

The switch Package

Version 1.1

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Abstract

This package offers two commands aimed at implementing a switch/case alike command.

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1 Introduction

There are many ways of implementing a switch case programming structure. Notably, one can use `\str_case:nn` from `expl3`, or go over a loop using `\pdfstrcmp`, or construct an if-then-else tower, etc.

This implements a solution, based on [1], which (besides being simple) has the advantage of being constant time: once the cases are set up, suffice a single (internal) if (`\ifcsname`) to select the correct code to be executed.

Note: The implementation creates a `\csname` for each case, and it uses (at the end) the primitive `\ifcsname` to select the correct case.

Note: The coding is done using `expl3`, just for the sake of readability, in the package comments one can find an implementation using just TeX primitives.

2 Commands

Two set of commands are created, one to be used in a `expl3` code régime, and another set to be used in a user document.

2.1 User Document ones

`\newswitch` `\newswitch <switch> {(default-code)}`

It will create a new switch `<switch>`, which will expects a single argument. In case the argument doesn't corresponds to any defined case, `<default-code>` will be used. The resulting `<switch>` command is expandable, if `<default-code>` and `<case-code>` (added by `\addcase`) also are. This is just an alias for `\switch_new:Nn`

Note: `#1` can be used in `<default-code>`. An error is raised if `<switch>` is already defined.

*<https://github.com/alceu-frigeri/switch>

`\addcase` `\addcase <switch> {<case>} {<case-code>}`

It will add a <case> to a previously defined <switch> and associates <case-code> with it. <case> will be fully expanded at definition time. Once defined one can call `\switch {case}`, which will put said <case-code> in the input stream. This is just an alias for `\switch_addcase:Nnn`.

2.1.1 Example

First we create a switch, and associate a few (or more) cases. Note the possibility of using an auxiliary (fully expandable) macro/command when defining the cases.

```
\def\CaseAstring{case-A}
\newswitch \myCase {I~ don't~ know:~ #1\par}
\addcase \myCase {\CaseAstring} {A~ was~ used\par}
\addcase \myCase {case-B} {B~ was~ used\par}
```

To use the <switch>, one just has to call it with <case> as an argument. Note the possibility of using an auxiliary macro/command (which has to be fully expandable) as a <case>.

```
\def\somemacro{case-A}
\def\someothermacro{case-X}
```

```
If B, then \myCase{case-B}
If A, then \myCase{case-A}
If X, then \myCase{case-X}
```

```
if somemacro: \myCase{\somemacro}
if someothermacro: \myCase{\someothermacro}
```

```
If B, then B was used
If A, then A was used
If X, then I don't know: case-X
if somemacro: A was used
if someothermacro: I don't know: case-X
```

2.2 Expl3 ones

`\switch_new:Nn` `\switch_new:Nn <switch> {<default-code>}`

It will create a new switch <switch>, which will expects a single, type n, argument. In case the argument doesn't corresponds to any defined case, <default-code> will be used. The resulting <switch> command is expandable, if <default-code> and <case-code> (added by `\switch_addcase:Nnn`) also are.

Note: #1 can be used in <default-code>. An error is raised if <switch> is already defined.

`\switch_addcase:Nnn` `\switch_addcase:Nnn <switch> {<case>} {<case-code>}`

It will add a <case> to a previously defined <switch> and associates <case-code> with it. <case> will be fully expanded at definition time. Once defined one can call `\switch {case}`, which will put said <case-code> in the input stream.

```
\switch_if_exist:NTF ★ \switch_if_exist:NTF <switch> {<if-true>} {<if-false>}
\switch_if_case_exist:NnTF ★ \switch_if_case_exist:NnTF <switch> {<case>} {<if-true>} {<if-false>}
```

new: 2025-05-13

Tests if the <switch>, or <case>, are defined or not. It doesn't test if they are really a <switch>/<case>.

```
\switch_undefine:N \switch_undefine:N <switch>
\switch_case_undefine:Nn \switch_case_undefine:Nn <switch> {<case>}
```

new: 2025-05-13

Undefine the <switch> and/or specific <case>. Please note, when undefining a <switch>, the \csname associated with the cases aren't undefined (if needed, they have to be undefined one by one).

