LaTeX Notes
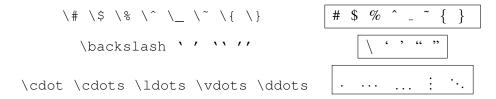
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Abstract

TEX document : article report book letter slides beamer $\cdots$

1 special characters

`\# \$ \% \^ \_ \~ \{ \}`	# $ % ^ _ ~ { }
`\backslash ` ' `` ''`	\ ' ' " "
`\cdot \cdots \ldots \vdots \ddots`	· ⋯ ... ⋮ ⋱

2 text font and size

`\text{}`	`\underline{}`	`\emph{}`	`\textrm{}`	`\textbf{}`
text	<u>under</u>	*emph*	Roman	**Bold**
`\textsf{}`	`\texttt{}`	`\textit{}`	`\textsc{}`	`\textsl{}`
Sans	Typewriter	*Italic*	CAPS	*Slanted*

`\tiny{}`	`\scriptsize{}`	`\footnote{}`	`\small{}`	`\normalsize{}`
tiny	scriptsize	footnotesize	small	normalsize
`\large{}`	`\Large{}`	`\LARGE{}`	`\huge{}`	`\Huge{}`
large	Large	LARGE	huge	Huge

3 Greek symbol

`\alpha` = α	`\beta` = β	`\gamma` = γ	`\delta` = δ	`\epsilon` = ϵ
`\varepsilon` = ε	`\zeta` = ζ	`\eta` = η	`\theta` = θ	`\vartheta` = ϑ
`\iota` = ι	`\kappa` = κ	`\lambda` = λ	`\mu` = μ	`\nu` = ν
`\xi` = ξ	`\o` = $\o$	`\pi` = π	`\varpi` = ϖ	`\rho` = ρ
`\varrho` = ϱ	`\sigma` = σ	`\varsigma` = ς	`\tau` = τ	`\upsilon` = υ
`\phi` = ϕ	`\varphi` = φ	`\chi` = χ	`\psi` = ψ	`\omega` = ω
`\Gamma` = Γ	`\Delta` = Δ	`\Theta` = Θ	`\Lambda` = Λ	`\Xi` = Ξ
`\Pi` = Π	`\Sigma` = Σ	`\Upsilon` = Υ	`\Phi` = Φ	`\Psi` = Ψ
`\Omega` = Ω	`\$` = $			

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*This note may assist you write academic paper or technical report.

4   math font

```
\usepackage{amsmath, amsfonts, amssymb}, \usepackage{mathrsfs}*
```

$$\texttt{\textbackslash mathrm\{\}} = \mathrm{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathit\{\}} = \mathit{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathbf\{\}} = \mathbf{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathbb\{\}} = \mathbb{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathsf\{\}} = \mathsf{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathtt\{\}} = \mathtt{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathcal\{\}} = \mathcal{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$*\texttt{\textbackslash mathscr\{\}} = \mathscr{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$
$$\texttt{\textbackslash mathfrak\{\}} = \mathfrak{A\,B\,C\,D\,E\,F\,G\,H\,I\,J\,K\,L\,M\,N\,O\,P\,Q\,R\,S\,T\,U\,V\,W\,X\,Y\,Z}$$

5   color

```
\usepackage{color} \textcolor[rgb]{0.0,1.0,0.5}{text}, from 0 to 1
```

```
\color{red}{R}   \color{green}{G}   \color{blue}{B}   \color{yellow}{Y}
```
$$\color{red}{R} \qquad \color{green}{G} \qquad \color{blue}{B} \qquad \color{yellow}{Y}$$

$$\texttt{\textbackslash frac\{1\}\{2\}} = \tfrac{1}{2}, \texttt{\textbackslash sqrt[3]\{2\}} = \sqrt[3]{2}, \texttt{X\_\{a\}\textasciicircum\{b\}} = X_a^b, \texttt{\textbackslash sum\_\{a\}\textasciicircum\{b\}} = \sum_a^b$$

