

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

Erwann Rogard†

Released 2020/04/06

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, `\OpsNew{⟨token list₁⟩}`, where `⟨token list₁⟩` identifies an object, begins a series of instructions alternating between ‘text’ and definitions, that themselves optionally expand using predefined or inline rules. For example,

`\OpsNew{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 `⟨token list₁⟩`, `\Space` also works. 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”.

Contents

I	Usage	3
1	Convention	3
2	Loading the package	3
3	\OpsClear	3
4	\OpsNew	3
4.1	{⟨token list₁⟩}	3
4.2	[⟨token list₂⟩]	4
4.3	i{⟨code₁⟩}	4
4.4	{⟨keyval list₁⟩}	4
4.5	*	4
4.6	s{{⟨token list₃⟩}{⟨token list₄⟩}{⟨token list₅⟩}}	4
4.7	o{⟨code₂⟩}	4
4.8	[⟨token list₆⟩]	4

*This file describes version v1.2, last revised 2020/04/06.

†firstname dot lastname AusTria gmail dot com

5	\OpsOption	4
5.9	Inner	4
5.10	Name	5
5.11	Outer	5
5.12	Separ	5
5.13	Write	5
6	\OpsRead	5
II	Listing	6
	Listing 1.	6
	Listing 2.	6
	Listing 3.	6
	Listing 4.	7
	Listing 5.	7
	Listing 6.	7
	Listing 7.	8
III	Other	9
1	Acknowledgment	9
2	Bug	9
3	Install	9
4	Support	9
5	Unit testing	9
	Change History	11
	Index	11
IV	Implementation	13
1	aux	13
2	log	15
3	make	16

4	msg	18
5	option	18
6	prop	19
7	seq	21
8	Front-end	21
9	Misc	22

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**.

<code>\usepackage</code>	<code>\usepackage{oops}</code>
--------------------------	--------------------------------

Environment Preamble

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

<code>\OpsClear</code>	<code>\OpsClear[\langle keyval\ list \rangle]</code>
------------------------	--

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

<code>\OpsNew</code>	<code>\OpsNew{\langle token\ list_1 \rangle}</code> <code>[\langle token\ list_2 \rangle]</code> <code>i{\langle code_1 \rangle}</code> <code>{\langle keyval\ list_1 \rangle}</code> <code>*</code> <code>s{\langle token\ list_3 \rangle}{\langle token\ list_4 \rangle}{\langle token\ list_5 \rangle}</code> <code>o{\langle code_2 \rangle}</code> <code>[\langle token\ list_6 \rangle]</code>
----------------------	---

Requirement $\langle token\ list_1 \rangle$ and $\langle keyval\ list_1 \rangle$ are 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 Elms={ ω_1 , \dots , ω_n }, Sample= Ω

Semantics 2. $\langle key_i \rangle[\langle token\ list_1 \rangle] \leftarrow \langle val_i \rangle$ defined in 1.

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

*

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 {~\&~}

$\langle token\ list_4 \rangle$

Example {,~}

$\langle token\ list_5 \rangle$

Example {~\&~}

$\langle code_2 \rangle$

Example \#1

$\langle token\ list_6 \rangle$

Semantics $\backslash\text{OpsNew}\{\langle token\ list_1 \rangle\}[\langle token\ list_6 \rangle]$

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

Semantics Set default options for $\backslash\text{OpsNew}$

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 $\langle path \rangle$ ’

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\$}}
% \OpsNew{Test}{ X =x, Y = y, Z = z }*
% \tab \X[Test]\Y[Test]\Z[Test]\\
% \OpsNew{Test}i{(#1)}{ X = x, Y = y, Z = z }*
% \tab \X[Test]\Y[Test]\Z[Test]\\
% \OpsNew{Test}{ X = x, Y = y, Z = z }*s{{\ \&\ }{\ \&\ }}
% \tab \X[Test]\Y[Test]\Z[Test]\\
% \OpsOption{ Write = \BooleanTrue }
% \OpsNew{Test}{ X = x, Y = y, Z = z }*o{\char`#1\char`}
% \tab \X[Test]\Y[Test]\Z[Test]\\
% \OpsClear[Test]
% \OpsOption{ Write = \BooleanFalse }
%
```

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

Listing 2.

```
% \OpsRead \tab \X[Test]\Y[Test]\Z[Test]
% \OpsClear[Test]
%
```

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

Listing 3.

