

oops, an object oriented practical scribe’s package.*

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Abstract

`oops` is a package for L^AT_EX (hence “scribe”) for generating macro definitions as the need arises in the document, and to organize them along two dimensions: functions and objects, hence “OO”. This is done using a minimalist interface built upon `xparse`[3]. Specifically, `\Ops<object>` begins a series of instructions alternating between ‘text’ and definitions, that themselves optionally expand using predefined or inline rules. For example,

```
\Ops<Math>[Let~]{Space=\Omega}*[-denote the sample space]{}
```

expands to: “Let Ω denote the sample space”. As a side effect, `\Space<Math>$` encodes “ Ω ”. `Math` being the default for `<object>`, it can be dropped. Optionally, the definitions can be written to a file, and restored, which can be useful for typesetting documents sharing the same notational conventions. Altogether, “practical”.

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*This file describes version v1.3, last revised 2020/04/06.

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Part I

Usage

This part describes .

Convention

1. Loosely, those of [2] and [3], for example as to the meaning of $\langle token list \rangle$ and -NoValue-.
2. If unspecified, the environment in which a function must be declared is **document**.
3. Where $\langle token list_1 \rangle$ is an optional argument, its default is **Math**.

`\usepackage` `\usepackage{oops}`

Environment Preamble

Requirement `oops.sty` is in the path of the L^AT_EX engine. See [Part III, section 4](#).

`\Ops` `\Ops<\langle token list_1 \rangle>`
`[\langle token list_2 \rangle]`
`i{\langle code_1 \rangle}`
`{\langle keyval list_1 \rangle}`
`*`
`s{\langle token list_3 \rangle}{\langle token list_4 \rangle}{\langle token list_5 \rangle}`
`o{\langle code_2 \rangle}`
`[\langle token list_6 \rangle]`

Requirement $\langle keyval list_1 \rangle$ is mandatory.

$\langle token list_1 \rangle$

Example **Math**, **ModelA**, **ModelB**

Semantics Registers a new object, if applicable

$\langle token\ list_2 \rangle$

Example Let~

Semantics Expands $\langle token\ list_2 \rangle$

$\langle code_1 \rangle$

Example $\mathbb{\#1}$

Semantics 1. $\langle val_i \rangle \leftarrow \langle code_1 \rangle$ applied to $\langle val_i \rangle$

$\langle keyval\ list_1 \rangle$

Example $\mathit{Elms}=\{\omega_1, \dots, \omega_n\}$, $\mathit{Sample}=\Omega$

Semantics 2. $\backslash\langle key_i \rangle\langle token\ list_1 \rangle < \langle val_i \rangle$ defined in 1.

3. If $\mathit{Write}=\mathit{BooleanTrue}$, writes the definitions made in 2. to file $\mathit{oops}\langle digits \rangle.\mathit{tex}$,
where $\langle digits \rangle=\mathit{pdfdate}$

*

Semantics 4. Expands $\langle code_2 \rangle$ applied to the list created in 1., using $\{\langle token\ list_3 \rangle\}\{\langle token\ list_4 \rangle\}\{\langle token\ list_5 \rangle\}$ as separator.

$\langle token\ list_3 \rangle$

Example $\{\sim\&\sim\}$

$\langle token\ list_4 \rangle$

Example $\{,\sim\}$

$\langle token\ list_5 \rangle$

Example $\{\sim\&\sim\}$

$\langle code_2 \rangle$

Example $\mathit{\$}\backslash\mathit{left}\{\mathit{\#1}\backslash\mathit{right}\backslash\mathit{\$}$

$\langle token\ list_6 \rangle$

Semantics $\backslash\mathit{Ops}\langle token\ list_1 \rangle > [\langle token\ list_6 \rangle]$

$\backslash\mathit{OpsClear}$

$\backslash\mathit{OpsClear}\langle keyval\ list \rangle >$

Semantics Clears any data created by $\backslash\mathit{Ops}\{\langle token\ list_1 \rangle\}$, for all $\langle token\ list_1 \rangle$ in
 $\langle keyval\ list \rangle$

