Me Into LaTeX

Utensil[1]

September 15, 2007

[1]Thanks to the reader.

Preface

This chapter will not be enumerated.

终于将这个我的第一个TEX文档写完了。这份文档简单地介绍了TEX的基本知识、常用环境，以及数学环境。

写这个文档的初衷其实是练习，这使得这个文档的源代码是和它讲述的TEX知识共同成长的，我学到了什么程度，就用 什么程度的TEX命令来进行排版。甚至在许多地方，文档和其源代码是密不可分的整体，共同完成对TEX知识的介绍。 例如，在一开始的许多地方，我没有在文档中同时展示源代码和其效果，我只在文档中给出其效果，而让读者自行查找是 什么源代码实现了这个效果·····

读者可能会对这份文档全部由英文写成表示愤慨，可是这里头很多陌生单词是和命令名一样的，其余则是生词不超过20个 的浅易英文，毕竟，我英文程度很一般。

我估计其实没什么人会看这份文档的，所以说明就只作这么多了。

大家有什么问题可以在我的博客http://blog.csdn.net/utensil/留言，或者发邮件到RonIzWright@126.com。最后数学符 号列表那里不知为什么总是处理不好，希望哪位高手指点一下。

P.S.这份文档是在CTEX下完成和进行编译的，感谢为CTEX付出的所有人！

Contents

[1] For example,protecting my footnote.

Chapter 1

Basics

1.1 Spaces and Reserved Symbols

It does not matter whether you enter one or several spaces after a word.

An empty line starts a new paragraph.

These symbols have to be slashed: # $ % ^ & _ { } ~

But if we slash \ will get an
line break,it's the same as the
\newline.

LaTeX will ignore the spaces after an order.

...

1.2 Hyphenation

We can tell LaTeX how to hyphenate,for example,this long long word: supercalifragilisticexpialidocious.

We can tell LaTeX not to hyphenate,for example,this long long word: supercalifragilisticexpialidocious.

This will cause an "underfull hbox".

If we lower the quality demand,LaTeX will do it like this:supercalifragilisticexpialidocious.

That's horrible,isn't it?So we have to resume it.

We can draw a quad around the texts: supercalifragilisticexpialidocious

1.3 Special Symbols

"sth"

'another sth'

-

–

—

−1

sths̃th

sth˜sth

∼

−30 °C
ff
ff
Hôtel,
naïve
élève
smørrebrød
¡Señorita!
Schönbrunner Schloß Straße
ò ó ô õ ō ȯ ö
ç ǒ ǒ ő ǫ ọ o̲ o͡o
œ Œ æ Æ å Å
ø Ø ł Ł ı ȷ ¡ ¿
Mr. Smith was happy to see her.
I like BASIC. What about you?

1.4 Structrue

\documentclass[options]{class}

1.4.1 Classes

article
report
book
slides

1.4.2 Options

10pt[11pt,12pt. . .]
letterpaper [a4paper,a5paper,b5paper,executivepaper,legalpaper. . .]
fleqn: Left align the math formulas.
leqno: Put the serial number of math formulas on its left.
titlepage, notitlepage
onecolumn, twocolumn
twoside, oneside
openright, openany: Where the new chapter starts.

1.4.3 Layers

\part{. . . }
\chapter{. . . }
\section{. . . }
\subsection{. . . }
\subsubsection{. . . }
\paragragh{. . . }
\subparagragh{. . . }

1.5 Cross Reference

See section 1.5 on page 6.

1.6 FootNote

See the footnote[1].

1.7 Emphasizing

You can use \underline,but *emph* is recommended.

You can also emphasize *text if it is set in italics,* in a *sans-serif* font, `or in` *`typewriter`* `style.`

1.8 Text Fonts

Roman
Sans Serif
`Typewriter`
medium
Bold Face
Upright
italic
slanted
Small Caps

1.9 Text Size

Tiny
Scriptsize
Footnotesize
Small
Normalsize
large
Large
LARGE
huge
Huge

[1] We don't need to say anything here.