```
% \OpsNew{Math}[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 }
% \OpcNew{Math}[Let ]
% {Space=\Omega, SigmaField=\mathcal{F}, Measure=\mathcal{P}}
% *s{{,},{,},{,}}o{\ensuremath{\{\#1\}}}
% [-denote the probability space, where $\SigmaField\subset
2^{\{Space\}}$.]
% {}
% \OpcClear
% \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}
% \OpcNew{Math}i{\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]} }
% [$n\in\mathbb{N}$,~$OffMenge\subseteq\mathbb{N}^n$ eine offene Menge und
% $f\in Ci(OffMenge,\mathbb{R})$.
% Dann gibt es auf jeder Strecke $Strecke\subseteq OffMenge$ einen
% Punkt $\xi\in Strecke$,~]
% { 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 Bug

1. **Input:** `Inner={\{####1\}`
Symptom: `\OpsRead` 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 $\langle token list_2 \rangle$, $\backslash cal F$
Workaround: $\backslash mathcal{F}$

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		Replaced: GenericObject by Name ..	10
General: Initial version	10	Replaced: Separators by Separ ..	10
v1.1		Revamped: much of the implementation	10
General: Added: Save	10	v1.2	
Added: Listing 1., 2., 3., 4., 6., and 9.	10	General: Added: optional star to \OpsNew as instruction to expand keyval list₁	10
Added: \OpsRestore	10	Deleted: \OpsTest	10
Added: \OpsTest	10	Deleted: keyval list₂ and code₃ ..	10
Deleted: Listing 1-5 from v1.0 ...	10	Deleted: Listing 2-3 from v1.1. ...	10
Fixed: apparent anomaly in v1.0's Listing 4, see Listing 1	10	Replaced: \OpsClear{<token list₁>} by \OpsClear[<keyval list>]	10
Replaced: \OpsOptions by \OpsOption ..	10	Replaced: \Restore by \Read	10
Replaced: {<keyval list₂>} by <keyval list₂> given that option type G not recommended[3]	10	Replaced: \Save by \Write	10

Index

The italic numbers denote the pages where the corresponding entry is described, numbers underlined point to the definition, all others indicate the places where it is used.

Symbols			
* (option)	4	\bool_gset_true:N	71
<code ₁ > (option)	4	\bool_if:nTF	86, 127, 279
<code ₂ > (option)	4	\bool_set_false:N	61
<keyval list ₁ > (option)	4	\BooleanFalse	284, 285
<token list ₁ > (option)	4	\BooleanTrue	4
<token list ₂ > (option)	4	C	
<token list ₃ > (option)	4	cs commands:	
<token list ₄ > (option)	4	\cs_generate_variant:Nn	
<token list ₅ > (option)	4		32, 78, 93, 103, 108, 161, 209
<token list ₆ > (option)	4	\cs_gset:Npn	160, 183, 195
Inner (option)	4	\cs_new:Nn	17, 171, 223, 227
Name (option)	5	\cs_new:Npn	231
Separ (option)	5	\cs_new_protected:Nn	
Write (option)	5		8, 12, 28, 41, 45, 54, 62, 67,
			73, 79, 84, 94, 104, 109, 158, 163,
			181, 185, 193, 210, 214, 218, 232, 236
_	297, 298	\cs_new_protected:Npn	4, 33, 113, 201
A		\cs_set:Nn	203
\AtEndDocument	60	\cs_set_protected:Nn	238
B		D	
\begingroup	131	\DeclareDocumentCommand	115
bool commands:		\def	131
\bool_gset_false:N	65	\documentclass	6