$\backslash\mathit{OpsOption}$

$\backslash\mathit{OpsOption}\{\langle kv10 \rangle\}$

Semantics Set default options for $\backslash\mathit{Ops}$

Inner

Semantics Default for $\langle code_1 \rangle$

Syntax Use `####1` as the argument to be replaced

Name

Semantics Default for $\langle token\ list_1 \rangle$

Outer

Semantics Default for $\langle code_2 \rangle$

Syntax Use `####1` as the argument to be replaced

Separ

Semantics Default for $\{\langle token\ list_3 \rangle\}\{\langle token\ list_4 \rangle\}\{\langle token\ list_5 \rangle\}$

Syntax That of ‘separators’ in [2, Section 8 of l3seq]

Write

Syntax $\langle boolean \rangle$

\OpsRead `\OpsRead[$\langle path \rangle$]`

Semantics 1. Reads the definitions in $\langle path \rangle$.

 2. Writes to `oops.log`: ‘read from $\langle path \rangle$ ’

Other The default for $\langle path \rangle$ is the last write-file (see $\langle keyval\ list_1 \rangle$)

Part II

Listing

Warning: To reproduce the listings in a L^AT_EX document, use the same formatting instructions as those of the documentation portion of `oops.dtx` (such as `\documentclass`, `\usepackage`, and `\newtcblisting`), and remove any `^A`. Any deviation from the original may require tinkering.¹

Listing 1.

```
% \OpsOption{
% Inner={\char`####1\char`}},
% ^A% spaces betw. inner and outer brackets matter!->
% Separ={\ \char`@\ }{\ \char`@\ },
% Outer={\char`####1\$}}
% \Ops<Test>{ X =x, Y = y, Z = z }*
% \tab \X<Test>\Y<Test>\Z<Test>\
% \Ops<Test>i{(#1)}{ X = x, Y = y, Z = z }*
% \tab \X<Test>\Y<Test>\Z<Test>\
% \Ops<Test>{ X = x, Y = y, Z = z }*s{\ \&\ }{\ \&\ }
% \tab \X<Test>\Y<Test>\Z<Test>\
% \OpsOption{ Write = \BooleanTrue }
% \Ops<Test>{ X = x, Y = y, Z = z }*o{\char`[#1\char`]}
% \tab \X<Test>\Y<Test>\Z<Test>\
% \OpsClear<Test>
% \OpsOption{ Write = \BooleanFalse }
%
```

$\widehat{\{x\}}\% \{y\} @ \{z\}\$$	$\{x\}\{y\}\{z\}$
$\widehat{(x)}\% (y) @ (z)\$$	$(x)(y)(z)$
$\widehat{\{x\}, \{y\} \& \{z\}}\$$	$\{x\}\{y\}\{z\}$
$[\{x\}\% \{y\} @ \{z\}]$	$\{x\}\{y\}\{z\}$

Listing 2.

```
% \OpsRead \tab \X<Test>\Y<Test>\Z<Test>
% \OpsClear<Test>
%
```

 $\{x\}\{y\}\{z\}$

Listing 3.

```
% \Ops[We call~]{Elems={\omega_1, \dots, \omega_n}}*
% [-the elementary events, and ]{Space=\Omega}
% [\begin{equation*}\Space=(\Elems)\end{equation*}~the sample space.]
```

¹For instance, in testing v1.1, I realized `\usepackage[T1]{fontenc}` was needed, to work with `\documentclass{article}` in place of `\documentclass{full}` [l3doc], hence added it to the documentation portion of `oops.dtx`

```
% {}
% \Opclear
%
```

We call $\omega_1, \dots, \omega_n$ the elementary events, and

$$\Omega = (\omega_1, \dots, \omega_n)$$

the sample space.