1.10 New Command

It's not recommended to set a font or a size for some texts directly,you should pack it in a style and apply the style to all the texts for which you want to set the font and the size.

Use \newcommand{*name*}[*num*]{*definition*} to pack styles or other commands.

Use \renewcommand{*name*}[*num*]{*definition*} to repack it.

For example:

`Large Typewriter`

Huge Sans Serif

Chapter 2

Useful Environments

2.1 Lists

2.1.1 Itemize

Default Style:

- Apple
- Pear
- Banana

Customized Style[1]:

* Eye
* Nose
* Ear

2.1.2 Enumerate

1. Point
2. Line
3. Polygon

2.1.3 Description

I prefer calling it definitions.

erklären German word,meaning “explain”.

klären German word,meaning “clear”.

[1] But it looks stupid.

2.2 Aligning

2.2.1 Flushleft

This text is
left-aligned. LaTeX is not trying to
make each line the same length.

2.2.2 Flushright

This text is
left-aligned. LaTeX is not trying to
make each line the same length.

2.2.3 Center

In the tremendous sea of faces.
We met,gathered then seperated.
I hope our friendship will go beyond time and space.
Wish you happiness and merriment.

2.3 Quoting

2.3.1 Quote

In *The Winter's Tale*,Shakespear said:

> I should leave grazing,were I of your flock,and only live by gazing.

2.3.2 Quotation

Quoting paragraphs:

> This fertile and sheltered tract of country, in which the fields are never brown and the springs never dry, is bounded on the south by the bold chalk ridge...
>
> The district is of historic, no less than of topographical interest. The Vale was known in former times as the Forest of White Hart, from a curious legend of King Henry III's reign...
>
> The forests have departed, but some old customs of their shades remain. Many, however, linger only in a metamorphosed or disguised form. ...

2.3.3 Verse

It's used for quoting poems.

I've Got A Pain In My Sawdust

w. Henry Edward Warner m. Herman Avery Wade

...

I've got a pain in my sawdust,
That's what's the matter with me;
Something is wrong with my little inside,
I'm just as sick as can be.

Don't let me faint,
someone get me a fan,
Someone else run for the medicine man,
Ev'ryone hurry as fast as you can,
I've got a pain in my sawdust.

...

Oh, sad was the day for the little bisque doll,
For they cut all her stitches away,
And looked for the seat of the terrible ache;
"T'was a delicate task", they all say,

For none of the surgeons had ever before
Performed on a dolly's inside,
They tried to restuff her but didn't know how,
And this was her wail as she died;
I've got a pain...

2.4 Just Show It In The Way That It's Typed

```
Use the pair of
                                    \begin{verbatim}
                And
                  \end{verbatim}
                Or
                             \verb| Contents that you want them to be
                             shown in the way it's typed |

      Actually,| pair can be replaced by any symbol pair
                                  like + # @ &
                       expect * and space,

     I guess it's prepared for CODES.
```

2.5 Tabular

Now it's time to create tables.
\begin{Tabular}{*Table Style*}
Table Contents
\end{Tabular}

2.5.1 Table Style

Table Style is not responsible for the creation of horizonal lines in the table,that's the responsibility of *Table Contents*'s.

l,r,c creates a row that is left-aligned,right-aligned or centered.

p{*width*} creates a row by the given width.

| creates a vertical line to separate rows.

@{*symbol*} separate rows with the symbol *symbol*.

2.5.2 Table Contents

& jump to the next row.

\\ jump to the next line.

hline creates a horizonal line through all rows.

cline{*i*-*j*} creates a horizonal line from row i to row j.

2.5.3 Examples

An ordinary table:

7C0	hexadecimal
3700	octal
11111000000	binary
1984	decimal

Using `@{}` to coordinate the radix point:

Pi expression	Value
π	3.1416
π^π	36.46
$(\pi^\pi)^\pi$	80662.7

2.6 Where To Put It?Float It!

`begin{figure}[`*placement specifier*]
or
`begin{table}[`*placement specifier*]

placement specifier	where to put it
h	put it on the current page.
t	put it on the top of a page.
b	put it on the bottom of a page.
p	put it on an individual page.
!	place it rigidly as placement specifier requested.

