The `templatetools` package

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Abstract
Collection of tools, which are helpful for the creation of a \LaTeX\ template if conditional paths for code execution are required.

1 Usage

1.1 Commands

The following commands check if a command sequence is defined or not.

\texttt{\textbackslash IfDefined} \{\texttt{command}\}\{\texttt{code defined}\}

Executes the code if the command is defined.

\texttt{\textbackslash IfUndefined} \{\texttt{command}\}\{\texttt{code undefined}\}

Executes the code if the command is not defined.

\texttt{\textbackslash IfElseDefined} \{\texttt{command}\}\{\texttt{defined}\}\{\texttt{undefined}\}

Executes either the code in the \texttt{defined} bracket if the command is defined or in the \texttt{undefined} bracket if the code is undefined.

\texttt{\textbackslash IfElseUndefined} \{\texttt{command}\}\{\texttt{undefined}\}\{\texttt{defined}\}

As \texttt{\textbackslash IfElseDefined}, but with switched brackets for defined and undefined.

Example

The \texttt{\usepackage} code is only executed if the required \texttt{\upmu} command is defined.

\begin{verbatim}
% Requires: Command \upmu
\textbackslash IfDefined{\upmu}{\textbackslash usepackage{\upmu}{gensymb}}
\end{verbatim}

\texttt{\textbackslash IfMultDefined} \{\texttt{list of commands}\}\{\texttt{defined}\}\{\texttt{undefined}\}

Checks a comma separated list of commands before it executes the defined code path if all commands were defined or the undefined code path else.
1.2 Draft mode

The following commands check if draft mode is active or not.

\IfDraft \{⟨draft mode active⟩\}
\IfNotDraft \{⟨draft mode disabled⟩\}
\IfNotDraftElse \{⟨draft mode disabled⟩\}{⟨draft mode active⟩}\}

Example

The bookmark is not loaded in draft mode:
\IfNotDraft\usepackage\{bookmark\}

1.3 Packages

These commands check if a package was loaded or not. This can be achieved in different ways with commands from other packages. The key point of these commands here is that they work not only in the preamble and include no @-char.

\IfPackageLoaded \{⟨package⟩\}{⟨is loaded⟩}\}
\IfPackageNotLoaded \{⟨package⟩\}{⟨is not loaded⟩}\}
\IfPackagesLoaded \{⟨list of packages⟩\}{⟨all are loaded⟩}\}
\IfPackagesNotLoaded \{⟨list of packages⟩\}{⟨none is loaded⟩}\}

Example

% Load epstopdf only if graphicx was loaded
\IfPackageLoaded\{graphicx\}\{
\usepackage\{epstopdf\}
\}
% Do not load subcaption if subfig was loaded (incompatible)
\IfPackageNotLoaded\{subfig\}\{
\usepackage\{subcaption\}[2011/08/17]
\}
1.4 Package Loading order

In \LaTeX{} documents it is quite often essential to load packages in the right order to ensure that everything works. However this makes it impossible to group similar packages together.

The following commands allow to execute code after or before a specified package and thus also allows to load packages in a specified order using \texttt{\usepackage} commands.

If the reference package was not loaded in the preamble the code will nevertheless be executed before \texttt{\begin{document}}

\texttt{\ExecuteAfterPackage{⟨after this package⟩}{⟨execute this code⟩}}

\texttt{\ExecuteBeforePackage{⟨before this package⟩}{⟨execute this code⟩}}

Example

cleveref package must be loaded after package hyperref.

\begin{verbatim}
% loading: must be loaded after hyperref and after varioref
\ExecuteAfterPackage{hyperref}{%
% caption and cleveref incompatible in Versions before 2011/12/24
\usepackage{cleveref}[2011/12/24]
}
\end{verbatim}

1.5 Tikz Library

Checks if a tikz library was loaded.