Listing 4.

```
% \OpcOption{ Write = \BooleanTrue }
% \Opc[Let ]
% {Space=\Omega, SigmaField=\mathcal{F}, Measure=\mathcal{P}}
% *s{{,},{,},{,}}o{\ensuremath{\{\#1\}}}
% [-denote the probability space, where $\SigmaField\subset
2^{\{Space\}}$.]
% {}
% \Opclear
% \OpcOption{ Write = \BooleanFalse }
%
```

Let $\{\Omega, \mathcal{F}, \mathcal{P}\}$ denote the probability space, where $\mathcal{F} \subset 2^\Omega$.

Listing 5.

```
% \OpcRead \tab $\Omega$ $\SigmaField$ $\Measure$
% \OpcClear
%
```

$$\Omega \mathcal{F} \mathcal{P}$$

Listing 6.

```
% \OpcOption{ Write = \BooleanTrue }
% \newtheorem{theorem}{Theorem}
% \Opc if{\mathbb{\#1}}
% { N = { N }, R = { R }, Grad = { \operatorname{grad} } }
% [\begin{theorem}
% [Mittelwertsatz f\"ur $n$ Variable]Es-sei-
% { OffMenge = {D}, Ci = {C^{\{1\}}}, Strecke = {[x_0,x]} }
% [$n\in\mathbb{N}$, $\sim$OffMenge\subseteq\mathbb{N}^n$ eine offene Menge und
% $f\in Ci(\sim$OffMenge, $\mathbb{R})$.
% Dann gibt es auf jeder Strecke $\sim$Strecke\subseteq\sim$OffMenge$ einen
% Punkt $\xi\in\sim$Strecke$,~]
% { yD = { f(x)-f(x_0) }, xD = { x-x_0 }, Steig = { \frac{yD}{xD} }
% } }
% [so dass gilt
% \begin{equation*}
```

```

%      \Steig = \Grad f(\xi)^{\top}
%      \end{equation*}
%      \end{theorem}]
%      {}
%      \OpsClear
%      \OpsOption{ Write = \BooleanFalse }
%

```

Theorem 1 (Mittelwertsatz für n Variable) *Es sei $n \in \mathbb{N}$, $D \subseteq \mathbb{R}^n$ eine offene Menge und $f \in C^1(D, \mathbb{R})$. Dann gibt es auf jeder Strecke $[x_0, x] \subset D$ einen Punkt $\xi \in [x_0, x]$, so dass gilt*

$$\frac{f(x) - f(x_0)}{x - x_0} = \text{grad} f(\xi)^\top$$

Listing 7.

```

%      \OpsRead \tab $\mathbb{N}$ $\mathbb{R}$ $\text{OffMenge}$ $\mathbb{C}$ $\text{Strecke}$
%

```

$$\bar{N} \bar{R} \bar{D} \bar{C}^\top [\bar{x}_0, \bar{x}]$$

Part III

Other

1 Acknowledgment

This work has benefited from Q&A's from the L^AT_EX community, see here: <https://tex.stackexchange.com/users/112708/erwann?tab=questions>. Specific references are made in Part IV. Listing 3 and Listing 4 are from [1]. Listing 6 is from tcolbox[4, 17.3].

2 Issues

1. **Input:** `Inner={\{####1\}}`
Symptom: `\OopsRead` fails
Workaround: `Inner={\char'####1\char'}}`
See: Listing 1
2. **Input:** Inside $\langle keyval list_1 \rangle$, $\{[a, b]\}$
Workaround: $\{[a, b]\}$ or $\{\char'a, b\char'\}$
See: Listing 6
3. **Input:** Inside $\langle token list_2 \rangle$, $\{[a, b]\}$
Workaround: $\{[a, b]\}$
4. **Input:** Inside $\langle token list_2 \rangle$, `\cal F`
Workaround: `\mathcal{F}`

3 Install

Compiling `oops.dtx` (under Unix, `$tex oops.dtx`) will generate `oops.sty` and `oops.pdf`

4 Support

This package is available from <https://www.ctan.org/pkg/oops> and <https://github.com/rogard/oops>.