Figure 2.1 is an example of Pop-Art.

2.7 Protect Fragile Commands[2]

Without `\protect`,I can't even put a footnote for the title of a section.

[2]For example,protecting my footnote.

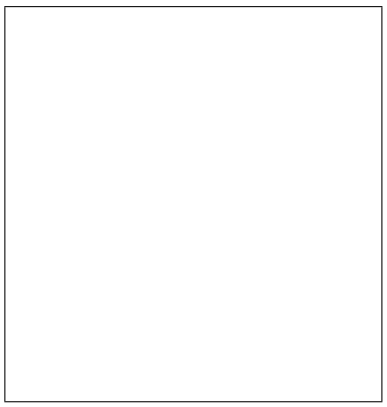

Figure 2.1: Five by Five in Centimetres.

Chapter 3

Math Formulas

Yeah!Eventually we've reached the most powerful function and also the most exciting part of LaTeX—Math formulas!We might use the AMS-LaTeX or other macros.

3.1 Math Modes

3.1.1 Math Formulas In Paragraphs

There are three choice:
`\begin{math}`*Formula*`\end{math}`
`$`*Formula*`$`
`\(` *Formula* `\)`

3.1.2 Math Formulas In Display Mode

The formula will stand alone,and will not be enumerated.
`\begin{displaymath}`*Formula*`\end{displaymath}`
`\[` *Formula* `\]`

3.1.3 Math Formulas In Equation Mode

The formula will stand alone,and will be enumerated.If we use `\begin{equation*}`,the equations will not be enumerated.
`\begin{equation}`*Formula*`\end{equation}`

3.1.4 Examples

Formulas in paragraph,$\lim_{n\to\infty}\sum_{k=1}^{n}\frac{1}{k^2}=\frac{\pi^2}{6}$.
Formulas in display mode:

$$\lim_{n\to\infty}\sum_{k=1}^{n}\frac{1}{k^2}=\frac{\pi^2}{6}$$

Formulas in equation mode[1]:

[1]With Package *amsfonts* or *amssymb*,we can have the blackboard bold font for sets.

$$\forall x \in \mathbb{R}: \qquad x^2 \geq 0 \tag{3.1}$$

Every letter in math mode will be treated as a variable,except when it's in `\textrm{}` or `\mathrm{}`:

$$x^2 \geq 0 \qquad \text{for all } x \in \mathbb{R} \tag{3.2}$$

The difference between `\mathrm{}` and `\textrm{}` as follows[2]:

$$2^{\mathrm{nd}} \quad 2^{\text{nd}} \tag{3.3}$$

See Section 3.6.3 on Page 22 to learn to deal with equations.

3.2 Math Spacing

3.2.1 Units

pt	point,$\frac{1}{72.27}$ inch.
bp	Adobe big point,$\frac{1}{72}$ inch.
pc	pica,12pt
mm	millimeter
cm	centimeter
in	inch,25.4mm
em	similar to the width of M.
ex	similar to the height of x.

3.2.2 Spaces

`\,`	$\frac{3}{18}$ quads.
`\:`	$\frac{4}{18}$ quads.
`\;`	$\frac{5}{18}$ quads.
`\!`	$-\frac{3}{18}$ quads.
`\quad`	1 quad,similar to the width of M.
`\qquad`	2 quads.

[2]If Package *amsmath* is used,there will be no difference.

3.2.3 Phantom

`\phantom` reserves room for something that exists but not to be displayed. See examples:

${}^{12}_{6}\mathrm{C}$ `{}^{12}_{6}\textrm{C}`

${}^{12}_{6}\mathrm{C}$ `{}^{12}_{\phantom{0}6}\textrm{C}`

Γ^{k}_{ij} `\Gamma_{ij}^{k}`

$\Gamma_{ij}{}^{k}$ `\Gamma_{ij}^{\phantom{ij}k}`

See Section 3.5.2 on Page 18 to learn *Superscript and Subscript*.