\texttt{\IfTikzLibraryLoaded{⟨library⟩}{⟨if loaded⟩}}

Example

Executes the code only of the tikz library was loaded.

\begin{verbatim}
\IfTikzLibraryLoaded{lindenmayersystems}{%
% code origin: pgf/tikz manual
\begin{tikzpicture}
pgfdeclarelindenmayersystem{Koch curve}{
  \rule{F -> F-F++F-F}
}
\shadedraw [top color=white, bottom color=blue!50, draw=blue!50!black]
  [l-system={Koch curve, step=2pt, angle=60, axiom=F++F++F, order =3}]
  lindenmayer system -- cycle;
\end{tikzpicture}
}
\end{verbatim}
1.6 Column types

\texttt{\LaTeX} provides no tool to check for the existence of a column type. This is provided by the following commands:

\begin{verbatim}
\IfColumntypeDefined{⟨columntype character⟩}{⟨is defined⟩}{⟨is undefined⟩}
\end{verbatim}

\begin{verbatim}
\IfColumntypesDefined{⟨columntype character list⟩}{⟨is defined⟩}{⟨is undefined⟩}
\end{verbatim}

Example

Executes the code only of the X column type is defined and the \texttt{tabularx} package was loaded by checking that \texttt{tabularx} is defined.

\begin{verbatim}
\IfColumntypeDefined{X}{\%}
\IfDefined{tabularx}{\%}
\begin{tabularx}{0.9\textwidth}{llXX}
\hline
l & l & X & X \\
\hline
\end{tabularx}
\end{verbatim}

1.7 Color definitions

Color definitions are saved in \texttt{\LaTeX} as names. The following commands provide a convenient way to check the existence of these color definitions.

\begin{verbatim}
\IfColorDefined{⟨color name⟩}{⟨is defined⟩}{⟨is undefined⟩}
\end{verbatim}

\begin{verbatim}
\IfColorsDefined{⟨list of color name⟩}{⟨is defined⟩}{⟨is undefined⟩}
\end{verbatim}

1.8 Math font version

\begin{verbatim}
\IfMathVersionDefined{⟨font version⟩}{⟨is defined⟩}{⟨is undefined⟩}
\end{verbatim}

1.9 Glossaries styles

\begin{verbatim}
\IfGlossariesStyleDefined{⟨style name⟩}{⟨is defined⟩}
\end{verbatim}
1.10 Bib environments

\IfBibEnvironmentDefined {⟨environment name⟩}{⟨is defined⟩}

1.11 Template Definitions

The following commands in principle define only macros, but in contrast to normal methods these are saved using two keys named \textit{group} and \textit{property}. With a matching command for the execution this allows to generate macros in an object like naming structure, which can be used to toggle settings.

\SetTemplateDefinition {⟨Group⟩}{⟨Property⟩}{⟨Code⟩}

Defines a collection of commands (a macro) with a \textit{group} and \textit{property}.

\UseDefinition {⟨Group⟩}{⟨Property⟩}

Execute macro save with the \textit{group} and \textit{property}.

Example

The following code allows to switch the colors anywhere in the document:

\SetTemplateDefinition{Target}{Web}{%
  \definecolor{pdfurlcolor}{rgb}{0,0,0.6}
}%
\SetTemplateDefinition{Target}{Print}{%
  \definecolor{pdfurlcolor}{rgb}{0,0,0}
}%
% Apply colors for web
\UseDefinition{Target}{Web}
2 Implementation

\NeedsTeXFormat{LaTeX2e}[1994/12/01]
\ProvidesPackage{templatetools} [2023/03/26 v0.2 Collection of conditional commands useful inside templates]
%
\%\%\% --- Necessary Packages
\%\%\% --------------------------------------------------------------
\RequirePackage{iftex}
\RequirePackage{etoolbox}
\RequirePackage{ltxcmds}
\RequirePackage{array} % for column types
\RequirePackage{ifdraft} % check draft
\RequirePackage{scrlfile}
%

2.1 Command sequences

\IfDefined \text{Wrapper to \texttt{ifcsdef} with only true path.}
\newcommand{\IfDefined}[2]{\ifcsdef{#1}{#2}{}}%
%
\IfUndefined \text{Wrapper to \texttt{ifcsdef} with only false path.}
\newcommand{\IfUndefined}[2]{\ifcsdef{#1}{}{#2}}%
%
\IfElseDefined \text{Wrapper to \texttt{ifcsdef} with true and false path.}
\newcommand{\IfElseDefined}[3]{\ifcsdef{#1}{#2}{#3}}%
%
\IfElseUndefined \text{Wrapper to \texttt{ifcsdef} with true and false path in reverse order.}
\newcommand{\IfElseUndefined}[3]{\ifcsdef{#1}{#3}{#2}}%
%
\IfMultDefined \text{Checks if more than one command is defined}
\newcommand{\IfMultDefined}[1]{%\def\do##1{\%\def\do##1{\% define \@tempa with trimmed index element.\edef\@tempa{\zap@space##1 \@empty}}\% check if package of current index is loaded\ifcsdef{\@tempa}{}{\@tempswafalse}%)%\Process csv list with command \do (etoolbox)\%}
\texttt{\textbackslash docslist}\{\#1\}\%  
\texttt{\textbackslash if@tempswa\textbackslash expandafter\textbackslash if\textbackslash expandafter\textbackslash else\textbackslash expandafter\textbackslash else}\texttt{\#1}\texttt{\fi}\%  

Thanks to \textsc{egreg, Andrei Vihrov, Martin Scharrer} on \url{tex.stackexchange.com} for the help to implement a command that checks a comma separated list.