5 Unit testing

It's not possible to check the expansion of a certain class of macros against predefined values[5]. Instead, one can check that Part II, as generated in section 3 on one's own machine, agrees with `bench.pdf` available at <https://github.com/rogard/oops>,

References

- [1] A.N. Shiryaev *Probability* Springer, 1995
- [2] The L^AT_EX3 Project Team *The L^AT_EX3 interfaces* <http://ftp.math.purdue.edu/mirrors/ctan.org/macros/latex/contrib/l3kernel/interface3.pdf>
- [3] The L^AT_EX3 Project Team *The xparse package* <http://ftp.math.purdue.edu/mirrors/ctan.org/macros/latex/contrib/l3packages/xparse.pdf>
- [4] Thomas F. Sturm *The tcolorbox package* <http://www.texdoc.net/texmf-dist/doc/latex/tcolorbox/tcolorbox.pdf>
- [5] <https://tex.stackexchange.com/a/534100/112708>

Change History

v1.0	General: Initial version	10	Revamped: much of the implementation	10
v1.1	General: Added: Save	10	v1.2	General: Added: optional star to \OpsNew as instruction to expand
	Added: Listing 1., 2., 3., 4., 6., and 9.	10		keyval list ₁
	Added:\OpsRestore	10		Deleted: \OpsTest
	Added:\OpsTest	10		Deleted: keyval list ₂ and code ₃
	Deleted: Listing 1-5 from v1.0	10		Deleted: Listing 2-3 from v1.1.
	Fixed: apparent anomaly in v1.0's Listing 4, see Listing 1	10		Replaced: \OpsClear{<token list ₁ >} by \OpsClear[<keyval list>]
	Replaced: \OpsOptions by \OpsOption	10		Replaced: \Restore by \Read
	Replaced: {<keyval list ₂ >} by <keyval list ₂ > given that option type G not recommended[3]	10		Replaced: \Save by \Write
	Replaced: GenericObject by Name	10	v1.3	General: Replaced: \OpsNew by \Ops
	Replaced: Separators by Separ	10		Replaced: {<token list ₁ >} and [<token list ₁ >] by <token list ₁ >

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Part IV

Implementation

```

1 <@@=oops>
2 \NeedsTeXFormat{LaTeX2e}[2019/10/01]
3 \ExplSyntaxOn

```

1 aux

```

\__oops_aux_inner_set:n #1 : <code>
4 \cs_new_protected:Nn \__oops_aux_inner_set:n
5 {
6   \cs_gset:Npn \__oops_aux_inner:n ##1 { #1 }
7   \cs_generate_variant:Nn \__oops_aux_inner:n { e }
8 }

(End definition for \__oops_aux_inner_set:n.)

\__oops_aux_key:w #1 : <key>
#2 : <value>
9 \cs_new_protected:Npn \__oops_aux_key:w #1 = #2 \q_stop

```

```

10 {
11   \seq_gput_right:Nx \g__oops_aux_key_seq { \tl_trim_spaces:n{ #1 } }
12 }

```

(End definition for __oops_aux_key:w.)

```

\__oops_aux_key:n #1 : < key = value >
13 \cs_new_protected:Nn \__oops_aux_key:n
14 {
15   \__oops_aux_key:w #1 \q_stop
16 }

```

(End definition for __oops_aux_key:n.)

```

\__oops_aux_key:N #1 : < seq >
17 \cs_new_protected:Nn \__oops_aux_key:N
18 {
19   \seq_gclear_new:N \g__oops_aux_key_seq
20   \seq_map_function:NN #1 \__oops_aux_key:n
21 }

```

(End definition for __oops_aux_key:N.)

```

\__oops_aux_outer_set:n #1 : < inline code >
22 \cs_new_protected:Nn \__oops_aux_outer_set:n
23 {
24   \cs_gset:Npn \__oops_aux_outer:n ##1 { #1 }
25 }