3.3 Math Sizing

3.3.1 Setting Size

$\displaystyle\{\}$

$\textstyle\{\}$

$\scriptstyle\{\}$

$\scriptscriptstyle\{\}$

3.3.2 Pairing size

```
\Bigg(\bigg(\Big(\big(\big)\Big)\bigg)\Bigg)
```

$$\Bigg(\bigg(\Big(\big(\big)\Big)\bigg)\Bigg)$$

```
\Bigg\{\bigg\{\Big\{\big\{\big\}\Big\}\bigg\}\Bigg\}
```

$$\Bigg\{\bigg\{\Big\{\big\{\big\}\Big\}\bigg\}\Bigg\}$$

```
\Bigg\|\bigg\|\Big\|\big\|\big\|\Big\|\bigg\|\Bigg\|
```

$$\Bigg\|\bigg\|\Big\|\big\|\big\|\Big\|\bigg\|\Bigg\|$$

```
1 + ( \frac{1}{ 1-x^{2} } ) ^3
```

$$1 + (\frac{1}{ 1-x^{2} }) ^3$$

Use the `\left` and `\right` pairs to determine the correct sizes of symbols.

```
1 + \left( \frac{1}{ 1-x^{2} } \right) ^3
```

$$1+\left(\frac{1}{1-x^2}\right)^3$$

If there is nothing on the right side,use "`\right.`".

```
y = \left\{
          \begin{array}{ l l }
               a   &  x \leq -5\\\\
               b+x &  -5 < x < 7\\\\
               l   &  x \geq 7
          \end{array}
    \right.
```

$$y=\begin{cases} a & x\leq -5 \\ b+x & -5<x<7 \\ l & x\geq 7 \end{cases}$$

See Section 3.6.1 on Page 21 to learn Environment *Array*.

3.3.3 Bold Fonts

`$\mu, M$`	μ, M
`$\mathbf{\mu},\mathbf{M}$`	$\mu, \mathbf{M}$
`\mbox{\boldmath $\mu, M$}`	$\boldsymbol{\mu, M}$

`\boldmath` must be used outside the math mode,or in the `\mbox{}` in the math mode.

3.4 Math Fonts

`\mathrm{ABCdef}`	ABCdef
`\mathit{ABCdef}`	ABCdef
`\mathnormal{ABCdef}`	$\mathnormal{ABCdef}$
`\mathcal{ABC}`	$\mathcal{ABC}$
`\mathfrak{ABCdef}`	$\mathfrak{ABCdef}$
`\mathbb{ABC}`	$\mathbb{ABC}$
`\mathtt{ABCdef}`	$\mathtt{ABCdef}$
`\mathsf{ABCdef}`	ABCdef
`\mathbf{ABCdef}`	$\mathbf{ABCdef}$

The command `\mathfrak{ABCdef}` requires Package *eufrak*.

3.5 Frequently Used Symbols

3.5.1 Dots

Observe carefully,then you will see that `\ldots` generates lower dots than `\cdots`.

`\ldots`	$\ldots$
`\cdot`	$\cdot$
`\cdots`	$\cdots$
`\vdots`	$\vdots$
`\ddots`	$\ddots$

See a practical example in Section 3.6.1 on Page 21.

3.5.2 Superscript and Subscript

`a_1`	a_1
`x^2`	x^2
`a_{ij}`	a_{ij}
`x^{y^z}`	x^{y^z}
`e^{x^2} \neq {e^x}^2`	$e^{x^2} \neq e^{x2}$
`{}^{12}_{\phantom{0}6}\mathrm{C}`	${}^{12}_{6}\mathrm{C}$

^ or _ might tinily changes its position and meaning,for example,see Section 3.5.8 on Page 20,they turn out to be upper and lower limits.