6   parenthesis

```
\left[␣\Bigg(␣\bigg|␣\Big<␣\big(␣.␣\big)␣\Big>␣\bigg|␣\Bigg)␣\right]=
```

$$\left[\Bigg(\bigg| \Big\langle \big(\cdot \big) \Big\rangle \bigg| \Bigg) \right]$$

7   space

```
A \ A ~ A \hspace{1ex} A \quad A \qquad A =
```
$$\mathrm{A\,A\,A\,A\quad A\qquad A}$$

$$\texttt{\textbackslash hat\{a\}} = \hat{a} \quad \texttt{\textbackslash check\{a\}} = \check{a} \quad \texttt{\textbackslash tilde\{a\}} = \tilde{a} \quad \texttt{\textbackslash grave\{a\}} = \grave{a} \quad \texttt{\textbackslash dot\{a\}} = \dot{a}$$
$$\texttt{\textbackslash ddot\{a\}} = \ddot{a} \quad \texttt{\textbackslash bar\{a\}} = \bar{a} \quad \texttt{\textbackslash vec\{a\}} = \vec{a} \quad \texttt{\textbackslash acute\{a\}} = \acute{a} \quad \texttt{\textbackslash breve\{a\}} = \breve{a}$$

8   math function

\arccos	\cos	\csc	\exp	\arcsin
arccos	cos	csc	exp	arcsin
\lg	\ln	\arctan	\cot	\det
lg	ln	arctan	cot	det
\lim	\log	\arg	\dim	\inf
lim	log	arg	dim	inf
\max	\sup	\tan	\min	\sin
max	sup	tan	min	sin

9 special symbol

\leq	\geq	\equiv	\ll	\gg	\doteq
$\leq$	$\geq$	$\equiv$	$\ll$	$\gg$	$\doteq$
\prec	\succ	\sim	\preceq	\succeq	\simeq
$\prec$	$\succ$	$\sim$	$\preceq$	$\succeq$	$\simeq$
\subset	\supset	\approx	\subseteq	\supseteq	\cong
$\subset$	$\supset$	$\approx$	$\subseteq$	$\supseteq$	$\cong$
\in	\ni	\propto	\mid	\parallel	\notin
$\in$	$\ni$	$\propto$	$\mid$	$\parallel$	$\notin$
\neq	\pm	\mp	\cdot	\div	\times
$\neq$	$\pm$	$\mp$	$\cdot$	$\div$	$\times$
\setminus	\star	\cup	\cap	\ast	\circ
$\setminus$	$\star$	$\cup$	$\cap$	$\ast$	$\circ$
\lor	\land	\bullet	\oplus	\diamond	\odot
$\lor$	$\land$	$\bullet$	$\oplus$	$\diamond$	$\odot$
\otimes	\dagger	\sum	\bigcup	\prod	\bigcap
$\otimes$	$\dagger$	$\sum$	$\bigcup$	$\prod$	$\bigcap$
\int	\oint	\bigodot	\bigoplus	\bigotimes	\bigvee
$\int$	$\oint$	$\bigodot$	$\bigoplus$	$\bigotimes$	$\bigvee$
\bigwedge	\leqslant	\geqslant	\leqq	\geqq	\lll
$\bigwedge$	$\leqslant$	$\geqslant$	$\leqq$	$\geqq$	$\lll$
\ggg	\triangleq	\thicksim	\because	\therefore	\backepsilon
$\ggg$	$\triangleq$	$\thicksim$	$\because$	$\therefore$	$\backepsilon$

