LaTeX Notes

Xue Shengke *

April 7, 2016

Abstract

TeX document : article report book letter slides beamer ···

1 special characters

`\# \$ \% \^ \_ \~ \{ \}`	# $ % ^ _ ~ { }
`\backslash ` ' `` ''`	\ ‘ ’ “ ”
`\cdot \cdots \ldots \vdots \ddots`	· ⋯ … ⋮ ⋱

2 text font and size

`\text{}`	`\underline{}`	`\emph{}`	`\textrm{}`	`\textbf{}`
text	under	*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` = ø	`\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	`\$` = $			

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

4 math font

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

`\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

`\mathit{}` = $A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z$

`\mathbf{}` = $\mathbf{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`\mathbb{}` = $\mathbb{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`\mathsf{}` = $\mathsf{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`\mathtt{}` = $\mathtt{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`\mathcal{}` = $\mathcal{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`*\mathscr{}` = $\mathscr{A\ B\ C\ D\ E\ F\ G\ H\ I\ J\ K\ L\ M\ N\ O\ P\ Q\ R\ S\ T\ U\ V\ W\ X\ Y\ Z}$

`\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}`
R	G	B	Y

`\frac{1}{2}` = $\frac{1}{2}$, `\sqrt[3]{2}` = $\sqrt[3]{2}$, `X_{a}^{b}` = X_a^b, `\sum_{a}^{b}` = $\sum_a^b$

6 parenthesis

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

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

7 space

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

`\hat{a}` = $\hat{a}$	`\check{a}` = $\check{a}$	`\tilde{a}` = $\tilde{a}$	`\grave{a}` = $\grave{a}$	`\dot{a}` = $\dot{a}$
`\ddot{a}` = $\ddot{a}$	`\bar{a}` = $\bar{a}$	`\vec{a}` = $\vec{a}$	`\acute{a}` = $\acute{a}$	`\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	\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}
```

$$y = \begin{cases} a & \text{first} \\ b & \text{second} \\ c & \text{third} \end{cases} \tag{1}$$

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}
```

$$a^2 = b^2 + c^2 \tag{2}$$

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

12 figure

```
\usepackage{graphicx}

    \begin{figure}
    \centering
        \includegraphics[\textwidth]{imagefile}
    \caption{text} \label{fig:key}
    \end{figure}
```

13 table

```
    \begin{table}[htp]
    \centering
        \begin{tabular}{|l|c|r|}
            \hline
            1 & 2 & 3 \\
            \hline
            left & middle & right \\
            \hline
        \end{tabular}
    \caption{text} \label{tab:key}
    \end{table}
```

1	2	3
left	middle	right

Table 1: text

14 section and paragraph

```
    \section{title}
    \subsection{subtitle}
    \subsubsection{subsubtitle}
    \paragraph{paragraphtitle}
        paragraph text
    \subparagraph{subparagraphtitle}
        subparagraph text
```

title

subtitle

subsubtitle

paragraphtitle paragraph text

subparagraphtitle subparagraph text

15 bibliography

```
    \cite{id in bibtex file}

    \bibliographystyle{plain}
    %style: plain ieeetr unsrt alpha abbrv apalike acm
    \bibliography{filename of bibtex}
```

16 LaTeX

```
% A simple LaTeX template
\documentclass[10pt,a4paper]{article} % report,book,letter, etc.
\usepackage[utf8]{inputenc}           % UTF-8 encoding
\usepackage{hyperref}                 % make bookmarks
\usepackage{amsmath, amsfonts, amssymb} % math package
\usepackage{graphicx}        % import image
\usepackage{color}           % colorful text
\usepackage{times}           % Times New Roman
    % mathpazo, fourier, charter, helvet, likewise
\title{Your Title}
\author{Your Name
    \thanks{This is the place you want to say thanks.}
    }
\date{date of writing}

\begin{document}
\maketitle
\section{First section}
    Your text goes here.
\subsection{Subsection}
    Your text goes here.
\section{Second section}
    Your text goes here.
\end{document}
```

17 beamer

```
% A simple Beamer template
\documentclass[10pt,mathserif]{beamer}
\mode<presentation>{
    \usetheme{CambridgeUS}
    % Szeged Berkeley beaver Amsterdam Copenhagen Berlin
    \usecolortheme{dolphin}
    % beaver crane dove lily orchid rose seagull seahorse
        sidebartab spruce whale wolverine
    \setbeamercovered{dynamic}  % transparent frame
    \setbeamertemplate{navigation symbols}{} % hide navigation
        bars
    \setbeamertemplate{caption}[numbered]
}
\usepackage{amsmath, amsfonts, amssymb} % math package
\usepackage[english]{babel} % main language English
\usepackage{color, graphicx} % colorful text and image
\usepackage{url} % hyperlink
\usepackage{times}  % Times New Roman
\usepackage{hyperref} % bookmarks

\title[abbreviation]{Title}
```

```
\author{ Author name \thanks{ thanks or self-introduction}}
\institute[abbreviation]{affiliation or department}
\date{Apr. 7, 2016}

\begin{document}
\AtBeginSection[]{
    \begin{frame}<beamer>{Outline}
    \tableofcontents[currentsection,currentsubsection]
    \end{frame}
}
\begin{frame}
    \titlepage
\end{frame}

\section{Introduction}
\begin{frame}{Frametitle}
    \pause
    Any text may represent here.
\end{frame}

\section{Bibliography}
\begin{frame}[allowframebreaks]{Bibliography}
    \label{Reference}
    \bibliographystyle{ieeetr}
    \bibliography{bibtex file name}
\end{frame}

\section*{Thanks}
\begin{frame}{End}
    \Huge Thanks for your listening.
\end{frame}
\end{document}
```

18 ctexart

```
% A simple Ctexart template
\documentclass[UTF8,a4paper,10pt]{ctexart}
\usepackage{amsmath, amsfonts, amssymb} % math package
\usepackage{graphicx}        % import image
\usepackage{color}           % colorful text
\usepackage{times}           % Times New Roman
% mathpazo, fourier, charter, helvet, likewise
\usepackage{hyperref}

\title{Chinese Title}
\author{Author name \thanks{thanks, self-introduction or contact
    }}
\date{\today}

\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.
```