E	
<code>\endgroup</code>	131
<code>\ensuremath</code>	276, 277
exp commands:	
<code>\exp_args:NNx</code>	96, 115
<code>\exp_args:No</code>	121, 216
<code>\exp_last_unbraced:Nf</code> ..	254, 267, 288
<code>\exp_last_unbraced:NNo</code>	141
<code>\exp_not:N</code>	25, 169, 179, 191, 199
<code>\exp_not:n</code>	149
<code>\expandafter</code>	131
<code>\ExplSyntaxOff</code>	317
<code>\ExplSyntaxOn</code>	3
F	
file commands:	
<code>\file_input:n</code>	75
I	
<code>\IfBooleanT</code>	135
<code>\IfValueT</code>	134, 147
<code>\IfValueTF</code>	313
iow commands:	
<code>\iow_close:N</code>	60, 64
<code>\iow_new:N</code>	59
<code>\iow_now:Nn</code>	88
<code>\iow_open:Nn</code>	70
K	
keys commands:	
<code>\keys_define:nn</code>	244
<code>\keys_set:nn</code>	308
M	
msg commands:	
<code>\msg_error:nnn</code>	23, 91, 177
<code>\msg_new:nnn</code> ..	153, 154, 155, 156, 157
<code>\msg_warning:nnn</code>	169, 191, 199
N	
<code>\NeedsTeXFormat</code>	2
<code>\NewDocumentCommand</code>	300, 305, 310
<code>\newtcblisting</code>	6
O	
oops internal commands:	
<code>__oops_aux_key:N</code>	12, 125
<code>__oops_aux_key:n</code>	8, 15
<code>__oops_aux_key:w</code>	4, 10
<code>\g__oops_aux_key_seq</code>	6, 14, 126, 137, 220, 221
<code>\g__oops_aux_keyval_seq</code> ..	122, 123, 125
<code>__oops_aux_name:n</code>	17, 247
<code>\g__oops_aux_prop</code> ..	27, 30, 38, 47, 124
<code>__oops_aux_prop:N</code>	45, 123
<code>__oops_aux_prop:n</code>	41, 51
<code>__oops_aux_prop:nn</code>	28, 32, 35
<code>__oops_aux_prop:w</code>	27, 43
<code>__oops_aux_val</code>	56, 57, 143
<code>__oops_aux_val:Nn</code>	54, 137
<code>__oops_log_close:</code>	59, 281
<code>__oops_log_entry</code>	131
<code>\g__oops_log_iow</code> ..	59, 60, 64, 70, 88, 91
<code>__oops_log_open:</code>	67, 280
<code>\g__oops_log_open_bool</code>	61, 65, 71, 86, 127
<code>__oops_log_read:</code>	79, 315
<code>__oops_log_read:n</code>	73, 81, 314
<code>\g__oops_log_to_tl</code>	69, 70, 81, 83
<code>__oops_log_write:n</code>	83, 129
<code>__oops_make_key:N</code>	109, 126
<code>__oops_make_key:n</code>	104, 111
<code>__oops_make_key:Nn</code>	94, 106
<code>__oops_make_new:nnn</code> ..	113, 255, 268, 289
<code>\g__oops_name_tl</code>	19, 25, 98, 301
<code>__oops_option_inner:n</code> ..	37, 39, 160, 161
<code>__oops_option_inner_default:n</code> ..	163, 167, 253
<code>__oops_option_inner_set:n</code> ..	121, 158
<code>\g__oops_option_inner_tl</code>	165, 169, 257, 270, 291
<code>__oops_option_name:n</code>	171
<code>\g__oops_option_name_tl</code>	173, 179
<code>__oops_option_outer:n</code>	139, 183
<code>__oops_option_outer_default:n</code> ..	181, 266
<code>__oops_option_outer_set:n</code> ..	138, 181
<code>\g__oops_option_outer_tl</code>	187, 191, 259, 272, 293
<code>__oops_option_separ_default:n</code> ..	193, 287
<code>\g__oops_option_separ_tl</code>	195, 199, 258, 271, 292
<code>__oops_prop_append:NN</code>	201, 212
<code>__oops_prop_append:Nn</code>	124, 210
<code>__oops_prop_append:nn</code>	203, 207
<code>__oops_prop_clear_new:n</code>	214, 221
<code>__oops_prop_clear_new_map:n</code> ..	218, 303
<code>__oops_prop_if_exist:nTF</code> ..	118, 223
<code>__oops_prop_item:nn</code>	100, 227
<code>__oops_prop_name:n</code>	57, 212, 216, 225, 229, 231, 234
<code>__oops_prop_new:n</code>	120, 232
<code>__oops_seq_from_prop:n</code>	238, 242
<code>__oops_seq_from_prop:NNn</code>	57, 236
<code>\OpsClear</code>	1, 3, 11, 300
<code>\OpsNew</code>	1, 3, 3, 4, 11, 115, 131, 149
<code>\OpsOption</code>	2, 4, 11, 305
<code>\OpsOptions</code>	11

