

# The whatsnote Class\*

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## 1 Introduction

The whatsnote  $\LaTeX$  class provides an elegant layout and powerful tools for taking notes in science, engineering, etc. It supports various compilation methods, such as pdf $\LaTeX$ , Xe $\LaTeX$ , Ap $\LaTeX$ , Lua $\LaTeX$ , etc.

## 2 Usage

To load this class, write the line

```
\documentclass{whatsnote}
```

### 2.1 Cover configuration

---

`\coverset` `\coverset`  $\{ \langle keys \rangle \}$

The `\coverset` macro can config the cover, the mandatory argument accepts the following keys

**title** =  $\langle string \rangle$  can set the title on the cover page.

**author**, **afill** =  $\langle string \rangle$  can set the author and the affliction respectively on the cover page, and they will be combined together with a vertical bar separated.

**date** =  $\langle string \rangle$  can set the date on the cover page.

**extinfo** =  $\langle string \rangle$  can add contents at the south east corner of the cover page (e.g., add your personal seal (“Yin Zhāng” in Chinese)).

**head**, **clogo** =  $\langle file \rangle$  can add pictures at the top / the center white area of the cover page accordingly.

**llogos** =  $\langle files' comma list \rangle$  can add a series of pictures at the “left bar” of the title page.

---

`\maketitle` `\maketitle` [ $\langle color \rangle$ ]

The `\maketitle` macro can generate the cover and config the theme color in its optional argument.

---

\*<https://github.com/myhsia/whatsnote>, <https://ctan.org/pkg/whatsnote>

---

`\sidehead` `\sidehead` `{\langle sidebar header \rangle}` `\sidefoot` `{\langle sidebar footer \rangle}`  
`\sidefoot` The `\sidehead`, `sidefoot` macros can config the header and footer in the sidebar.

---

`\mathemph` `\mathemph` `{\langle math equation \rangle}`  
The `\mathemph` macro can color-emphing math formula.

### 3 Working Example

```
\documentclass[11pt]{whatsnote}

\usepackage[versionfa = 7, hook]{fontawesomescaled}
\usepackage{duckuments}
\coverset{
  title   = Demo for the \textsc{WhatsNote} Package,
  author  = \ttfamily \textsc{Mingyu Xia},
  afill   = <\href{mailto:xiamingyu@westlake.edu.cn}
            {xiamingyu@westlake.edu.cn}>,
  date    = November 2025,
  extinfo = {\href{https://github.com/myhsia/whatsnote}
            {\faIconScaled[scale = 4]{github}}},
  head    = example-image-golden.pdf,
  clogo   = example-grid-100x100pt.pdf,
  llogos  = {example-image-duck, example-image-duck,
            example-image-duck, example-image-duck}
}

\begin{document}

\maketitle[teal]
\frontmatter \tableofcontents \mainmatter

\duckument[full]

\end{document}
```

# Golden ratio

(Original size: 32.361×200 bp)

## Demo for the WHATSNOTE Package

MINGYU XIA | <xiamingyu@westlake.edu.cn>

0.9	-1.0	2.0	0.9	4.0	5.0	6.0	7.0	8.0	9.0
0.8	-1.8	2.8	3.8	4.8	5.8	6.8	7.8	8.8	9.8
0.7	-1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7	9.7
0.6	-1.6	2.6	3.6	4.6	5.6	6.6	7.6	8.6	9.6
0.5	-1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
0.4	-1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4	9.4
0.3	-1.3	2.3	3.3	4.3	5.3	6.3	7.3	8.3	9.3
0.2	-1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2	9.2
0.1	-1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1	9.1
0.0	-1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0

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## Contents

<b>1 A friendly duck at level 0 (chapter)</b>	<b>1</b>
1.1 A friendly duck at level 1 (section)	1
1.1.1 A friendly duck at level 2 (subsection)	2
1.2 Lists	4
1.2.1 Example for ducks (itemize)	4
1.2.2 Example for ducks (enumerate)	5
1.2.3 Example for ducks (description)	5

## CHAPTER 1 A friendly duck at level 0 (chapter)

There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math. Only displayed equations remained legible. That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye dukctor there is. He shall heal me from my disease!"

"But my duck, how are you supposed to manage your daily routines without my visual guidance", replied the underduckling. The smart duck's face turned grim in anger. "You dare to talk back?" The underduckling blushed ashamed. How could he have objections after his duck gave strict orders? The underduckling was so embarrassed about his own behaviour he had to solve an equation.

After the equation was solved and the underduckling prepared his leave for the next day it fell asleep in a shaky mood. It did not know what the journey had prepared for him and if he was prepared enough for it. His sleep was restless. The dreams he had that night were not calm and bright as they used to be for an innocent underduckling.

Before dawn the underduckling woke. He didn't have the feeling of being well rested. But nonetheless he knew that this was the day he should leave. Except saying goodbye to his beloved ones there was nothing holding him back. His duck had sent him on the most important mission a five weeks old inexperienced underduckling was ever sent on. He bid farewell to his mother, all his brothers and sisters, and finally from his duck. The bag was shouldered, the boots were tied, the underduckling left.

As the underduckling went along he saw a tree. It was so tall he couldn't even approximate its height. Oh, how small he felt. What should he, a small duckling whose plumage was still fluffy, achieve in this vast, gigantic world? He stuck his trembling wings under the straps of his backpack to calm his shaking limbs. Where should he start his search? How should he survive in the hostile nature surrounding the sheltered pond of his community?

### 1.1 A friendly duck at level 1 (section)

There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math. Only displayed equations remained legible. That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye dukctor there is. He shall heal me from my disease!"

"But my duck, how are you supposed to manage your daily routines without my visual guidance", replied the underduckling. The smart duck's face turned grim in anger. "You dare to talk back?" The underduckling

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As the underduckling went along he saw a tree. It was so tall he couldn't even approximate its height. Oh, how small he felt. What should he, a small duckling whose plumage was still fluffy, achieve in this vast, gigantic world? He stuck his trembling wings under the straps of his backpack to calm his shaking limbs. Where should he start his search? How should he survive in the hostile nature surrounding the sheltered pond of his community?

### 1.1.1 A friendly duck at level 2 (subsection)

There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math. Only displayed equations remained legible. That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye ducktor there is. He shall heal me from my disease!"

"But my duck, how are you supposed to manage your daily routines without my visual guidance", replied the underduckling. The smart duck's face turned grim in anger. "You dare to talk back?" The underduckling blushed ashamed. How could he have objections after his duck gave strict orders? The underduckling was so embarrassed about his own behaviour he had to solve an equation.