```

(End definition for __oops_aux_outer_set:n.)

```

\__oops_aux_prop:w #1 : < key >
#2 : < value >
26 \prop_new:N \g__oops_aux_prop
27 \cs_new_protected:Nn \__oops_aux_prop:nn
28 {
29   \prop_gput:Nnn \g__oops_aux_prop{ #1 } { #2 }
30 }
31 \cs_generate_variant:Nn \__oops_aux_prop:nn { eo }
32 \cs_new_protected:Npn \__oops_aux_prop:w #1 = #2 \q_stop
33 {
34   \__oops_aux_prop:eo
35   { \tl_trim_spaces:n{ #1 } }
36   { \__oops_aux_inner:e{ \tl_trim_spaces:n{ #2 } } }
37 % ^^A\prop_gput:Noo \g__oops_aux_prop % v1.1, FAIL with N = N (OK with N= N)
38 % ^^A { \tl_trim_spaces:n{ #1 } } { \__oops_aux_inner:n{ #2 } }
39 }

```

(End definition for __oops_aux_prop:w.)

```

\__oops_aux_prop:n #1 : < key = value >
40 \cs_new_protected:Nn \__oops_aux_prop:n
41 {
42   \__oops_aux_prop:w #1 \q_stop
43 }

```

(End definition for __oops_aux_prop:n.)

```
\__oops_aux_prop:N #1 : <keyval list>
44 \cs_new_protected:Nn \__oops_aux_prop:N
45 {
46   \prop_gclear_new:N \g__oops_aux_prop
47   \seq_if_empty:NTF #1
48   { \c_empty_tl }
49   {
50     \seq_map_function:NN #1 \__oops_aux_prop:n
51   }
52 }
```

(End definition for __oops_aux_prop:N.)

```
\__oops_aux_val:Nn #1 : <seq>
#2 : <tl var name>
53 \cs_new_protected:Nn \__oops_aux_val:Nn
54 {
55   \seq_gclear_new:N \__oops_aux_val
56   \__oops_seq_from_prop:NNn \__oops_aux_val #1 { \__oops_prop_name:n{ #2 } }
57 }
```

(End definition for __oops_aux_val:Nn.)

2 log

```
\__oops_log_close:
58 \iow_new:N \g__oops_log_iow
59 \AtEndDocument{\iow_close:N \g__oops_log_iow}
60 \bool_set_false:N \g__oops_log_open_bool
61 \cs_new_protected:Nn \__oops_log_close:
62 {
63   \iow_close:N \g__oops_log_iow
64   \bool_gset_false:N \g__oops_log_open_bool
65 }
```

(End definition for __oops_log_close:.)

```
\__oops_log_open:
66 \cs_new_protected:Nn \__oops_log_open:
67 {
68   \tl_gset:Nx \g__oops_log_to_tl{oops\pdfdate}
69   \iow_open:Nn \g__oops_log_iow {\g__oops_log_to_tl}
70   \bool_gset_true:N \g__oops_log_open_bool
71 }
```

(End definition for __oops_log_open:.)

```

\__oops_log_read:n #1: <path>
72 \cs_new_protected:Nn \__oops_log_read:n
73 {
74   \file_input:n{#1}
75   \tl_log:n{read~from~#1}
76 }
77 \cs_generate_variant:Nn \__oops_log_read:n { e }

(End definition for \__oops_log_read:n.)

\__oops_log_read:
78 \cs_new_protected:Nn \__oops_log_read:
79 {
80   \__oops_log_read:ef\g__oops_log_to_tl}
81 }

(End definition for \__oops_log_read:.)

\__oops_log_write:n
82 \tl_new:N \g__oops_log_to_tl
83 \cs_new_protected:Nn \__oops_log_write:n
84 {
85   \bool_if:nTF{ \g__oops_log_open_bool }
86   {
87     \iow_now:Nn \g__oops_log_iow { #1 }
88     \tl_log:n{ write~to~#1 }
89   }
90   { \msg_error:nnn{ __oops }{ iow }{ \g__oops_log_iow } }
91 }
92 \cs_generate_variant:Nn \__oops_log_write:n { e }

(End definition for \__oops_log_write:n.)

