{10}\def\mw@HeadingWholeWidth{10}%
    \gmu@ifempty{#1}{}{\mw@processflags#1,\relax}% If #1 is omitted, the flags
          are left unchanged. If #1 is given, even as [], the flags are first cleared and
          then processed again.
  \fi
  \gmu@ifundefined{#2}{\@namedef{#2}{\mw@section{#2}}}{}%
  \mw@secdef{#2}{@preskip} {#3}{2 oblig.}%
  \mw@secdef{#2}{@head}    {#4}{3 oblig.}%
  \mw@secdef{#2}{@postskip}{#5}{4 oblig.}%
  \ifx\empty#1\relax
    \mw@secundef{#2@flags}{1 (optional)}%
  \else\mw@setflags{#2}%
  \fi}
```

`\mw@secdef`

```
\def\mw@secdef#1#2#3#4{%
         % #1  the heading name,
         % #2  the command distincter,
         % #3  the meaning,
         % #4  the number of argument to error message.
  \gmu@ifempty{#3}
    {\mw@secundef{#1#2}{#4}}
    {\@namedef{#1#2}{#3}}}
```

`\mw@secundef`

```
\def\mw@secundef#1#2{%
  \gmu@ifundefined{#1}{%
    \ClassError{mwcls/gm}{%
      command \bslash#1  undefined \MessageBreak
      after \bslash SetSectionFormatting!!!\MessageBreak}{%
      Provide the #2 argument of \bslash SetSectionFormatting.}}{}}
```

First argument is a sectioning command (wo. the backslash) and second the stuff to be added at the beginning of the heading declarations.

`\addtoheading`

```
\def\addtoheading#1#2{%
    \n@melet{gmu@addtoheading@resa}{#1@head}%
10492     \edef\gmu@addtoheading@resa{\unexpanded{#2}\@xa\unexpanded{%
              \gmu@addtoheading@resa}}%
10493     \n@melet{#1@head}{gmu@addtoheading@resa}%
10494 }
```

```
10496 }% of \@ifnotmw's else.
```

Negative `\addvspace`

When two sectioning commands appear one after another (we may assume that this occurs only when a lower section appears immediately after higher), we prefer to put the *smaller* vertical space not the larger, that is, the preskip of the lower sectioning not the postskip of the higher.

For that purpose we modify the very inner macros of MWCLS to introduce a check whether the previous vertical space equals the postskip of the section one level higher.

```
10508 \@ifnotmw{}{% We proceed only in MWCLS.
```

The information that we are just after a heading will be stored in the `\gmu@prevsec` macro: any heading will define it as the section name and `\everypar` (any normal text) will clear it.

`\@afterheading`

```
10513 \def\@afterheading{%
10514   \@nobreaktrue
10515   \xdef\gmu@prevsec{\mw@HeadingType}% added now
10516   \everypar{%
10517     \grelaxen\gmu@prevsec% added now. All the rest is original LaTeX.
10518     \if@nobreak
10519     \@nobreakfalse
10520     \clubpenalty \@M
10521     \if@afterindent \else
10522     {\setbox\z@\lastbox}%
10523     \fi
10524     \else
10525     \clubpenalty \@clubpenalty
10526     \everypar{}%
10527     \fi}}
```

If we are (with the current heading) just after another heading (one level lower I suppose), then we add the less of the higher header's post-skip and the lower header pre-skip or, if defined, the two-header-skip. (We put the macro defined below just before `\addvspace` in **mwcls** inner macros.)

`\gmu@checkaftersec`

```
10534 \def\gmu@checkaftersec{%
10535   \gmu@ifundefined{gmu@prevsec}{}{%
10536     \ifgmu@postsec% an additional switch that is true by default but may be turned
              into an \ifdim in special cases, see line 10572.
10539     {\@xa\mw@getflags\@xa{\gmu@prevsec}%
10540       \glet\gmu@checkaftersec@resa\mw@HeadingBreakAfter}%
10541     \if\mw@HeadingBreakBefore\def\gmu@checkaftersec@resa{11}\fi% if the cur-
              rent heading inserts page break before itself, all the play with vskips is
              irrelevant.
10544     \if\gmu@checkaftersec@resa\else
10545     \penalty10000\relax
10546     \skip\z@=\csname\gmu@prevsec @postskip\endcsname\relax
10547     \skip\tw@=\csname\mw@HeadingType @preskip\endcsname\relax
```

```
    \gmu@ifundefined{\mw@HeadingType @twoheadskip}{%
      \ifdim\skip\z@>\skip\tw@
      \vskip-\skip\z@% we strip off the post-skip of previous header if it's bigger than current pre-skip
      \else
      \vskip-\skip\tw@% we strip off the current pre-skip otherwise
      \fi}{% But if the two-header-skip is defined, we put it
      \penalty10000
      \vskip-\skip\z@
      \penalty10000
      \vskip-\skip\tw@
      \penalty10000
      \vskip\csname\mw@HeadingType @twoheadskip\endcsname
      \relax}%
    \penalty10000
    \hrule height\z@\relax% to hide the last (un)skip before subsequent \addvspaces.
    \penalty10000
    \fi
    \fi
  }% of \gmu@ifundefined{gmu@prevsec} 'else'.
}% of \def\gmu@checkaftersec.
```

```
\def\ParanoidPostsec{% this version of \ifgmu@postsec is intended for the special case of sections may contain no normal text, as while gmdocing.
  \def\ifgmu@postsec{% note this macro expands to an open \if.
    \skip\z@=\csname\gmu@prevsec @postskip\endcsname\relax
    \ifdim\lastskip=\skip\z@\relax% we play with the vskips only if the last skip is the previous heading's postskip (a counter-example I met while gmdocing).
  }}
```

```
\let\ifgmu@postsec\iftrue
```

```
\def\gmu@getaddvs#1\addvspace#2\gmu@getaddvs{%
  \toks\z@={#1}%
  \toks\tw@={#2}}
```

And the modification of the inner macros at last:

```
\def\gmu@setheading#1{%
  \@xa\gmu@getaddvs#1\gmu@getaddvs
  \edef#1{%
    \the\toks\z@\@nx\gmu@checkaftersec
    \@nx\addvspace\the\toks\tw@}}
```

```
\gmu@setheading\mw@normalheading
\gmu@setheading\mw@runinheading
```

```
\def\SetTwoheadSkip#1#2{\@namedef{#1@twoheadskip}{#2}}
```

```
}% of \@ifnotmw's else.
```

My setup of headings for mwcls

The setup of headings' skips was tested in 'real' typesetting, for money that is. The skips are designed for 11/13 pt leading and together with my version of **mw11.clo** option file for **mwcls** make the headings (except paragraph and subparagraph) consist of an integer number of lines. The name of the declaration comes from my employer of that time, "Wiedza Powszechna" Editions.

```
\@ifnotmw{}{% We define this declaration only when in mwcls.
```

\WPheadings

```
\DeclareCommand\WPheadings{T{\chapter}}{%
  \SetSectionFormatting[breakbefore,wholewidth]
      {part}{\z@\@plus1fill}{}{\z@\@plus3fill}%
  \gmuIfValueF{#1}{%
    \gmu@ifundefined{chapter}{}{%
      \SetSectionFormatting[breakbefore,wholewidth]
      {chapter}
      {66\p@}% {67\p@} for Adventor/Schola 0,95.
      {\FormatHangHeading{\LARGE}}
      {27\p@\@plus0,2\p@\@minus1\p@}%
    }%
  }% of unless #1

  \SetTwoheadSkip{section}{27\p@\@plus0,5\p@}%
  \SetSectionFormatting{section}
      {24\p@\@plus0,5\p@\@minus5\p@}%
      {\FormatHangHeading {\Large}}
      {10\p@\@plus0,5\p@}% ed. Krajewska of "Wiedza Powszechna", as we understand her, wants the skip between a heading and text to be rigid.

  \SetTwoheadSkip{subsection}{11\p@\@plus0,5\p@\@minus1\p@}%
  \SetSectionFormatting{subsection}
      {19\p@\@plus0,4\p@\@minus6\p@}
      {\FormatHangHeading {\large}}% 12/14 pt
      {6\p@\@plus0,3\p@}% after-skip 6 pt due to p.12, not to squeeze the before-skip too much.

  \SetTwoheadSkip{subsubsection}{10\p@\@plus1,75\p@\@minus1\p@}%
  \SetSectionFormatting{subsubsection}
      {10\p@\@plus0,2\p@\@minus1\p@}
      {\FormatHangHeading {\normalsize}}
      {3\p@\@plus0,1\p@}% those little skips should be smaller than you calculate out of a geometric progression, because the interline skip enlarges them.

  \SetSectionFormatting[runin]{paragraph}
      {7\p@\@plus0,15\p@\@minus1\p@}
      {\FormatRunInHeading{\normalsize}}
      {2\p@}%
  \SetSectionFormatting[runin]{subparagraph}
      {4\p@\@plus1\p@\@minus0,5\p@}
      {\FormatRunInHeading{\normalsize}}
      {\z@}%
}% of \WPheadings
}% of \@ifnotmw
```

Compatibilising standard and mwcls sectionings

If you use Marcin Woliński's document classes (**mwcls**), you might have met their little queerness: the sectioning commands take two optional arguments instead of standard one. It's reasonable since one may wish one text to be put into the running head, another to the toc and yet else to the page. But the order of optionalities causes an incompatibility with the standard classes: MW section's first optional argument goes to the running head not to toc and if you've got a source file written with the standard classes in mind and use the first (and only) optional argument, the effect with **mwcls** would be different if not error.

Therefore I counter-assign the commands and arguments to reverse the order of optional arguments for sectioning commands when **mwcls** are in use and reverse, to make **mwcls**-like sectioning optionals usable in the standard classes.

With the following in force, you may both in the standard classes and in **mwcls** give a sectioning command one or two optional arguments (and mandatory the last, of course). If you give just one optional, it goes to the running head and to toc as in scls (which is unlike in **mwcls**). If you give two optionals, the first goes to the running head and the other to toc (like in **mwcls** and unlike in scls).

(In both cases the mandatory last argument goes only to the page.)

What more is unlike in scls, it's that even with them the starred versions of sectioning commands allow optionals (but they still send them to the Gobbled Tokens' Paradise).

(In **mwcls**, the only difference between starred and non-starred sec commands is (not) numbering the titles, both versions make a contents line and a mark and that's not changed with my redefinitions.)

```
\@ifnotmw{% we are not in mwcls and want to handle mwcls-like sectionings i.e., those written with two optionals.
  \def\gmu@secini{gm@la}%
  \Store@Macros{%
    \partmark \chaptermark \sectionmark \subsectionmark
    \subsubsectionmark \paragraphmark}%
```

\gmu@secxx

```
  \def\gmu@secxx#1#2[#3]#4{%
    \ifx\gmu@secstar\@empty
```

a tiny little trick to allow a special version of the heading just to the running head.

```
      \@namedef{#1mark}##1{% we redefine \⟨sec⟩mark to gobble its argument and to launch the stored true marking command on the appropriate argument.
        \storedcsname{#1mark}{#2}%
        \Restore@MacroSt{#1mark}% after we've done what we wanted we restore original \#1mark.
      }%
      \def\gmu@secstar{[#3]}% if \gmu@secstar is empty, which means the sectioning command was written starless, we pass the 'true' sectioning command #3 as the optional argument. Otherwise the sectioning command was written with star so the 'true' s.c. takes no optional.
    \fi
    \@xa\@xa\csname\gmu@secini#1\endcsname
    \gmu@secstar{#4}}%
```

```
}{% we are in mwcls and want to reverse MW's optionals order i.e., if there's just one optional, it should go both to toc and to running head.
  \def\gmu@secini{gm@mw}%
  \let\gmu@secmarkh\@gobble% in mwcls there's no need to make tricks for special version to running headings.
```

\gmu@secxx

```
  \def\gmu@secxx#1#2[#3]#4{%
    \@xa\@xa\csname\gmu@secini#1\endcsname
    \gmu@secstar[#2][#3]{#4}}%
}
```

```
\def\gmu@sec#1{\@dblarg{\gmu@secx{#1}}}
```

```
\def\gmu@secx#1[#2]{%
  \@ifnextchar[{\gmu@secxx{#1}{#2}}{\gmu@secxx{#1}{#2}[#2]}}% if there's only one optional, we double it not the mandatory argument.
```

```
\def\gmu@straightensec#1{% the parameter is for the command's name.
  \gmu@ifundefined{#1}{}{% we don't change the ontological status of the command because someone may test it.
    \n@melet{\gmu@secini#1}{#1}%
    \@namedef{#1}{%
      \gmu@ifstar{\def\gmu@secstar{*}\gmu@sec{#1}}{%
        \def\gmu@secstar{}\gmu@sec{#1}}}}%
}%
```

```
\let\do\gmu@straightensec
\do{part}\do{chapter}\do{section}\do{subsection}\do{subsubsection}
\@ifnotmw{}{\do{paragraph}}% this 'straightening' of \paragraph with the standard article caused the 'TeX capacity exceeded' error. Anyway, who on Earth wants paragraph titles in toc or running head?
```

```
⟨/mw⟩
```

`enumerate*` and `itemize*` moved to **gmbase**.

The gmtypos package—some bits of typography (in a non-systematic way)

Mostly according to Polish 20th Century typesetting standards.

```
⟨utils⟩     \gmu@PackOptionX{typos}
⟨*typos⟩
\RequirePackage{gmcommand, gmnotonlypream}
```

```
\unless\ifcsname ifgmu@quiet\endcsname
  \@xa\newif\csname ifgmu@quiet\endcsname
\fi
```

quiet

```
\DeclareOption{quiet}{\gmu@quiettrue}
```

```
\ProcessOptions
```

Brave New World of XƎTEX

`\@ifXeTeX` moved to **gmbase** (2010/04/10)

The `\udigits` declaration causes the digits to be typeset uppercase. I provide it since by default I prefer the lowercase (nautical) digits.

```
\AtBeginDocument{%
  \@ifpackageloaded{fontspec}{%
    \pdef\udigits{%
      \addfontfeature{Numbers=Uppercase}}%
  }{%
    \emptify\udigits}%
}
```

Fractions

```
\def\Xedekfracc{\gmu@ifstar\gmu@xedekfraccstar\gmu@xedekfraccplain}
```

(plain) The starless version turns the font feature `frac` on.

(*) But nor my modification of Minion Pro neither TEX Gyre Pagella doesn't feature the `frac` font feature properly so, with the starred version of the declaration we use the characters from the font where available (see the `\@namedef`s below) and the `numr` and `dnom` features with the fractional slash otherwise (via `\gmu@dekfracc`).

(**) But Latin Modern Sans Serif Quotation doesn't support the numerator and denominator positions so we provide the double star version for it, which takes the char from font if it exist and typesets with lowers and kerns otherwise.

```
\def\gmu@xedekfraccstar{%
  \def\gmu@xefraccdef##1##2{%
      \iffontchar\font ##2
        \@namedef{gmu@xefracc##1}{\char##2 }%
      \else
        \n@melet{gmu@xefracc##1}{relax}%
      \fi}%
    \def\gmu@dekfracc##1/##2{%
      {\addfontfeature{%
           VerticalPosition=Numerator}##1}\gmu@numeratorkern
      \char"2044 \gmu@denominatorkern
      {\addfontfeature{VerticalPosition=Denominator}##2}}%
```

We define the fractional macros. Since Adobe Minion Pro doesn't contain $\frac{n}{5}$ nor $\frac{n}{6}$, we don't provide them here.

```
    \gmu@xefraccdef{1/4}{"BC}%
    \gmu@xefraccdef{1/2}{"BD}%
    \gmu@xefraccdef{3/4}{"BE}%
    \gmu@xefraccdef{1/3}{"2153}%
    \gmu@xefraccdef{2/3}{"2154}%
    \gmu@xefraccdef{1/5}{"2155}%
    \gmu@xefraccdef{2/5}{"2156}%
    \gmu@xefraccdef{3/5}{"2157}%
    \gmu@xefraccdef{4/5}{"2158}%
    \gmu@xefraccdef{1/6}{"2159}%
    \gmu@xefraccdef{5/6}{"215A}%
    \gmu@xefraccdef{1/8}{"215B}%
    \gmu@xefraccdef{3/8}{"215C}%
    \gmu@xefraccdef{5/8}{"215D}%
    \gmu@xefraccdef{7/8}{"215E}%
    \pdef\dekfracc@args##1/##2{%
      \gmu@ifundefined{gmu@xefracc\detokenize{##1/##2}}{%
        \gmu@dekfracc{##1}/{##2}}{%
        \csname gmu@xefracc\detokenize{##1/##2}\endcsname}%
      \if@gmu@mmhbox\egroup\fi
    }% of \dekfracc@args.
    \gmu@ifstar{\let\gmu@dekfracc\gmu@dekfraccsimple}{}%
  }
```

```
\def\gmu@xedekfraccplain{% ‘else’ of the main \gmu@ifstar
    \pdef\dekfracc@args##1/##2{%
      \ifmmode\hbox\fi{%
```

```
        \addfontfeature{Fractions=On}%
        ##1/##2}%
      \if@gmu@mmhbox\egroup\fi
    }% of \dekfracc@args
  }
```

\if@gmu@mmhbox

```
\newif\if@gmu@mmhbox% we'll use this switch for \dekfracc and also for \thous
      (hacky thousand separator).
```

```
\pdef\dekfracc{%
  \ifmmode\hbox\bgroup\@gmu@mmhboxtrue\fi
  \dekfracc@args}
```

```
\def\gmu@numeratorkern{\kern-.055em\relax}
\def\gmu@denominatorkern{\kern-.05em\relax}
```

What have we just done? We defined two versions of the `\Xefractions` declaration. The starred version is intended to make use only of the built-in fractions such as 1/2 or 7/8. To achieve that, a handful of macros is defined that expand to the Unicodes of built-in fractions and `\dekfracc` command is defined to use them.

The unstarred version makes use of the Fraction font feature and therefore is much simpler.

Note that in the first argument of `\gmu@ifstar` we wrote 8 (eight) `#`s to get the correct definition and in the second argument 'only' 4. (The LaTeX 2_ε Source claims that that is changed in the 'new implementation' of `\gmu@ifstar` so maybe it's subject to change.)

A simpler version of `\dekfracc` is provided in line 12147.

