LaTeX handout

tinyynoob

May 29, 2022

author: tinyynoob
contact: sadpotato1920@gmail.com

Preface

LaTeX is an excellent tool for word processing, especially for those containing mathematical symbols or equations.

This handout provides some examples for common-used syntax in LaTeX. You can download such as TeX Live to use LaTeX at local side. Or you may use it online on Overleaf, which provides convenience.

This handout is written at CCU during event "Pick up student! Pick up teacher!".

Contents

1 Title

section declares title

1.1 Sub title

Lorem Ipsum is simply dummy text of the printing and typesetting industry.

1.1.1 Level 3 title

Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book.

1.1.2 Another level 3 title

It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged.

1.2 Paragraph, Newline and Space

Hello, world! Hello, world!
Hello, world! Hello, world!
Hello, world!
Hello, world! Hello, world!
Hello, world!
Hello, world!

1.3 Indents

1.3.1 Normal

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested.

Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

1.3.2 No indents

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested.

Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

1.3.3 flushleft

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested.
Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

1.3.4 flushright

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested.
Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero are also reproduced in their exact original form, accompanied by English versions from the 1914 translation by H. Rackham.

1.4 fill

I am at beginning.
Normal position

hfill to here

I am at bottom of this page, by vfill.

2 Objects

2.1 Ordered List

1. (a) int
   (b) long
2. floating types
   (a) float
   (b) double

2.2 Unordered List

2.2.1 normal

- apple
- watermelon
- pear

2.2.2 custom

- abcd

> I look like terminal.

ijkl

- mnop

□ qrst

2.3 Tabular

2.3.1 example 1

cell1	cell2	cell3
cell4	cell5	cell6
cell7	cell8	cell9

2.3.2 example 2

left	mid	right
cellllllll4	cell5	cellllllll6
cellllllll7	cell8	cellllllll9

3 Math

There are two modes for math in LaTeX.

$x = 3 \div 5 = \frac{3}{5}$ may be inlined in words, or be displayed themselves:

$$x = 3 \div 5 = \frac{3}{5}$$

$$x = \quad 3 \div 5$$

Don't forget to import package *amsmath* at front!

Inline mathematical expression $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 + 25 + 27 + 29 + 31 + 33 + 35 + 37 + 39 + 41 + 43 + 45 + 47 + 49 + 51 + 53 + 55 + 57 + 59 + 61 + 63 + 64 + 67 + 69$ would be wrapped automatically.

3.1 Symbols

The display of the symbols are very easy.

x, y, z, α, β, ϕ, Φ, ω, Ω

$\exists$, $\forall$, $>$, $\geq$, $\leq$, $\gg$, $\pm$, $\mp$, $/$, $\backslash$

3.2 Subscripts

$$x^3 \quad x^y \quad \pi^2 \quad x^20 \quad x^{20}$$

$$x_3 \quad x_y \quad \delta_2 \quad x_20 \quad x_{20}$$

$$x_5^7 \quad x_5^{79} \quad x_{52}^7 \quad x_{52}^{79} \quad x_i^2 \quad x_{i^2}$$

$$\lim_{x \to 0^+} \frac{1}{x} = +\infty$$

$$v' \quad \vec{v} \quad \hat{v} \quad \bar{v} \quad \tilde{v}$$

3.3 Parenthesis

3.4 Math font style

- E

$$\mathrm{E} \quad E \quad \mathrm{E} \quad \mathbf{E} \quad \mathcal{E} \quad \mathbb{E} \quad \mathscr{E}$$

- L

$$\mathrm{L} \quad L \quad \mathrm{L} \quad \mathbf{L} \quad \mathcal{L} \quad \mathbb{L} \quad \mathscr{L}$$

3.5 cases

$$\operatorname{sgn}(x) = \begin{cases} 1 & x > 0 \\ 0 & x = 0 \\ -1 & x < 1 \end{cases}$$

3.6 matrix

$$\begin{matrix} a & b \\ c & d \end{matrix}$$

$$\det \begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

$$\begin{pmatrix} 1 & 2 & 0 \\ 3 & 4 & 0 \end{pmatrix}^{T}_{2\times 3} = \begin{pmatrix} 1 & 3 \\ 2 & 4 \\ 0 & 0 \end{pmatrix}$$

3.7 align

$$y = \int_1^5 3x\,dx \tag{1}$$
$$= \frac{3}{2}x^2\Big]_1^5 \tag{2}$$
$$= \frac{3}{2}\cdot(25-1) = 36 \tag{3}$$

$$\cos(x) = \frac{\mathrm{d}\sin x}{\mathrm{d}x} \tag{4}$$
$$= \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!}\cdot x^{2n-1} \tag{5}$$
$$= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots \tag{6}$$

3.8 Equation references

$$f(x) = \ln x \tag{7}$$

$$f(x) = \ln x \tag{8}$$

$$f(x) = \ln x$$

$$g(x) = e^x \tag{3.8.9}$$

From Equation (7), Equation 7 in subsection 3.8, we know that f is a logarithmic function. Equation (3.8.9)

$$\cos(x) = \frac{\mathrm{d}\sin x}{\mathrm{d}x} \tag{3.8.10}$$
$$= \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!}\cdot x^{2n-1} \tag{3.8.11}$$
$$= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots \tag{3.8.12}$$

We have (3.8.11), (3.8.12)

$$
\begin{aligned}
y &= \int_1^5 3x\,dx \\
&= \frac{3}{2}x^2\Big]_1^5 \\
&= \frac{3}{2}\cdot(25-1) = 36
\end{aligned}
$$

3.9 substack