After the equation was solved and the underduckling prepared his leave for the next day it fell asleep in a shaky mood. It did not know what the journey had prepared for him and if he was prepared enough for it. His sleep was restless. The dreams he had that night were not calm and bright as they used to be for an innocent underduckling.

Before dawn the underduckling woke. He didn't have the feeling of being well rested. But nonetheless he knew that this was the day he should leave. Except saying goodbye to his beloved ones there was nothing holding him back. His duck had sent him on the most important mission a five weeks old inexperienced underduckling was ever sent on. He bid farewell to his mother, all his brothers and sisters, and finally from his duck. The bag was shouldered, the boots were tied, the underduckling left.

As the underduckling went along he saw a tree. It was so tall he couldn't even approximate its height. Oh, how small he felt. What should he, a small duckling whose plumage was still fluffy, achieve in this vast,

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Before dawn the underduckling woke. He didn't have the feeling of being well rested. But nonetheless he knew that this was the day he should leave. Except saying goodbye to his beloved ones there was nothing holding him back. His duck had sent him on the most important mission a five weeks old inexperienced underduckling was ever sent on. He bid farewell to his mother, all his brothers and sisters, and finally from his duck. The bag was shouldered, the boots were tied, the underduckling left.

As the underduckling went along he saw a tree. It was so tall he couldn't even approximate its height. Oh, how small he felt. What should he, a small duckling whose plumage was still fluffy, achieve in this vast, gigantic world? He stuck his trembling wings under the straps of his backpack to calm his shaking limbs. Where should he start his search? How should he survive in the hostile nature surrounding the sheltered pond of his community?

## 1.2 Lists

### 1.2.1 Example for ducks (itemize)

- First swims father drake
- Then floats mother duck
- After her paddles baby duckling
- And over there bathes uncle canard

#### Nested ducks

- swimming father drake
  - swimming father drake
    - swimming father drake
      - swimming father drake
      - floating mother duck
    - floating mother duck
  - floating mother duck
- floating mother duck

gigantic world? He stuck his trembling wings under the straps of his backpack to calm his shaking limbs. Where should he start his search? How should he survive in the hostile nature surrounding the sheltered pond of his community?

### A friendly duck at level 3 (subsection)

There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math. Only displayed equations remained legible. That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye ducktor there is. He shall heal me from my disease!"

"But my duck, how are you supposed to manage your daily routines without my visual guidance", replied the underduckling. The smart duck's face turned grim in anger. "You dare to talk back?" The underduckling blushed ashamed. How could he have objections after his duck gave strict orders? The underduckling was so embarrassed about his own behaviour he had to solve an equation.

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Before dawn the underduckling woke. He didn't have the feeling of being well rested. But nonetheless he knew that this was the day he should leave. Except saying goodbye to his beloved ones there was nothing holding him back. His duck had sent him on the most important mission a five weeks old inexperienced underduckling was ever sent on. He bid farewell to his mother, all his brothers and sisters, and finally from his duck. The bag was shouldered, the boots were tied, the underduckling left.

As the underduckling went along he saw a tree. It was so tall he couldn't even approximate its height. Oh, how small he felt. What should he, a small duckling whose plumage was still fluffy, achieve in this vast, gigantic world? He stuck his trembling wings under the straps of his backpack to calm his shaking limbs. Where should he start his search? How should he survive in the hostile nature surrounding the sheltered pond of his community?

**A friendly duck at level 4 (paragraph)** There once was a very smart but sadly blind duck. When it was still a small duckling it was renowned for its good vision. But sadly as the duck grew older it caught a sickness which caused its eyesight to worsen. It became so bad, that the duck couldn't read the notes it once took containing much of inline math. Only displayed equations remained legible. That annoyed the smart duck, as it wasn't able to do its research any longer. It called for its underduckling and said: "Go, find me the best eye ducktor there is. He shall heal me from my disease!"

"But my duck, how are you supposed to manage your daily routines without my visual guidance", replied the underduckling. The smart duck's face turned grim in anger. "You dare to talk back?" The underduckling blushed ashamed. How could he have objections after his duck gave strict orders? The underduckling was so embarrassed about his own behaviour he had to solve an equation.

### 1.2.2 Example for ducks (enumerate)

1. First swims father drake
2. Then floats mother duck
3. After her paddles baby duckling
4. And over there bathes uncle canard

#### Nested ducks

1. swimming father drake
  - (a) swimming father drake
    - i. swimming father drake
      - A. swimming father drake
      - B. floating mother duck
    - ii. floating mother duck
  - (b) floating mother duck
2. floating mother duck

### 1.2.3 Example for ducks (description)

**drake** is the swimming father

**duck** is the floating mother

**duckling** is the paddling baby

**canard** is the bathing uncle

#### Nested ducks

**drake** is the swimming father

**drake** is the swimming father

**drake** is the swimming father

**drake** is the swimming father

**duck** is the floating mother

**duck** is the floating mother

**duck** is the floating mother

**duck** is the floating mother

## A The Source Code

Assign the module name of the variables and control sequences, which will be automatically replaced by `l3docstrip`.

```
1 <@@=whats>
```

### A.1 The `whatsnote.cls` file

Start the optionlist class for `l3docstrip`.

```
2 <*class>
```

Define the date, version, and summary variables, and declare the class.

```
3 \def \whatsnote@date {2025-11-12}
4 \def \whatsnote@version {v5.0B}
5 \def \whatsnote@tldr
6 {LaTeX class for taking notes in science, engineering, etc.}
7 \ProvidesExplClass {whatsnote} {\whatsnote@date}
8 {\whatsnote@version} {\whatsnote@tldr}
```

Functions for broadcast errors and warnings.

```
\_whats_msg_new:nn
\_whats_msg_error:nn
\_whats_msg_warning:nn
9 \cs_new_protected:Npn \_whats_msg_new:nn #1#2
10 { \msg_new:nnn { whatsnote } {#1} {#2} }
11 \cs_new_protected:Npn \_whats_msg_error:nn #1#2
12 { \msg_error:nnn { whatsnote } {#1} {#2} }
13 \cs_new_protected:Npn \_whats_msg_warning:nn #1#2
14 { \msg_error:nnn { whatsnote } {#1} {#2} }
```

*(End of definition for `\_whats_msg_new:nn`, `\_whats_msg_error:nn`, and `\_whats_msg_warning:nn`.)*