```
\pdef\textsuperscript@@#1{%
  \@textsuperscript{\selectfont#1}}%
\def\@textsuperscript#1{%
  {\m@th\ensuremath{^{\mbox{\fontsize\sf@size\z@#1}}}}}
```

```
\let\textsuperscript@@\textsuperscript
```

\textsuperscript

```
\def\GMtextsuperscript{%
  \@ifXeTeX{%
    \DeclareCommand\textsuperscript{sm}{%
      \gmuIfValueTF{##1}{\textsuperscript@@{##2}}%
      {%
        \begingroup
        \addfontfeature{VerticalPosition=Numerator}##2%
        \endgroup}}%
  }{\truetextsuperscript}}
```

```
\def\truetextsuperscript{%
  \let\textsuperscript\textsuperscript@@
}
```

Settings for mathematics in main font

\gmath \garamath

I used these terrible macros while typesetting E. Szarzyński's *Letters* in 2008. The `\gmath` declaration introduces math-active digits and binary operators and redefines Greek letters and parentheses, the `\garamath` declaration redefines the quantifiers and is more Garamond Premier Pro-specific.

\gmath

So, when you set default fonts (in the preamble), put `\gmath` to set what possible from them to math. This sets the `normal` math version. If you want to use another set of fonts elsewhere in your document and have according math for them, set them 'for a while' in the preamble and in their scope declare `\gmath[`*⟨version⟩*`]`. Then put `\mathversion{normal}` right after `\begin{document}` and `\gmath[`*⟨version⟩*`]` where you want those other fonts.

`\gmath` takes second optional argument, in parentheses, which should be (sth. that expands to) a `\fontspec` font selecting command. A font selected by this command will be declared and used when some char in basic font is missing and only else the default math font will be left for such a char.

So,

`\gmath[`*⟨version⟩*`](`*⟨rescue font (fontspec-ification)⟩*`)`

Note that `\gmath` without first optional argument has always to come first because otherwise it overwrite settings of your math version.

```
\def\gmu@getfontstring{%
  \xdef\gmu@fontstring{%
    \gmu@fontstring@}}
```

```
\def\gmu@fontstring@{%
  \@xa\@xa\@xa\gmu@fontstring@@\@xa\meaning\the\font\@nil}
```

```
\def\gmu@fontstring@@#1"#2"#3\@nil{"#2"}
```

```
\def\gmu@getfontscale#1Scale#2=#3,{%
  \ifx\gmu@getfontscale#3\else
    \def\gmu@tempa{MatchLowercase}%
    \def\gmu@tempb{#3}%
    \ifx\gmu@tempa\gmu@tempb
      \gmu@calc@scale{5}%
      \@xa\@firstoftwo
    \else
      \def\gmu@tempa{MatchUppercase}%
      \ifx\gmu@tempa\gmu@tempb
        \gmu@calc@scale{8}%
        \afterfifi\@firstoftwo
        \else\afterfifi\@secondoftwo
      \fi
    \fi
    {\xdef\gmu@fontscalebr{[\gmu@fontscale] }}%
    {\xdef\gmu@fontscalebr{[#3] }}%
    \afterfi\gmu@getfontscale
  \fi
}
```

```
\def\gmu@getfontdata#1{%
  \global\emptify\gmu@fontscalebr
  \begingroup
  #1%
  \@xa\@xa\@xa\gmu@getfontscale
  \csname zf@family@options\f@family\endcsname
  ,Scale=\gmu@getfontscale,%
  \gmu@getfontstring
  \xdef\gmu@theskewchar{\the\skewchar\font}%
  \endgroup}
```

```
\def\gmu@stripchar#1"{"}
```

`\gmath@getfamnum`

```
\DeclareCommand\gmath@getfamnum{C{\gmath@fam}}{%
```

```
  \edef\gmath@famnum{\@xa\gmu@stripchar\meaning#1}%
}
```

\XeTeXmathcode⟨*char slot*⟩ [⟨=⟩]⟨*type*⟩ ⟨*family*⟩ ⟨*char slot*⟩

\gmathFams

```
\DeclareCommand\gmathFams{o  % the name of math version
  C{\NoValue} % ‘rescue’ font. Will be accessible via \symgmathRoman⟨version⟩
        (math family) and \gmath@fontt⟨version⟩ (font).
}{%
  \gmuIfValueT{#1}{%
    \DeclareMathVersion{#1}% this sets the defaults so no need to define them ex-
          plicitly
    }% of if #1 given

  \gmu@getfontdata{\rmfamily\itshape}%
  \edef\gmu@tempa{%
    \gmuIfValueTF{#1}{\@nx\SetSymbolFont{letters}{#1}}%
    {\@nx\DeclareSymbolFont{letters}}%
    {\encodingdefault}{gmathit\gmuPutIfValue{#1}}{m}{it}%
    \gmuIfValueT{#1}{%
      \@nx\DeclareSymbolFont{letters#1}%
      {\encodingdefault}{gmathit\gmuPutIfValue{#1}}{m}{it}%
      }%
    \@nx\DeclareFontFamily{\encodingdefault}{gmathit\gmuPutIfValue{%
          #1}}{%
      \skewchar\font\gmu@theskewchar\space}%
    \@nx\DeclareFontShape{\encodingdefault}{gmathit\gmuPutIfValue{%
          #1}}{m}{it}{%
      <-> \gmu@fontscalebr \gmu@fontstring}{}%
    \gmuIfValueT{#1}{%
      \@nx\SetMathAlphabet\@nx\mathit{#1}{\encodingdefault}{%
            gmathit#1}{m}{it}}%
  }\gmu@tempa
  \gmuIfValueT{#2}{%
    \gmu@getfontdata{#2\gmu@ifstored{\upshape}{\storedcsname{%
          upshape}}{\upshape}}%
    \edef\gmu@tempa{%
      \@nx\DeclareSymbolFont{gmathRoman\gmuPutIfValue{#1}}%
      {\encodingdefault}{gmathRm\gmuPutIfValue{#1}}{m}{n}%
      \@nx\DeclareFontFamily{\encodingdefault}{gmathRm\gmuPutIfValue{%
            #1}}{%
        \skewchar\font\gmu@theskewchar\space}%
      \@nx\DeclareFontShape{\encodingdefault}{gmathRm\gmuPutIfValue{%
            #1}}{m}{n}{%
        <-> \gmu@fontscalebr \gmu@fontstring}{}%
    }\gmu@tempa
    \@xa\font\csname gmath@fontt\gmuPutIfValue{#1}\endcsname
    =\gmu@fontstring\relax

    \gmu@getfontdata{#2\gmu@ifstored{\itshape}{\storedcsname{%
          itshape}}{\itshape}}%
    \edef\gmu@tempa{%
      \@nx\DeclareSymbolFont{gmathItalic\gmuPutIfValue{#1}}%
      {\encodingdefault}{gmathIt\gmuPutIfValue{#1}}{m}{n}%
      \@nx\DeclareFontFamily{\encodingdefault}{gmathIt\gmuPutIfValue{%
           #1}}{%
        \skewchar\font\gmu@theskewchar\space}%
      \@nx\DeclareFontShape{\encodingdefault}{gmathIt\gmuPutIfValue{%
           #1}}{m}{n}{%
        <-> \gmu@fontscalebr \gmu@fontstring}{}%
    }\gmu@tempa
  }% of if #2 given

  \gmu@getfontdata{\rmfamily\upshape}%
  \edef\gmu@tempa{%
    \gmuIfValueTF{#1}{\@nx\SetSymbolFont{gmathroman}{#1}}%
    {\@nx\DeclareSymbolFont{gmathroman}}%
    {\encodingdefault}{gmathrm\gmuPutIfValue{#1}}{m}{n}%
    \@nx\DeclareFontFamily{\encodingdefault}{gmathrm\gmuPutIfValue{%
         #1}}{%
      \skewchar\font\gmu@theskewchar\space}%
    \@nx\DeclareFontShape{\encodingdefault}{gmathrm\gmuPutIfValue{%
         #1}}{m}{n}{%
      <-> \gmu@fontscalebr \gmu@fontstring}{}%
    \gmuIfValueT{#1}{%
      \@nx\SetMathAlphabet\@nx\mathrm{#1}{\encodingdefault}{%
           gmathrm#1}{m}{n}}%
  }\gmu@tempa
    \@xa\font\csname gmath@font\gmuPutIfValue{#1}\endcsname
    =\gmu@fontstring\relax
    \gmathfamshook
}

\emptify\gmathfamshook
```

\gmathbase

```
\DeclareCommand\gmathbase{oC{\NoValue}}{%
  \gmathFams[#1](#2)%
```

\gmath@do

```
  \DeclareCommand\gmath@do{%
    m % (1) the character or CS to be declared,
    o % (2) the Unicode to be assigned,
    m % (3) math type (CS like \mathord etc.)
    C{\gmath@fam} % font family
  }{%
    \gmath@getfamnum(##4)%
    \gmuIfValueTF{##2}{%
      \edef\gmu@tempa{%
        = \mathchar@type##3\space
        \gmath@famnum\space
        "##2\relax}%
      \if\relax\@nx##1%
        \gmu@ifstored{##1}{}{\Store@Macro##1}%
        \edef\gmu@tempa{%
          \XeTeXmathchardef \@nx##1\gmu@tempa}%
        \else
        \edef\gmu@tempa{%
          \XeTeXmathcode `##1 \gmu@tempa}
        \fi%
      }%
  {% no value of ##2
    \edef\gmu@tempa{%
      \XeTeXmathcode `##1 =
      \mathchar@type##3\space
      \gmath@famnum\space
      `##1\relax}%
  }%
  \gmu@tempa
}% of \gmath@do
```

`\gmath@doif`

```
\DeclareCommand\gmath@doif{%
  m         % (1) the Unicode hex of char enquired,
  m       % (2) the char or CS to be declared,
  m       % (3) math type CS(\mathord etc.),
  o       % (4) second-choice Unicode (taken if first-choice is absent),
  o       % (5) third-choice Unicode (as above if second-choice is absent from
          font).
  B{\gmath@fam} % (6) never used in this package. Why?
  C{\NoValue}
}{%
  \gmu@storeifnotyet{##2}%
  \@xa\let\@xa\gmath@ft\csname
    gmath@font%
    \ifx\gmath@fam##6\else t\fi
    \gmath@version
  \endcsname
  \iffontchar\gmath@ft"##1 \gmath@do##2[##1]##3(##6)%
  \else
    \gmuIfValueTF{##4}{%
      \iffontchar\gmath@ft"##4 \gmath@do##2[##4]##3(##6)%
      \else
        \gmuIfValueTF{##5}{%
          \iffontchar\gmath@ft"##5 \gmath@do##2[##5]##3(##6)%
          \else
            \gmath@restore{##1}{##2}{##3}{##4}{##5}{##7}%
          \fi}%
        {\gmath@restore{##1}{##2}{##3}{##4}{##5}{##7}}%
      \fi}%
    {\gmath@restore{##1}{##2}{##3}{##4}{##5}{##7}}%
  \fi
}% of \gmath@doif In the command above we try to define math char or a CS
     in the family given as ##6. If there're no respective chars, we try the same
     with the family given (as a word) in ##7.
\def\gmath@restore##1##2##3##4##5##6{%
  \gmuIfValueT{##6}%
  {\ifcsname ##6\endcsname
      \edef\gmu@tempa{%
        \unexpanded{\gmath@doif{##1}{##2}{##3}[##4][##5]}%
        {\@xanxcs{##6}}\relax
      }\gmu@tempa
      \@xa\@gobbletwo % if family ##6 is defined, we gobble the other branch
    \fi
  }%
```

```
        \firstofone
        {\if\relax\@nx##2%
            \Restore@Macro##2%
          \fi
        }%
      }%
\iffalse % doesn't work in a non-math font.
```

\gmath@delc

```
      \DeclareCommand\gmath@delc{mo}{%
           %  #1   the char or CS to be declared,
           % [#2]  the Unicode (if not the same as the char).
      \gmath@getfamnum
      \gmuIfValueTF{##2}{%
        \edef\gmu@tempa{%
          = \gmath@famnum\space "##2\relax}%
        \edef\gmu@tempa{%
          \XeTeXdelcode `##1 \gmu@tempa}
      }%
      {%
        \edef\gmu@tempa{%
          \XeTeXdelcode `##1 =
          \gmath@famnum\space
          `##1\relax}%
      }%
      \gmu@tempa
    }% of \gmath@delc

    \def\gmath@delcif##1##2{%
         %  #1   the Unicode enquired,
         %  #2   the char to be delcode-declared
      \iffontchar\gmath@font"##1 \gmath@delc##2[##1]\fi}
\fi% of iffalse

    \def\gmath@delimif##1##2##3{%
         %  #1   the Unicode enquired,
         %  #2   the CS defined as \XeTeXdelimiter,
         %  #3   the math type CS (probably \mathopen or \mathclose).
      \iffontchar\gmath@font"##1
        \gmath@getfamnum
        \protected\edef##2{\@nx\ensuremath{%
            \XeTeXdelimiter \mathchar@type##3\space
            \gmath@famnum\space "##1\relax}}%
      \fi}% of \gmath@delimif.

    \pdef\rmopname##1##2##3{%
      \mathop {##1\kern \z@ \mathrm{##3}}\csname n##2limits@\endcsname
    }%
```

\gmu@dogmathbase

```
    \DeclareCommand\gmu@dogmathbase{oC{\NoValue}}{%
      \Restore@Macro\mathchar@type%
      \gmuIfValueT{##1}{\mathversion{##1}}%
      \edef\gmath@version{\gmuPutIfValue{##1}}%
      \@xa\let\@xa\gmath@fam\csname symgmathroman%
      \endcsname
      \edef\gmath@famm{symgmathRoman\gmath@version}% as you see, this is not
           a font family (number) but a macro containing the name: of the secondary
```

('rescue') family.

```
\typeout{@@@ gmutils.sty: taking some math chars from the font^^J \gmu@fontstring@}%
\gmath@do+\mathbin
\gmath@doif{2212}-\mathbin[2013](\gmath@famm)% minus sign if present or else en dash
\gmath@do=\mathrel
\gmath@do0\mathord
\gmath@do1\mathord
\gmath@do2\mathord
\gmath@do3\mathord
\gmath@do4\mathord
\gmath@do5\mathord
\gmath@do6\mathord
\gmath@do7\mathord
\gmath@do8\mathord
\gmath@do9\mathord
\gmath@doif{2264}\le\mathrel(\gmath@famm)%
\let\leq\le
\let\leeng\le
\gmath@doif{2265}\ge\mathrel(\gmath@famm)%
\let\geq\ge
\let\geeng\ge
\gmath@doif{2A7D}\xleq\mathrel(\gmath@famm)%
\gmath@doif{2A7E}\xgeq\mathrel(\gmath@famm)%
\@ifpackageloaded{polski}{%
  \ifdefined\xleq
  \gmu@storeifnotyet\leq
  \let\leq=\xleq
  \let\le=\leq
  \fi
  \ifdefined\xgeq
  \gmu@storeifnotyet\geq
  \let\geq=\xgeq
  \let\ge=\geq
  \fi}{}%
\gmath@do.\mathpunct
\gmath@do,\mathpunct
\gmath@do;\mathpunct
\gmath@do…\mathpunct
\gmath@do(\mathopen
\gmath@do)\mathclose
\gmath@do[\mathopen
\gmath@do]\mathclose
\gmath@doif{00D7}×\mathbin (\gmath@famm)%
\gmath@do:\mathrel
\gmath@doif{00B7}·\mathbin(\gmath@famm)%
\gmath@doif{22C6}⋆\mathbin(\gmath@famm)% low star
\gmath@doif{2300}\varnothing\mathord(\gmath@famm)%
\gmath@doif{221E}\infty\mathord(\gmath@famm)%
\gmath@doif{2248}\approx\mathrel(\gmath@famm)%
\gmath@doif{2260}\neq\mathrel(\gmath@famm)%
```

```
\let\ne\neq
\gmath@doif{00AC}\neg\mathbin(\gmath@famm)%
\gmath@doif{00AC}\nego\mathord(\gmath@famm)%
\gmath@do/\mathop
\gmath@do<\mathrel
\gmath@do>\mathrel
\gmath@doif{2329}\langle\mathopen(\gmath@famm)%
\gmath@doif{232A}\rangle\mathclose(\gmath@famm)%
\gmath@doif{2202}\partial\mathord(\gmath@famm)%
\gmath@doif{00B1}\pm\mathbin(\gmath@famm)%
\gmath@doif{007E}\sim\mathrel(\gmath@famm)%
\gmath@doif{2190}\leftarrow\mathrel(\gmath@famm)%
\gmath@doif{2192}\rightarrow\mathrel(\gmath@famm)%
\gmath@doif{2194}\leftrightarrow\mathrel(\gmath@famm)% if not present,
    % \gmathfurther will take care of it if left and right arrows are present.
\gmath@doif{2191}\uparrow\mathrel(\gmath@famm)% it should be a delimiter (declared with \gmath@delimif) but in a non-math font the delimiters don't work (2008/11/19) and I don't think I'll ever need up- and down-arrows as delimiters.
\gmath@doif{2193}\downarrow\mathrel(\gmath@famm)%
\gmath@doif{2208}\in\mathrel[03F5][0454](\gmath@famm)%
```

As a fan of modal logics I allow redefinition of `\lozenge` and `\square` iff both are in the font. I don't accept the 'ballot box' U+2610.