<code>\OpsRead</code>	2, 5, 9, 310	Q	
<code>\OpsRestore</code>	11	quark commands:	
<code>\OpsTest</code>	11	<code>\q_stop</code>	4, 10, 33, 43
options:			
<code>*</code>	4	R	
<code><code₁></code>	4	<code>\Read</code>	11
<code><code₂></code>	4	<code>\Restore</code>	11
<code><keyval list₁></code>	4	S	
<code><token list₁></code>	4	<code>\Save</code>	11
<code><token list₂></code>	4	seq commands:	
<code><token list₃></code>	4	<code>\seq_gclear_new:N</code>	14, 56
<code><token list₄></code>	4	<code>\seq_gput_right:Nn</code>	6, 240
<code><token list₅></code>	4	<code>\seq_if_empty:NTF</code>	48
<code><token list₆></code>	4	<code>\seq_map_function:NN</code>	
<code>Inner</code>	4	15, 51, 111, 221, 242
<code>Name</code>	5	<code>\seq_set_from_clist:Nn</code>	122, 220
<code>Separ</code>	5	<code>\seq_use:Nnnn</code>	142
<code>Write</code>	5	T	
<code>Outer</code>	5	tl commands:	
<code>Outer (option)</code>	5	<code>\c_empty_tl</code>	49, 119, 133
P		<code>\tl_gset:Nn</code>	19, 69, 165, 173, 187
<code>\pdfdate</code>	69	<code>\tl_log:n</code>	76, 89
prop commands:		<code>\tl_new:N</code>	83
<code>\prop_clear_new:N</code>	216	<code>\tl_trim_spaces:n</code>	6, 36, 37, 39
<code>\prop_gclear_new:N</code>	47	U	
<code>\prop_gput:Nnn</code>	30, 38, 205	<code>\usepackage</code>	3, 6
<code>\prop_if_exist:NTF</code>	225	W	
<code>\prop_item:Nn</code>	205, 229, 240	<code>\Write</code>	11
<code>\prop_map_function:NN</code>	207		
<code>\prop_new:N</code>	27, 234		
<code>\ProvideDocumentCommand</code>	97		

Part IV

Implementation

```

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

```

1 aux

```

\__oops_aux_key:w #1: < key >
                  #2: < value >

4 \cs_new_protected:Npn \__oops_aux_key:w #1 = #2 \q_stop
5 {
6   \seq_gput_right:Nx \g__oops_aux_key_seq { \tl_trim_spaces:n{ #1 } }
7 }

```

(End definition for `__oops_aux_key:w`.)

```

__oops_aux_key:n #1: < key = value >
8 \cs_new_protected:Nn \__oops_aux_key:n
9 {
10   \__oops_aux_key:w #1 \q_stop
11 }

(End definition for \__oops_aux_key:n.)

__oops_aux_key:N #1: < seq >
12 \cs_new_protected:Nn \__oops_aux_key:N
13 {
14   \seq_gclear_new:N \g__oops_aux_key_seq
15   \seq_map_function:NN #1 \__oops_aux_key:n
16 }

(End definition for \__oops_aux_key:N.)

__oops_aux_name:n #1: < tl var name >
17 \cs_new:Nn \__oops_aux_name:n
18 {
19   \tl_gset:Nn \g__oops_name_tl{ #1 }
20 }
21 \__oops_aux_name:n
22 {
23   \msg_error:nnx{ __oops }
24   { generic }
25   { \exp_not:N\g__oops_name_tl~undefined }
26 }

(End definition for \__oops_aux_name:n.)

__oops_aux_prop:w #1: < key >
#2: < value >
27 \prop_new:N \g__oops_aux_prop
28 \cs_new_protected:Nn \__oops_aux_prop:nn
29 {
30   \prop_gput:Nnn \g__oops_aux_prop{ #1 } { #2 }
31 }
32 \cs_generate_variant:Nn \__oops_aux_prop:nn { eo }
33 \cs_new_protected:Npn \__oops_aux_prop:w #1 = #2 \q_stop
34 {
35   \__oops_aux_prop:eo
36   { \tl_trim_spaces:n{ #1 } }
37   { \__oops_option_inner:e{ \tl_trim_spaces:n{ #2 } } }
38   % ^^A\prop_gput:Noo \g__oops_aux_prop % v1.1, FAIL with N = N (OK with N= N)
39   % ^^A { \tl_trim_spaces:n{ #1 } } { \__oops_option_inner:n{ #2 } }
40 }

(End definition for \__oops_aux_prop:w.)

__oops_aux_prop:n #1: < key = value >
41 \cs_new_protected:Nn \__oops_aux_prop:n
42 {
43   \__oops_aux_prop:w #1 \q_stop
44 }