`\_whats_provide_module:n` Function for providing modules with the predefined date and version variables.

```
15 \cs_new_protected_nopar:Npn \_whats_provide_module:n #1
16 {
17   \ProvidesExplFile {whats-#1-module.code.tex}
18   {\whatsnote@date} {\whatsnote@version}
19   { whatsNote ~ \text_titlecase:n {#1} ~ Module }
20 }
```

Function for loading modules.

```
\_whats_load_module:n
21 \cs_new_protected_nopar:Npn \_whats_load_module:n #1
22 {
23   \clist_map_inline:nn {#1}
24   {
25     \file_if_exist_input:nF { whats-##1-module.code.tex }
26     { \_whats_msg_error:nn { not found module } {##1} }
27   }
28 }
29 \_whats_msg_new:nn { not found module }
30 { The ~ whats ~ module ~ ‘#1’ ~ not ~ found. }
```

*(End of definition for `\_whats_provide_module:n` and `\_whats_load_module:n`.)*

`\g_whats_base_class_options_clist` Variable for storing global option for basic class.

```

31 \clist_new:N \g__whats_base_class_options_clist
32 \keys_define:nn { whats / classoption }
33 {
34   unknown .code:n = \__whats_unknown_option:n { #1 },
35 }

```

*(End of definition for \g\_\_whats\_base\_class\_options\_clist.)*

`\__whats_unknown_option:n` Parsing unknown options: pass them to the basic class.

```

36 \cs_new_protected_nopar:Npn \__whats_unknown_option:n #1
37 {
38   \tl_if_empty:nTF { #1 }
39     { \clist_gput_right:NV \g__whats_base_class_options_clist \l_keys_key_str }
40     {
41       \exp_args:NNx \clist_gput_right:Nn \g__whats_base_class_options_clist
42         { \l_keys_key_str = \exp_not:n {#1} }
43     }
44 }
45 \ProcessKeyOptions [ whats / classoption ]

```

*(End of definition for \\_\_whats\_unknown\_option:n.)*

Load basic class with some preloaded options.

```

46 \PassOptionsToClass { book } { 11pt }
47 \PassOptionsToPackage { svgnames } { xcolor }
48 \exp_args:NNV \LoadClass [ \g__whats_base_class_options_clist ] { book }

```

Load modules for whatsnote.

```

49 \__whats_load_module:n { typeset, layout, theorem, cover }

```

End the input stream of whatsnote.cls.

```

50 \file_input_stop:

```

End the optionlist class for l3docstrip.

```

51 \</class>

```

## A.2 The `whats-typeset-module.code.tex` file

Start the optionlist typeset for l3docstrip.

```

52 \*typeset)

```

Declare the module file.

```

53 \__whats_provide_module:n { typeset }

```

Load the amssymb, bbm, bm, cancel, extarrows, mathtools, nicematrix, xfrac packages.

```

54 \RequirePackage{amssymb, bbm, bm, cancel, extarrows,
55               mathtools, nicematrix, xfrac}

```

Load the e style esvect package for `\vec` arrow, then define the anti-vector arrow.

```

56 \RequirePackage[e]{esvect}
57 \let \vec \vv
58 \DeclareRobustCommand \cev [1]{\mathpalette\do@cev{#1}}
59 \newcommand \do@cev [2]{
60   \vbox{\offinterlineskip
61     \ialign{##\cr
62       \hidewidth\reflectbox{\m@th#1\vec{}}\mkern4mu$\}\hidewidth\cr

```

```

63     $\m@th#1#2$\cr
64   }
65 }
66 }

```

Load the `fixdif` and derivative packages for inputting math derivatives, suppress warnings when using `xetex`.

```

67 \sys_if_engine_xetex:T { \PassOptionsToPackage { no-math } { fontspec } }
68 \RequirePackage{fixdif, derivative}

```

Define some mathematic operators.

```

69 \newdef \D {\mathsf D}
70 \newdef \upe {\mathrm e}
71 \newdef \iu {\mathrm i \mkern1mu}
72 \let \sinh \relax \let \cosh \relax \let \tanh \relax \let \coth \relax
73 \DeclareMathOperator \sinh {sh}
74 \DeclareMathOperator \cosh {ch}
75 \DeclareMathOperator \tanh {th}
76 \DeclareMathOperator \coth {cth}
77 \DeclareMathOperator \sgn {sgn}
78 \DeclareMathOperator \cotan {\qopname\relax o{ctg}}
79 \DeclareMathOperator \im {im}
80 \DeclareMathOperator \adj {adj}
81 \DeclareRobustCommand \tran{\mkern-1.5mu\mathsf T}
82 \DeclareRobustCommand \identity {\ensuremath{\mathbbm 1}}

```

Load the `siunitx` package for inputting physics units, then declare the unit “angstrom”.

```

83 \RequirePackage{siunitx}
84 \DeclareSIUnit \angstrom {\text \AA}

```

Load the `mhchem` package for inputting chemistry formula.

```

85 \RequirePackage[version = 4]{mhchem}

```

Load the `physics2` package’s some modules for quick math and physics input. Temporarily change the module name for hacking the package<sup>1</sup>.

```

86 \@@=phy
87 \RequirePackage{physics2}
88 \usephysicsmodule{ab, ab.braket, diagmat, xmat, qtext.legacy, op.legacy}

```

Switch the star and non-star branches for the Dirac brackets inputting commands to make the non-equal height brackets the default.

```

89 \DeclareRobustCommand \bra
90   {\@ifstar{\phy@d@lx{br.m}{br.a}}{\phy@d@lx{br.m}{br.a}*}}
91 \DeclareRobustCommand \ket
92   {\@ifstar{\phy@d@lx{kt.m}{kt.a}}{\phy@d@lx{kt.m}{kt.a}*}}
93 \DeclareRobustCommand \braket
94   {\@ifstar{\phy@d@lx{bk.m}{bk.a}}{\phy@d@lx{bk.m}{bk.a}*}}
95 \DeclareRobustCommand \ketbra
96   {\@ifstar{\phy@d@lx{kb.m}{kb.a}}{\phy@d@lx{kb.m}{kb.a}*}}

```

Extend the `diagmat` module for the `physics2` package: support the small matrices, and enable users to modify the alignments of the matrices’ elements.

```

97 \DeclareDocumentCommand \diagmat { s 0 } m }
98   {
99     \IfBooleanTF {#1}