2.2 Draft mode

\texttt{\textbackslash IfDraft} Tests if \texttt{\@draft} is undefined and executed false path in case draft string is defined.

\begin{verbatim}
\newcommand{\IfDraft}[1]{\ifx\@draft\@undefined \else #1 \fi}
\end{verbatim}

\texttt{\textbackslash IfNotDraft} Similar to \texttt{\IfDraft} but executes only path for draft mode undefined.

\begin{verbatim}
\newcommand{\IfNotDraft}[1]{\ifx\@draft\@undefined #1 \fi}
\end{verbatim}

\texttt{\textbackslash IfNotDraftElse} Similar to \texttt{\IfDraft} but executes true and false path.

\begin{verbatim}
\newcommand{\IfNotDraftElse}[2]{\ifx\@draft\@undefined #1 \else #2 \fi}
\end{verbatim}

2.3 Packages

If a package is loaded can be checked in many ways, but here the \texttt{\ltx@ifpackageloaded} is used because it can be executed anywhere in the document.

\texttt{\textbackslash IfPackageLoaded} Wrapper to \texttt{\ltx@ifpackageloaded} with only true path.

\begin{verbatim}
\newcommand{\IfPackageLoaded}[2]{\ltx@ifpackageloaded\{#1\}\{#2\}\}}
\end{verbatim}

\texttt{\textbackslash IfPackageNotLoaded} Wrapper to \texttt{\ltx@ifpackageloaded} with only false path.

\begin{verbatim}
\newcommand{\IfPackageNotLoaded}[2]{\ltx@ifpackageloaded\{#1\}\{#2\}\}}
\end{verbatim}

\texttt{\textbackslash IfElsePackageLoaded} Wrapper to \texttt{\ltx@ifpackageloaded}

\begin{verbatim}
\let\IfElsePackageLoaded\ltx@ifpackageloaded
\end{verbatim}
\IfPackagesLoaded  Checks a list of packages
56 \newcommand{\IfPackagesLoaded}[1]{%
57 \@tempswatrue
58 \def\do##1{%
59 \edef\@tempa{\zap@space##1 \empty}\%
60 \ltx@ifpackageloaded{\@tempa}{\@tempswafalse}\%
61 \}
62 \docsvlist{#1}\%
63 \if@tempsw\expandafter\@firstoftwo\else\expandafter\@secondoftwo\fi%
64 %
65 %}

\IfPackagesNotLoaded  Invers check if all packages in a list are not loaded
66 \newcommand{\IfPackagesNotLoaded}[1]{%
67 \@tempswatrue
68 \def\do##1{%
69 \edef\@tempa{\zap@space##1 \empty}\%
70 \ltx@ifpackageloaded{\@tempa}{\@tempswafalse}{}\%
71 \}
72 \docsvlist{#1}\%
73 \if@tempsw\expandafter\@firstoftwo\else\expandafter\@secondoftwo\fi%
74 %
75 %}

\ExecuteAfterPackage  Executes the code after the reference package has been loaded (using \AfterAtEndOfPackage) or finally at the end of the preamble if the reference package was not loaded until then.
76 \newcommand{\ExecuteAfterPackage}[2]{%
77 %#1: after this package
78 %#2: code to execute
79 \AfterAtEndOfPackage{#1}{%
80 #2\%
81 }
82 \AtEndPreamble%
83 \IfPackageNotLoaded{#1}{%
84 #2\%
85 }
86 %}
87 %

\ExecuteBeforePackage  Executes the code directly before the reference package is loaded (using \BeforePackage) or finally at the end of the preamble if the reference package was not loaded until then.
88 \newcommand{\ExecuteBeforePackage}[2]{%
89 %#1: before this package
90 %#2: code to execute
91 \BeforePackage{#1}{%
92 #2\%
93 %}
2.4 Tikz library

\IfTikzLibraryLoaded \textbf{\texttt{Checks if the tikz library is loaded}}

```latex
\def\IfTikzLibraryLoaded#1{\ifcsname tikz@library@#1@loaded\endcsname\expandafter\@firstoftwo\else\expandafter\@secondoftwo\fi}
```

Thanks to \textsc{egreg} and \textsc{Marco Daniel} on \texttt{tex.stackexchange.com} for their help with this command.

