Name

FLOW – Typeset Flow diagrams in LaTeX

Date

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Synopsis

`\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 build 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 file, 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 with 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 to large. Before starting a structure it is adviced to set the desired text size. For the default setting of the unit width `\scriptsize` is recommended.
When you run into errors like `overfull vbox[]` you may have to use a smaller text size like `\tiny`. In a default sized box 4 lines of `scriptsize` text can be placed. When `tiny` is used 5 lines will fit.
Do not forget to reset the text size to `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:

- `\unitwidth=size`
  Specifies the minimum width of a unit. Size must be given as a standard LaTeX length.

Structure definition macro is:

- `\STRUCT{struct-name}{struct-description}{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 `\STRUCT` command.

Statement macros are:

- `\ACTION{action}%`
  Specifies a normal statement.
- `\PROC{proc-name}{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.
- `\LABEL{lab-name}%`
  Specifies a label with a label-name of only a few letters.
- `\IF{condition}\THEN{statements}\ELSE{statements}\ENDIF%`
  Specifies an if statement with a condition and a collection of statements in the `THEN` and the `ELSE` part. Neither the `THEN` nor the `ELSE` part is optional. If one of them is not needed an empty statement, "`{}`", must be used.
- `\REPEAT{statements}\UNTIL{test}%`
  Specifies a loop statement with a collection of statements and an end-condition.
- `\WHILE{condition}{statements}\ENDWHILE%`
  Specifies a loop statement with a start-condition and a collection of statements.
- `\CASE{case-item}{when-statements}\ENDCASE%`
  Specifies a case statement with a case-item and a collection of when-statements.
- `\WHEN{condition}{statements}%`
  Part of a case statement. Specifies a condition and a collection of statements.

Options are:

- `\setiftext{downward}{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 `\STRUCT` statement, the settings remain valid for all `\IF` statements in all following structures until they

are reset by a `\setiftext` command with the same scope. (Remember to put the `\setiftext` command **after** any font size changing commands).

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

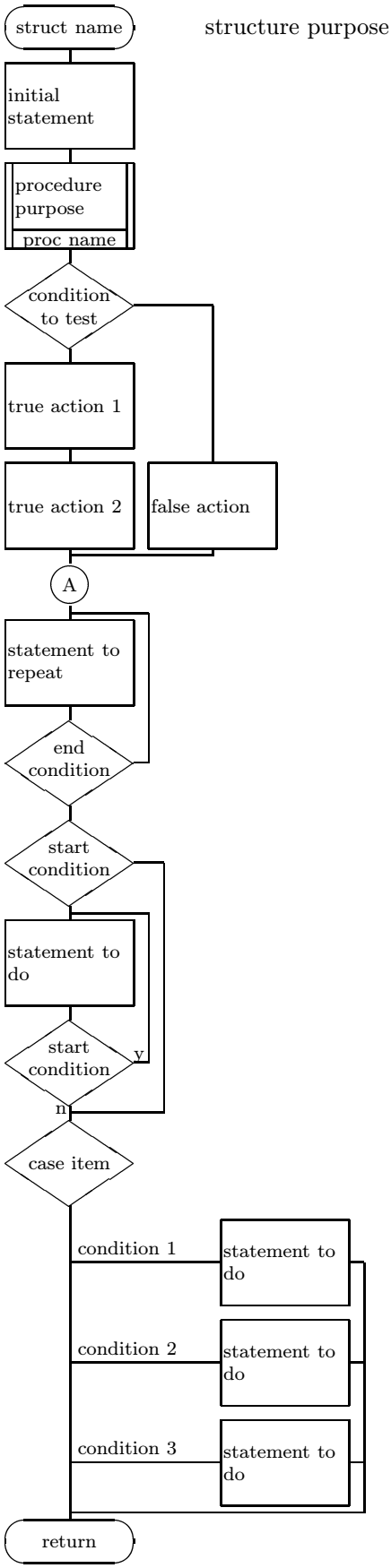
The `Flow` option is mutually exclusive with the `Nassi` option because the same macro names are used.
Always put the same number of actions in each branch (`WHEN` statement) of a `CASE` statement. Only `ACTION` and `PROC` statements are allowed here.
`Flow` has a limit to the number of statement macro's 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
\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}%
  }%
  \UNTIL{end condition}%
  \WHILE{start condition}{%
    \ACTION{statement to do}%
  }%
  \ENDWHILE%
  \CASE{case item}{%
    \WHEN{condition 1}{%
      \ACTION{statement to do}%
    }%
    \WHEN{condition 2}{%
      \ACTION{statement to do}%
    }%
    \WHEN{condition 3}{%
      \ACTION{statement to do}%
    }%
  }%
  \ENDCASE%
}%
\normalsize
```


struct name
structure purpose
initial statement
procedure purpose
proc name
condition to test
true action 1
true action 2
false action
A
statement to repeat
end condition
start condition
statement to do
start condition
y
n
case item
condition 1
statement to do
condition 2
statement to do
condition 3
statement to do
return