```

3 make

```

\__oops_make_key:Nn #1: < token >
#2: < key >
93 \cs_new_protected:Nn \__oops_make_key:Nn
94 {
95   \exp_args:NNx
96   \ProvideDocumentCommand{ #1 }
97   { D<>{\g__oops_option_name_tl} }
98   {
99     \__oops_prop_item:nn{ ##1 }{ #2 }
100   }
101 }
102 \cs_generate_variant:Nn \__oops_make_key:Nn { c }

(End definition for \__oops_make_key:Nn.)

```



```

\__oops_make_key:n #1 : < key >

103 \cs_new_protected:Nn \__oops_make_key:n
104 {
105   \__oops_make_key:cn{#1}{#1}
106 }
107 \cs_generate_variant:Nn \__oops_make_key:n { e }

(End definition for \__oops_make_key:n.)

\__oops_make_key:N #1 : < seq >

108 \cs_new_protected:Nn \__oops_make_key:N
109 {
110   \seq_map_function:NN #1 \__oops_make_key:e
111 }

(End definition for \__oops_make_key:N.)

\__oops_make_new:nnnn #1 : < token list >
#2 : < seq1 >
#3 : < seq2 >
#4 : < prop >

112 \cs_new_protected:Npn \__oops_make_new:nnnn #1 #2 #3 #4
113 {
114   \exp_args:NNx \DeclareDocumentCommand \Ops
115   { D<>{#1} +o E{ i }{ { #2 } } m s E{ s o }{ { #3 }{ #4 } } +o }
116   {
117     \__oops_prop_if_exist:nTF{ ##1 }
118     { \c_empty_tl }
119     { \__oops_prop_new:n{ ##1 } }
120     \exp_args:No \__oops_aux_inner_set:n{ ##3 }
121     \seq_set_from_clist:Nn \g__oops_aux_keyval_seq { ##4 }
122     \__oops_aux_prop:N \g__oops_aux_keyval_seq
123     \__oops_prop_append:Nn \g__oops_aux_prop { ##1 }
124     \__oops_aux_key:N \g__oops_aux_keyval_seq
125     \__oops_make_key:N \g__oops_aux_key_seq
126     \bool_if:nTF{ \g__oops_log_open_bool }
127     {%^A https://tex.stackexchange.com/questions/536597
128       \__oops_log_write:n
129       {
130         \begingroup \def \__oops_log_entry { \Ops< ##1 >i{##3}{ ##4 } } \expandafter \endgroup
131       }
132     }\c_empty_tl}
133     \IfValueT{ ##2 }{ ##2 }
134     \IfBooleanT{ ##5 }
135     {
136       \__oops_aux_val:Nn \g__oops_aux_key_seq { ##1 }
137       \__oops_aux_outer_set:n{ ##7 }
138       \__oops_aux_outer:n
139       {
140         \exp_last_unbraced:NNo
141         \seq_use:Nnnn
142         \__oops_aux_val
143         { ##6 }

```

```

144     }
145   }
146   \IfValueT{ ##8 }
147   {
148     \exp_not:n{ \0ops< ##1 >[ ##8 ] }
149   }
150 }
151 }

```

(End definition for __oops_make_new:nnnn.)

4 msg

```

152 \msg_new:nnn {__oops}{ generic }{ #1 }
153 \msg_new:nnn {__oops}{ iow }{ #1~is~closed~can't~write }
154 \msg_new:nnn {__oops}{ keyonly }{ #1~does~not~take~values;~keyval~is~#2 }
155 \msg_new:nnn {__oops}{ keywrong }{ #1~does~not~recognize~key~#2 }
156 \msg_new:nnn {__oops}{ unset }{ #1~unset }

```

5 option

```

\__oops_aux_inner:n #1: <code>
157 \cs_new_protected:Nn \__oops_option_inner:n
158 {
159   \tl_gset:Nn \g__oops_option_inner_tl { #1 }
160 }
161 \__oops_option_inner:n
162 {
163   \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_inner_tl }
164 }