2.2.1 Example

First we create a switch, and associate a few (or more) cases. Note the possibility of using an auxiliary (fully expandable) macro/command when defining the cases.

```

\ExplSyntaxOn
\def\CaseAstring{case-A}
\switch_new:Nn \TextCase {I~ don't~ know:~ #1\par}
\switch_addcase:Nnn \TextCase {\CaseAstring} {A~ was~ used\par}
\switch_addcase:Nnn \TextCase {case-B} {B~ was~ used\par}
\ExplSyntaxOff

```

To use the `<switch>`, one just has to call it with `<case>` as an argument. Note the possibility of using an auxiliary macro/command (which has to be fully expandable) as a `<case>`.

<pre> \def\somemacro{case-A} \def\someothermacro{case-X} If B, then \TextCase{case-B} If A, then \TextCase{case-A} If X, then \TextCase{case-X} if somemacro: \TextCase{\somemacro} if someothermacro: \TextCase{\someothermacro} </pre>	<pre> If B, then B was used If A, then A was used If X, then I don't know: case-X if somemacro: A was used if someothermacro: I don't know: case-X </pre>
--	---

3 Advanced Use

Since the resulting `<switch>` is fully expandable (if the provided `<case-code>`s also are), one can design the `<case-code>`s to absorb one or more parameter/tokens.

Careful: make sure that all `<case-code>`s absorb the same number of parameters, to avoid “leftovers” or tricky errors.

For instance, note the use of `\@gobble` to absorb an unused parameter, or how `\cmdY` is defined (with two parameters) then used with a “fixed one”. The resulting command, `\TCase`, absorbs 2 tokens/parameters:

```

\NewDocumentCommand \cmdX{m} {I got #1}
\NewDocumentCommand \cmdY{mm} {Two: #1 and #2}
\NewDocumentCommand \Astring{} {case-A}

\makeatletter
\newswitch \TCase {I~ don't~ know:~ #1 \@gobble}
\makeatother
\addcase \TCase {\Astring} {\cmdY{A~ given}}
\addcase \TCase {case-B} {B~ was~ used. \cmdX}

```

<pre> If B, then \TCase{case-B}{extra-B}\par If A, then \TCase{case-A}{extra-A}\par If X, then \TCase{case-X}{extra-X}\par </pre>	<pre> If B, then B was used. I got extra-B If A, then Two: A given and extra-A If X, then I don't know: case-X </pre>
---	---

Needless to say, the same applies under `expl3`.

```

\ExplSyntaxOn
\cs_new:Npn \__cmdX:n #1 {I~ got~ #1}
\cs_new:Npn \__cmdY:nn #1#2 {Two:~ #1~ and~ #2}
\tl_new:N \l__case_tl
\tl_set:Nn \l__case_tl {case-A}

\switch_new:Nn \TxCase {I~ don't~ know:~ #1 \use_none:n}
\switch_addcase:Nnn \TxCase {\l__case_tl} {\__cmdY:nn{A~ given}}
\switch_addcase:Nnn \TxCase {case-B} {B~ was~ used.~ \__cmdX:n}
\ExplSyntaxOff

```

<pre> If B, then \TxCase{case-B}{extra-B}\par If A, then \TxCase{case-A}{extra-A}\par If X, then \TxCase{case-X}{extra-X}\par </pre>	<pre> If B, then B was used. I got extra-B If A, then Two: A given and extra-A If X, then I don't know: case-X </pre>
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References

- [1] Paul Gaborit. *Stack Exchange answer about Implementing Switch Cases*. 2012. URL: <https://tex.stackexchange.com/questions/64131/implementing-switch-cases/343306#343306> (visited on 12/10/2016).