```

---

<sup>1</sup>@AlphaZTX has not merged my suggestion for the `physics2` package. Blame him!

```

100     { \_phy_diagmat_type:nnn { small } {#2} {#3} }
101     { \_phy_diagmat_type:nnn {      } {#2} {#3} }
102   }
103 \DeclareDocumentCommand \pdiagmat { s O{} m }
104   {
105     \IfBooleanTF {#1}
106     { \_phy_diagmat_type:nnn { psmall } {#2} {#3} }
107     { \_phy_diagmat_type:nnn { p      } {#2} {#3} }
108   }
109 \DeclareDocumentCommand \bdiagmat { s O{} m }
110   {
111     \IfBooleanTF {#1}
112     { \_phy_diagmat_type:nnn { bsmall } {#2} {#3} }
113     { \_phy_diagmat_type:nnn { b      } {#2} {#3} }
114   }
115 \DeclareDocumentCommand \Bdiagmat { s O{} m }
116   {
117     \IfBooleanTF {#1}
118     { \_phy_diagmat_type:nnn { Bsmall } {#2} {#3} }
119     { \_phy_diagmat_type:nnn { B      } {#2} {#3} }
120   }
121 \DeclareDocumentCommand \vdiagmat { s O{} m }
122   {
123     \IfBooleanTF {#1}
124     { \_phy_diagmat_type:nnn { vsmall } {#2} {#3} }
125     { \_phy_diagmat_type:nnn { v      } {#2} {#3} }
126   }
127 \DeclareDocumentCommand \Vdiagmat { s O{} m }
128   {
129     \IfBooleanTF {#1}
130     { \_phy_diagmat_type:nnn { Vsmall } {#2} {#3} }
131     { \_phy_diagmat_type:nnn { V      } {#2} {#3} }
132   }

```

Restore the module name.

```

133 <@=@whats>

```

Load and config the hyperref package, suppress the bookmark warnings.

```

134 \RequirePackage{hyperref}
135 \hypersetup{colorlinks, citecolor = teal}
136 \let\oldHyPsd@CatcodeWarning\HyPsd@CatcodeWarning
137 \renewcommand \HyPsd@CatcodeWarning [1]
138   {\ifnum\pdfstrcmp{#1}{math shift}=0 \else \oldHyPsd@CatcodeWarning{#1} \fi}
139 \pdfstringdefDisableCommands{
140   \def\intop{int} \def\ilimits@{lim}
141   \def\infty{infty} \let\HyPsd@CatcodeWarning@gobble
142 }

```

**\mathemph** Macro for color-emphing math formula.

```

143 \NewDocumentCommand \mathemph { O{} m } {\ifmmode
144   \colorbox{Crimson!15}{\vphantom{\$ \displaystyle #1$} \$ \displaystyle #2$} \else
145   \colorbox{Crimson!15}{\vphantom{#1} #2} \fi}

```

*(End of definition for \mathemph. This function is documented on page 2.)*

```

146 \color_set:nnn { eqcolor } { HTML } { 2F4F4F }

```



Restore the definition for `\[` and `\]` changed by `amsmath`, then apply the equations' color (high-unstable, temporarily disabled).

```

147 % \def \dollar@begin { \def \eqcolor {\color{eqcolor}} \eqcolor $$ }
148 % \def \dollar@end { $$ \color_select:n {black} }
149 \DeclareRobustCommand \[
150 {
151   \scan_stop:
152   \if_mode_math:
153     \@badmath
154   \else:
155     \if_mode_vertical:
156       \nointerlineskip
157       \makebox[.6\linewidth]{ }
158     \fi:
159     \dollar@begin % \color_select:n { eqcolor }
160     \fi:
161   }
162 \DeclareRobustCommand \]
163 {
164   \scan_stop:
165   \if_mode_math:
166     \if_mode_inner:
167       \@badmath
168     \else:
169       \dollar@end
170     \fi:
171   \else:
172     \@badmath
173   \fi:
174   \ignorespaces
175 }

```

End the input stream of `whats-typeset-module.code.tex`.

```

176 \file_input_stop:

```

End the optionlist typeset for `l3docstrip`.

```

177 </typeset>

```

### A.3 The `whats-layout-module.code.tex` file

Start the optionlist layout for `l3docstrip`.

```

178 <*layout>

```

Declare the module file.

```

179 \__whats_provide_module:n { layout }

```

Load the `anyfontsize`, `lmodern`, `microtype`, `manfnt`, `ragged2e`, `soul`, `libertine`, `ulem`, `xcolor` packages.

```

180 \RequirePackage{anyfontsize, lmodern, microtype, manfnt, ragged2e, soul}
181 \RequirePackage[mono = false, osf]{libertine}
182 \RequirePackage[normalem]{ulem}
183 \RequirePackage[svgnames]{xcolor}

```

Config the geometry.

```

184 \RequirePackage[left = 1.25in, vmargin = 1in, headheight = 15pt,
185                 right = .75in, headsep = 15pt]{geometry}

```

```

186 \RequirePackage{graphicx, pgfplots}
187 \graphicspath{{./media/logos/} {./media/}}
188 \pgfplotsset{compat = newest}
189 % Table and list
190 \RequirePackage{booktabs, array, enumext}
191 \setenumext[enumext, 1]{label = (\alph*)}
192 \setenumext[enumext, 2]{label = \roman*}
193 \RequirePackage[inline]{enumitem}

Config the header and footer.
194 \RequirePackage{fancyhdr}
195 \renewcommand* \chaptermark [1]
196 {
197     \markboth
198     {
199         \normalfont \biolinumLF \scshape
200         \int_compare:nNnT { \c@secnumdepth } > { \m@ne }
201         { \if@mainmatter \@chapapp \ \thechapter .~\ \fi } #1
202     } {}
203 }
204 \renewcommand* \sectionmark [1]
205 {
206     \markright
207     {
208         \normalfont \sffamily
209         \int_compare:nNnT { \c@secnumdepth } > { \z@ } { \thesection . \ } #1
210     }
211 }
212 \fancyhead[OR]{\sffamily \rightmark}
213 \fancyhead[OL]{\sffamily \thepage}
214 \fancyhead[EL]{\sffamily \leftmark}
215 \fancyhead[ER]{\sffamily \thepage}
216 \fancyfoot[L,C,R]{}
217 \pagestyle{fancy}

Config the header rule and footer rule style.
218 \renewcommand* \headrulewidth {1pt}
219 \renewcommand* \footrulewidth {.5pt}
220 \hook_gput_code:nnn { cmd / headrule / before } { . }
221 { \color_select:n { black!25 } }
222 \renewcommand \footrule
223 {
224     \if@fancyplain \let \footrulewidth \plainfootrulewidth \fi
225     \color_select:n { black!25 }
226     \hrule \@width \headwidth \@height \footrulewidth
227 }

Paragraphs configurations.
228 \linespread{1.2}
229 \RequirePackage{titlesec, subcaption}
230 \titleformat \chapter [hang] {\huge \bfseries \sffamily}
231 {\biolinumLF \scshape \@chapapp \ \thechapter} {1em} {}
232 \titlespacing* \chapter {\z@} {\z@} {30pt}
233 \titlespacing \paragraph {\z@} {1.5ex minus .1 ex} {1pc}
234 \RequirePackage{paracol}