```

(End definition for __oops_aux_prop:n.)

```
\__oops_aux_prop:N #1 : <keyval list>
45 \cs_new_protected:Nn \__oops_aux_prop:N
46 {
47   \prop_gclear_new:N \g__oops_aux_prop
48   \seq_if_empty:NTF #1
49   { \c_empty_tl }
50   {
51     \seq_map_function:NN #1 \__oops_aux_prop:n
52   }
53 }
```

(End definition for __oops_aux_prop:N.)

```
\__oops_aux_val:Nn #1 : <seq>
#2 : <tl var name>
54 \cs_new_protected:Nn \__oops_aux_val:Nn
55 {
56   \seq_gclear_new:N \__oops_aux_val
57   \__oops_seq_from_prop:NNn \__oops_aux_val #1 { \__oops_prop_name:n{ #2 } }
58 }
```

(End definition for __oops_aux_val:Nn.)

2 log

```
\__oops_log_close:
59 \iow_new:N \g__oops_log_iow
60 \AtEndDocument{\iow_close:N \g__oops_log_iow}
61 \bool_set_false:N \g__oops_log_open_bool
62 \cs_new_protected:Nn \__oops_log_close:
63 {
64   \iow_close:N \g__oops_log_iow
65   \bool_gset_false:N \g__oops_log_open_bool
66 }
```

(End definition for __oops_log_close:.)

```
\__oops_log_open:
67 \cs_new_protected:Nn \__oops_log_open:
68 {
69   \tl_gset:Nx \g__oops_log_to_tl{oops\pdfdate}
70   \iow_open:Nn \g__oops_log_iow {\g__oops_log_to_tl}
71   \bool_gset_true:N \g__oops_log_open_bool
72 }
```

(End definition for __oops_log_open:.)

```

\__oops_log_read:n #1: <path>

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

(End definition for \__oops_log_read:n.)

\__oops_log_read:

79 \cs_new_protected:Nn \__oops_log_read:
80 {
81   \__oops_log_read:ef\g__oops_log_to_tl}
82 }

(End definition for \__oops_log_read:.)

\__oops_log_write:n

83 \tl_new:N \g__oops_log_to_tl
84 \cs_new_protected:Nn \__oops_log_write:n
85 {
86   \bool_if:nTF{ \g__oops_log_open_bool }
87   {
88     \iow_now:Nn \g__oops_log_iow { #1 }
89     \tl_log:n{ write~to~#1 }
90   }
91   { \msg_error:nnn{ __oops }{ iow }{ \g__oops_log_iow } }
92 }
93 \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 >

94 \cs_new_protected:Nn \__oops_make_key:Nn
95 {
96   \exp_args:NNx
97   \ProvideDocumentCommand{ #1 }
98   { 0{ \g__oops_name_tl } }
99   {
100     \__oops_prop_item:nn{ ##1 }{ #2 }
101   }
102 }
103 \cs_generate_variant:Nn \__oops_make_key:Nn { c }

(End definition for \__oops_make_key:Nn.)

```



```

\__oops_make_key:n #1 : < key >

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

(End definition for \__oops_make_key:n.)

\__oops_make_key:N #1 : < seq >

109 \cs_new_protected:Nn \__oops_make_key:N
110 {
111   \seq_map_function:NN #1 \__oops_make_key:e
112 }

(End definition for \__oops_make_key:N.)

\__oops_make_new:nnn #1 : < seq1 >
#2 : < seq2 >
#3 : < prop >

113 \cs_new_protected:Npn \__oops_make_new:nnn #1 #2 #3
114 {
115   \exp_args:NNx \DeclareDocumentCommand \OpsNew
116   { m +o E{ i } { { #1 } } m s E{ s o } { { #2 } { #3 } } +o }
117   {
118     \__oops_prop_if_exist:nTF{ ##1 }
119     { \c_empty_tl }
120     { \__oops_prop_new:n{ ##1 } }
121     \exp_args:No \__oops_option_inner_set:n{ ##3 }
122     \seq_set_from_clist:Nn \g__oops_aux_keyval_seq { ##4 }
123     \__oops_aux_prop:N \g__oops_aux_keyval_seq
124     \__oops_prop_append:Nn \g__oops_aux_prop { ##1 }
125     \__oops_aux_key:N \g__oops_aux_keyval_seq
126     \__oops_make_key:N \g__oops_aux_key_seq
127     \bool_if:nTF{ \g__oops_log_open_bool }
128     {%^A https://tex.stackexchange.com/questions/536597
129       \__oops_log_write:n
130       {
131         \begingroup \def \__oops_log_entry { \OpsNew{ ##1 }i{##3}{ ##4 } } \expandafter \endgroup
132       }
133     }\c_empty_tl}
134     \IfValueT{ ##2 }{ ##2 }
135     \IfBooleanT{ ##5 }
136     {
137       \__oops_aux_val:Nn \g__oops_aux_key_seq { ##1 }
138       \__oops_option_outer_set:n{ ##7 }
139       \__oops_option_outer:n
140       {
141         \exp_last_unbraced:NNo
142         \seq_use:Nnnn
143         \__oops_aux_val
144         { ##6 }
145       }
146     }