\nless	\ngtr	\subsetneqq	\subsetneqq
$\nless$	$\ngtr$	$\subsetneqq$	$\subsetneqq$
\nleq	\ngeq	\nleqslant	\ngeqslant
$\nleq$	$\ngeq$	$\nleqslant$	$\ngeqslant$
\nleqq	\ngeqq	\nprec	\nsucc
$\nleqq$	$\ngeqq$	$\nprec$	$\nsucc$
\npreceq	\nsucceq	\precneqq	\succneqq
$\npreceq$	$\nsucceq$	$\precneqq$	$\succneqq$
\neq	\nLeftarrow	\nRightarrow	\nLeftrightarrow
$\neq$	$\nLeftarrow$	$\nRightarrow$	$\nLeftrightarrow$
\square	\blacksquare	\vartriangle	\blacktriangle
$\square$	$\blacksquare$	$\vartriangle$	$\blacktriangle$
\triangledown	\blacktriangledown	\lozenge	\blacklozenge
$\triangledown$	$\blacktriangledown$	$\lozenge$	$\blacklozenge$
\nexists	\backprime	\bigstar	\varnothing
$\nexists$	$\backprime$	$\bigstar$	$\varnothing$

\leftarrow	\rightarrow	\leftrightarrow
←	→	↔
\Leftarrow	\Rightarrow	\Leftrightarrow
⇐	⇒	⇔
\rightleftharpoons	\uparrow	\downarrow
⇌	↑	↓
\updownarrow	\Uparrow	\Downarrow
↕	⇑	⇓
\Updownarrow	\leftrightharpoons	\rightleftharpoons
⇕	⇋	⇌
\dashleftarrow	\dashrightarrow	\leftleftarrows
⇠	⇢	⇇
\rightrightarrows	\leftrightarrows	\rightleftarrows
⇉	⇆	⇄

\dots	\cdots	\vdots	\ddots	\forall	\exists
…	⋯	⋮	⋱	∀	∃
\mho	\partial	′	\prime	\emptyset	\infty
℧	∂	′	′	∅	∞
\nabla	\triangle	\diamondsuit	\heartsuit	\clubsuit	\spadesuit
∇	△	◇	♡	♣	♠

10   equation

```
1    \begin{equation}
2        y=\left\{
3        \begin{array}{ll}
4            a & \textrm{first} \\
5            b & \textrm{second}\\
6            c & \textrm{third}
7        \end{array}
8        \right.
9    \end{equation}
```

$$y = \left\{ \begin{array}{ll} a & \text{first} \\ b & \text{second} \\ c & \text{third} \end{array} \right. \qquad (1)$$

11   align

```
1    \begin{align}
2    a^2 &= b^2 + c^2  \\
3    x   &= \frac{-b \pm \sqrt{b^2
        - 4ac}}{2a}
4    \end{align}
```

$$a^2 = b^2 + c^2 \qquad (2)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad (3)$$

12 figure

```
1  \usepackage{graphicx}
2
3      \begin{figure}
4      \centering
5          \includegraphics[width=\textwidth]{imagefile}
6      \caption{text} \label{fig:key}
7      \end{figure}
```

13 table

```
1       \begin{table}[htp]
2       \centering
3          \begin{tabular}{|l|c|r|}
4              \hline
5              1 & 2 & 3 \\
6              \hline
7              left & middle & right \\
8              \hline
9          \end{tabular}
10     \caption{text} \label{tab:key}
11     \end{table}
```

1	2	3
left	middle	right

Table 1: text

14 section and paragraph

```
1       \section{title}
2       \subsection{subtitle}
3       \subsubsection{subsubtitle}
4       \paragraph{paragraphtitle}
5           paragraph text
6       \subparagraph{subparagraphtitle}
7           subparagraph text
```

title

subtitle

subsubtitle

paragraphtitle   paragraph text

subparagraphtitle   subparagraph text

15 bibliography

```
1       \cite{id in bibtex file}
2
3       \bibliographystyle{plain}
4       %style: plain ieeetr unsrt alpha abbrv apalike acm
5       \bibliography{filename of bibtex}
```