```
\if\iffontchar\gmath@font"25CA 0\else 1\fi
   \iffontchar\gmath@font"25FB 0\else\iffontchar\gmath@font"25A1 0\else 2\fi\fi
  \gmath@do\lozenge[25CA]\mathord
  \gmath@doif{25FB}\square\mathord[25A1](\gmath@famm)% 'medium white square (modal operator)' of just 'white square'.
\fi
\gmath@doif{EB08}\bigcircle\mathbin(\gmath@famm)%
\gmath@doif{2227}\wedge\mathbin(\gmath@famm)%
\gmath@doif{2228}\vee\mathbin(\gmath@famm)%
\gmath@doif{0393}\Gamma\mathalpha(\gmath@famm)%
\gmath@doif{0394}\Delta\mathalpha(\gmath@famm)%
\gmath@doif{0398}\Theta\mathalpha(\gmath@famm)%
\gmath@doif{039B}\Lambda\mathalpha(\gmath@famm)%
\gmath@doif{039E}\Xi\mathalpha(\gmath@famm)%
\gmath@doif{03A3}\Sigma\mathalpha(\gmath@famm)%
\gmath@doif{03A5}\Upsilon\mathalpha(\gmath@famm)%
\gmath@doif{03A6}\Phi\mathalpha(\gmath@famm)%
\gmath@doif{03A8}\Psi\mathalpha(\gmath@famm)%
\gmath@doif{03A9}\Omega\mathalpha(\gmath@famm)%
\@xa\let\@xa\gmath@fam\csname symletters\gmath@version%
\endcsname
\edef\gmath@famm{symgmathItalic\gmath@version}%
\gmath@doif{03B1}\alpha\mathalpha(\gmath@famm)%
\gmath@doif{03B2}\beta\mathalpha(\gmath@famm)%
\gmath@doif{03B3}\gamma\mathalpha(\gmath@famm)%
\gmath@doif{03B4}\delta\mathalpha(\gmath@famm)%
\gmath@doif{03F5}\epsilon\mathalpha(\gmath@famm)%
\gmath@doif{03B5}\varepsilon\mathalpha(\gmath@famm)%
```

```
    \gmath@doif{03B6}\zeta\mathalpha(\gmath@famm)%
    \gmath@doif{03B7}\eta\mathalpha(\gmath@famm)%
    \gmath@doif{03B8}\theta\mathalpha(\gmath@famm)%
    \gmath@doif{03D1}\vartheta\mathalpha(\gmath@famm)%
    \gmath@doif{03B9}\iota\mathalpha(\gmath@famm)%
    \gmath@doif{03BA}\kappa\mathalpha(\gmath@famm)%
    \gmath@doif{03BB}\lambda\mathalpha(\gmath@famm)%
    \gmath@doif{03BC}\mu\mathalpha(\gmath@famm)%
    \gmath@doif{03BD}\nu\mathalpha(\gmath@famm)%
    \gmath@doif{03BE}\xi\mathalpha(\gmath@famm)%
    \gmath@doif{03C0}\pi\mathalpha(\gmath@famm)%
    \gmath@doif{03A0}\Pi\mathalpha(\gmath@famm)%
    \gmath@doif{03C1}\rho\mathalpha(\gmath@famm)%
    \gmath@doif{03C3}\sigma\mathalpha(\gmath@famm)%
    \gmath@doif{03DA}\varsigma\mathalpha(\gmath@famm)% 03C2?
    \gmath@doif{03C4}\tau\mathalpha(\gmath@famm)%
    \gmath@doif{03C5}\upsilon\mathalpha(\gmath@famm)%
    \gmath@doif{03D5}\phi\mathalpha(\gmath@famm)%
    \gmath@doif{03C7}\chi\mathalpha(\gmath@famm)%
    \gmath@doif{03C8}\psi\mathalpha(\gmath@famm)%
    \gmath@doif{03C9}\omega\mathalpha(\gmath@famm)%
    \if 1 1%
    \iffontchar\gmath@font"221A
      \fontdimen61\gmath@font=1pt
      \edef\sqrtsign{%
        \XeTeXradical \@xa\gmu@stripchar\meaning\symgmathroman\space
             "221A\relax}%
    \fi
    \fi% of if 1 1.
    \def\max{\rmopname \relax m{max}}%
    \def\min{\rmopname \relax m{min}}%
    \def\lim{\rmopname \relax m{lim}}%
    \def\sin{\rmopname \relax o{sin}}%
    \def\cos{\rmopname \relax o{cos}}%
    \def\tg{\rmopname \relax o{tg}}%
    \def\ctg{\rmopname \relax o{ctg}}%
    \def\tan{\rmopname \relax o{tan}}%
    \def\ctan{\rmopname \relax o{ctan}}%
  }% of \gmu@dogmathbase
  \AtBeginDocument{\gmu@dogmathbase[#1](#2)%
    \let\gmathbase\gmu@dogmathbase
  }% of atbd
    \not@onlypreamble\gmathbase
}% of \gmathbase
```

The `\gmatbase` declaration defines a couple of gmath defining commands and then launches them for the default font at begin document and becomes only that launching.

```
\@onlypreamble\gmathbase
```

It works as follows: if `\gmathbase` occurs first time in a document inside `document` then an error error is raised. But if `\gmathbase` occurs first time in the preamble, then it removes itself from the only-preamble list and redefines itself to be only the inner macro of the former itself.

```
\pdef\gmathfurther{%
 \def\do##1##2##3{\gmu@storeifnotyet##1%
  \def##1{%
   \mathop{\mathchoice{\hbox{%
      \rm
      \edef\gma@tempa{\the\fontdimen8\font}%
      \larger[3]%
      \lower\dimexpr(\fontdimen8\font-\gma@tempa)/2 %
       \hbox{##2}}}{\hbox{%
       \rm
       \edef\gma@tempa{\the\fontdimen8\font}%
       \larger[2]%
       \lower\dimexpr(\fontdimen8\font-\gma@tempa)/2 %
       \hbox{##2}}}%
     {\mathrm{##2}}{\mathrm{##2}}}##3}}%
  \iffontchar\gmath@font"2211    \do\sum{\char"2211}{}\fi%
  \do\forall{\gma@quantifierhook \rotatebox[origin=c]{180}{A}%
   \gmu@forallkerning
  }{\nolimits}%
  \def\gmu@forallkerning{\setbox0=\hbox{A}\setbox2=\hbox{%
     \scriptsize x}%
   \kern\dimexpr\ht2/3*2 -\wd0/2\relax}% to be able to redefine it when the
       big quantifier is Bauhaus-like.
  \do\exists{\rotatebox[origin=c]{180}{\gma@quantifierhook
     E}}\nolimits%
  \def\do##1##2##3{\gmu@storeifnotyet##1%
   \def##1{##3{%
     \mathchoice{\hbox{\rm##2}}{\hbox{\rm##2}}%
     {\hbox{\rm\scriptsize##2}}{\hbox{\rm\tiny##2}}}}}%
  \unless\iffontchar\gmath@font"2227
   \do\vee{\rotatebox[origin=c]{90}{<}}\mathbin%
  \fi
  \unless\iffontchar\gmath@font"2228
   \do\wedge{\rotatebox[origin=c]{-90}{<}}\mathbin
  \fi
  \unless\iffontchar\gmath@font"2194
   \if\iffontchar\gmath@font"2190 0\else1\fi
    \iffontchar\gmath@font"2192 0\else2\fi
    \do\leftrightarrow{\char"2190\kern-0,1em \char"2192}\mathrel
  \fi\fi
  \def\do##1##2##3{\gmu@storeifnotyet##1%
   \def##1####1{##2{\hbox{%
      \rm
      \setbox0=\hbox{####1}%
      \edef\gma@tempa{\the\ht0}%
      \edef\gma@tempb{\the\dp0}%
      ##3%
      \setbox0=\hbox{####1}%
     \lower\dimexpr(\ht0 + \dp0)/2-\dp0
        -((\gma@tempa+\gma@tempb)/2-\gma@tempb) %
     \box0}}}}%
 \do\bigl\mathopen\larger
```

```
   \do\bigr\mathclose\larger
   \do\Bigl\mathopen\largerr
   \do\Bigr\mathclose\largerr
   \do\biggl\mathopen{\larger[3]}%
   \do\biggr\mathclose{\larger[3]}%
   \do\Biggl\mathopen{\larger[4]}%
   \do\Biggr\mathclose{\larger[4]}%
   \addtotoks\everymath{%
     \def\do##1##2{\gmu@storeifnotyet##1%
       \def##1{\ifmmode##2{\mathchoice
           {\hbox{\rm\char`##1}}{\hbox{\rm\char`##1}}%
           {\hbox{\rm\scriptsize\char`##1}}{\hbox{%
                \rm\tiny\char`##1}}}%
         \else\char`##1\fi}}%
     \do\{\mathopen
     \do\}\mathclose
     \def\={\mathbin{=}}%
     \def\neqb{\mathbin{\neq}}%
     \let\neb\neqb
     \def\do##1{\gmu@storeifnotyet##1%
       \edef\gma@tempa{%
         \def\@xanxcs{\@xa\gobble\string##1r}{%
           \@nx\mathrel{\@nx##1}}}%
       \gma@tempa}%
     \do\vee \do\wedge \do\neg
     \def\fakern{\mkern-3mu}%
     \thickmuskip=8mu plus 4mu\relax
     \gma@gmathhook
   }% of \everymath.
   \everydisplay\everymath
   \ifdefined\Url
     \ampulexdef\Url{\let\do}\@makeother
     {\everymath{}\let\do\@makeother}% I don't know why but the url package's
          % \url typesets the argument inside a math which caused digits not to be
          typewriter but Roman and lowercase.
  \fi% of \ifdefined\Url.
}% of \def\gmathfurther.

\Store@Macro\mathchar@type

\gmath \DeclareCommand\gmath{oC{\NoValue}}{%
  \gmathbase[#1](#2)%
  \gmathfurther
  \gmuIfValueT{#1}{\csname gmathhook#1\endcsname}% this allows adding version-
       specific stuff (I first used this for Fell fonts rescued with Garamond Premier)
}

\pdef\gmathscripts{%
  \addtotoks\everymath{\catcode`\^=7\relax \catcode`\_=8\relax }%
  \everydisplay\everymath}

\pdef\gmathcats{%
  \addtotoks\everymath{\gmu@septify}%
  \everydisplay\everymath}

\emptify\gma@quantifierhook
```

```
\def\quantifierhook#1{%
  \def\gma@quantifierhook{#1}}

\emptify\gma@gmathhook
\def\gmathhook#1{\addtomacro\gma@gmathhook{#1}}

\def\gma@dollar$#1${{\gmath$#1$}}%
\def\gma@bare#1{\gma@dollar$#1$}%
\def\gma@checkbracket{\@ifnextchar\[%
  \gma@bracket\gma@bare}
\def\gma@bracket\[#1\]{{\gmath\[#1\]}\@ifnextchar\par{}{\noindent}}
\def\gma{\@ifnextchar$%
  \gma@dollar\gma@checkbracket}

\DeclareCommand\garamath{%
  O{\rm}% the font command
}{%
```

Before 2009/10/19 all the stuff was added to `\everymath` which didn’t work.

```
  \quantifierhook{\addfontfeature{OpticalSize=800}}%
  \def\gma@arrowdash{{%
      \setbox0=\hbox{\char"2192}\copy0\kern-0,6\wd0
      \bgcolor\rule[-\dp0]{0,6\wd0}{%
           \dimexpr1,07\ht0+\dp0}\kern-0,6\wd0}}%
  \def\gma@gmathhook{%
    \def\do####1####2####3{\gmu@storeifnotyet####1%
      \def####1{####3{%
          \mathchoice{\hbox{#1####2}}{\hbox{#1####2}}%
          {\hbox{#1\scriptsize####2}}{\hbox{#1\tiny####2}}}}}%
    \do\mapsto{\rule[0,4ex]{0,1ex}{0,4ex}\kern-0,05em%
      \gma@arrowdash\kern-0,05em\char"2192}\mathrel
    \do\cup{\scshape u}\mathbin
    \do\varnothing{\setbox0=\hbox{\gma@quantifierhook\addfontfeature{%
         Scale=1.272727}0}%
      \setbox2=\hbox{\char"2044}%
      \copy0 \kern-0,5\wd0 \kern-0,5\wd2 \lower0,125\wd0 \copy2
      \kern0,5\wd0\kern-0,5\wd2}{}% of \varnothing
    \do\leftarrow{\char"2190\kern-0,05em\gma@arrowdash}\mathrel
    \do\shortleftarrow{\char"2190}\mathrel
    \do\rightarrow{\gma@arrowdash\kern-0,05em\char"2192}\mathrel
    \do\shortrightarrow{\char"2192\relax}\mathrel
    \do\in{\gma@quantifierhook\char"0454}\mathbin
    \do\prec{\gma@quantifierhook
      \rotatebox[origin=c]{-90}{%
        \glyphname{u03A5.a}}}\mathrel % added 2009/9/11
  }% of \gma@gmathhook
}% of \garamath.
```

Minion and Garamond Premier kerning and ligature fixes

»Ws« shall not make long »s« because long »s« looks ugly next to »W«.

```
\def\gmu@tempa{\kern-0,08em\penalty10000\hskip0sp\relax
  s\penalty10000\hskip0sp\relax}

\protected\edef\Vs{V\gmu@tempa}
```

```
\protected\edef\Ws{W\gmu@tempa}

\pdef\Wz{W\kern-0,05em\penalty10000\hskip0sp\relax z}
```

A left-slanted font

Or rather a left Italic *and* left slanted font. In both cases we sample the skewness of the itshape font of the current family, we reverse it and apply to `\itshape` in `\litshape` and `\textlit` and to `\sl` in `\lsl`. Note a slight asymmetry: `\litshape` and `\textlit` take the current family while `\lsl` and `\textlsl` the basic Roman family and basic (serif) Italic font. Therefore we introduce the `\lit` declaration for symmetry, that declaration left-slants `\it`.

I introduced them first while typesetting E. Szarzyński's *Letters* to follow his (elaborate) hand-writing and now I copy them here when need left Italic for his *Albert Camus' The Plague* to avoid using bold font.

Of course it's rather esoteric so I wrap all that in a declaration.

```
               \pdef\leftslanting@{%
\litdimen        \def\litdimen{\strip@pt\fontdimen1\font ex}%
\litcorrection   \def\litcorrection{%
                   \ifhmode\null\nobreak\hskip\litdimen\relax\fi}%
\litkern         \def\litkern{% note it's to be used inside the left slanted font, unlike \litcorrection, intended to be used before switching to left slant/italic.
                   \leavevmode\null
                   \kern-\litdimen\relax}%
\dilitkern       \def\dilitkern{\kern\litdimen\litkern}%

                 \pdef\litshape{%
                   \litcorrection
                   \itshape
                   \@tempdima=-2\fontdimen1\font
                   \advance\leftskip by\strip@pt\fontdimen1\font ex % to assure at least the lowercase letters not to overshoot to the (left) margin. Note this has any effect only if there is a \par in the scope.
                   \litcorrection
                   \edef\gmu@tempa{%
                     \@nx\addfontfeature{FakeSlant=\strip@pt\@tempdima}}% when not \edefed, it caused an error, which is perfectly understandable.
                   \gmu@tempa}%
                 \pdef\textlit##1{%
                   {\litshape##1}}%
                 \pdef\lit{\rm\litshape}%
                 \pdef\lsl{{%
                     \litcorrection
                     \it
                     \@tempdima=-\fontdimen1\font
                     \litcorrection
                     \xdef\gmu@tempa{%
                       \@nx\addfontfeature{RawFeature={%
                           slant=\strip@pt\@tempdima}}}}%
                   \rm  % Note in this declaration we left-slant the basic Roman font not the itshape of the current family.
                   \gmu@tempa}%
```

Now we can redefine `\em` and `\emph` to use left Italic for nested emphasis. In Polish typesetting there is bold in nested emphasis as I have heard but we don't like bold since it perturbs homogeneous greyness of a page. So we introduce a three-cycle instead of two-: Italic, left Italic, upright.