```

(End definition for __oops_aux_inner:n.)

```

\__oops_option_name:n #1: <token list>
165 \cs_new:Nn \__oops_option_name:n
166 {
167   \tl_gset:Nn \g__oops_option_name_tl{ #1 }
168 }
169 \__oops_option_name:n
170 {
171   \msg_error:nnx{ __oops }
172   { generic }
173   { \exp_not:N\g__oops_option_name_tl~undefined }
174 }

```

(End definition for __oops_option_name:n.)

```

\__oops_option_outer:n #1: <inline code>
175 \cs_new_protected:Nn \__oops_option_outer:n
176 {
177   \tl_gset:Nn \g__oops_option_outer_tl { #1 }
178 }
179 \__oops_option_outer:n

```

```

180 {
181   \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_outer_tl }
182 }

```

(End definition for __oops_option_outer:n.)

```

\__oops_option_separ:n #1 : { \ token list_1 } { \ token list_2 } { \ token list_3 }
183 \cs_new_protected:Nn \__oops_option_separ:n
184 {
185   \cs_gset:Npn \g__oops_option_separ_tl { #1 }
186 }
187 \__oops_option_separ:n
188 {
189   \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_separ_tl }
190 }

```

(End definition for __oops_option_separ:n.)

6 prop

```

\__oops_prop_append:NN #1 : \ prop_1
\__oops_prop_append:cN #2 : \ prop_2
191 \cs_new_protected:Npn \__oops_prop_append:NN #1 #2
192 {
193   \cs_set:Nn \__oops_prop_append:nn
194   {
195     \prop_gput:Nnx #1 { ##1 } { \prop_item:Nn #2 { ##1 } }
196   }
197   \prop_map_function:NN #2 \__oops_prop_append:nn
198 }
199 \cs_generate_variant:Nn \__oops_prop_append:NN { cN }

```

(End definition for __oops_prop_append:NN.)

```

\__oops_prop_append:Nn #1 : \ prop
#2 : \ tl var name
200 \cs_new_protected:Nn \__oops_prop_append:Nn
201 {
202   \__oops_prop_append:cN{ \__oops_prop_name:n { #2 } } #1
203 }

```

(End definition for __oops_prop_append:Nn.)

```

\__oops_prop_clear_new:n #1 : \ tl var name
204 \cs_new_protected:Nn \__oops_prop_clear_new:n
205 {
206   \exp_args:No \prop_clear_new:c{ \__oops_prop_name:n { #1 } }
207 }

```

(End definition for __oops_prop_clear_new:n.)

```

\__oops_prop_clear_new_map:n #1 : < keyval list >
208 \cs_new_protected:Nn \__oops_prop_clear_new_map:n
209 {
210   \seq_set_from_clist:Nn \g__oops_aux_key_seq { #1 }
211   \seq_map_function:NN \g__oops_aux_key_seq \__oops_prop_clear_new:n
212 }

(End definition for \__oops_prop_clear_new_map:n.)

\__oops_prop_if_exist:nTF #1 : < token list1 >
#2 : < token list2 >
#3 : < token list3 >
213 \cs_new:Nn \__oops_prop_if_exist:nTF
214 {
215   \prop_if_exist:cTF{ \__oops_prop_name:n { #1 } }{ #2 }{ #3 }
216 }

(End definition for \__oops_prop_if_exist:nTF.)

\__oops_prop_item:nn #1 : < tl var name >
#2 : < key >
217 \cs_new:Nn \__oops_prop_item:nn
218 {
219   \prop_item:cn { \__oops_prop_name:n { #1 } } { #2 }
220 }

(End definition for \__oops_prop_item:nn.)

\__oops_prop_name:n #1 : < tl var name >
221 \cs_new:Npn \__oops_prop_name:n #1{ __oops_#1 }

(End definition for \__oops_prop_name:n.)

\__oops_prop_new:n #1 : < tl var name >
222 \cs_new_protected:Nn \__oops_prop_new:n
223 {
224   \prop_new:c{ \__oops_prop_name:n { #1 } }
225 }

(End definition for \__oops_prop_new:n.)

