

The commandoptionals package*

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1 Introduction

This package provides a command `\newcommandoptionals` that allows defining new commands with a variable number of optional and mandatory arguments.

2 Usage

`\newcommandoptionals{\langle cmd \rangle}[\langle num_opt \rangle][\langle num_mand \rangle]`
Defines a new command `\langle cmd \rangle`.

- `\langle num_opt \rangle`: Number of optional arguments (default 0).
- `\langle num_mand \rangle`: Number of mandatory arguments (default 0).

The sum of optional and mandatory arguments must not exceed 9.

The syntax for the defined command will be: `\langle cmd \rangle [\langle opt1 \rangle]...[\langle optN \rangle]{\langle mand1 \rangle}...{\langle mandM \rangle}`

3 Implementation

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{commandoptionals}[2026/01/31 v1.2 Command with variable optionals]
3
4 \RequirePackage{xparse}
5
6 \ExplSyntaxOn
7
8 % Variables to store counts and temporary lists
9 \int_new:N \l__cmdopt_opt_count_int
10 \int_new:N \l__cmdopt_mand_count_int
11 \int_new:N \l__cmdopt_total_count_int
12 \tl_new:N \l__cmdopt_arg_spec_tl
```

*This document corresponds to `commandoptionals` v1.2, dated 2026/01/31.

```

13 \tl_new:N \l__cmdopt_cmd_name_tl
14 \seq_new:N \l__cmdopt_defaults_seq
15
16 % Error message
17 \msg_new:nnn { commandoptionals } { too-many-args }
18 {
19 The~sum~of~optional~(#1)~and~mandatory~(#2)~arguments~must~be~maximum~9.
20 }
21
22 % Main command: \newcommandoptionals{\cmd}{N} [M]
23 \NewDocumentCommand{\newcommandoptionals}{ m O{0} O{0} }
24 {
25 \tl_set:Nn \l__cmdopt_cmd_name_tl { #1 }
26 \int_set:Nn \l__cmdopt_opt_count_int { #2 }
27 \int_set:Nn \l__cmdopt_mand_count_int { #3 }
28
29 % Check constraints
30 \int_set:Nn \l__cmdopt_total_count_int { \l__cmdopt_opt_count_int + \l__cmdopt_mand_count_int }
31 \int_compare:nNnTF { \l__cmdopt_total_count_int } > { 9 }
32 {
33 \msg_error:nnxx { commandoptionals } { too-many-args }
34 { \int_use:N \l__cmdopt_opt_count_int }
35 { \int_use:N \l__cmdopt_mand_count_int }
36 }
37 {
38 % Clear previous defaults
39 \seq_clear:N \l__cmdopt_defaults_seq
40 % Start scanning for default values
41 \__cmdopt_scan_defaults:n { \l__cmdopt_opt_count_int }
42 }
43 }
44
45 \cs_new_protected:Npn \__cmdopt_scan_defaults:n #1
46 {
47 \int_compare:nNnTF { #1 } > { 0 }
48 {
49 % Expect a default value in []
50 \__cmdopt_grab_default:w { #1 }
51 }
52 {
53 % Finished defaults, read body
54 \__cmdopt_read_body:w
55 }
56 }
57
58 \NewDocumentCommand{ \__cmdopt_grab_default:w } { m r[] }
59 {
60 \seq_put_right:Nn \l__cmdopt_defaults_seq { #2 }
61 \__cmdopt_scan_defaults:n { \int_eval:n { #1 - 1 } }
62 }

```

```

63
64 % Read body: { ... }
65 \NewDocumentCommand{ \__cmdopt_read_body:w } { +m }
66 {
67 \__cmdopt_define_command:n { #1 }
68 }
69
70 \cs_new_protected:Npn \__cmdopt_define_command:n #1
71 {
72 \tl_clear:N \l__cmdopt_arg_spec_tl
73
74 % Append Optional specs 0{default}
75 \seq_map_inline:Nn \l__cmdopt_defaults_seq
76 {
77 \tl_put_right:Nn \l__cmdopt_arg_spec_tl { 0{ ##1 } }
78 }
79
80 % Append Mandatory specs m
81 \int_step_inline:nn { \l__cmdopt_mand_count_int }
82 {
83 \tl_put_right:Nn \l__cmdopt_arg_spec_tl { m }
84 }
85
86 % Define the command
87 % parsing the tl variables to get the content
88 \use:x { \DeclareDocumentCommand \exp_not:V \l__cmdopt_cmd_name_tl { \l__cmdopt_arg_spec_tl } }
89 }
90
91 \ExplSyntaxOff

```