```
  \pdef\em{%
    \ifdim\fontdimen1\font=\z@  \itshape
    \else
      \ifdim\fontdimen1\font>\z@ \litshape
      \else \upshape
      \fi
    \fi}%
  \pdef\emph##1{%
    {\em##1}}%
}% of \leftslanting@.
```

```
\pdef\leftslanting{\AtBeginDocument\leftslanting@}
```

```
\AtBeginDocument{\let\leftslanting\leftslanting@}
```

Fake Old-style Numbers

While preparing documentation of this package I faced an æsthetic problem of lack of old-style numbers in a font I fancy. The font is for the sans serif and the digits occur only in the date in title so it would be a pity not too use a nice font when only one or two numbers are needed.

`\romorzero`

```
\def\romorzero#1{%
  \ifnum#1=0 zero\else\romannumeral#1 \fi}
```

`\fakeonum`

```
\DeclareCommand\fakeonum{%
  o % fake bold for the digit »2« (for which emboldening improves look),
  >Pm   % the text to fake old-style numbers in.
}{% I tried to use this command as a declaration but active digits are very uncomfort-
       able, e.g. you can't define macros with arguments.
  \gmu@if@onum{#2}{%
    \begingroup
    \edef\gmu@tempa{#2}%
    \makeatletter%
    \gmuIfValueT{#1}{%
      \prependtomacro\fake@onum@ii{%
        \begingroup\addfontfeature{FakeBold=#1}}%
      \addtomacro\fake@onum@ii\endgroup
    }%
    \endlinechar\m@ne % to suppress the line end added by \scantokens, especially
          in active ^^M's scopes.
    \gmu@dofakeonum
    \@xa\scantokens\@xa{\gmu@tempa}%
    \endgroup
  }% of \gmu@ifonum 'else'.
}% of \fakeonum.
```

`\gmu@dofakeonum`

```
\def\gmu@dofakeonum{%
  \def\do##1{%
    \catcode`##1\active
    \scantokens{%
```

```
      \@xa\let\@xa##1%
      \csname fake@onum@\@xa\romorzero\string##1\endcsname\empty}}%
  \do0\do1\do2\do3\do4\do5\do6\do7\do8\do9%
}
```

```
\def\do#1#2{%
  \@namedef{fake@onum@\romorzero#1}{#2}}
```

\gmu@tempa

```
\def\gmu@tempa#1{%
  \do#1{\leavevmode
    \gmu@calculateslant{#1}% uses \gmu@tempa and \gmu@tempb, therefore goes first. And defines \gmu@tempd.
    \gmu@measurewd{#1}% the width of char #1 is in \gmu@tempa without kerning and in \gmu@tempb with kerning.
```

```
    \edef\gmu@tempc{\the\fontcharht\font`#1}%
    \hbox to \gmu@tempb {%
      \hss\resizebox{\gmu@tempa}%
      {\dimexpr\fontdimen5\font+\gmu@tempc-\fontdimen8\font}%
      {\gmu@tempd#1}\hss}}}
```

```
\gmu@tempa0 % \fake@onum@zero
\gmu@tempa1 % \fake@onum@i
\gmu@tempa2 % \fake@onum@ii
```

\gmu@tempa

```
\def\gmu@tempa#1{%
  \do#1{\leavevmode
    \gmu@measurewd{#1}%
    \lower
    \dimexpr\fontdimen8\font-\fontdimen5\font\relax
    \hbox to \gmu@tempb {\hss#1\hss}}%
}
```

```
\gmu@tempa3 % \fake@onum@iii
\gmu@tempa4 % \fake@onum@iv
\gmu@tempa5 % \fake@onum@v
\gmu@tempa7 % \fake@onum@vii
\gmu@tempa9 % \fake@onum@ix
```

\gmu@tempa

```
\def\gmu@tempa#1{% to preserve pseudo-kerning in digits sequences.
  \do#1{\leavevmode
  \gmu@measurewd#1%
  \hbox to \gmu@tempb {\hss#1\hss}}}
```

```
\gmu@tempa6 % \fake@onum@vi
\gmu@tempa8 % \fake@onum@viii
```

\gmu@if@onum

```
\protected\def\gmu@if@onum{%
  \edef\gmu@tempa{\@xa\meaning\the\font}%
  \@xa\@ifinmeaning\detokenize{+onum}\of\gmu@tempa
}
```

Thus `\gmu@if@onum` becomes a two-argument command that executes its `#1` if there is +`onum` in current font specification or its `#2` if +`onum` is absent.

One could easily generalise `\gmu@if@onum` to `\@if@fontfeature`, i.e. to a test for an arbitrary font feature, probably with employing that very nice feature specification of **fontspec**, so that you could write `\IfFontFeature{Numbers=OldStyle}{}{fake old-style digits}`.

```
\pdef\gmu@getslant{% we define \gmu@tempa to the (fake) slant of current font.
  \edef\gmu@tempa{\@xa\meaning\the\font\detokenize{slant=0,}}%
  \edef\gmu@tempb{%
    \def\@nx\gmu@tempb####1%
    \detokenize{slant=}%
    ####2,####3}%
  \gmu@tempb\@nil{##2}%
  \edef\gmu@tempa{\@xa\gmu@tempb\gmu@tempa\@nil pt}%
}
```

\gmu@calculateslant

```
\def\gmu@calculateslant#1{%
  \gmu@getslant
  \edef\gmu@tempa{\the\numexpr\dimexpr\fontdimen1\font + \gmu@tempa}%
        % \gmu@tempa bears the number of scaled points of total slant
        ( \fontdimen1\font+ slant=... if present) per 1pt of #1.
  \edef\gmu@tempa{\the\numexpr \gmu@tempa *
    \numexpr\fontdimen5\font\relax/\numexpr\fontcharht\font`#1
    \relax}% we scale the total slant of #1 by the ratio of original and scaled height
          of #1.
  \edef\gmu@tempd{%
    \the\dimexpr \gmu@tempa sp  - \fontdimen1\font}% and we subtract slant-
          fontdimen from the scaled total slant.
  \ifdim\gmu@tempd=\z@ \emptify\gmu@tempd
  \else\edef\gmu@tempd{%
    \@nx\addfontfeature{FakeSlant=\strip@pt\dimexpr\gmu@tempd}}%
  \fi}
```

\gmu@cepstnof

```
\DeclareCommand\gmu@cepstnof{O{\gmu@tempa}% a cs to be \xdefed the font spec-
        ification,
  s% not used really,
  m% \fontspec token or name of feature font ( Italic, Bold, SmallCaps, BoldItalic
        ),
  O{, Scale=MatchLowercase}% fontspec font features (key=val)
}
{% \gmu@cepstnof's body
```

\gmu@cepstnof@resc

```
  \def\gmu@cepstnof@resc##1:##2:\@nil{%
    \ifx:##2:\else RawFeature={\gmu@maybestripcomma##2,,\@nil} \fi}%
```

\gmu@cepstnof@resd

```
  \def\gmu@cepstnof@resd##1/##2/\@nil{% to check whether font name contains
        / (which may not be true!)
    \ifx&##2&\@xa\@firstoftwo\else\@xa\@secondoftwo\fi}%
```

\gmu@cepstnof@rese

```
  \def\gmu@cepstnof@rese##1:##2:\@nil{% to check whether the font name con-
        tains : when it doesn't contain /.
    \ifx&##2&\@xa\@firstoftwo\else\@xa\@secondoftwo\fi}%

  \edef\gmu@cepstnof@resa{%
```

now, reserved B parses the font name and features. It uses an auxiliary reserved C because after / may be or may not be features specification.

```
    \@xa\@xa\@xa\gmu@cepstnof@resd\@xa\meaning\the\font//\@nil
    {% font name doesn't contain a slash
      \@xa\@xa\@xa\gmu@cepstnof@rese\@xa\meaning\the\font::\@nil
      {% nor does it contain a colon
        \def\@nx\gmu@cepstnof@resb\detokenize{select font
```

```
          "}####1\detokenize{"}####2\@nx\@nil{%
          \ifx\fontspec#3%
            \@nx\@nx\@nx\fontspec[\@gobble#4\@empty]{####1}% gobble a comma
          \else
            #3Font={####1}, #3Features={\@gobble #4\@empty}%
          \fi
        }%
      }%
      {% no slash but there is a colon
        \def\@nx\gmu@cepstnof@resb\detokenize{select font
          "}####1:####2\detokenize{"}####3\@nx\@nil{%
          \ifx\fontspec#3%

                  \@nx\@nx\@nx\fontspec[\@nx\gmu@cepstnof@resc####2::\@nx\@nil#4]{
                  ####1}%
          \else
            #3Font={####1}, #3Features={%
                  \@nx\gmu@cepstnof@resc####2::\@nx\@nil#4}%
          \fi
        }%
      }%
    }% of ‘no slash’ case
    {% font name contains a slash
      \def\@nx\gmu@cepstnof@resb\detokenize{select font
        "}####1/####2\detokenize{"}####3\@nx\@nil{%
        \ifx\fontspec#3%

                \@nx\@nx\@nx\fontspec[\@nx\gmu@cepstnof@resc####2::\@nx\@nil#4]{%
                ####1}%
        \else
          #3Font={####1}, #3Features={%
                \@nx\gmu@cepstnof@resc####2::\@nx\@nil#4}%
        \fi
      }% of \gmu@cepstnof@resb
    }% of ‘slash present’ case
  }\gmu@cepstnof@resa
  \xdef#1{\@xa\@xa\@xa\gmu@cepstnof@resb\@xa\meaning\the\font\@nil}%
}%
```

\gmu@stripcomma

```
\def\gmu@stripcomma#1,{#1}
```

\gmu@maybestripcomma

```
\def\gmu@maybestripcomma#1,,#2\@nil{#1}

\pdef\gmu@setbasefont{\@xa\let\@xa\gmu@basefont\the\font}

\let\setbasefont\gmu@setbasefont
```

\gmu@calc@scale

```
\DeclareCommand\gmu@calc@scale{%
  O{1}% a factor,
  m% number of the fontdimen
  }
{\begingroup
```

We ‘descale’ the current font:

```
  \gmu@cepstnof\fontspec[, Scale=1]\gmu@tempa
  \@xa\let\@xa\gmu@currfont@descaled\the\font
  \gmu@basefont
  \gmu@cepstnof\fontspec[, Scale=1]\gmu@tempa
```

now also the base font is descaled.

```
  \xdef\gmu@fontscale{%
    \strip@pt
    \dimexpr  1pt *
     \numexpr\dimexpr#1\fontdimen#2\font\relax\relax /
    \numexpr\fontdimen#2\gmu@currfont@descaled\relax
    \relax}%
  \endgroup}
```

Varia

A very neat macro provided by **doc**. I copy it ~verbatim.

`\gmu@tilde`

```
\def\gmu@tilde{%
  \leavevmode\lower.8ex\hbox{$\,\widetilde{\mbox{ }}\,$}}
```

Originally there was just `\ ` instead of `\mbox{ }` but some commands of ours do redefine `\ `.

```
\AtBeginDocument{% to bypass redefinition of \~ as a text command with various
        encodings
  \pdef\texttilde{%
    \@ifnextchar/{\gmu@tilde\kern-0,1667em\relax}\gmu@tilde}}
```

We prepare the proper kerning for “~/”.

While typesetting poetry, I was surprised that sth. didn’t work. The reason was that original `\obeylines` does `\let` not `\def`, so I give the latter possibility.

`\defobeylines`

```
\foone{\catcode`\^^M\active}% the comment signs here are crucial.
{\def\defobeylines{\catcode`\^^M=13 \def^^M{\par}}}
```

Another thing I dislike in LaTeX yet is doing special things for `\…skip`’s, ’cause I like the Knuthian simplicity. So I sort of restore Knuthian meanings:

`\deksmallskip` `\undeksmallskip` `\dekmedbigskip` `\dekmedskip` `\dekbigskip`

```
\def\deksmallskip{\vskip\smallskipamount}
\def\undeksmallskip{\vskip-\smallskipamount}
\def\dekmedbigskip{\vskip\glueexpr \medskipamount+\smallskipamount}
\def\dekmedskip{\vskip\medskipamount}
\def\dekbigskip{\vskip\bigskipamount}
```

`\hfillneg`

```
\def\hfillneg{\hskip 0pt plus -1fill\relax}
```

A mark for the **TO-DO!**s:

`\TODO`

```
\newcommand*{\TODO}[1][]{{%
    \sffamily\bfseries\huge TO-DO!\if\relax#1\relax\else\space\fi#1}}
```

I like two-column tables of contents. First I tried to provide them by writing `\begin{% multicols}{2}` and `\end{multicols}` out to the **.toc** file but it worked wrong in some cases. So I redefine the internal LaTeX macro instead.

`\twocoltoc` `\@starttoc`

```
\newcommand*\twocoltoc{%
  \RequirePackage{multicol}%
  \def\@starttoc##1{%
    \begin{multicols}{2}\makeatletter
```

```
      \NamedInput % changed from \@input 2010/8/13.
      {\jobname .##1}%
      \if@filesw \@xa \newwrite \csname tf@##1\endcsname
        \immediate \openout \csname tf@##1\endcsname \jobname
             .##1\relax
      \fi
      \@nobreakfalse\end{multicols}%
  }% of \starttoc
}
```

```
\@onlypreamble\twocoltoc
```

An equality sign properly spaced:

```
\pdef\equals{\hunskip${}={}$\ignorespaces}
```

And for the LaTeX's pseudo-code statements:

```
\pdef\eequals{\hunskip${}=={}$\ignorespaces}
```

```
\pdef\·{\hunskip${}·{}$\ignorespaces}
```

While typesetting a UTF-8 ls-R result I found a difficulty that follows: UTF-8 encoding is handled by the **inputenc** package. It's O.K. so far. The UTF-8 sequences are managed using active chars. That's O.K. so far. While writing such sequences to a file, the active chars expand. You feel the blues? When the result of expansion is read again, it sometimes is again an active char, but now it doesn't star a correct UTF-8 sequence.

Because of that I wanted to 'freeze' the active chars so that they would be `\write`n to a file unexpanded. A very brutal operation is done: we look at all 256 chars' catcodes and if we find an active one, we `\let` it `\relax`. As the macro does lots and lots of assignments, it shouldn't be used in `\edef`s.

\freeze@actives

```
\def\freeze@actives{%
  \count\z@\z@
  \@whilenum\count\z@<\@cclvi\do{%
    \ifnum\catcode\count\z@=\active
      \uccode`\~=\count\z@
      \uppercase{\let~\relax}%
    \fi
    \advance\count\z@\@ne}}
```

A macro that typesets all 256 chars of given font. It makes use of `\@whilenum`.

\ShowFont

```
\newcommand*\ShowFont[1][6]{%
  \begin{multicols}{#1}[The current font (the \f@encoding\ encoding):]
    \parindent\z@
    \count\z@\m@ne
    \@whilenum\count\z@<\@cclv\do{
      \advance\count\z@\@ne
      \ \the\count\z@:~\char\count\z@\par}
  \end{multicols}}
```

A couple of macros for typesetting liturgic texts such as psalmody of Liturgia Horarum. I wrap them into a declaration since they'll be needed not every time.

\liturgiques
\czerwo
\czer

```
\newcommand*\liturgiques[1][red]{% Requires the color package.
  \gmu@RPfor{xcolor}\color%
  \newcommand*\czerwo{\small\color{#1}}% environment
  \newcommand{\czer}[1]{\leavevmode{\czerwo##1}}% we leave vmode because if
```

we don't, then `verse`'s `\everypar` would be executed in a group and thus its effect lost.

```
                  \Store@Macro\*%
                  \def\*{\czer{\storedcsname{*}}}%
\+                \def\+{\czer{†}}%
\nieczer          \newcommand*\nieczer[1]{\textcolor{black}{##1}}%
                }
```

After the next definition you can write `\gmu@RP[⟨options⟩]{⟨package⟩}{⟨CS⟩}` to get the package `#2` loaded with options `#1` if the CS`#3` is undefined.

```
\gmu@RPfor      \newcommand*\gmu@RPfor[3][]{%
                  \ifx\relax#1\relax\emptify\gmu@resa
\gmu@resa         \else \def\gmu@resa{[#1]}%
                  \fi
                  \@xa\RequirePackage\gmu@resa{#2}}
```

Since inside `document` we cannot load a package, we'll redefine `\gmu@RPfor` to issue a request before the error issued by undefined CS.

