Name

FLOW – Typeset Flow diagrams in \LaTeX

Date

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Synopsis

\ texttt{STRUCT\{struct name\}\{structure purpose\}\{statements\}}

For a description of the statements see section Macros

Description

The Flow macros enable the user to create flow diagrams in a \LaTeX
document. The macros can be used in any type of document, within all the standard \LaTeX
environments. A flow diagram in this context is described in macros resembling a pseudo code. The
diagram itself is defined as a structure and is built from statements. Macros are available
for all standard programming statements (if, while, action etc.).
The Language Sensitive Editor for \LaTeX, LSA, is extended to support the creation of flow
diagrams with the Flow macros.
The macros needed to create a flow diagram in your \LaTeX
document will be made available
to you when you include the option Flow in the \documentstyle command at the start
of your \LaTeX
document, as in the following example:

\documentstyle[11pt,Flow]{article}

A flow diagram in the context of the Flow macros is called a structure. The drawing of the
diagram is based on units. A unit can be seen as the box in which an action is described.
The unit has an attribute, the width. It determines the width of the boxes to be drawn.
Users can change the width of units through a macro which must be used before the actual
structure is described.
By default the text in the diagrams is typeset in the same size as the text in the document.
This will be too large. Before starting a structure it is advised to set the desired text size.
For the default setting of the unit width \texttt{\scriptsize} is recommended.
When you run into errors like overfull \texttt{vbox[]} you may have to use a smaller text size
like \texttt{\tiny}. In a default sized box 4 lines of \texttt{\scriptsize} text can be placed. When \texttt{\tiny}
is used 5 lines will fit.
Do not forget to reset the text size to \texttt{\normalsize} after the structure.

Macros

The available macros fall into three categories:

1. Width setting of the units. It must appear before the structure.
2. Definition of the structure itself.
3. Statements. They must appear within the structure definition.
Width setting macro is:
\[\texttt{\textbackslash unitwidth} = \texttt{size}\]
Specifies the minimum width of a unit. Size must be given as a standard \LaTeX\ length.

Structure definition macro is:
\[\texttt{\textbackslash STRUCT}\{\text{struct-name}\}\{\text{struct-description}\}\{\text{statements}\}\%\]
Specifies the complete diagram. The structure name will appear at the top of the flow diagram and the description, which can be a short description of its purpose, will be put beside the actual diagram. The statements of the structure, described below, must be specified as part of the \texttt{\textbackslash STRUCT} command.

Statement macros are:
\[\texttt{\textbackslash ACTION}\{\text{action}\}\%\]
Specifies a normal statement.

\[\texttt{\textbackslash PROC}\{\text{proc-name}\}\{\text{proc-description}\}\%\]
Specifies a special kind of action, a procedure call. The proc-name will be put below the proc-description text in the same box, separated by a horizontal line.

\[\texttt{\textbackslash LABEL}\{\text{lab-name}\}\%\]
Specifies a label with a label-name of only a few letters.

\[\texttt{\textbackslash IF}\{\text{condition}\}\{\text{THEN}\{\text{statements}\}\{\text{ELSE}\{\text{statements}\}\{\text{ENDIF}\}\%\]
Specifies an if statement with a condition and a collection of statements in the \texttt{THEN} and the \texttt{ELSE} part. Neither the \texttt{THEN} nor the \texttt{ELSE} part is optional. If one of them is not needed an empty statement, \texttt{"{}\}}, must be used.

\[\texttt{\textbackslash REPEAT}\{\text{statements}\}\{\text{UNTIL}\{\text{test}\}\%\]
Specifies a loop statement with a collection of statements and an end-condition.

\[\texttt{\textbackslash WHILE}\{\text{condition}\}\{\text{statements}\}\{\text{ENDWHILE}\}%\]
Specifies a loop statement with a start-condition and a collection of statements.

\[\texttt{\textbackslash CASE}\{\text{case-item}\}\{\text{when-statements}\}\{\text{ENDCASE}\}%\]
Specifies a case statement with a case-item and a collection of when-statements.

\[\texttt{\textbackslash WHEN}\{\text{condition}\}\{\text{statements}\}%\]
Part of a case statement. Specifies a condition and a collection of statements.

Options are:
\[\texttt{\textbackslash setiftext}\{\text{downward}\}\{\text{right-hand}\}%\]
Specifies the text to be put on the downward and right-hand sides of the condition of an if statement. By default the settings are empty. The scope for these settings depends on the position of the command within the document.

−If the command occurs before a \texttt{\textbackslash STRUCT} statement, the settings remain valid for all \texttt{\textbackslash IF} statements in all following structures until they are reset by a \texttt{\textbackslash setiftext} command with the same scope. (Remember to put the \texttt{\textbackslash setiftext} command \texttt{after} any font size changing commands).

−If the command occurs inside a \texttt{\textbackslash STRUCT} statement but outside any other commands, the settings will remain valid for all \texttt{\textbackslash IF} statements in the same structure until they are reset by a \texttt{\textbackslash setiftext} command with the same scope.

−If the command occurs inside a command within a structure, the settings will remain valid for all \texttt{\textbackslash IF} statements within the command (for instance an if statement within the then or else part of another if statement) until they are reset by a \texttt{\textbackslash setiftext} command with the same scope.
It is allowed to ‘nest’ the \setiftext commands, thus changing the settings for a particular part of a structure or a document.

Note that each line within the structure, including the command itself, must be concluded by a %.

The text appearing (between the braces) in the structure definition and in all statements is free but must adhere to the standard \LaTeX syntax. Every text is considered a paragraph in the \LaTeX context.

Files

The file TEX$INPUTS:FLOW.STY specifies the flow macros.

See also

The pages on \LaTeX, LSA and NASSI in this section of the manual.

Bugs

The Flow option is mutually exclusive with the Nassi option because the same macro names are used.

Always put the same number of actions in each branch (\textit{WHEN} statement) of a \textit{CASE} statement. Only \textit{ACTION} and \textit{PROC} statements are allowed here.

\textit{Flow} has a limit to the number of statement macro’s in one structure definition. For example a maximum of 26 IF macro’s can be used. If one of these limits is reached, \LaTeX shows some curious error messages, like “You cannot use = as a prefix”, which have no relation at all to the real problem.

Example

The following is an example of a structure with all possible statements. The resulting diagram is shown below.

\scriptsize
\begin{verbatim}
\STRUCT{struct name}{structure purpose}{%
  \ACTION{initial statement}%
  \PROC{proc name}{procedure purpose}%
  \IF{condition\ to test}%
    \THEN{%
      \ACTION{true action 1}%
      \ACTION{true action 2}%
    }%
  \ELSE{%
    \ACTION{false action}%
  }%
  \ENDIF%
\LABEL{A}%
\REPEAT{%
  \ACTION{statement to repeat}%
}%
\end{verbatim}
\UNTIL{end condition}\\
\WHILE{start condition}\\
\ACTION{statement to do}\\\
\ENDWHILE\\
\CASE{case item}\\
\WHEN{condition 1}\\
\ACTION{statement to do}\\
\ENDWHILE\\
\WHEN{condition 2}\\
\ACTION{statement to do}\\
\WHEN{condition 3}\\
\ACTION{statement to do}\\
\ENDCASE\\
\normalsize