3.5.3 Square Root

`\sqrt{a}`	$\sqrt{a}$
`\sqrt[n]{a}`	$\sqrt[n]{a}$
`\surd`	$\surd$
`\sqrt{ x^{2}+\sqrt{y} }`	$\sqrt{x^2+\sqrt{y}}$

3.5.4 Line and Brace

`\overline{m+n}`	$\overline{m+n}$
`\underline{m+n}`	$\underline{m+n}$
`\underbrace{ a+b+\cdots+z }_{26}`	$\underbrace{a+b+\cdots+z}_{26}$
`\overbrace{ a+b+\cdots+z }^{26}`	$\overbrace{a+b+\cdots+z}^{26}$

3.5.5 Vector

`\vec a`	$\vec{a}$
`\overrightarrow{AB}`	$\overrightarrow{AB}$
`\overleftarrow{AB}`	$\overleftarrow{AB}$

3.5.6 Fraction

```
1/2              1/2

3\frac{1}{2}     3\frac{1}{2}
```

```
y^{}_{\mathrm{A}}= \displaystyle\frac
{
    p^*_{\mathrm{A}} x^{}_{\mathrm{A}}
}
{
    p^*_{\mathrm{A}} x^{}_{\mathrm{A}}
+
    p^*_{\mathrm{B}}(1-x^{}_{\mathrm{A}})
}
```

$$y_{\mathrm{A}} = \frac{p^*_{\mathrm{A}} x_{\mathrm{A}}}{p^*_{\mathrm{A}} x_{\mathrm{A}} + p^*_{\mathrm{B}}(1 - x_{\mathrm{A}})}$$

```
N_{\mathrm{OG}}= \frac
{
    y^{}_1 - y^{}_2
}
{
    \displaystyle\frac
    {
        (y^{}_1 - y^*_1) - (y^{}_2 - y^*_2)
    }
    {
        \ln\frac{y^{}_1 - y^*_1}{y^{}_2 - y^*_2}
    }
}
```

$$N_{\mathrm{OG}} = \frac{y_1 - y_2}{\frac{(y_1 - y_1^*) - (y_2 - y_2^*)}{\ln \frac{y_1 - y_1^*}{y_2 - y_2^*}}}$$

3.5.7 Binomial Coefficients And Customized Fraction

Without Package *amsmath*,we can only use

`{n \choose m}` or `{x \atop y+2}` to generate the binomial coefficients or similar structures:

$$\binom{n}{m} \qquad \atop{x}{y+2}$$

With Package *amsmath*,we can use `\binom{n}{m}` to generate binomial coefficients:

$$\binom{n}{m}$$

But the most powerful part is the command `\genfrac{}{}{}{}{}{}`,it has six arguments:

Argument 5 and 6 are the numerator and the denominator.

Argument 1 and 2 are the left delimiter and the right delimiter.'.' means there are no delimiter.

Argument 3 is the thickness of the line between the numerator and the denominator,set it to 0pt to make it invisible.

Argument 4 is the size of the numerator and the denominator.displaystyle = 0, textstyle = 1, scriptstyle = 2, scriptscriptstyle = 3.

The Command `\genfrac{(}{)}{0pt}{}{n}{m}` works exactly the same as `\binom{n}{m}`.

$$\binom{n}{m}$$

3.5.8 Sum,Product And Calculus

`\sum_{i=1}^{n}`:

$$\sum_{i=1}^{n}$$

`\int_{0}^{\frac{\pi}{2}}`:

$$\int_{0}^{\frac{\pi}{2}}$$

`\prod_\epsilon`:

$$\prod_{\epsilon}$$

`\iint_D`:

$$\iint_{D}$$

`\iiint_V`:

$$\iiint_{V}$$

`\idotsint_{\mathbb{R^{\mathrm n}}}`:

$$\idotsint_{\mathbb{R^{\mathrm n}}}$$

3.6 Math Array

3.6.1 Array

```
\mathbf{X} = \left( \begin{array}{ccc}
x_{11} & x_{12} & \ldots \\
x_{21} & x_{22} & \ldots \\
\vdots & \vdots & \ddots
```