```
                \AtBeginDocument{%
\gmu@RPfor        \renewcommand*\gmu@RPfor[3][]{%
                    \unless\ifdefined#3%
                      \@ifpackageloaded{#2}{}{%
                        \typeout{^^J! Package `#2' not loaded!!! (\on@line)^^J}}%
                    \fi}}
```

It's very strange to me but it seems that 𝔠 is not defined in the basic math packages. It is missing at least in the *Symbols* book.

```
                \pprovide\continuum{%
                  \gmu@RPfor{eufrak}\mathfrak\ensuremath{\mathfrak{c}}}
```

And this macro I saw in the ltugproc document class and I liked it.

```
\iteracro       \def\iteracro{%
                  \pdef\acro##1{%
                    \begingroup
                    \acropresetting
                    \gmu@acrospaces##1 \gmu@acrospaces
                    \endgroup
                  }%
                }

                \emptify\acropresetting

                \iteracro

\gmu@acrospaces \def\gmu@acrospaces#1 #2\gmu@acrospaces{%
                  \gmu@acroiter#1\gmu@acroiter
                  \ifx\relax#2\relax\else
                    \space
                    \afterfi{\gmu@acrospaces#2\gmu@acrospaces}% when #2 is nonempty, it is
                        ended with a space. Adding one more space in this line resulted in an
                        infinite loop, of course.
                  \fi
                }

\gmu@acroiter   \def\gmu@acroiter#1{%
```

```
  \gmu@notif {x\@xa\@xa} {\@firstofmany#1\@undefined\@nil \gmu@acroiter}
  {\gmu@acrokernel{#1}%
```

and iterate

```
    \gmu@acroiter
  }% of if sentinel or not
  {}%
}
```

\gmu@acrokernel

```
\def\gmu@acrokernel #1{%
  \gmu@if {cat} {a\@xanx\@firstofmany#1\@undefined\@nil}%
  {\gmu@if {num} {`#1=\uccode`#1\space }% a space to delimit numer (without it further macros were expanded which in this case are \expandafter%\@firstoftwo\else\@secondoftwo and this made the test didn't work.)
    {{\acrocore{#1}}}%
    {{#1}}% tu było \smallerr
  }%
  {#1}%
}
```

We extract the very thing done to the letters to a macro because we need to redefine it in fonts that don't have small caps.

```
\pdef\acrocore{\smaller % was: \scshape\lowercase
}
```

Since the fonts I am currently using do not support required font feature, I skip the following definition.

\IMHO
\AKA

```
\def\IMHO{\acro{IMHO}\spifletter}
\def\AKA{\acro{AKA}\spifletter}
```

```
\pdef\usc#1{{\addfontfeature{Letters=UppercaseSmallCaps}#1}}
```

\uscacro

```
\def\uscacro{\let\acrocore\usc}
```

`\SecondClass` moved to gmbase.

Cf. *The TEX book* ex. 11.6.
A line from LATEX:

```
% \check@mathfonts\fontsize\sf@size\z@\math@fontsfalse\selectfont
```

didn't work as I would wish: in a `\footnotesize`'s scope it still was `\scriptsize`, so too large.

\gmu@dekfraccsimple

```
\def\gmu@dekfraccsimple#1/#2{\leavevmode\kern.1em
  \raise.7ex\hbox{%
    \gmu@fracfontsetup#1}\gmu@numeratorkern
  \dekfraccslash\gmu@denominatorkern
  {%
    \gmu@fracfontsetup#2}%
  \if@gmu@mmhbox\egroup\fi}
```

\gmu@fracfontsetup

```
\def\gmu@fracfontsetup{%
  \smaller[3]\addfontfeature{FakeBold=1}}
```

\dekfraccsimple

```
\def\dekfraccsimple{%
  \let\dekfracc@args\gmu@dekfraccsimple
}
\@ifXeTeX{\def\dekfraccslash{\char"2044 }}
{\def\dekfraccslash{/}} % You can define it as the fraction slash, \char"2044
\dekfraccsimple
```

A macro that acts like `\,` (thin and unbreakable space) except it allows hyphenation afterwards:

```
\newcommand*\ikern{\,\penalty\@M\hskip\z@skip\relax}
```

Faked small caps

```
\def\gmu@scapLetters#1{%
  \ifx#1\relax\relax\else% two \relaxes to cover the case of empty #1.
    \ifcat a\@nx#1\relax
      \ifnum\the\lccode`#1=`#1\relax
        {\fakescapscore\MakeUppercase{#1}}% not Plain \uppercase because that works bad with inputenc.
      \else#1%
      \fi
    \else#1%
    \fi%
    \@xa\gmu@scapLetters
  \fi}%
\def\gmu@scapSpaces#1 #2\@nil{%
  \ifx#1\relax\relax
  \else\gmu@scapLetters#1\relax
  \fi
  \ifx#2\relax\relax
  \else\afterfi{\ \gmu@scapSpaces#2\@nil}%
  \fi}
\def\gmu@scapss#1\@nil{{\def~{{\nobreakspace}}%
    \gmu@scapSpaces#1 \@nil}}% % \def\\{{\newline}}\relax adding redefinition of \\ caused stack overflow. Note it disallows hyphenation except at \-.
```

```
\pdef\fakescaps#1{{\gmu@scapss#1\@nil}}
```

```
\let\fakescapscore\gmu@scalematchX
```

Experimente z akcentami patrz no3.tex.

```
\def\tinycae{{\tiny\AE}}% to use in \fakescaps[\tiny]{…}
```

```
\RequirePackage{calc}
```

wg `\zf@calc@scale` pakietu **fontspec**.

```
\@ifpackageloaded{fontspec}{%
  \def\gmu@scalar{1.0}%
  \def\zf@scale{}%
  \def\gmu@scalematchX{%
    \begingroup
      \ifx\zf@scale\empty\def\gmu@scalar{1.0}%
      \else\let\gmu@scalar\zf@scale\fi
      \setlength\@tempdima{\fontdimen5\font}% 5—ex height
      \setlength\@tempdimb{\fontdimen8\font}% 8—XeTeX synthesised uppercase height.
      \divide\@tempdimb by1000\relax
      \divide\@tempdima by\@tempdimb
      \setlength{\@tempdima}{\@tempdima*\real{\gmu@scalar}}%
      \gmu@ifundefined{fakesc@extrascale}{}{%
        \setlength{\@tempdima}{\@tempdima*\real{%
             \fakesc@extrascale}}}%
      \@tempcnta=\@tempdima
      \divide\@tempcnta by 1000\relax
      \@tempcntb=-1000\relax
      \multiply\@tempcntb by\@tempcnta
      \advance\@tempcntb by\@tempdima
      \xdef\gmu@scscale{\the\@tempcnta.%
        \ifnum\@tempcntb<100 0\fi
        \ifnum\@tempcntb<10 0\fi
        \the\@tempcntb}%
    \endgroup
    \addfontfeature{Scale=\gmu@scscale}%
  }}{\let\gmu@scalematchX\smallerr}
```

\fakescextrascale
\fakesc@extrascale

```
\def\fakescextrascale#1{\def\fakesc@extrascale{#1}}
```

See above/see below

To generate a phrase as in the header depending of whether the respective label is before of after.

\wyzejnizej

```
\newcommand*\wyzejnizej[1]{%
  \edef\gmu@tempa{\gmu@ifundefined{r@#1}{\arabic{page}}{%
      \@xa\@xa\@xa\@secondoftwo\csname r@#1\endcsname}}%
  \ifnum\gmu@tempa<\arabic{page}\relax wy\.zej\fi
  \ifnum\gmu@tempa>\arabic{page}\relax ni\.zej\fi
  \ifnum\gmu@tempa=\arabic{page}\relax \@xa\ignorespaces\fi
}
```

`luzniej` and `napapierki`—environments for fine-tuning of pragraphs vs. page breaks

The name of first of them comes from Polish typesetters' phrase “rozbijać [skład] na papierki”—‘to broaden [leading] with paper scratches’. The English term is “feathering” or “carding”.

WARNING. According to the guidelines for good typographers' practice, e.g., Filip Trzaska's manual of 1960's, the practice mentioned above and facilitated by the environment defined below is

WRONG / UNETHICAL / SINFUL / AN ABOMINATION / BAD KARMA*

at least in Poland (alhough probably not illegal in most countries, including Poland).

Please think twice before comitting it and don't blame me when judged by your Buddha(s) / God(s) / Conscience(s) / Atman(s) / Karman(s) / Brahman(s)*.

* depending on your Ethics/Morality Provider.

Please note also that using the **geometry** package option `lines=`⟨*number*⟩ or `heightrounded` is pretty sufficient in typical cases to get leading without over- and underfulls.

FYI, the proper practice seem to be, translating into TEX terms, to set `\baselineskip` rigid (as the standard classes do and probably all the others), set all the standard vskips as (integer) multiples of the normal-size `\baselineskip` and then, when a part of text is set with smaller or larger font sizes, complete it with fractional vskips that with its own heigt add up to an integer multiple of the normal `\baselineskip`.

If all this is done correctly, all the normal size lines are placed evenly on all pages, which is called “register” in Polish and “grid” in English.

Now, having said that, let’s provide you with a tool of temptation and fall.

\napapierkistretch

```
\def\napapierkistretch{0,3pt}% It’s quite much for 11/13pt leading.
```

\napapierkicore

```
\def\napapierkicore{\advance\baselineskip%
  by 0ptplus\napapierkistretch\relax}
```

```
\DeclareEnvironment{napapierki}{s}{%
  \par\gmuIfValueT{#1}{\global}%
  \napapierkicore}
{%
  \par
  \gmuIfValueT{#1}{\global\baselineskip=1\baselineskip\relax
  }%
}% so that you can use \napapierki*…\endnapapierki* in interlacing environments.
```

\gmu@luzniej

```
\newcount\gmu@luzniej
```

\luzniejcore

```
\newcommand*\luzniejcore[1][1]{%
  \advance\gmu@luzniej\@ne% We use this count to check whether we open the en-
          vironment or just set \looseness inside it again.
  \ifnum\gmu@luzniej=\@ne  \multiply\tolerance by 2 \fi
  \looseness=#1\relax}
```

After `\begin{luzniej}` we may put the optional argument of `\luzniejcore`

luzniej

```
\newenvironment*{luzniej}{\par\luzniejcore}{\par}
```

The starred version sets `\looseness` in `\everypar`, which has its advantages and disadvantages.

luzniej*

```
\newenvironment*{luzniej*}[1][1]{%
  \multiply\tolerance by 2\relax
  \everypar{\looseness=#1\relax}}{\par}
```

\nawj

```
\newcommand*\nawj{\kern0,1em\relax}% a kern to be put between parentheses and
          letters with descendants such as j or y in certain fonts.
```

The original `\pauza` of **polski** has the skips rigid (one is even a kern). We make the skips flexible. Moreover, our `\pauza` begins with `\ifhmode` to be usable also at the beginning of a line where it marks a part of a dialogue.

\pauza@skipcore

```
\def\pauza@skipcore{\hskip0.2em plus0.1em\relax
  \pauzacore
  \@ifnextanyIS {,;:}%
  {% 2009/11/22 added a special case of a comma following pauza, 2011/02/22, 13.33
          extended to colon and semicolon (well, the latter should not happen in such a
          position but a colon did (in Polish)).
  }{\hskip.2em plus0.1em\relax\ignorespaces}}%
```

\ppauza@skipcore

```
\def\ppauza@skipcore{\unskip\penalty10000\hskip0.2em plus0.1em\relax
          \ppauza@dash\hskip.2em plus0.1em\ignorespaces}
```

```
\AtBeginDocument{%
  \pdef\pauza{%
    \ifhmode
      \unskip\penalty10000
      \hskip0.2em plus0.1em\relax
      \pauzacore\hskip.2em plus0.1em\relax\ignorespaces%
    \else
      \pauzadial
    \fi
  }%
```

According to *Instrukcja technologiczna. Skład ręczny i maszynowy* the dialogue dash (in Polish) should be followed by a rigid hskip of 1/2 em.

```
  \pdef\pauzadial{%
    \ifhmode\unskip\quad\else\leavevmode\fi
    \pauzacore\penalty10000\hskip0,5em\ignorespaces
  }
```

And a version with no space at the left, to begin a `\noindent`ed paragraph explaining e.g. a quotation:

```
  \pdef\lpauza{%
    \leavevmode
    \pauzacore\hskip.2em plus0.1em\ignorespaces}%
```

We define `\ppauza` as an en dash surrounded with thin stretchable spaces and sticking to the upper line or bare but discretionary depending on the next token being space$_1$0. Of course you'll never get such a space after a literal CS so an explicit `\ppauza` will always result with a bare discretionary en dash, but if we `\let–\ppauza`…

```
   \pdef\ppauza{%
    \ifvmode    \PackageError{gmutils}{%
      command \bslash ppauza (en dash) not intended for vmode.}{%
      Use \bslash ppauza (en dash) only in number and numeral ranges.}%
    \else
      \unskip\discretionary
      {\ppauza@dash}{\ppauza@dash}{\ppauza@dash}%
    \fi}%
}% of at begin document
```

```
\ifdefined\XeTeXversion
\AtBeginDocument{% to be independent of moment of loading of polski.
  \pdef\—{%
    \ifhmode
      \unskip\penalty10000
      \afterfi{%
        \@ifnextanyRS { ,;:}% was comma as a special case; 2011/02/22, 13.32 added colon and semicolon.
```

The above needs some explanation, I suppose. We check if next token is blank space or some punctuations, for which purpose we use `\@ifnextanyRS`, where `RS` stands for "respecting space". So if next is a space it turns true. Then `\pauza@skipcore`'s test does not respect space (gobbles it) and typesets punctuators with no skip while a blank replaces with a skip.

```
        {\pauza@skipcore}%
        {\@ifnextMac{\pauza@skipcore}%
          {\pauzacore\penalty\hyphenpenalty\hskip\z@skip}%
        }%
      }% of \afterfi's argument
      \else
```

According to *Instrukcja technologiczna. Skład ręczny i maszynowy* the dialogue dash should be followed by a rigid hskip of 1/2 em.

```
      \leavevmode\pauzacore\penalty10000\hskip0,5em\ignorespaces
    \fi
  }%
```

The next command's name consists of letters and therefore it eats any spaces following it, so `\@ifnextspace` would always be false, therefore we don't use it.

```
  \pdef\–{%
    \ifvmode   \PackageError{gmutils}{%
      command \bslash ppauza (en dash) not intended for vmode.}{%
      Use \bslash ppauza (en dash) only in number and numeral
          ranges.}%
    \else
      \afterfi{%
        \@ifnextspace{\ppauza@skipcore}{%
          \@ifnextMac\ppauza@skipcore
          {\unskip\discretionary
            {\ppauza@dash}{\ppauza@dash}{\ppauza@dash}}}%
      }%
    \fi
  }%
\emdash            \def\emdash{\char`\—}
}% of at begin document
```

```
\longpauza         \def\longpauza{%
\pauzacore@long      \def\pauzacore@long{—}%
                     \let\pauzacore\pauzacore@long
                   }
                   \longpauza
```

```
\shortpauza        \def\shortpauza{%
\pauzacore@short     \def\pauzacore@short{\hbox{–\kern,23em\relax\llap{–}}}%
                     \let\pauzacore\pauzacore@short
                   }%
\ppauza@dash       \def\ppauza@dash{–}%
```

```
                   \else % not XeTeX
\longpauza         \def\longpauza{\def\pauzacore{---}}
\pauzacore         \longpauza
\shortpauza        \def\shortpauza{%
\pauzacore           \def\pauzacore{--\kern,23em\relax\llap{--}}}%
\ppauza@dash       \def\ppauza@dash{--}%
```

```
\fi% of if XeTeX or not.
```

```
\ifdefined\XeTeXversion
```

If you have all the three dashes on your keyboard (as I do), you may want to use them for short instead of `\pauza`, `\ppauza` and `\dywiz`. The shortest dash is defined to be smart in math mode and result with −.