```

```

147     \IfValueT{ ##8 }
148     {
149         \exp_not:n{ \OpsNew{ ##1 }[ ##8 ] }
150     }
151 }
152 }

```

(End definition for `__oops_make_new:nnn`.)

4 msg

```

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

```

5 option

`__oops_option_inner_set:n` #1: *⟨inlinecode⟩*

```

158 \cs_new_protected:Nn \__oops_option_inner_set:n
159 {
160     \cs_gset:Npn \__oops_option_inner:n ##1 { #1 }
161     \cs_generate_variant:Nn \__oops_option_inner:n { e }
162 }
163 \cs_new_protected:Nn \__oops_option_inner_default:n
164 {
165     \tl_gset:Nn \g__oops_option_inner_tl { #1 }
166 }
167 \__oops_option_inner_default:n
168 {
169     \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_inner_tl }
170 }

```

(End definition for `__oops_option_inner_set:n`.)

`__oops_option_name:n` #1: *⟨token list⟩*

```

171 \cs_new:Nn \__oops_option_name:n
172 {
173     \tl_gset:Nn \g__oops_option_name_tl{ #1 }
174 }
175 \__oops_option_name:n
176 {
177     \msg_error:nnx{ __oops }
178     { generic }
179     { \exp_not:N \g__oops_option_name_tl~undefined }
180 }

```

(End definition for `__oops_option_name:n`.)

`__oops_option_outer_set:n` #1: *⟨ inline code ⟩*

```

\__oops_option_outer_default:n
181 \cs_new_protected:Nn \__oops_option_outer_set:n
182 {

```

```

183 \cs_gset:Npn \__oops_option_outer:n ##1 { #1 }
184 }
185 \cs_new_protected:Nn \__oops_option_outer_default:n
186 {
187 \tl_gset:Nn \g__oops_option_outer_tl { #1 }
188 }
189 \__oops_option_outer_default:n
190 {
191 \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_outer_tl }
192 }

```

(End definition for __oops_option_outer_set:n and __oops_option_outer_default:n.)

```

\__oops_option_separ_default:n #1 : { \token_list_1 } { \token_list_2 } { \token_list_3 }
193 \cs_new_protected:Nn \__oops_option_separ_default:n
194 {
195 \cs_gset:Npn \g__oops_option_separ_tl { #1 }
196 }
197 \__oops_option_separ_default:n
198 {
199 \msg_warning:nnn{ __oops }{ unset }{ \exp_not:N \g__oops_option_separ_tl }
200 }

```

(End definition for __oops_option_separ_default:n.)

6 prop

```

\__oops_prop_append:NN #1 : \prop_1
\__oops_prop_append:cN #2 : \prop_2
201 \cs_new_protected:Npn \__oops_prop_append:NN #1 #2
202 {
203 \cs_set:Nn \__oops_prop_append:nn
204 {
205 \prop_gput:Nnx #1 { ##1 } { \prop_item:Nn #2 { ##1 } }
206 }
207 \prop_map_function:NN #2 \__oops_prop_append:nn
208 }
209 \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
210 \cs_new_protected:Nn \__oops_prop_append:Nn
211 {
212 \__oops_prop_append:cN{ \__oops_prop_name:n { #2 } } #1
213 }