$$\mathbf{X} = \left(\begin{array}{ccc} x_{11} & x_{12} & \ldots \\ x_{21} & x_{22} & \ldots \\ \vdots & \vdots & \ddots \end{array} \right)$$

```
\left(\begin{array}{c|c}
1 & 2 \\
\hline
3 & 4
\end{array}\right)
```

$$\left(\begin{array}{c|c} 1 & 2 \\ \hline 3 & 4 \end{array}\right)$$

3.6.2 Eqnarray

Environment *Eqnarray* must be used outside the math mode,because it's an environment similar to Environment *Equation*.

```
\begin{eqnarray}
f(x) & = & \cos x \\
f'(x) & = & -\sin x \\
\int_{0}^{x} f(y)\mathrm dy & = & \sin x
\end{eqnarray}
```

$$\begin{eqnarray} f(x) & = & \cos x \tag{3.4} \\ f'(x) & = & -\sin x \tag{3.5} \\ \int_0^x f(y)\mathrm{d}y & = & \sin x \tag{3.6} \end{eqnarray}$$

Put the whole environment in `{\setlength\arraycolsep{2pt} }`, then the space around "=" will be smaller:

$$\begin{eqnarray} f(x) & = & \cos x \tag{3.7} \\ f'(x) & = & -\sin x \tag{3.8} \\ \int_0^x f(y)\mathrm{d}y & = & \sin x \tag{3.9} \end{eqnarray}$$

Use Environment *Eqnarray* to split a long equation:

```
\begin{eqnarray}
\lefteqn{ \cos x = 1 -\frac{x^{2}}{2!} +{} }
\nonumber\\
& & {}+\frac{x^{4}}{4!} -\frac{x^{6}}{6!}+{}\cdots
\end{eqnarray}
```

$$\begin{aligned}\cos x = 1 - \frac{x^2}{2!} + \\ + \frac{x^4}{4!} - \frac{x^6}{6!} + \cdots\end{aligned} \tag{3.10}$$

3.6.3 Align

With Package *amsmath*,we can use Environment *Align* to deal with equations.Use & to tell LaTeX how to align.Observe the usage of Environment *Subequations*.

```
\begin{subequations}
\begin{align}
x & \equiv 2 \pmod 3 \\
x & \equiv 3 \pmod 5 \\
\end{align}
\end{subequations}
```

$$x \equiv 2 \pmod 3 \tag{3.11a}$$
$$x \equiv 3 \pmod 5 \tag{3.11b}$$
$$x \equiv 2 \pmod 7 \tag{3.11c}$$

3.7 Math Theorem

To initialize a Theorem System,we should put the following declaration in the preamble area(The area between `\documentclass` and `\begin{document}` is called the *preamble*).

`\newtheorem{`*name*`}[`*counter*`]{`*text*`}[`*section*`]`

name is the identifier of the theorem for LaTeX,and *text* will be displayed as the name of the theorem.

counter and *section* shall not be given at the same time.*counter* is the identifier of the counter for LaTeX,it shall be the name of another theorem.If we replace *section* by "section","chapter" or "subsection",the theorem will be enumerated by section,chapter or subsection.

For example,declare like this in the preamble,

```
\newtheorem{Theorem}{定理}[section]
```

and then,

```
\begin{Theorem}
sth.
\end{Theorem}
```

will generate:

定理 3.7.1 *sth.*

And declare like this in the preamble,

```
\newtheorem{FirstTheorem}{定理}
\newtheorem{NextTheorem}[Theorem]{定理}
```

and then,

```
\begin{FirstTheorem}
Something.
\end{FirstTheorem}
\begin{NextTheorem}
Some other thing.
\end{NextTheorem}
```

定理 1 *Something.*

定理 2 *Some other thing.*

3.8 Symbol Lists

See its source to know how to type it.If a symbol is with a superscript "A" on its left side,then it's only provided by *amsmath*.