```

```

235 \columnratio{.64}
236 \RequirePackage{framed}
237 \setlength \FrameSep {\z@}
238 \setlength \parindent {\z@}

```

Config the appearance of appendix in toc.

```

239 \renewcommand \@pnumwidth {2.5em}
240 \renewcommand \appendix {
241   \cleardoublepage
242   \setcounter{chapter}{0}
243   \setcounter{section}{0}
244   \gdef\@chapapp{\appendixname}
245   \gdef\thechapter{\@Alph\c@chapter}
246   \addtocontents {toc} { \protect \makeatletter }
247   \addtocontents {toc} {
248     \token_to_str:N \renewcommand* \token_to_str:N \l@section
249       { \token_to_str:N \@dottedtocline {1} {1.5em} {5em} }
250   }
251   \addtocontents {toc} { \protect \makeatother }
252   \renewcommand*\familydefault {\sfdefault}
253   \pagenumbering{roman}
254 }

```

End the input stream of `whats-layout-module.code.tex`.

```

255 \file_input_stop:

```

End the optionlist class for `l3docstrip`.

```

256 </layout>

```

#### A.4 The `whats-theorem-module.code.tex` file

Start the optionlist theorem for `l3docstrip`.

```

257 <*theorem>

```

Declare the module file.

```

258 \__whats_provide_module:n { theorem }

```

Load the `keytheorems` package, and predefine the following environments.

```

259 \RequirePackage{keytheorems}
260 \newcounter {week}
261 \newcommand \newweek { \refstepcounter{week} \clearpage }
262 \newkeytheorem { theorem   } [ parent   = section, style = definition ]
263 \newkeytheorem { example   } [ parent   = section, style = definition ]
264 \newkeytheorem { definition } [ parent   = section, style = definition ]
265 \newkeytheorem { problem   } [ parent   = week,    style = definition ]
266 \newkeytheorem { solution  } [ numbered  = false,  style = definition ]
267 \newkeytheorem { remark    } [ numbered  = false,  style = remark    ]

```

```

268 \file_input_stop:
269 </theorem>

```

## A.5 The `whats-cover-module.code.tex` file

Start the optionlist cover for `l3docstrip`.

```
270 <*cover>
```

Declare the module file.

```
271 \__whats_provide_module:n { cover }
```

Load the `tikz` package for graphing the (The `expl3` syntax needs to be temporarily turned off).

```
272 \RequirePackage{tikz, zref-totpages}
```

```
273 \ExplSyntaxOff
```

```
274 \usetikzlibrary{fadings, patterns, arrows.meta}
```

```
275 \tikzset{ > = Stealth, every picture/.append style = {
```

```
276     line join = round, line cap = round, thick } }
```

```
277 \ExplSyntaxOn
```

**`\coverset`** Macro for cover configuration by setting keys.

```
278 \DeclareDocumentCommand \coverset { m } { \keys_set:nn { __whats / coverset } {#1} }
```

Comma list for storing the left logos' path.

```
\l__whats_cover_llogos_clist 279 \clist_new:N \l__whats_cover_llogos_clist
```

Token lists for storing elements on the cover page.

```
280 \keys_define:nn { __whats / coverset }
```

```
\@title
```

```
281 {
```

```
\@author 282 title .tl_gset:N = \@title,
```

```
\@afill 283 author .tl_gset:N = \@author,
```

```
\@date 284 afill .tl_gset:N = \@afill,
```

```
\l__whats_cover_extinfo_tl 285 date .tl_gset:N = \@date,
```

```
\l__whats_cover_head_tl 286 date .initial:n = \today,
```

```
\l__whats_cover_clogo_tl 287 extinfo .tl_set:N = \l__whats_cover_extinfo_tl,
```

```
288 head .tl_set:N = \l__whats_cover_head_tl,
```

```
289 clogo .tl_set:N = \l__whats_cover_clogo_tl,
```

```
290 llogos .clist_set:N = \l__whats_cover_llogos_clist,
```

```
291 }
```

*(End of definition for `\coverset` and others. These functions are documented on page 1.)*

**`\sidehead`** Macros for configuring the header and footer on the sidebar.

**`\sidefoot`** `\DeclareRobustCommand * \sidehead [1] { \tl_gset:Nn \@sidehead {#1} }`

`\@sidehead` `\DeclareRobustCommand * \sidefoot [1] { \tl_gset:Nn \@sidefoot {#1} }`

`\@sidefoot` Set the header and footer of the sidebar  $\langle title\ name \rangle$ ,  $\langle page\ number \rangle$  /  $\langle total\ page \rangle$  by default.

```
294 \sidehead{\@title}
```

```
295 \sidefoot{\thepage\,/\,\ztotpages}
```

*(End of definition for `\sidehead` and others. These functions are documented on page 2.)*

Declare a hook for sidebar.

```
296 \hook_gset_rule:nnnn { shipout / background } { shipout__whats }
```

```
297 { before } { pgfracs }
```

`\maketitle` Redefine the `\maketitle` macro for graphing the cover and load the hook.

```
298 \DeclareDocumentCommand \maketitle { 0 { gray } }
299 {
300   \_whats\_maketitle:n {#1}
301   \hook_gput_code:nnn { shipout / background } { shipout\_whats }
302   { \if@mainmatter \_whats\_sidebar\_hook:n {#1} \fi }
303 }
```