2.5 Column types in tables

The code in this section was inspired by the discussion with \textsc{EGREG} on \texttt{tex.stackexchange.com} on the detection of column definitions.

Creates a list of predefined column types

```latex
\expandafter\let\csname columntype@l\endcsname\@empty
\expandafter\let\csname columntype@c\endcsname\@empty
\expandafter\let\csname columntype@r\endcsname\@empty
\expandafter\let\csname columntype@p\endcsname\@empty
\expandafter\let\csname columntype@m\endcsname\@empty
\expandafter\let\csname columntype@b\endcsname\@empty
\expandafter\let\csname columntype@@\endcsname\@empty
\expandafter\let\csname columntype@!\endcsname\@empty
\expandafter\let\csname columntype@|\endcsname\@empty
\expandafter\let\csname columntype@<\endcsname\@empty
\expandafter\let\csname columntype@>\endcsname\@empty
\expandafter\let\csname columntype@=\endcsname\@empty
\CheckIfColumntypeDefined\textbf{\texttt{Creates a bool variable that saves the status of the column type.}}

\newcommand\CheckIfColumntypeDefined[1]{\providebool{tpl@coltype@#1}}
```

\%
126 \% check if new column type of this name was created
127 \ifcsdef{NC@find}\string#1\%
128 \{\setbool{tpl@coltype@#1}\{true\}\%
129 \%
130 \% if not check if it is a predefined column type
131 \{\ifcsdef{column@type}\string#1\%
132 \{\setbool{tpl@coltype@#1}\{true\}\%
133 \{\setbool{tpl@coltype@#1}\{false\}\%
134 \%
135 \%

\isColumntypeDefined \% Returns the bool variable which can be interpreted by \ifboolexpr. This should only be used internally and fails for nonexistent bool variables.
136 \newcommand\isColumntypeDefined[1]{tpl@coltype@#1}
137 \%

\IfColumntypeDefined \% Executes \CheckIfColumntypeDefined and uses the resulting bool variable with \isColumntypeDefined in a conditional sequence with \ifboolexpr.
138 \newcommand{\IfColumntypeDefined}[3]{%
139 \%
140 \% Execute check which create bool variable
141 \CheckIfColumntypeDefined{#1}
142 \%
143 \% use bool variable for if sequence
144 \ifboolexpr{ bool{\isColumntypeDefined{#1}} }{#2}{#3}%
145 }%

\IfColumntypesDefined \% Checks a comma separated list instead of a single string.
146 \newcommand{\IfColumntypesDefined}[1]{%
147 \@tempswatrue
148 \def{do}{1}{%
149 \edef{tempa}{\zap@space\#1 \&empty}%
150 \%
151 \%
152 \%
153 \%
154 \%
155 \%
156 \%
157 \%
158 \%

2.6 Color definitions

\IfColorDefined \% Tests if a color is defined
159 \newcommand{\IfColorDefined}[3]{%
160 \ifcsdef{\string\color \#1}
\IfColorsDefined \Does the same for a list (comma separated) of color names.

\IfMathVersionDefined \Checks if a mathversion font is defined.

\IfGlossariesStyleDefined \Checks if a glossaries style is defined.

\IfBibEnvironmentDefined \Checks if a bib environment is defined.
2.10 Template definitions

`\SetTemplateDefinition` Defines a macro with the `group` and `property` parameter names.

```latex
\newcommand\SetTemplateDefinition[3]{% 1: group, 2: property, 3: code
  \csdef{tpl@definition@#1@#2}{#3}
%
}
```

`\UseDefinition` Executes the macro using `\csuse` if it is defined. Otherwise a warning is thrown.

```latex
\newcommand\UseDefinition[2]{% 1: #1, 2: #2
  \ifcsdef{tpl@definition@#1@#2}
    \csuse{tpl@definition@#1@#2}
  \else
    \PackageWarning{templatetools}{Definition #1->#2 is unknown\MessageBreak}{}
  \fi
%
%
}
```

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\end{array}
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