```
                   \foone{\catcode`—\active \catcode`–\active \catcode`-\active}{%
\adashes             \def\adashes{\AtBeginDocument\adashes}% because \pauza is defined at begin
                         document.
\adashes             \AtBeginDocument{\def\adashes{%
```

\—
\–

```
      \catcode`—\active \def—{\—}%
      \catcode`–\active \def–{\–}%
      \addtomacro\dospecials{\do\–\do\—}%
      \addtomacro\@sanitize{\@makeother\–\@makeother\—}%
      \addtomacro\gmu@septify{\do\–13\do\—13\relax}%
}}}
\else
\relaxen\adashes
\fi
```

The hyphen shouldn't be active IMHO because it's used in TeX control such as `\hskip-2pt`. Therefore we provide the `\ahyphen` declaration reluctantly, because sometimes we need it and always use it with caution. Note that my active hyphen in vertical and math modes expands to $-_{12}$.

\gmu@dywiz

```
\def\gmu@dywiz{\ifmmode-\else
  \ifvmode-\else\afterfifi\dywiz\fi\fi}%
```

\ahyphen

```
\foone{\catcode`-\active}{% aktivnyj diefis aktywny dywiz active hyphen
    \def\ahyphen{\let-\gmu@dywiz\catcode`\-\active}}
```

To get current time. Works in ε-TeXs, including XeTeX. `\czas` typesets 15.20 and `\czas[:]` typesets 15:20.

\czas

```
\newcommand*\czas[1][.]{%
  \the\numexpr(\time-30)/60\relax#1%
  \@tempcnta=\numexpr\time-(\time-30)/60*60\relax
  \ifnum\@tempcnta<10 0\fi\the\@tempcnta}
```

tytulowa

```
\newenvironment*{tytulowa}{\newpage}{\par\thispagestyle{%
     empty}\newpage}
```

To typeset peoples' names on page 4 (the editorial page):

\nazwired

```
\def\nazwired{\quad\textsc}
```

Typesetting dates in my memoirs

A date in the `YYYY-MM-DD` format we'll transform into 'DD mmmm YYYY' format or we'll just typeset next two tokens/`{…}` if the arguments' string begins with `--`. The latter option is provided to preserve compatibility with already used macros and to avoid a starred version of `\thedate` and the same time to be able to turn `\datef` off in some cases (for **SevSev04.tex**).

\gmu@datefsl

```
\pdef\polskadata{%
  \DeclareCommand\gmu@datefsl{%
    ##1    Q{0123456789\bgroup}>iT{/-} % year
    ##2    Q{0123456789\bgroup}>iT{/-} % month
    ##3    Q{0123456789\bgroup} % day
                 >is % terminator of date scanning that will be gobbled
    ##4    T{,}% another terminator of date, but this will be printed
    ##5    K{##1\gmu@datefsl} % additional stuff after comma (or instead date)
  }{%
      \gmuIfValueF{##2}{\gmuPutIfValue{##3}}%
      \gmuIfValueT{##2}{%
        \@tempcnta=0##3\relax\the\@tempcnta
        \ifcase##2\relax\or\ stycznia\or\ lutego%
        \or\ marca\or\ kwietnia\or\ maja\or\ czerwca\or\ lipca\or\ sierpnia%
        \or\ września\or\ października\or\ listopada\or\ grudnia\else
        {}%
        \fi}%
        \gmuIfValueT{##1}{\space ##1}%
        \gmuPutIfValue{##4}%
        \gmu@ifempty{##5}{}{ ##5}%
      }% of \gmu@datefsl.
  }% of \polskadata
```

```
\polskadata
```

For documentation in English:

```
\pdef\englishdate{%
```

\gmu@datefsl

```
  \DeclareCommand\gmu@datefsl{%
    Q{0123456789\bgroup}>iT{/-} % (1) year
    Q{0123456789\bgroup}>iT{/-} % (2) month
    Q{0123456789\bgroup} % (3) day
    >is
    T{,}  K{##1\gmu@datefsl} % (4, 5) additional stuff after comma
  }{%
    \gmuIfValueF{##2}{\gmuPutIfValue{##3}}%
    \gmuIfValueT{##2}{%
      \ifcase##2\relax\or January\or February%
        \or March\or April\or May\or June\or July\or August%
        \or September\or October\or November\or December\else
        {}%
      \fi}%
    \space
    \@tempcnta=##3\relax\the\@tempcnta,
    \gmuIfValueT{##1}{ ##1}%
    \gmuPutIfValue{##4}%
    \gmu@ifempty{##5}{}{ ##5}%
  }% of \gmu@datefsl.
}%
```

Dates for memoirs to be able to typeset them also as diaries.

\ifdate

```
\newif\ifdate
\pdef\bidate #1{%
  \gmu@datefsl#1\gmu@datefsl
}
```

\linedate

```
\DeclareCommand\linedate{s{}m}
{%
  \par
  \linedate@hook #1#2\@nil%
  \addvspace{\dateskipamount}%
  \possvfil% if we put it before \addvspace, the v-space is always added.
```

```
  \ifdate
```

```
%%    \addvspace{\dateskipamount}%
```

```
    \if@CofaćPrzedDatą@
```

```
      \penalty\@M
      \vskip-0,5\baselineskip
    \else
      \@CofaćPrzedDatą@true
    \fi
    \date@line{\DateFont \bidate{#1#2}}%
    \nopagebreak
%%   \else% %\ifnum\arabic{dateinsection}>0\dekbigskip\fi
%%    \addvspace{\bigskipamount}\possvfil
  \fi
}% end of \linedate.
```

\if@CofaćPrzedDatą@

```
\newif\if@CofaćPrzedDatą@
\@CofaćPrzedDatą@true
```

```
\pdef\NoPredate {\@CofaćPrzedDatą@false}
```

\DateFont

```
\newcommand*\DateFont{\footnotesize\itshape}
```

\linedate@hook

```
\def\linedate@hook #1\@nil{}
```

\dateskipamount

```
\newskip\dateskipamount
\dateskipamount\medskipamount
```

```
\pdef\rdate{\let\date@line\rightline \linedate}
```

\date@left

```
\def\date@left#1{\par{%
    \raggedright#1%
    \leftskip\z@skip
    \@@par}}%
```

```
\pdef\ldate{%
  \let\date@line\date@left
  \linedate}
```

\runindate

```
\newcommand*\runindate[1]{%
  \paragraph{\footnotesize\itshape \gmu@datef#1\gmu@datef}%
  \stepcounter{dateinsection}}
```

I'm not quite positive which side I want the date to be put to so let's `let` for now and we'll be able to change it in the very documents.

```
\let\thedate\ldate
```

```
\pdef\zwrobcy#1{\emph{#1}} % ostinato, allegro con moto, garden party etc., także
        kompliment
```

```
\pdef\tytul#1{\emph{#1}}
```

Maszynopis w świecie justowanym zrobi delikatną chorągiewkę. (The `maszynopis` environment will make a delicate ragged right if called in a justified world.)

maszynopis

```
\newenvironment{maszynopis}[1][]{#1\ttfamily
  \hyphenchar\font=45\relax% this assignment is global for the font.
  \@tempskipa=\glueexpr\rightskip+\leftskip\relax
  \ifdim\gluestretch\@tempskipa=\z@
  \tolerance900
```

it worked well with tolerance = 900.

```
  \advance\rightskip by\z@ plus0,5em\relax\fi
```

```
                  \fontdimen3\font=\z@% we forbid stretching spaces…
                 %  \fontdimen4\font=\z@ but allow shrinking them.
                  \hyphenpenalty0 % not to make TeX nervous: in a typewriting this marvellous algorithm of hyphenation should be turned off and every line broken at the last allowable point.
                  \Store@Macro\pauzacore
\pauzacore        \def\pauzacore{-\rlap{\kern-0,3em-}-}%
                }{\par}
```

```
                \pdef\justified{%
                  \leftskip=1\leftskip% to preserve the natural length and discard stretch and shrink.
                  \rightskip=1\rightskip
                  \parfillskip=1\parfillskip
                  \advance\parfillskip by 0sp plus 1fil\relax
                  \let\\\@normalcr}
```

To conform Polish recommendation for typesetting saying that a paragraph's last line leaving less than `\parindent` should be stretched to fill the text width:

```
\fullpar        \DeclareCommand\fullpar{%
                  T{+-}%
                  Q{+-0123456789} % optional looseness (most probably negative)
                }{%
                  \begingroup
                  \gmuIfValueT{#1}{\looseness=#1\gmuIfValueTF{#2}{#2}{1}\relax
                    \multiply\tolerance by \tw@
                  }%
                  \fullparcore
                  \par
                  \endgroup}
```

```
                \pdef\fullparcore{%
                  \hunskip
                  \parfillskip\z@skip}
```

To conform Polish recommendation for typesetting that says that the last line of a paragraph has to be 2`\parindent` long at least. The idea is to set `\parfillskip` naturally rigid and long as `\textwidth-2\parindent`, but that causes non-negligible shrinking of the inter-word spaces so we provide a declaration to catch the proper glue where the parindent is set (e.g. in footnotes parindent is 0 pt)

```
\twoparinit     \newcommand*\twoparinit{% the name stands for 'last paragraph line's length minimum two \parindent.
\twopar@defts     \def\twopar@defts{%
                    \hsize-\leftskip-\rightskip-\fontcharwd\font`…}%
\twopar@atleast   \def\twopar@atleast{2\@parindent}%
\twopar           \DeclareCommand\twopar{%
                    T{+-}% (1) you can specify loosening the paragraph by one only by typing single + and tightening by one by typing single -.
                    Q{+-0123456789}% (2)
                    A{\twopar@atleast}% (3)
                    >iT{\cipolagwa}}{%
                    \begingroup
                    \gmuIfValueT{##1}{%
                      \looseness=##1\gmuIfValueTF{##2}{##2}{1}\relax
```

```
      \multiply\tolerance by2
    }%
    \twoparcore<##3>%
    \endgraf
    \endgroup
  }% of \twopar.
```

```
  \ifdefined\XeTeXversion
\twoparcore
    \DeclareCommand\twoparcore{%
      A{\twopar@atleast}
      \gobblespace
    }{%
      \hunskip % it's O.K. it's in a group, it'll work anyway.
      \edef\gmu@tempa{\the\dimexpr\twopar@defts-##1\relax}%
      \parfillskip=\glueexpr\gmu@tempa minus \gmu@tempa
      \relax% to delimit \glueexpr.
      \relax% to delimit the assignment.
    }%
  \else % not XeTeX—doesn't use \fontcharwd.
\twoparcore
    \DeclareCommand\twoparcore{%
      A{\twopar@default}
      \gobblespace
    }{%
      \hunskip % it's O.K. it's in a group, it'll work anyway.
      {\setbox0=\hbox{\dots}%
        \xdef\gmu@tempa{\the\wd0}}%
      \edef\gmu@tempa{%
        \the\dimexpr\hsize-\leftskip-\rightskip
        -\gmu@tempa-2\@parindent\relax}%
      \parfillskip=\glueexpr\gmu@tempa minus \gmu@tempa
      \relax% to delimit \glueexpr.
      \relax% to delimit the assignment.
    }%
  \fi
```

```
  \AtBeginDocument{%
\restoreparindent
    \def\restoreparindent{\parindent\@parindent}%
  }% of \AtBeginDocument.
}% of \twoparinit.
```

For dati under poems

Or explanations under results of **time**.

```
\gmu@leftskipcorr
\def\gmu@leftskipcorr{%
  \kern1\leftskip
  \ifcsname \@currenvir leftskip\endcsname
    \kern-1\csname \@currenvir leftskip\endcsname
  \fi
}
```

```
\wherncore
\DeclareCommand\wherncore{om}{%
```

- `% [#1] o` ptional value of `\hskip` of (left) indent of the parbox. If absent, parbox is aligned right;
- `% [#2] o t` ext for the datum parbox.

```
  \gmuIfValueTF{#1}{\leftline{%
      \kern1\leftskip
      \whernfont
      \hskip#1\relax\parbox
      {\dimexpr\hsize-\leftskip-\rightskip-#1}%
      {#2}% of \parbox,
    }% of \leftline,
  }% of ValueT{#1}.
  {% ValueF{#1}:
    \rightline
    {\whernfont
      \whern@parbox{#2}%
      \kern1\rightskip
    }% of \rightline,
    \setprevdepth
  }% of ValueF{#1},
}% of \wherncore.
```

\whern@parbox

```
\DeclareCommand\whern@parbox{%
  T {\leftskip\rightskip}% horizontal alignment of resulting box (the side to be ragged)
  O{t} % vertical alignment of parbox
  >is % separator
  O{0,7666\hsize} % (3) width of parbox
  m % (4) parbox contents
}{%
```

```
% #1 S the skip of the ragged side,
% #2 S t he \parbox's contents.
```

```
  \parbox[#2]{#3}{%
    \gmuIfValueTF{#1}{#1}{\leftskip}=0sp plus \textwidth
    \parfillskip0sp\relax
    \let\\\linebreak
    \disobeylines
    \whernfont #4\unskip\strut\endgraf
    \getprevdepth
  }% of \parbox,
}% of \whern@parbox.
```

\whern

```
\def\whern{%
  \endgraf\nopagebreak
  \gmu@ifstar{\wherncore}%
  {\vskip\whernskip\wherncore}%
}
```

```
\let\whernfont\footnotesize
```

\whernskip

```
\newskip\whernskip
\whernskip2\baselineskip minus 2\baselineskip\relax
```

\whernup

```
\foone{\obeylines}{%
  \DeclareCommand\whernup{%
#1     o % a vskip before
     >is % separating star (ignored)
#2     o  % custom width of parbox
#3    >Pm%
#4    o % a vskip between this box and subsqt. text
    >iQ{ \par
    }%
  }% of args’ spec
}% of obey lines
{\par
  \gmuIfValueT{#1}{\vskip#1\relax}%
```

The `prosato` env. of **gmverse** & derivs. set some positive parskip and counterkrank its first occurrence by a vskip of its negative. Therefore here we put ourselves in a `\rlap` and put at the very beginning of a paragraph.

```
  \ifinner \noindent\nobreak\kern-1\leftskip \nobreak
    \rlap{%
      \vbox{%
      \fi % of if inner
      \leftline{%
        \gmuIfValueTF{#2}{\whern@parbox\rightskip[b][#2]}%
        {\whern@parbox\rightskip[b]}%
        {#3}%
      }%
      \ifinner
        \gmuIfValueT {#4}{\vskip\glueexpr #4\endexpr }%
        \phantom{Ala ma Filifjonkgyr}%
      }% of vbox
    }% of rlap

    \penalty\@M
    \kern 1\leftskip
    \@ifenvir{quote}{\hskip\z@skip}{\hskip\parindent\relax}%
  \else
    \gmuIfValueT {#4}{\vskip \glueexpr #4\endexpr }%
  \fi
}% of \whernup’s body.
```

Thousand separator

```
\pdef\thousep#1{% a macro that’ll put the thousand separator between every two three-digit groups.
```

First we check whether we have at least five digits.

```
  \gmu@thou@fiver#1\relax\relax\relax\relax\relax% we put five \relaxes after the parameter to ensure the string will meet \gmu@thou@fiver’s definition.
  \gmu@thou@fiver{#1}{% if more than five digits:
    \emptify\gmu@thou@put
    \relaxen\gmu@thou@o\relaxen\gmu@thou@i\relaxen\gmu@thou@ii
    \@tempcnta\z@
    \gmu@thou@putter#1\gmu@thou@putter
    \gmu@thou@put
  }}
```

\gmu@thou@fiver

```
\def\gmu@thou@fiver#1#2#3#4#5\gmu@thou@fiver#6#7{% this macro only checks if the text delimited with itself consists of at least five tokens/braces
  \ifx\relax#5\relax\@xa\@firstoftwo
\else\@xa\@secondoftwo
\fi{#6}{#7}}
```

\gmu@thou@putter

```
\def\gmu@thou@putter #1#2{% we are sure to have at least five tokens before the sentinel \gmu@thou@putter.
\advance\@tempcnta\@ne
\@tempcntb\@tempcnta
\divide\@tempcntb3\relax
\@tempcnta=\numexpr\@tempcnta-\@tempcntb*3
\edef\gmu@thou@put{\@xau{\gmu@thou@put}\unexpanded{#1}%
  \ifx\gmu@thou@putter#2\else
    \ifcase\@tempcnta
      \gmu@thou@o\or\gmu@thou@i\or\gmu@thou@ii% all three CSes are yet \relax so we may put them in an \edef safely.
    \fi
  \fi}% of \edef
\ifx\gmu@thou@putter #2% if we are at end of the digits…
  \edef\gmu@tempa{%
    \ifcase\@tempcnta
      \gmu@thou@o\or\gmu@thou@i\or\gmu@thou@ii
    \fi}%
  \@xa\let\gmu@tempa\gmu@thousep% … we set the proper CS…
\else% or …
  \afterfi{% iterate.
    \gmu@thou@putter#2}% of \afterfi
\fi% of if end of digits.
}% of \gmu@thou@putter.
```

\gmu@thousep

```
\def\gmu@thousep{\,}% in Polish the recommended thousand separator is a thin space.
```

So you can type `\thousep{7123123123123}` to get 7 123 123 123 123. But what if you want to apply `\thousep` to a count register or a `\numexpr`? You should write one or two `\expandafter`s and `\the`. Let's do it only once for all:

```
\pdef\xathousep#1{\@xa\thousep\@xa{\the#1}}
```

Now write `\xathousep{\numexpr 10*9*8*7*6*120}` to get 3 628 800.

\shortthousep
\thous

```
\def\shortthousep{%
  \DeclareCommand\thous{
    D {\NoValue} % decimal argument
  }{%
```

we declare it as a command with Q-type argument to allow spaces between digits.