```

7 seq

```

\__oops_seq_from_prop:NNn #1 : < seq1 >
#2 : < seq2 > (keys)
#3 : < prop >
226 \cs_new_protected:Nn \__oops_seq_from_prop:NNn
227 {
228   \cs_set_protected:Nn \__oops_seq_from_prop:n
229   {
230     \seq_gput_right:No #1 { \prop_item:cn{ #3 }{ ##1 } }
231   }
232   \seq_map_function:NN #2 \__oops_seq_from_prop:n
233 }

(End definition for \__oops_seq_from_prop:NNn.)

```

8 Front-end

```

234 \keys_define:nn { __oops }
235 {
236   Name .code:n={
237     % ^A    \__oops_aux_name:n{ #1 }
238     \__oops_option_name:n{ #1 }
239     \exp_last_unbraced:Nf
240     \__oops_make_new:nnnn
241     {
242       { \g__oops_option_name_tl }
243       { \g__oops_option_inner_tl }
244       { \g__oops_option_separ_tl }
245       { \g__oops_option_outer_tl }
246     }
247   },
248   Name .value_required:n = false,
249   Name .default:n = { Math },
250   Name .initial:n = { Math },
251   Inner .code:n={
252     \__oops_option_inner:n{ #1 }
253     \exp_last_unbraced:Nf
254     \__oops_make_new:nnnn
255     {
256       { \g__oops_option_name_tl }
257       { \g__oops_option_inner_tl }
258       { \g__oops_option_separ_tl }
259       { \g__oops_option_outer_tl }
260     }
261   },
262   Inner .value_required:n = false,
263   Inner .default:n = { #####1 },
264   Inner .initial:n = { #####1 },
265   Outer .code:n={
266     \__oops_option_outer:n{ #1 }
267     \exp_last_unbraced:Nf
268     \__oops_make_new:nnnn
269     {
270       { \g__oops_option_name_tl }
271       { \g__oops_option_inner_tl }
272       { \g__oops_option_separ_tl }
273       { \g__oops_option_outer_tl }
274     }
275   },
276   Outer .value_required:n = false,
277   Outer .default:n = { \ensuremath{#####1} },
278   Outer .initial:n = { \ensuremath{#####1} },
279   Write .code:n = {
280     \bool_if:nTF{#1}
281     {\__oops_log_open:}
282     {\__oops_log_close:}
283   },
284   Write .value_required:n = false,
285   Write .default:n = \BooleanFalse,

```

```

286 Write .initial:n = \BooleanFalse,
287 Separ .code:n={
288   \__oops_option_separ:n{ #1 }
289   \exp_last_unbraced:Nf
290   \__oops_make_new:nnnn
291   {
292     { \g__oops_option_name_tl }
293     { \g__oops_option_inner_tl }
294     { \g__oops_option_separ_tl }
295     { \g__oops_option_outer_tl }
296   }
297 },
298 Separ .value_required:n = false,
299 Separ .default:n = { { {\ }and{\ } } { ,{\ } } { ,{\ }and{\ } } },
300 Separ .initial:n = { { {\ }and{\ } } { ,{\ } } { ,{\ }and{\ } } }
301 }

```

\OpsClear #1 : $\langle \textit{tl var name} \rangle$

```

302 \NewDocumentCommand{ \OpsClear }
303 { D<>{\g__oops_option_name_tl} }
304 {
305   \__oops_prop_clear_new_map:n{ #1 }
306 }

```

(End definition for \OpsClear. This function is documented on page 4.)

\OpsOption

```

307 \NewDocumentCommand{ \OpsOption }
308 { m }
309 {
310   \keys_set:nn{ __oops }{ #1 } % TODO record
311 }

```

(End definition for \OpsOption. This function is documented on page 4.)

\OpsRead

```

312 \NewDocumentCommand{\OpsRead}
313 {o}
314 {
315   \IfValueTF{#1}
316   {\__oops_log_read:e{#1}}
317   {\__oops_log_read:}
318 }

```

(End definition for \OpsRead. This function is documented on page 5.)

9 Misc

```

319 \ExplSyntaxOff

```