```

(End definition for __oops_prop_append:Nn.)

```

\__oops_prop_clear_new:n #1 : < tl var name >

214 \cs_new_protected:Nn \__oops_prop_clear_new:n
215 {
216   \exp_args:No \prop_clear_new:c{ \__oops_prop_name:n { #1 } }
217 }

(End definition for \__oops_prop_clear_new:n.)

\__oops_prop_clear_new_map:n #1 : < keyval list >

218 \cs_new_protected:Nn \__oops_prop_clear_new_map:n
219 {
220   \seq_set_from_clist:Nn \g__oops_aux_key_seq { #1 }
221   \seq_map_function:NN \g__oops_aux_key_seq \__oops_prop_clear_new:n
222 }

(End definition for \__oops_prop_clear_new_map:n.)

\__oops_prop_if_exist:nTF #1 : < token list1 >
#2 : < token list2 >
#3 : < token list3 >

223 \cs_new:Nn \__oops_prop_if_exist:nTF
224 {
225   \prop_if_exist:cTF{ \__oops_prop_name:n { #1 } }{ #2 }{ #3 }
226 }

(End definition for \__oops_prop_if_exist:nTF.)

\__oops_prop_item:nn #1 : < tl var name >
#2 : < key >

227 \cs_new:Nn \__oops_prop_item:nn
228 {
229   \prop_item:cn { \__oops_prop_name:n { #1 } } { #2 }
230 }

(End definition for \__oops_prop_item:nn.)

\__oops_prop_name:n #1 : < tl var name >

231 \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 >

232 \cs_new_protected:Nn \__oops_prop_new:n
233 {
234   \prop_new:c{ \__oops_prop_name:n { #1 } }
235 }

(End definition for \__oops_prop_new:n.)

```

7 seq

```

\__oops_seq_from_prop:NNn #1: < seq1 >
#2: < seq2 > (keys)
#3: < prop >

236 \cs_new_protected:Nn \__oops_seq_from_prop:NNn
237 {
238   \cs_set_protected:Nn \__oops_seq_from_prop:n
239   {
240     \seq_gput_right:No #1 { \prop_item:cn{ #3 }{ ##1 } }
241   }
242   \seq_map_function:NN #2 \__oops_seq_from_prop:n
243 }

(End definition for \__oops_seq_from_prop:NNn.)

```

8 Front-end

```

244 \keys_define:nn { __oops }
245 {
246   Name .code:n={
247     \__oops_aux_name:n{ #1 }
248   },
249   Name .value_required:n = false,
250   Name .default:n = { Math },
251   Name .initial:n = { Math },
252   Inner .code:n={
253     \__oops_option_inner_default:n{ #1 }
254     \exp_last_unbraced:Nf
255     \__oops_make_new:nnn
256     {
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_default:n{ #1 }
267     \exp_last_unbraced:Nf
268     \__oops_make_new:nnn
269     {
270       { \g__oops_option_inner_tl }
271       { \g__oops_option_separ_tl }
272       { \g__oops_option_outer_tl }
273     }
274   },
275   Outer .value_required:n = false,
276   Outer .default:n = { \ensuremath{####1} },
277   Outer .initial:n = { \ensuremath{####1} },
278   Write .code:n = {

```

```

279     \bool_if:nTF{#1}
280     {\__oops_log_open:}
281     {\__oops_log_close:}
282   },
283   Write .value_required:n = false,
284   Write .default:n = \BooleanFalse,
285   Write .initial:n = \BooleanFalse,
286   Separ .code:n={
287     \__oops_option_separ_default:n{ #1 }
288     \exp_last_unbraced:Nf
289     \__oops_make_new:nnn
290     {
291       { \g__oops_option_inner_tl }
292       { \g__oops_option_separ_tl }
293       { \g__oops_option_outer_tl }
294     }
295   },
296   Separ .value_required:n = false,
297   Separ .default:n = { { {\ }and{\ } } { {\ } } { {\ }and{\ } } },
298   Separ .initial:n = { { {\ }and{\ } } { {\ } } { {\ }and{\ } } }
299 }

```

\OpsClear #1 : \langle *tl var name* \rangle

```

300 \NewDocumentCommand{ \OpsClear }
301 { 0{\g__oops_name_tl} }
302 {
303   \__oops_prop_clear_new_map:n{ #1 } % TODO record
304 }

```

(End definition for \OpsClear. This function is documented on page 3.)

\OpsOption

```

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

```

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

\OpsRead

```

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

```

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

9 Misc

```

317 \ExplSyntaxOff

```