```
    \ifmmode\hbox\bgroup\@gmu@mmhboxtrue\fi
    \gmuIfValueTF{##1}{% we are given a sequence of digits
      \@tempcnta=##1\relax
      \ifnum\@tempcnta<0 $-$%
        \@tempcnta=-\@tempcnta
      \fi
      \xathousep\@tempcnta
      \if@gmu@mmhbox\egroup
      \else\@xa\spifletter
      \fi
    }%
    {% no bare digits given, then we assume the argument is braced.
      \thousep
    }%
  }% of \thous.
}% of \shortthousep.
```

And now write `\thous 3628800` to get 3 628 800 even with a blank space (beware of the range of TEX's counts).

Footnotes suggested by Andrzej Tomaszewski

`\ATfootnotes`

```
\DeclareCommand\ATfootnotes{s}{%
```

We make the footnote mark in the footnote `\scriptsize` not `\scriptscriptsize`.

```
  \gmuIfValueT{#1}% the following setting is suitable for old style numbers in footnote marks, therefore I place it in the starred version of the command.
  {\prependtomacro\gmu@ATfootnotes{%
      \pdef\@makefnmark{%
        \mbox {\normalfont \textsuperscript {\smaller[3]\@thefnmark}}}%
    }% of prepend,
  }% of \gmuIfValueT.

  \gmu@ATfootnotes
  \gmu@AT@ampulex\maketitle% without hyperref
  \unless\if@HyOrg@maketitle@ampulexed@
    \ifdefined\HyOrg@maketitle
      \afterfi{\gmu@AT@ampulex\HyOrg@maketitle}% with hyperref
    \fi
    \@HyOrg@maketitle@ampulexed@true
  \fi
}
```

`yOrg@maketitle@ampulexed@`

```
\newif\if@HyOrg@maketitle@ampulexed@

\pdef\gmu@AT@ampulex #1{%
  \ampulexdef#1{\def\@makefnmark}%
  \if@twocolumn
  {\gmu@ATfootnotes\if@twocolumn}% Ampulex redefinition of \maketitle for the standard classes.
```

`\@makefntext`

```
  \ampulexdef#1{\long\def\@makefntext}%
  \if@twocolumn{\gmu@ATfootnotes\if@twocolumn}% Ampulex redefinition of \maketitle for mwcls.
}

\pdef\gmu@ATfootnotes{%
```

And we make the footnote number not be in superscript but on the base line, according to Andrzej Tomaszewski's suggestion on BachoTEX 2008, and the same size as in the footnote mark.

```
  \long\pdef\@makefntext##1{%
    \ifdefined\@parindent \parindent\@parindent
    \else \parindent 1em\relax
    \fi
    \indent{\ATf@font\scriptsize%
      {\@thefnmark}}%
    \gmu@fnhook
  \enspace\ignorespaces##1}%
}
```

```
\let\ATf@font\normalfont
```

```
\emptify\gmu@fnhook
```

Only this paragraph

```
\pdef\rrthis{% ‘rag right this’: make only the current paragraph ragged right (e.g.
      if the paragraph consists of a long URL).
 \begingroup\rightskip=0sp plus \hsize \endgraf\endgroup}
```

```
\pdef\centerthis{% 2009/12/15
 \begingroup
 \rightskip=1\rightskip plus \hsize
 \leftskip=1\leftskip plus\hsize
 \parfillskip=\z@skip
 \endgraf\endgroup}
```

Conditional tilde

Polish typesetting standards say that for *czcionki* (font size) 12 dd and 10 dd, if leading is narrower that 31/2 *kwadratu*, 31/2×48 dd, then hanging letters are allowed, which also applies to *czcionki* 8 and 6 dd in less than 3 *kwadraty* leading. I take this recommendation not strictly but as an inspiration, i.e., I translate »dd« to »pt«.

\TrzaskaTilde

```
\def\TrzaskaTilde{%
 \@xa\DeclareCommand\@xa\gmu@smarttilde
 \@xa{\@xa T\@xa{\all@stars~}}{%
  \gmuIfValueTF{##1}{\nobreakspace{}}%
  {\ifdim\dimexpr\hsize-\leftskip-\rightskip
   -\ifdim\hangindent<\z@-\fi\hangindent % the last parameter is used with
       respect to the floatflt package.
   >%
    \ifdim\f@size pt>\dimexpr10pt-1sp\relax
     168dd
    \else
     144dd
    \fi
    \nobreakspace {}%
   \else
    \ %
   \fi
  }% of \gmu@ifstar’s else,
 }% of \gmu@smarttilde,
 \let~\gmu@smarttilde
}% of \TrzaskaTilde.
```

A really empty page

Copied from Marcin Woliński’s macros.

\clearemptydoublepage

```
\newcommand{\clearemptydoublepage}{%
```

```
        \newpage{\pagestyle{empty}\cleardoublepage}}
```

```
\foone\obeylines{%
```

\disobeylines

```
  \def\disobeylines{% for arguments in which line end is active to simulate normal behaviour
    \ifnum\catcode`\^^M=\active%
      \pdef^^M{\@ifnextgroup{\ifhmode\unskip\space\fi}{%
          \gmu@disMinner}}%
```

\gmu@disMinner

```
      \def\gmu@disMinner##1{%
        \ifx^^M##1\endgraf%
        \else\afterfi{\ifhmode\unskip\space\fi}\fi##1}%
    \fi}%
}
```

The \⋆ CS and active ⋆ should be defined different to make them distinguishable by tests, especially with `\gmu@ifstar` in mind.

```
\DeclareCommand\⋆{Q{0123456789}{1}}
{\gmu@flexhyphen
  \gmu@star@loop0{#1}\relax
}%
```

\gmu@star@loop

```
\def\gmu@star@loop#1#2{% this is an expandable loop as in The ε-TeX Manual p. 9.
   \ifnum#1<\numexpr#2\relax%
     \gmu@lowstar
     \gmu@flexhyphen
     \@xa\gmu@star@loop
     \@xa{\number\numexpr#1+1\@xa}%
     \@xa{\number#2\@xa}%
   \fi}
```

```
\ifdefined\XeTeXversion
```

```
\foone{%
  \catcode`„\active
  \catcode`”\active
  \catcode`’\active
  \catcode`—\active
  \catcode`–\active
}{%
```

\activequotes

```
  \def\activequotes{%
    \incsdef„{}{\@ifnextchar—%
      {\lv\llap{\string„}\pauzadial}{\string„}}%
    \incsdef”{}{\string”\@ifnextanyRS{.,}{\quotkern}{}}%
    \incsdef’{}{\string’\@ifnextanyRS{.,}{\quotkern}{}}%
    \catcode`„\active
    \catcode`”\active
    }%
```

\activepunctsQ

```
    \def\activepunctsQ {„”’——}%
}
```

(Cyrillic) iotified e. The special delimiter that will be lost.

```
\catcode`Ѥ\active
```

defined later, here for proper catcode.

\ac

```
\DeclareCommand\ac {b} {%
13164   \gmuIfValueTF{#1}%
13165   {%
13166     \acro{#1}%
13167   }%
13168   {\ac@u}%
13169 }
```

`\ac@kernel`

```
13171 \def\ac@kernel#1{{\gmu@acrokernel {#1}}}% #1 in braces because \acrocore
          valid in Dzienniczek uses \lowercase (that requires braced text).
```

Delimiters of until-iterating arguments

They don't contain space(s)!

```
13179 \@xa\def\@xa\@dc@basicdelims\@xa{%
13180   \two@Ms \par \relax
13181   \bgroup
13182   \egroup \begingroup \endgroup
13183   \begin \end
13184   $%
13185   \(\)\[\]% other math delims
13186   &\\% tabular delims
13187 }
```

Now *they* do:

```
13190 \let\@dc@basicdelimsp\@dc@basicdelims

13192 \@xa\addtomacro\@xa\@dc@basicdelimsp
13193 \@xa{\all@spaces}

13195 \@xa\def\@xa\@dc@punctanddelims
13196 \@xa{\@dc@basicdelims :,.;?!„”«»‹ ›"'`'′}%

13198 \let \@dc@acpunctanddelims \@dc@punctanddelims

13200 \@xa\addtomacro\@xa\@dc@acpunctanddelims
13201 \@xa{\activepunctsQ}
```

now, it's the list containing spaces

```
13204 \let \@dc@acpunctanddelimsp \@dc@punctanddelims

13206 \@xa\addtomacro\@xa\@dc@acpunctanddelimsp
13207 \@xa{\all@spaces}

13209 \addtomacro\@dc@acpunctanddelimsp{~}
```

acro iterating until

`\ac@u`

```
13212 \DeclareCommand\ac@u{
13213   >\@xa U {\@dc@acpunctanddelimsp ()[]<>Ѥ} \default{}
13214   \eacher {\ac@kernel}
13215   >iW{Ѥ}
13216 }
13217 {%
13218   \ifmmode\@xa\text\else\@xa\firstofone\fi{#1}%
13219 }
```

```
13221 \fi % of if XeTeX of l. 13134.
```

`enumerate*` and `itemize*`

We wish the starred version of `enumerate` to be just numbered paragraphs. But **hyperref** redefines `\item` so we should do it a smart way, to set the LaTeX's `list` parameters that is.

(Marcin Woliński in **mwcls** defines those environments slightly different: his item labels are indented, mine are not; his subsequent paragraphs of an item are not indented, mine are.)

`enumerate*`

```
\@namedef{enumerate*}{%
  \ifnum\@enumdepth>\thr@@
    \@toodeep
  \else
    \advance\@enumdepth\@ne
    \edef\@enumctr{enum\romannumeral\the\@enumdepth}%
    \@xa\list\csname label\@enumctr\endcsname{%
      \partopsep\topsep \topsep\z@ \leftmargin\z@
      \itemindent\@parindent % %\advance\itemindent\labelsep
      \labelwidth\@parindent
      \advance\labelwidth-\labelsep
      \listparindent\@parindent
      \usecounter \@enumctr
      \def\makelabel##1{##1\hfil}}%
  \fi}
\@namedef{endenumerate*}{\endlist}
```

`itemize*`

```
\@namedef{itemize*}{%
  \ifnum\@itemdepth>\thr@@
    \@toodeep
  \else
    \advance\@itemdepth\@ne
    \edef\@itemitem{labelitem\romannumeral\the\@itemdepth}%
    \@xa\list\csname\@itemitem\endcsname{%
      \partopsep\topsep \topsep\z@ \leftmargin\z@
      \itemindent\@parindent
      \labelwidth\@parindent
      \advance\labelwidth-\labelsep
      \listparindent\@parindent
      \def\makelabel##1{##1\hfil }}%
  \fi}
\@namedef{enditemize*}{\endlist}
```

```
⟨/typos⟩
```

The gmparts package—in/exclusion of parts of one file analogous to `\include`

```
⟨utils⟩      \gmu@PackOptionX{parts}
⟨*parts⟩
```

```
\RequirePackage{gmcommand}
```

`\include` not only .tex’s

`\include` modified by me below lets you to include files of any extension provided that extension in the argument.

If you want to `\include` a non-.tex file and deal with it with `\includeonly`, give the latter command full file name, with the extension that is.

`\gmu@getext`

```
\def\gmu@getext#1.#2\@nil{%
  \def\gmu@filename{#1}%
  \def\gmu@fileext{#2}}

\def\include#1{\relax
  \ifnum\@auxout=\@partaux
  \@latex@error{\string\include\space cannot be nested}\@eha
  \else \@include#1 \fi}

\def\@include#1 {%
  \gmu@getext#1.\@nil
  \ifx\gmu@fileext\empty\def\gmu@fileext{tex}\fi
  \clearpage
  \if@filesw
    \immediate\write\@mainaux{\string\@input{\gmu@filename.aux}}%
  \fi
  \@tempswatrue
  \if@partsw
    \@tempswafalse
    \edef\reserved@b{#1}%
    \@for\reserved@a:=\@partlist\do{%
      \ifx\reserved@a\reserved@b\@tempswatrue\fi}%
  \fi
  \if@tempswa
    \let\@auxout\@partaux
    \if@filesw
      \immediate\openout\@partaux \gmu@filename.aux
      \immediate\write\@partaux{\relax}%
    \fi
    \@input@{\gmu@filename.\gmu@fileext}%
    \inclasthook
    \clearpage
    \@writeckpt{\gmu@filename}%
    \if@filesw
      \immediate\closeout\@partaux
    \fi
  \else
```

If the file is not included, reset `\@include` `\deadcycles`, so that a long list of non-included files does not generate an ‘Output loop’ error.

```
    \deadcycles\z@
    \@nameuse{cp@\gmu@filename}%
  \fi
  \let\@auxout\@mainaux
}
```

`\whenonly`

```
\newcommand\whenonly[3]{%
  \def\gmu@whonly{#1,}%
  \ifx\gmu@whonly\@partlist\afterfi{#2}\else\afterfi{#3}\fi}
```

I assume one usually includes chapters or so so the last page style should be closing.

```
\def\inclasthook{\thispagestyle{closing}}
```

Switching on and off parts of one file

The `\include` facility is very nice only it forces you to split your source in many files. Therefore I provide a tool analogous to `\include` and using the same `\includeonly` mechanism/list to switch on and off parts of the same source file.

```
\def\filepart#1{\relax
  \ifnum\@auxout=\@partaux
  \@latex@error{\string\filepart\space cannot be nested}\@eha
  \else\afterfi{\@filepart#1 }\fi}
```

```
\def\@filepart#1 {%
  \clearpage
  \edef\gmu@filepartname{#1}% we'll use it later
  \if@filesw
    \immediate\write\@mainaux{\string\@input{#1.aux}}%
  \fi
  \@tempswatrue
  \if@partsw
    \@tempswafalse
    \@for\gmu@filepart@resa:=\@partlist\do{%
      \ifx\gmu@filepart@resa\gmu@filepartname\@tempswatrue\fi}%
  \fi
  \if@tempswa
    \let\@auxout\@partaux
    \if@filesw
      \immediate\openout\@partaux #1.aux
      \immediate\write\@partaux{\relax}%
    \fi
    \@xa\@firstoftwo
  \else
```

If the file is not included, reset `\@include` `\deadcycles`, so that a long list of non-included files does not generate an ‘Output loop’ error.

```
    \deadcycles\z@
    \@nameuse{cp@\gmu@filepartname}%
    \let\@auxout\@mainaux
    \@xa\@secondoftwo
  \fi
  {\iftrue}%
  {\let\endfilepart\fi
    \csname gm@skipped@#1\endcsname
    \def\next{\Restore@MacroSt {endfilepart}%
      \@ifnextchar\bgroup{\show\NextBgroup\@gobble}{}}%
    \@xa\next\iffalse}%
}
```

`\endfilepart`

```
\DeclareCommand\endfilepart{b}{% Note the argument is not used really. Maybe
          later we'll use it for checking of proper matching. Or maybe not.
  \inclasthook
13400   \clearpage
13401   \@writeckpt{\gmu@filepartname}%
13402   \if@filesw
13403   \immediate\closeout\@partaux
13404   \fi
13405   \fi% this \fi closes \Iftrue put by line 13377.
13406   \let\@auxout\@mainaux
13407 }
```

```
13409 \Store@Macro\endfilepart
```

```
              13411 \def\nofileparts{%
              13412   \let\filepart\@gobble
\endfilepart  13413   \DeclareCommand\endfilepart{b}{}%
              13414 }
```

Fix of including when fontspec is used

The **fontspec** package creates counters for font families. If a **fontspec** command is used in a part of a document and then such a part is skipped, an error occurs 'No counter zf@fam@… defined'. Now we fix that by ensuring all the counters are defined before they are set.

Note it's a draft version which doesn't support resetting of one counter within another.

```
13426 \def\includecountfix{%
13427   \def\@wckptelt##1{%
13428     \immediate\write\@partaux{%
13429       \providecounter{##1}% to provide the font counters defined in parts of the
                document.
13432       \string\setcounter{##1}{\the\@nameuse{c@##1}}}}%
13433 }
```

```
   13435 \pdef\providecounter#1{%
#1 13436   \unless\ifcsname c@#1\endcsname\newcounter{#1}\fi}
```

```
13438 ⟨/parts⟩
```

The gmurl package

```
13445 ⟨utils⟩      \gmu@PackOptionX{url}
13446 ⟨*url⟩
```

```
13448 \RequirePackage{gmcommand}
```

hyperref's `\nolinkurl` into `\url*`

```
13452 \def\urladdstar{%
13453   \AtBeginDocument{%
13454     \@ifpackageloaded{hyperref}{%
13455       \Store@Macro\url
13456       \pdef\url{\gmu@ifstar{\nolinkurl}{\storedcsname{url}}}%
13457     }{}}}
```

```
13459 \@onlypreamble\urladdstar
```

A fix to the url package

It happened that a URLs typeset with the `\url` command of the **url** package came out sort of spaced because kerning was off because of the math mode. So I provide a redefinition of the internal macros of the **url** package which in my version uses not math mode but `\scantokens` and not `\relpenalty` and `\binoppenalty` but `\hyphenpenalty` (as it is in the paragraph) and `\discretionary`. I tried putting explicit penalties after the symbols but that spoiled kerning.

The rules of line breaking are somewhat different, too: in the original **url** package line breaks are forbidden between any two symbols listed in `\UrlBigBreaks`. In my version line breaks are forbidden between any two *identical* 'URL Breaks' and 'URL Big Breaks'.

There are some more differences in formatting some chars, i.a. `~`, `%` and angle brackets which I don't treat specially and just take from font assuming the font provides ASCII chars and checking whether it provides the angle brackets.