0	1	2	3	4	5	6	7	8
1	$\bar{a}$	$\acute{a}$	$\check{a}$	$\grave{a}$	$\dot{a}$	$\ddot{a}$	$\hat{a}$	$\widehat{A}$
2	$\vec{a}$	$\breve{a}$	$\tilde{a}$	$\widetilde{A}$				
3	α	β	γ	δ	ϵ	ε	ζ	η
4	θ	ϑ	ι	κ	λ	μ	ν	ξ
5	o	π	ϖ	ρ	ϱ	σ	ς	τ
6	υ	ϕ	φ	χ	ψ	ω		
7	Γ	Δ	Θ	Λ	Ξ	Π	Σ	Υ
8	Φ	Ψ						

0	1	2	3	4	5	6	7	8
1	$<$	$\leq$	$>$	$\geq$	$=$	$\equiv$	$\ll$	$\gg$
2	$\prec$	$\preceq$	$\succ$	$\succeq$	$\sim$	$\simeq$	$\approx$	$\cong$
3	$\subset$	$\subseteq$	$\supset$	$\supseteq$	${}^{A}\sqsubset$	$\sqsubseteq$	${}^{A}\sqsupset$	$\sqsupseteq$
4	$\doteq$	$\propto$	${}^{A}\bowtie$	$\bowtie$	$\vdash$	$\dashv$	$\perp$	$\models$
5	$\mid$	$\parallel$	$\smile$	$\frown$	$\asymp$	$:$	$\notin$	$\neq$
6	$+$	$-$	$\pm$	$\mp$	$\cdot$	$\times$	$/$	$\div$
7	$\oplus$	$\ominus$	$\odot$	$\otimes$	$\oslash$	$\setminus$	$\vee$	$\wedge$
8	$\cup$	$\cap$	$\sqcup$	$\sqcap$	$\triangle$	$\triangledown$	$\triangleleft$	$\triangleright$

0	1	2	3	4	5	6	7	8
1	${}^{A}\triangleleft$	${}^{A}\triangleright$	${}^{A}\trianglelefteq$	${}^{A}\trianglerighteq$	$\star$	$*$	$\circ$	$\bigcirc$
2	$\bullet$	$\diamond$	$\uplus$	$\amalg$	$\dagger$	$\ddagger$	$\wr$	
3	$\sum$	$\prod$	$\bigsqcup$	$\bigsqcup$	$\bigcup$	$\bigcap$	$\int$	$\oint$
4	$\bigvee$	$\bigwedge$	$\bigoplus$	$\bigotimes$	$\bigodot$	$\biguplus$		
5	$\leftarrow$	$\rightarrow$	$\longleftarrow$	$\longrightarrow$	$\Leftarrow$	$\Rightarrow$	$\Longleftarrow$	$\Longrightarrow$
6	$\uparrow$	$\downarrow$	$\Uparrow$	$\Downarrow$	$\leftrightarrow$	$\Leftrightarrow$	$\longleftrightarrow$	$\Longleftrightarrow$
7	$\updownarrow$	$\Updownarrow$	$\nearrow$	$\searrow$	$\swarrow$	$\nwarrow$	$\rightsquigarrow$	$\Longleftrightarrow$
8	$\mapsto$	$\longmapsto$	$\hookleftarrow$	$\hookrightarrow$	$\leftharpoondown$	$\rightharpoondown$	$\leftharpoonup$	$\rightharpoonup$
9		$\rightleftharpoons$						

0	1	2	3	4	5	6	7	8
1	$($	$)$	$[$	$]$	$\{$	$\}$	$\langle$	$\rangle$
2	$\lfloor$	$\rfloor$	$\lceil$	$\rceil$	$\vert$	$\vert$	$\Vert$	$\Vert$
3	$\big($	$\big)$	$\big[$	$\big]$	$\big\vert$	$\big\Vert$	$\big\langle$	$\big\rangle$

As you can see,I have some problems here that I can't deal with.So I have decided to skip the rest of symbols.