*(End of definition for `\maketitle`. This function is documented on page 1.)*

`\_whats\_maketitle:n` The auxiliary command for `\maketitle`.

```
304 \cs_new_protected_nopar:Npn \_whats\_maketitle:n #1
305 {
306   \pagecolor{#1!10}
307   \let \cleardoublepage \clearpage
308   \begin{titlepage}
309     \begin{tikzpicture} [ remember ~ picture, overlay ]
310       \tl_if_empty:NF \l\_whats\_cover\_head\_tl
311       {
312         \node [ yshift = .325\paperheight, opacity = .5,
313               rotate ~ around = { pi \c\_colon\_str
314                 ([yshift = .325\paperheight]current ~ page.center)} ]
315               at (current ~ page.center)
316               { \includegraphics [width = \paperwidth]
317                 { \l\_whats\_cover\_head\_tl } };
318       }
319       \clist_if_empty:NF \l\_whats\_cover\_llogos\_clist
320       {
321         \int_step_inline:nn { \clist_count:N \l\_whats\_cover\_llogos\_clist }
322         {
323           \node
324             [ opacity = .25, yshift = {
325               -.6\paperheight / 2 /
326               \clist_count:N \l\_whats\_cover\_llogos\_clist +
327               ##1 * .6\paperheight /
328               \clist_count:N \l\_whats\_cover\_llogos\_clist }
329             ] at ([xshift = .1\paperwidth]current ~ page.south ~ west)
330             {
331               \includegraphics
332               [
333                 height = .6\paperheight/6,
334                 width = .16\paperwidth, keepaspectratio
335               ] { \clist_item:Nn \l\_whats\_cover\_llogos\_clist { ##1 } }
336             };
337         }
338       }
339       \fill [ white, opacity = .5 ] (current ~ page.south ~ east) rectangle +
340         (-.8\paperwidth, .6\paperheight);
341       \node [ gray, above ~ left, inner ~ sep = 1em ] at
342         (current ~ page.south ~ east) { \l\_whats\_cover\_extinfo\_tl };
343       \fill [ white, opacity = .5 ] (current ~ page.south ~ east) rectangle +
344         (-.7\paperwidth, .7\paperheight);
345       \node
346         [ shift = {(-.35*\paperwidth, .65*\paperheight)},
```

```

347         darkgray, font = \Huge \bfseries \sffamily
348     ] at (current ~ page.south ~ east) { \@title };
349     \node
350     [ shift = {(-.75*\paperwidth,.3*\paperheight)},
351       rotate = 90, gray, opacity = .6, font = \huge \sffamily
352     ] at (current ~ page.south ~ east) { \@author\ | \ \@afill };
353     \tl_if_empty:NF { \l__whats_cover_clogo_tl }
354     {
355         \node (cover ~ logo)
356         [ shift = {(.65*\paperwidth,.3*\paperheight)}]
357         at (current ~ page.south ~ west)
358         {
359             \includegraphics[ height = .4\paperheight ]
360             { \l__whats_cover_clogo_tl }
361         };
362     }
363     \end{tikzpicture}
364     \clearpage \thispagestyle{empty}
365     \centering
366     \vspace* \fill \sffamily
367     \Large This ~ page ~ was ~ intentionally ~ left ~ blank.
368     \vspace* \fill
369     \end{titlepage}
370     \pagecolor{Beige!30}
371 }

```

(End of definition for \\_\_whats\_@maketitle:n)

\\_\_whats\_sidebar\_hook:n Hook for graphing the sidebar: different on odd and even pages.

```

372 \cs_new_protected:Npn \__whats_sidebar_hook:n #1
373 {
374     \int_if_odd:nTF { \arabic { page } }
375     {
376         \tikz [remember ~ picture, overlay] {
377             \fill [ #1, opacity = .125 ]
378             (current ~ page.south ~ west) rectangle
379             ([xshift = +.5in]current ~ page.north ~ west);
380         \node [ opacity = .25, inner ~ xsep = .25in,
381             above, inner ~ ysep = {1in - \footskip + 1ex},
382             font = \sffamily \large,
383             ] at ([xshift = +.25in]current ~ page.south ~ west)
384             { \rotatebox {-90} {\@sidehead} };
385         \node [ opacity = .25, inner ~ xsep = .25in,
386             above, inner ~ ysep = \headsep, yshift = -1in,
387             font = \sffamily \large,
388             ] at ([xshift = +.25in]current ~ page.north ~ west)
389             { \rotatebox {-90} {\@sidefoot} };
390     }
391     }
392     {
393         \tikz [remember ~ picture, overlay] {
394             \fill [ #1, opacity = .125 ]
395             (current ~ page.south ~ east) rectangle
396             ([xshift = -.5in]current ~ page.north ~ east);

```

```

397     \node [ opacity = .25, inner ~ xsep = .25in,
398             above, inner ~ ysep = {1in - \footskip + 1ex},
399             font = \sffamily \large,
400             ] at ([xshift = -.25in]current ~ page.south ~ east)
401             { \rotatebox {+90} {\@sidehead} };
402     \node [ opacity = .25, inner ~ xsep = .25in,
403             above, inner ~ ysep = \headsep, yshift = -1in,
404             font = \sffamily \large,
405             ] at ([xshift = -.25in]current ~ page.north ~ east)
406             { \rotatebox {+90} {\@sidefoot} };
407     }
408 }
409 }

```

*(End of definition for \\_whats\_sidebar\_hook:n)*

End the input stream of `whats-cover-module.code.tex`.

```

410 \file_input_stop:

```

End the optionlist cover for `l3docstrip`.

```

411 </cover>

```

# 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.

<b>Symbols</b>	
$\backslash$ , .....	295
$\lceil$ .....	149
$\lfloor$ .....	V
$\sqcup$ .....	201, 209, 231, 352
$\rceil$ .....	162
$\rfloor$ .....	V
<b>A</b>	
$\AA$ .....	84
$\addtocontents$ .....	246, 247, 251
$\adj$ .....	80
$\alph$ .....	191
$\angstrom$ .....	84
$\appendix$ .....	240
$\appendixname$ .....	244
$\arabic$ .....	374
<b>B</b>	
$\Bdiagmat$ .....	115
$\bdiagmat$ .....	109
$\begin$ .....	308, 309
$\bfseries$ .....	230, 347
$\biolinumLF$ .....	199, 231
$\bra$ .....	89
$\braket$ .....	93
<b>C</b>	
$\centering$ .....	365
$\cev$ .....	58
$\chapter$ .....	230, 232
$\chaptermark$ .....	195
$\cleardoublepage$ .....	241, 307
$\clearpage$ .....	261, 307, 364
clist commands:	
$\clist_count:N$ .....	321, 326, 328
$\clist_gput_right:Nn$ .....	39, 41
$\clist_if_empty:NTF$ .....	319
$\clist_item:Nn$ .....	335
$\clist_map_inline:nn$ .....	23
$\clist_new:N$ .....	31, 279
$\color$ .....	147
color commands:	
$\color_select:n$ .....	148, 159, 221, 225
$\color_set:nnn$ .....	146
$\colorbox$ .....	144, 145
$\columnratio$ .....	235
$\cosh$ .....	72, 74
$\cotan$ .....	78
$\coth$ .....	72, 76
$\coverset$ .....	1, 278
$\cr$ .....	61, 62, 63
cs commands:	
$\cs_new_protected:Npn$ .....	9, 11, 13, 372
$\cs_new_protected_nopar:Npn$ .....	15, 21, 36, 304
<b>D</b>	
$\D$ .....	69
$\DeclareDocumentCommand$ .....	97, 103, 109, 115, 121, 127, 278, 298
$\DeclareMathOperator$ .....	73, 74, 75, 76, 77, 78, 79, 80
$\DeclareRobustCommand$ .....	58, 81, 82, 89, 91, 93, 95, 149, 162, 292, 293
$\DeclareSIUnit$ .....	84
$\def$ .....	3, 4, 5, 140, 141, 147, 148
$\diagmat$ .....	97
$\displaystyle$ .....	144
<b>E</b>	
$\else$ .....	138, 144
else commands:	
$\else:$ .....	154, 168, 171
$\end$ .....	363, 369
$\ensuremath$ .....	82
$\eqcolor$ .....	147
exp commands:	
$\exp_args:NNV$ .....	48
$\exp_args:NNx$ .....	41
$\exp_not:n$ .....	42
$\ExplSyntaxOff$ .....	273
$\ExplSyntaxOn$ .....	277
<b>F</b>	
$\familydefault$ .....	252
$\fancyfoot$ .....	216
$\fancyhead$ .....	212, 213, 214, 215
$\fi$ .....	138, 145, 201, 224, 302
fi commands:	
$\fi:$ .....	158, 160, 170, 173
file commands:	
$\file_if_exist_input:nTF$ .....	25
$\file_input_stop:$ .....	50, 176, 255, 268, 410
$\fill$ .....	339, 343, 366, 368, 377, 394
$\footrule$ .....	222



<code>\footrulewidth</code> .....	219, 224, 226	<code>\linespread</code> .....	228
<code>\footskip</code> .....	381, 398	<code>\linewidth</code> .....	157
<code>\FrameSep</code> .....	237	<code>\LoadClass</code> .....	48
<b>G</b>		<b>M</b>	
<code>\gdef</code> .....	244, 245	<code>\makeatletter</code> .....	246
<code>\graphicspath</code> .....	187	<code>\makeatother</code> .....	251
<b>H</b>		<code>\makebox</code> .....	157
<code>\headrulewidth</code> .....	218	<code>\maketitle</code> .....	1, IX, 298
<code>\headsep</code> .....	386, 403	<code>\markboth</code> .....	197
<code>\headwidth</code> .....	226	<code>\markright</code> .....	206
<code>\hidewidth</code> .....	62	<code>\mathbbm</code> .....	82
hook commands:		<code>\mathemph</code> .....	2, 143
<code>\hook_gput_code:nnn</code> .....	220, 301	<code>\mathpalette</code> .....	58
<code>\hook_gset_rule:nnnn</code> .....	296	<code>\mathrm</code> .....	70, 71
<code>\hrule</code> .....	226	<code>\mathsf</code> .....	69, 81
<code>\Huge</code> .....	347	<code>\mkern</code> .....	62, 71, 81
<code>\huge</code> .....	230, 351	msg commands:	
<code>\hypersetup</code> .....	135	<code>\msg_error:nnn</code> .....	12, 14
<b>I</b>		<code>\msg_new:nnn</code> .....	10
<code>\ialign</code> .....	61	<b>N</b>	
<code>\identity</code> .....	82	<code>\newcommand</code> .....	59, 261
if commands:		<code>\newcounter</code> .....	260
<code>\if_mode_inner:</code> .....	166	<code>\newdif</code> .....	69, 70, 71
<code>\if_mode_math:</code> .....	152, 165	<code>\NewDocumentCommand</code> .....	143
<code>\if_mode_vertical:</code> .....	155	<code>\newkeytheorem</code> ...	262, 263, 264, 265, 266, 267
<code>\IfBooleanTF</code> .....	99, 105, 111, 117, 123, 129	<code>\newweek</code> .....	261
<code>\ifmmode</code> .....	143	<code>\node</code> 312, 323, 341, 345, 349, 355, 380, 385, 397, 402	
<code>\ifnum</code> .....	138	<code>\nointerlineskip</code> .....	156
<code>\ignorespaces</code> .....	174	<code>\normalfont</code> .....	199, 208
<code>\im</code> .....	79	<b>O</b>	
<code>\includegraphics</code> .....	316, 331, 359	<code>\offinterlineskip</code> .....	60
<code>\infty</code> .....	141	<b>P</b>	
int commands:		<code>\pagecolor</code> .....	306, 370
<code>\int_compare:nNnTF</code> .....	200, 209	<code>\pagenumbering</code> .....	253
<code>\int_if_odd:nTF</code> .....	374	<code>\pagestyle</code> .....	217
<code>\int_step_inline:nn</code> .....	321	<code>\paperheight</code> .....	312, 314, 325, 327, 333, 340, 344, 346, 350, 356, 359
<code>\intop</code> .....	140	<code>\paperwidth</code> 316, 329, 334, 340, 344, 346, 350, 356	
<code>\iu</code> .....	71	<code>\paragraph</code> .....	233
<b>K</b>		<code>\parindent</code> .....	238
<code>\ket</code> .....	91	<code>\PassOptionsToClass</code> .....	46
<code>\ketbra</code> .....	95	<code>\PassOptionsToPackage</code> .....	47, 67
keys commands:		<code>\pdfstrcmp</code> .....	138
<code>\keys_define:nn</code> .....	32, 280	<code>\pdfstringdefDisableCommands</code> .....	139
<code>\l_keys_key_str</code> .....	39, 42	<code>\pdiagmat</code> .....	103
<code>\keys_set:nn</code> .....	278	<code>\pgfplotsset</code> .....	188
<b>L</b>		phy internal commands:	
<code>\Large</code> .....	367	<code>\__phy_diagmat_type:nnn</code> .....	
<code>\large</code> .....	382, 387, 399, 404	.....	100, 101, 106,
<code>\leftmark</code> .....	214	.....	107, 112, 113, 118, 119, 124, 125, 130, 131
<code>\let</code> .....	57, 72, 136, 141, 224, 307		