```
\@ifXeTeX{%
  \pdef\UrlFix{\AtBeginDocument{%
      \@ifpackageloaded{url}{\gmu@UrlFix}{}}%
    \relaxen\UrlFix}%
  \AtBeginDocument{%
    \pdef\UrlFix{%
      \@ifpackageloaded{url}{\gmu@UrlFix}{}%
      \relaxen\UrlFix}}%
}
{%
  \pdef\UrlFix{\PackageWarning{gmutils}{!!! The \string\UrlFix\space
      declaration works only with XeTeX}}%
}
```

```
\@ifXeTeX{}{%
  \edef\gmu@restoreUpUpUp{\catcode`\@nx\^^^=\the\catcode`\^^^}%
  \AtEndOfPackage\gmu@restoreUpUpUp
  \catcode`\^^^=9 }
```

```
\def\gmu@UrlFix{%
```

default style assignments

```
  \def\UrlBreaks{\do\.\do\@\do\\\do\/\do\!\do\_\do\|\do\;\do\]%
    \do\)\do\,\do\?\do\'\do\"\do\+\do\=\do\#\do\%\do\~\do\_\do\|%
    \do\{\do\}\do\$}%
  \def\UrlBigBreaks{\do\:}%
  \def\UrlNoBreaks{\do\(\do\[\do\{}%
  \def\UrlSpecials{%
    \do\ {\hbox{\visiblespace}}\do\^^M{\hbox{\visiblespace}}}%
```

```
  \def\Url@Format##1{%
    \UrlFont
    \ifdefined\verbatim@specials
      \catcode`\>\active
      \verbatim@specials
      \verbatim@mathhack
    \fi % setting of the escape char, begin and end group and optionally math shift,
          defined in gmverb.
    \gmu@UrlSetup
    \UrlLeft
  \edef\gmu@theendlinechar{\the\endlinechar}%
  \endlinechar\m@ne
  \kern\z@% to forbid hyphenating the first word if the URL begins with a word
  \hyphenchar\font=\UrlHyphenchar\relax
  \let\-\gmu@discretionaryhyphen
  \scantokens{##1}%
  \endlinechar\gmu@theendlinechar\relax
  \UrlRight
}% of \Url@Format.

\edef\UrlHyphenchar{%
  \ifdefined\gmv@hyphenchar\gmv@hyphenchar
  \else"A6 \fi}% broken bar, ¦ or the same as provided in gmverb for verbatims. You can redefine it as you please. This char is used as the hyphenation char in URLs and therefore should be different from - (hyphen), which is often a part of an URL. The broken bar seems to be quite unlikely in URLs and/or file names.

\def\verbatim@mathhack{%
  \ifdefined\verbatim@specials@list
    \@xa\verbatim@mathhack@\verbatim@specials@list
  \fi
}%

\def\verbatim@mathhack@##1##2##3##4##5##6{%
  \gmuIfValueT{##4}{%
    \edef\gmu@thinmuskip{\the\thinmuskip}%
    \edef\gmu@medmuskip{\the\medmuskip}%
    \edef\gmu@thickmuskip{\the\thickmuskip}%
    \begingroup
    \lccode`\~=`##4\lowercase{%
      \endgroup\def~####1~}%
    {$\thinmuskip\gmu@thinmuskip\relax
      \medmuskip\gmu@medmuskip\relax
      \thickmuskip\gmu@thickmuskip\relax
      ####1%
      $}%
    \catcode`##4\active
  }%
}%

\def\gmu@UrlSetup{%
  \medmuskip\Urlmuskip \thickmuskip\medmuskip \thinmuskip0mu%
  \relpenalty\UrlBigBreakPenalty \binoppenalty\UrlBreakPenalty
  \def\do{\gmu@doUrlMath\UrlBreakPenalty}\UrlBreaks % bin ( \hyphenpenalty anyway)
  \def\do{\gmu@doUrlMath\UrlBigBreakPenalty}\UrlBigBreaks % rel ( \hyphenpenalty anyway)
  \def\do{\gmu@doUrlMath\@M}\UrlNoBreaks % open (no break)
  \def\do{\gmu@doUrlMathAc\UrlBreakPenalty}% ( \hyphenpenalty)
  \UrlSpecials
  \if \iffontchar\font"2329 1\else0\fi\iffontchar\font"232A
      1\else2\fi
```

we check whether the font provides both left and right angle brackets.

```
    \gmu@measurewd{^^^^2329}%
```

```
13587     \edef\gmu@tempa{%
13588       \@nx\gmu@doUrlMathAc\@M\@nx\<{%
13589         \hbox to\gmu@tempb{\unexpanded{\hss\char"2329 \hss}}}%
13590       }\gmu@tempa
13591     \gmu@measurewd{^^^^232a}%
13592     \edef\gmu@tempa{%
13593       \@nx\do\@nx\>{%
13594         \hbox to\gmu@tempb{\unexpanded{\hss\char"232A \hss}}}%
13595       }\gmu@tempa
13596   \else
13597     \gmu@doUrlMathAc\@M\<{\langle}\do\>{\rangle}%
13598   \fi
13599   \iffontchar\font"22C6 % low star
13600     \do\*{\hbox{\char"22C6 }}%
13601   \else \do\**%
13602   \fi
13603   \ifx\do@url@hyp\@empty
13604     \gmu@measurewd{-}% this macro is defined in line 3849.
13605     \edef\gmu@tempa{%
13606       \unexpanded{\gmu@doUrlMathAc\@M\-}%
13607       {\hbox to \gmu@tempb{\unexpanded{\hss-\hss}}%
13608         \@nx\-}% hyphen is a good point for hyphenation, but the hyphenation
                   char should be sth. else, and it is indeed: ¦ (broken bar, \char"A6).
                   See also line 13542
13612     }\gmu@tempa
13613   \fi
13614   \addfontfeature{Ligatures=NoCommon, Mapping=none}% instead of ‘doing’ \ver¦
             % batim@nolig@list.
13616 }% of \gmu@UrlSetup.

13620 \def\gmu@doUrlMath##1##2{%
           % #1 value of the penalty (used as a Boolean: if < 10 000,
             % \hyphenpenalty will be used anyway, if ≥ 10 000, there will be no \dis¦
             cretionary),
           % #2 the char, given as \⟨char⟩.
13627   \begingroup
13628   \lccode`\~=`##2\lowercase{%
13629     \endgroup\def~{\@ifnextchar~}%
13630     \@xa\addtomacro\@xa~}% of \lowercase.
13631   \ifnum##1<\@M
13632   {%
13633     {\char`##2\csname gmu@dbl\string##2kern\endcsname}% if next is the same
               char
13634     {\ifmmode\char`##2% else
13635       \else\gmu@urlbreakable{##1}{##2}%
13636       \fi}%
13637   }% of \addtomacro’s argument \ifnum true.
13638   \else
13639   {%
13640     {\char`##2\csname gmu@dbl\string##2kern\endcsname}{\char`##2}%
13641   }% of \addtomacro’s argument \ifnum false.
13642   \fi
13643     \catcode`##2=\active
```

```
    }% of \gmu@doUrlMath.

  \def\gmu@doUrlMathAc##1##2##3{%
       % #1  (value of) a penalty (see the remark to ##1 of the previous macro),
       % #2  the char (as \⟨char⟩),
       % #3  the definition.
    \begingroup
    \lccode`\~=`##2\lowercase{%
      \endgroup\def~{\@ifnextchar~}%
      \@xa\addtomacro\@xa~}% of \lowercase.
    \ifnum ##1<\@M
    {%
      {\ifmmode\char`##2\else$##3\m@th$\fi}%
      {\ifmmode\char`##2%
        \else\discretionary{\hbox{$##3\m@th$}}{}{\hbox{$##3\m@th$}}%
        \fi}%
    }% of \addtomacro's argument if num true.
    \else
    {%
      {\ifmmode\char`##2\else$##3\m@th$\fi}{%
           \ifmmode\char`##2\else$##3\m@th$\fi}%
    }% of \addtomacro's argument if num false.
    \fi
    \catcode`##2=\active
  }% of \gmu@doUrlMathAc.

  \pdef\gmu@url@rigidbreak##1##2{\discretionary{\char`##2}{}{%
       \char`##2}}%

  \pdef\gmu@url@flexbreak##1##2{\penalty\@M \hskip\z@ plus0,03em
    \char`##2\penalty##1\hskip\z@ plus0,03em\relax}%

  \let\gmu@urlbreakable\gmu@url@flexbreak

  \def\Url@z##1{%
```

Do any hyper referencing due to hyperref (or perform a url-def)

```
    \Url@HyperHook
```

Now do the formatting in a group (can also have `\Url@HyperHook` take this as an argument).

```
    {\Url@Format{##1}}%
    \endgroup}%

  \DeclareUrlCommand\file{\urlstyle{sf}}%

  \emptify\Url@moving% with our settings \url is pretty allowed in moving arguments, I hope.
}% of \gmu@UrlFix.
```

\UrlSlashKern

```
\DeclareCommand\UrlSlashKern{O{tt}m}%
{\AtBeginDocument{%
    \@nameedef{url@#1style}{\def\@nx\UrlFont{%
        \@xanxcs{#1family}%
        \def\@xanxcs{gmu@dbl\string\/kern}%
        {\kern#2\relax}%
      }% of \UrlFont
    }% of \url#1style
    \urlstyle{#1}%
  }% of \AtBeginDocument
}% of \UrlSlashKern
```

```
\def\DeclareUrlCommand#1#2{\pdef#1{\leavevmode\begingroup #2\Url}}
```

```
%%  [#1][#1]{\def}{#1}{\pdef#1}
```

```
\foolc ~ : {%
  \@ifXeTeX{%
    \def\metaat~{%
      \penalty\@M \hskip\z@skip
      \meta{at}% it's a Cyrillic »a«!
      \penalty\exhyphenpenalty
      \hskip\z@skip
    }%
    \def\metadot~{%
      \penalty\@M \hskip\z@skip
      \meta{dot}% it's a Cyrillic »o«!
      \penalty\exhyphenpenalty
      \hskip\z@skip
    }%
  }% of if XeTeX
  {%
    \def\metaat~{\PackageError{gmurl}{Command \bslash metaat
        works only in XeTeX}@}%
    \def\metadot~{\PackageError{gmurl}{Command \bslash metaat
        works only in XeTeX}.}%
  }% of if not XeTeX
}% of \foolc
```

```
⟨/url⟩
```

The gmRCS package

```
⟨utils⟩      \gmu@PackOptionX{RCS}
⟨*RCS⟩
```

```
\def\ParseRCSVersion$Id%
: #1.#2,v #3 #4 #5 #6 #7${%
  \def\RCSFileName{#1}%
  \def\RCSFileExt{#2}%
  \def\RCSFile{#1.#2}%
  \def\RCSVersion{#3}%
  \def\RCSDate{#4}%
  \def\RCSTime{#5}%
  \def\RCSAuthor{#6}%
}
```

And the expandable version of those above (when we only one datum at one place)

```
\def\defRCSeDatum
#1% datum name
```

```
#2% datum definition (basically #number)
{%
  \@namedef{eRCS#1}$Id%
  : ##1.##2,v ##3 ##4 ##5 ##6 ##7${#2}%
}
```

```
\defRCSeDatum{File}{#1.#2} % \eRCSFile
\defRCSeDatum{Version}{#3}% \eRCSVersion
\defRCSeDatum{Date}{#4}% \eRCSVDate
\defRCSeDatum{Time}{#5}% \eRCSVTime
\defRCSeDatum{Author}{#6}% \eRCSVAuthor
```

```
⟨/RCS⟩
```

Back to gmutils

```
⟨*utils⟩
```

```
\ExecuteOptionsX{command, envir, ampulex, relsize, meta, logos,
  notonlypream, %
%% mw=off,
  typos, parts, url}
```

```
\ProcessOptionsX
```

```
\def\doifdefined#1{\ifdefined#1\@xa#1\fi}
```

```
\doifdefined\gmu@Require@command
\doifdefined\gmu@Require@envir
\doifdefined\gmu@Require@ampulex
\doifdefined\gmu@Require@relsize
\doifdefined\gmu@Require@meta
\doifdefined\gmu@Require@logos
\doifdefined\gmu@Require@notonlypream
\doifdefined\gmu@Require@mw
\doifdefined\gmu@Require@typos
\doifdefined\gmu@Require@parts
\doifdefined\gmu@Require@url
\doifdefined\gmu@Require@RCS
```

Third person pronouns

Is a reader of my documentations ‘she’ or ’he’ and does it make a difference?

Previous versions of this documentation were consequently alternating ’he’ and ’she’ and provided specific macros for that purpose. Now I’m not that queer-and-gender so I take what is normally used these days, ’they’ that is.

(The issue of human sexes and genders (certainly much more numerous than 2) is complex and delicate and a TeX macro package is probably not the best place to discuss it.)

```
\def\heshe{they}
\def\hisher{their}
```

```
\def\himher{them}
\def\hishers{theirs}

\def\HeShe{They}
\def\HisHer{Their}
\def\HimHer{Them}
\def\HisHers{Theirs}

⟨/utils⟩
\endinput
```

End of file ‘gmutils.gmd’.

□

Change History

- **gmtypos** v0.94
  - `\date@left`:
    - `\leftline` replaced with `\par`…`\par` to work well with **floatflt**, 12636
  - `\gmu@dogmathbase`:
    - removed definition of `\`⟨*letter*⟩s and `\`⟨*digit*⟩s, 11388
  - `\if@gmu@mmhbox`:
    - made to work also in math mode, even with math-active digits, 10874
- **gmtypos** v0.96
  - `\gmath`:
    - added, 11501
  - `\gmu@dogmathbase`:
    - Greek letters completed. Wrapped with `\addtotoks` to allow using in any order with `\garamath` and others, 11388
    - the `\everymath`'s left brace moved here: earlier all the stuff was put into `\everymath`, 11456
- **gmtypos** v0.97
  - `\*`:
    - removed (it was a text tilde, available as `\texttilde`), 11896
- **gmtypos** v0.98
  - `\@makefntext`:
    - added, 13037
  - `\ATfootnotes`:
    - moved here from my own private macro package to allow the beauty of these footnotes for the general audience, 12976
  - `\fakeonum`:
    - added, 11683
  - `\napapierkicore`:
    - added optional star controlling globalness, 12296
- **gmutils**
  - `\gmFileKind`:
    - CheckSum 10678 , 369
- **gmutils** v0.80
  - `\gmFileKind`:
    - CheckSum 1689 , 369
- **gmutils** v0.84
  - `\gmFileKind`:
    - CheckSum 2684 , 369
- **gmutils** v0.85
  - `\gmFileKind`:
    - CheckSum 2795 , 369
- **gmutils** v0.87
  - `\gmFileKind`:
    - CheckSum 4027 , 369
- **gmutils** v0.88
  - `\gmFileKind`:
    - CheckSum 4040 , 369
- **gmutils** v0.90
  - `\gmFileKind`:
    - CheckSum 4035 , 369
- **gmutils** v0.91
  - `\gmFileKind`:
    - CheckSum 4055 , 369
- **gmutils** v0.92
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    - CheckSum 4133 , 369
- **gmutils** v0.93
  - `\gmFileKind`:
    - CheckSum 4140 , 369
    - CheckSum 4501 , 369
- **gmutils** v0.94
  - `\gmFileKind`:
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- **gmutils** v0.95
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- **gmutils** v0.96
  - `\gmFileKind`:
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- **gmutils** v0.97
  - `\gmFileKind`:
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    - put to CTAN on 2008/11/22, 369
- **gmutils** v0.98
  - `\gmFileKind`:
    - CheckSum 5429 , 369
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    - CheckSum 5627 because of `\fakeonum`, 369
    - CheckSum 6035 because of `\DeclareCommand`, `\arg`, 369
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    - CheckSum 6147 because of `\arg` in verbatims, 369
    - CheckSum 6535 because of `\UrlFix`, 369
    - CheckSum 6656 because of type settings for **gmdoc** (`\narrativett`) and for `\verbatimspecials`, 369
- **gmutils** v0.991
  - `\gmFileKind`:
    - CheckSum 8257 because of some shorthands and major development of `\DeclareCommand`, including 'Knuthian' and general optional arguments and '`\afterassignment`' pseudo-argument, 369
    - put to CTAN on 2010/03/04, 369
- **gmutils** v0.993
  - `\gmFileKind`:
    - CheckSum 12497 , 369
    - CheckSum 12591 , 369
    - CheckSum 12970 , 369
    - CheckSum 8257 because of **gmbase** cutting out from **gmutils**, 369

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