LaTeX practice note

Contents

Writing in two columns:

NOT Recommended:

```
PRO TIP don't use `[twocolumn]` when you want to put images on center
instead use the `[multicols]` package whenever you want to write in multiple columns.
```

```
\documentclass[twocolumn]{article}
```

THE Recommended Way:

```
\usepackage{multicol}
\begin{document}
\begin{multicols}{Number Of Columns}
YOUR TEXT
\end{multicols}
\end{document}
```

Neat Margins

This makes your paper margins and scales, more precise.

```
\usepackage[margin=1in]{geometry}
```

Inserting images:

```
\usepackage{graphicx}
%If your image file is in your tex directory, then you dont need this line.
\graphicspath{{./YOURFOLDER/}}
\begin{figure}[htbp]
%[htbp] lets you to use h,t,b,p keywords for putting your image, here,top,bottom,page.
\includegraphics[height = 5cm]{your image name with the extension}
%[scale=0] is for when you want to scale your image
% You can also use [width, height] for resizing your image file.
% And Finally \centerline puts your image in center
\end{figure}
```

```
Its not necessary to use the `\begin{figure}` but its better to use it so you can control th
```

```
Using `!` after your [hbtp], fit your image in the page you are currently in.
~~~latex
\begin{figure}[h!]
\includegraphics{image name}
\end{figure}
~~~
```

Center Your Image

```
\begin{center}
\includegraphics{your image name with the extension}
\end{center}
```

Writing Chemistry Formulas

We should use the `{mhchem}` package for this and you should put a `\ce` before every chemistry formula you want to write.

```
\usepackage[version=4]{mhchem}
\ce {HCL ->[H2O] H+ + Cl-}
\ce{Na2SO4 ->[H2O] Na+ + SO4^2-}
\ce{(2Na+,SO4^2- ) + (Ba^2+, 2Cl- ) -> BaSO4 v + 2NaCl
```

Using Math Mode For Writing Chem Formulas

```
Na_{2}SO_{4} \Rightarrow^{H_{2}O} Na^{+} + SO4^{2-}
```

$$Na_2SO_4 \Rightarrow^{H_2O} Na^+ + SO4^{2-}$$

Sub/Superscript In math mode, you can write your subscript in this `{}` and your superscripts after an underline:

```
collapse: open
`x^{-x} $$ <p align="center">&</p> $$ a_{n}`
$$ x^{-x} $$ <p align="center">&</p> $$ a_{n} $$
```

Text

Writing Abstracts

```
title: LaTeX
collapse: open
icon: text-width
~~~latex
\begin{abstract}

\end{abstract}
~~~
```

Frame Box

```
title: LaTeX
collapse: open
icon: text-width
```

~~~latex
\usepackage{framed}
\begin{document}

\begin{framed}

\end{framed}

\end{document}
~~~

Examples

```latex
\begin{exe}
\ex Test 1
\ex Test 2
\end{exe}
```

Fonts

There is no Times New Roman in LaTeX but you can get a similar font like it by using this package:

```latex
\usepackage{mathptmx}
```

This one is a nice font for text:

```latex
\usepackage{bookman}
```

And for math equations:

```latex
\usepackage{eulervm}
```

And the persian font style is:

```latex
\usepackage{xepersian}
\settextfont{XB Yas}
```

```
title: Use XePerisan Package As The Last Package!
If u put it before other packages, it might cause erorrs and issues.
```

Font Size

In LaTeX we only have 10, 11, 12 point font sizes, but we can write in smaller or bigger font size with this commands:

```latex
\tiny, \scriptsize, \footnotesize, \small,
\normalsize, \large, \Large, \LARGE, \huge, \Huge
```

And if you want to change only a small part of a text and dont have to go back and use `\normalsize` over and over, you can use those commands like this:

```
{\Large Hello}
```

How To Use Any Font In LaTeX

you cant do this in pdfLaTeX compiler, you should change your compiler to `XeLaTeX` first and then use this commands:

```
\usepacakage{fontspec}
\setmainfont{the font exact name}
```

Separating The Math Font

```
\usepackage{unicode-math}
\setmathfont{Cambria Math or Anyting}
```

Defining Fonts

```
\defpersianfont\ name the variable{The Font Name}
\deflatinfont\ name the variable{The Font Name}

%And Then You Can Call Your Defined Font Anywhere In The Text You Want.
{\variablename And Write Your Text In Here}
```

Encoding Fonts

If you don't use:

```
\usepackage[T1]{fontenc}
```

- Words containing accented characters cannot be automatically hyphenated
- You cannot properly copy-and-paste such words from the output (DVI/PS/PDF)
- Characters like the pipe sign, less than and greater sign give unexpected results in text ## Colors

```
\usepackage{xcolor}
{\color{defined-color}YOUR TEXT}
```