<code>\plainfootrulewidth</code>	224	<code>\@height</code>	226
<code>\ProcessKeyOptions</code>	45	<code>\@ifstar</code>	90, 92, 94, 96
<code>\protect</code>	246, 251	<code>\@pnumwidth</code>	239
<code>\ProvidesExplClass</code>	7	<code>\@sidefoot</code>	292, 389, 406
<code>\ProvidesExplFile</code>	17	<code>\@sidehead</code>	292, 384, 401
<b>Q</b>			
<code>\qopname</code>	78	<code>\@title</code>	280, 294, 348
<b>R</b>			
<code>\reflectbox</code>	62	<code>\@width</code>	226
<code>\refstepcounter</code>	261	<code>\c@chapter</code>	245
<code>\relax</code>	72, 78	<code>\c@secnumdepth</code>	200, 209
<code>\renewcommand</code>	137,	<code>\do@cev</code>	58, 59
	195, 204, 218, 219, 222, 239, 240, 248, 252	<code>\dollar@begin</code>	147, 159
<code>\RequirePackage</code>	54, 56, 68,	<code>\dollar@end</code>	148, 169
	83, 85, 87, 134, 180, 181, 182, 183, 184,	<code>\HyPsd@CatcodeWarning</code>	136, 137, 141
	186, 190, 193, 194, 229, 234, 236, 259, 272	<code>\if@fancyplain</code>	224
<code>\rightmark</code>	212	<code>\if@mainmatter</code>	201, 302
<code>\roman</code>	192	<code>\ilimits@</code>	140
<code>\rotatebox</code>	384, 389, 401, 406	<code>\l@section</code>	248
<b>S</b>			
scan commands:		<code>\m@ne</code>	200
<code>\scan_stop:</code>	151, 164	<code>\m@th</code>	62, 63
<code>\scshape</code>	199, 231	<code>\oldHyPsd@CatcodeWarning</code>	136, 138
<code>\sectionmark</code>	204	<code>\phy@d@lx</code>	90, 92, 94, 96
<code>\setcounter</code>	242, 243	<code>\whatsnote@date</code>	3, 7, 18
<code>\setenumext</code>	191, 192	<code>\whatsnote@tldr</code>	5, 8
<code>\setlength</code>	237, 238	<code>\whatsnote@version</code>	4, 8, 18
<code>\sfdefault</code>	252	<code>\z@</code>	209, 232, 233, 237, 238
<code>\sffamily</code>	208, 212, 213, 214,	<code>\text</code>	84
	215, 230, 347, 351, 366, 382, 387, 399, 404	text commands:	
<code>\sgn</code>	77	<code>\text_titlecase:n</code>	19
<code>\sidefoot</code>	2, 292	<code>\thechapter</code>	201, 231, 245
<code>\sidehead</code>	2, 292	<code>\thepage</code>	213, 215, 295
<code>\sidehead,<sub>u</sub>sidefoot</code>	2	<code>\thesection</code>	209
<code>\sinh</code>	72, 73	<code>\thispagestyle</code>	364
str commands:		<code>\tikz</code>	376, 393
<code>\c_colon_str</code>	313	<code>\tikzset</code>	275
sys commands:		<code>\titleformat</code>	230
<code>\sys_if_engine_xetex:TF</code>	67	<code>\titlespacing</code>	232, 233
<b>T</b>			
<code>\tanh</code>	72, 75	tl commands:	
$\TeX$ and $\LaTeX$ commands:		<code>\tl_gset:Nn</code>	292, 293
<code>\@Alph</code>	245	<code>\tl_if_empty:NTF</code>	310, 353
<code>\@afill</code>	280, 352	<code>\tl_if_empty:nTF</code>	38
<code>\@author</code>	280, 352	<code>\today</code>	286
<code>\@badmath</code>	153, 167, 172	token commands:	
<code>\@chapapp</code>	201, 231, 244	<code>\token_to_str:N</code>	248, 249
<code>\@date</code>	280	<code>\tran</code>	81
<code>\@dottedtocline</code>	249	<b>U</b>	
<code>\@gobble</code>	141	<code>\upe</code>	70
<b>U</b>			
<code>\@height</code>	226	<code>\usephysicsmodule</code>	88
<code>\@ifstar</code>	90, 92, 94, 96	<code>\usetikzlibrary</code>	274
<code>\@pnumwidth</code>	239	<b>V</b>	
<code>\@sidefoot</code>	292, 389, 406	<code>\vbox</code>	60
<code>\@sidehead</code>	292, 384, 401	<code>\Vdiagmat</code>	127
<code>\@title</code>	280, 294, 348	<code>\vdiagmat</code>	121
<code>\@width</code>	226		
<code>\c@chapter</code>	245		
<code>\c@secnumdepth</code>	200, 209		
<code>\do@cev</code>	58, 59		
<code>\dollar@begin</code>	147, 159		
<code>\dollar@end</code>	148, 169		
<code>\HyPsd@CatcodeWarning</code>	136, 137, 141		
<code>\if@fancyplain</code>	224		
<code>\if@mainmatter</code>	201, 302		
<code>\ilimits@</code>	140		
<code>\l@section</code>	248		
<code>\m@ne</code>	200		
<code>\m@th</code>	62, 63		
<code>\oldHyPsd@CatcodeWarning</code>	136, 138		
<code>\phy@d@lx</code>	90, 92, 94, 96		
<code>\whatsnote@date</code>	3, 7, 18		
<code>\whatsnote@tldr</code>	5, 8		
<code>\whatsnote@version</code>	4, 8, 18		
<code>\z@</code>	209, 232, 233, 237, 238		

<code>\vec</code> .....	57, 62	<code>\l__whats_cover_llogos_clist</code> ...	
<code>\vphantom</code> .....	144, 145	.....	279, 319, 321, 326, 328, 335
<code>\vspace</code> .....	366, 368	<code>\__whats_load_module:n</code> .....	21, 21, 49
<code>\vv</code> .....	57	<code>\__whats_msg_error:nn</code> .....	9, 11, 26
<b>W</b>			
whats internal commands:			
<code>\__whats_maketitle:n</code> ...	300, 304, 304	<code>\__whats_msg_new:nn</code> .....	9, 9, 29
<code>\g__whats_base_class_options_-</code>		<code>\__whats_msg_warning:nn</code> .....	9, 13
<code>clist</code> .....	31, 39, 41, 48	<code>\__whats_provide_module:n</code> .....	
<code>\l__whats_cover_clogo_tl</code>	280, 353, 360	.....	15, 15, 53, 179, 258, 271
<code>\l__whats_cover_extinfo_tl</code> ..	280, 342	<code>\__whats_sidebar_hook:n</code> ..	302, 372, 372
<code>\l__whats_cover_head_tl</code> ..	280, 310, 317	<code>\__whats_unknown_option:n</code> ..	34, 36, 36
<b>Z</b>			
<code>\ztotpages</code> .....			295