16 LaTeX

```
1    % A simple LaTeX template
2    \documentclass[10pt,a4paper]{article} % report,book,letter, etc.
3    \usepackage[utf8]{inputenc}          % UTF-8 encoding
4    \usepackage{hyperref}                % make bookmarks
5    \usepackage{amsmath, amsfonts, amssymb} % math package
6    \usepackage{graphicx}        % import image
7    \usepackage{color}           % colorful text
8    \usepackage{times}           % Times New Roman
9        % mathpazo, fourier, charter, helvet, likewise
10   \title{Your Title}
11   \author{Your Name
12       \thanks{This is the place you want to say thanks.}
13       }
14   \date{date of writing}
15
16   \begin{document}
17   \maketitle
18   \section{First section}
19       Your text goes here.
20   \subsection{Subsection}
21       Your text goes here.
22   \section{Second section}
23       Your text goes here.
24   \end{document}
```

17 beamer

```
1    % A simple Beamer template
2    \documentclass[10pt,mathserif]{beamer}
3    \mode<presentation>{
4        \usetheme{CambridgeUS}
5        % Szeged Berkeley beaver Amsterdam Copenhagen Berlin
6        \usecolortheme{dolphin}
7        % beaver crane dove lily orchid rose seagull seahorse
8            sidebartab spruce whale wolverine
8        \setbeamercovered{dynamic}  % transparent frame
9        \setbeamertemplate{navigation symbols}{} % hide navigation
            bars
10       \setbeamertemplate{caption}[numbered]
11   }
12   \usepackage{amsmath, amsfonts, amssymb} % math package
13   \usepackage[english]{babel} % main language English
14   \usepackage{color, graphicx} % colorful text and image
15   \usepackage{url} % hyperlink
16   \usepackage{times}  % Times New Roman
17   \usepackage{hyperref} % bookmarks
18
19   \title[abbreviation]{Title}
```

```
20    \author{ Author name \thanks{ thanks or self-introduction }}
21    \institute [abbreviation]{ affiliation or department}
22    \date{Apr. 7, 2016}
23
24    \begin{document}
25    \AtBeginSection []{
26        \begin{frame}<beamer>{Outline}
27        \tableofcontents [currentsection, currentsubsection]
28        \end{frame}
29    }
30    \begin{frame}
31        \titlepage
32    \end{frame}
33
34    \section{Introduction}
35    \begin{frame}{Frametitle}
36        \pause
37        Any text may represent here.
38    \end{frame}
39
40    \section{Bibliography}
41    \begin{frame}[allowframebreaks]{Bibliography}
42        \label{Reference}
43        \bibliographystyle{ieeetr}
44        \bibliography{bibtex file name}
45    \end{frame}
46
47    \section*{Thanks}
48    \begin{frame}{End}
49        \Huge Thanks for your listening.
50    \end{frame}
51    \end{document}
```

18   ctexart

```
1     % A simple Ctexart template
2     \documentclass[UTF8, a4paper, 10pt]{ctexart}
3     \usepackage{amsmath, amsfonts, amssymb} % math package
4     \usepackage{graphicx}          % import image
5     \usepackage{color}             % colorful text
6     \usepackage{times}             % Times New Roman
7     % mathpazo, fourier, charter, helvet, likewise
8     \usepackage{hyperref}
9
10    \title{Chinese Title}
11    \author{Author name \thanks{thanks, self-introduction or contact
            }}
12    \date{\today}
13
14    \begin{document}
```

```
15      \maketitle
16      \section{Introduction}
17      This file may generate a pdf document with Chinese characters.
            However, the bookmarks will be messy text if it contains
            Chinese text inside. Use 'gbk2uni' tool to solve this problem.
18      \section{Reference}
19          list your references here.
20      \newpage
21      From the second page, title and page number are shown at heading,
            left side and right side, respectively.
22      \end{document}
```

19   bibtex

```
1   Compile tex file accompanied by bibtex file
2   LaTeX  *.tex
3   LaTeX  *.tex
4   BibTeX *.tex
5   LaTeX  *.tex
6   then the sequence number of reference are correct.
```

20   gbk2uni

```
1   Solve messy text(e.g. Chinese) in bookmarks (in command prompt)
2   pdfLaTeX *.tex
3   gbk2uni  *.out
4   pdfLaTeX *.tex
5   then the bookmarks show in Chinese correctly.
```