Page Color

```
\pagecolor{defined-color}
```

Bold/*italic*/Underline/Box

```
\textbf{Bold}
\textit{Italic}
\underline{Underline}
```

```
\emph{Emphasis}
\fbox{Box}
```

Lines

```
\rule{\textwidth}{0.4pt}
**TIP** : Use \par\noindent before your line.
```

Box

You can use `\fbox{...}` to put a frame around a `\parbox{...}` containing your text. Here's an example document. Note the `\noindent` that prevents the box from being shifted to the right.

```
```latex
\documentclass{article}

\begin{document}

\noindent\fbox{%
    \parbox{\textwidth}{%
        The quick brown fox jumps right over the lazy dog. the quick brown fox jumps right o
    }%
}
\end{document}
```

Page Break

```
\pagebreak
```

Center Your Text

You can use three methods for centering a text: - First

```
\centerline{}
```

- Second

```
\begin{center}

\end{center}
```

- Third

```
\centering{}
```

Right Align

```
\begin{flushright}
```
```

Left Align

```
\begin{flushleft}
```

```
print("hello")
```

Chapters

This one is for `{book}` document class

```
\chapter{}
```

Hypertext

```
\usepackage{hyperref}
\label{Whatever You Want To Call It}
```

Trees

`qtree` is a bit picky when it comes to spaces. Every sequence of `]`s must be preceded by a space, like this:

```
\usepackage{qtree}

\Tree [.S This [.VP [.V is ] ] ]
```

Bibliography

Bibitem

This method works even without citing any references in your writing

```
\begin{thebibliography}{9 or 99 or 999 or 9999 or 99...}
\bibitem{citekey}
YOUR CITATION IN HERE
\end{thebibliography}
```

For persian, you should use these commands for a better style:

```
\setLTRbibitems
\begin{thebibliography}{9 or 99 or 999 or 9999 or 99...}
\resetlatinfont
\bibitem{citekey}
YOUR CITATION IN HERE
\end{thebibliography}
```

Reference Style

```
title: References Format
~~~latex
@article{label,
author = {},
title = {},
journal = {},
year = {},
volume = {},
number = {},
pages = {},
month = {},
}
~~~
```

BibTeX

Unlike the Bibitem method, BibTeX make references only if you cite them. First we need to make another file with a .bib extension and then we put our references in that file. There are many types of referencing style such as `book` or `phdthesis inproceeding` etc. After you've created your bib file, then you should put this command at the end of your file:

```
\bibliographystyle{plain}
\bibliography{YOUR FILE NAME WITHOUT THE EXTENSION}
\end{document}
```

And then you can cite while your writing, like this:

```
\cite{ref label name}
```

If your using persian, then this commands will make your references in the correct way:

```
\setLTRbibitem
\bibliographystyle{plain}
\bibliography{YOUR FILE NAME WITHOUT THE EXTENSION}
\end{document}
```

Lists

Bulleted Lists

```
\begin{itemize}
    \item Apple
    \item Oranges
```

```
    \item Avocados
\end{itemize}
```

Blind Text

Amplified Lorem Ipsum.

```
\usepackage{blindtext}
\begin{document}
\blinddocument
\end{document}
```

Footer/Header

```
\usepackage{fancyhdr}
\pagestyle{fancy}
```

Then you need to clear the default layout

```
\usepackage{fancyhdr}
\pagestyle{fancy} %There's also a "plain" style for this.
\fancyhf{} %This will reset the default fancy layout so you can define your own.
```

There are some letters you need to know before you can define your own header/footer: L: Left field
C: Center field
R: Right field
H: Header
F: Footer

```
\usepackage{fancyhdr}
\pagestyle{fancy}
\lhead{}
\chead{}
\rhead{\thepage}
\lfoot{}
\cfoot{}
\rfoot{}
\renewcommand{\plainheadrulewidth}{0pt} %Used to determine the thickness of the line, Defau
```

```
~~~latex
Use this command after your \maketitle command
to remove the title page layout and page number:
\thispagestyle{empty}
~~~
```

Math

Summation can be inserted as shown below:

```
\begin{equation}
\sum_{x=i}^{n}x_{i}
\end{eqution}
```

```
title: Summation
$$ \sum_{x=i}^{n}x_{i} $$
```

Product sequence can be inserted as shown in Eqn.

```
\begin{equation}
\prod_{x=i}^{n}x_{i}
\end{eqution}
```

```
title: Product Sequence
$$ \prod_{x=i}^{n}x_{i} $$
```

Integration can be inserted as shown:

```
\begin{equation}
\int_{0}^{n}x^2dx
\end{eqution}
```

```
title: Integration
$$ \int_{0}^{n}x^2dx $$
```