Basic LaTeX Commands

Yiren Ding

Qibao Dwight High School

June 13, 2017

Basic document

A basic document starts with:

```
\documentclass{article}
\usepackage{amsmath}
\usepackage{amssymb}
\usepackage{enumerate}

\title{My Title}
\author{Yiren Ding}

\begin{document}
\maketitle

Your contents here.

\end{document}
```

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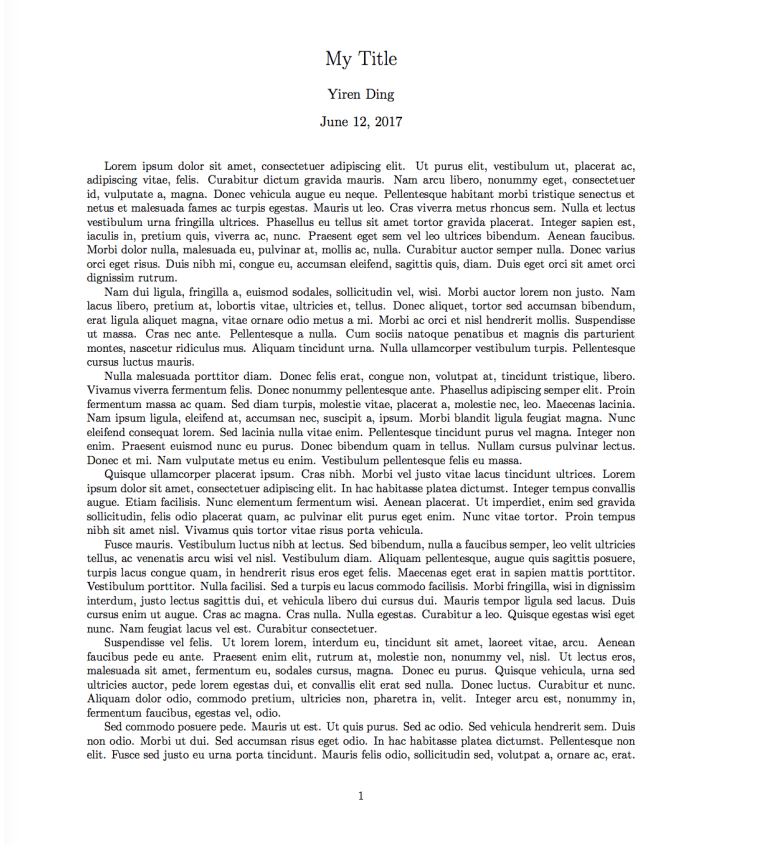

My Title

Yiren Ding

June 12, 2017

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1

Itemize and Enumerate

To make a list, we can type:

```
\begin{enumerate}
  \item How to lose weight:
    \begin{itemize}
      \item Eat healthy
      \item Exercise
    \end{itemize}
  \item No other way!
\end{enumerate}
```

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```

1. How to lose weight:
   - Eat healthy
   - Exercise
2. There is no other way!

Sections and Subsections

To organize the file use:

```
\section{First section}
Some text here.

\subsection{First subsection}
Some text here.

\section{Second section}
Some text here.
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1 First section

Some text here.

1.1 First subsection

Some text here.

2 Second section

Some text here.

Tables

- To make a table, we type:

```
\begin{tabular}{|r|c|l|p{1in}|}
  \hline
  1st column & 2nd column & 3rd column & 4th column\\
  \hline
  a & b & c & d \\
  \hline
\end{tabular}
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- If much of the table contains math formulas in it, you can use the `\begin{array}..\end{array}` environment instead.

Typing Math

Source:

```
1 An important equation:
2 $$E=mc^2$$
```

Result:

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The following is true:
\begin{align}
  f(x) & = (x+1)(x-1) \\
  & = x^2 -1 \\
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Result:

The following is true:

$$\begin{aligned} f(x) &= (x+1)(x-1) && (2)\\ &= x^2 - 1 && (3)\\ &= x^2 + e^{i\pi} && (4) \end{aligned}$$

Writing math expressions

- Superscripts and subscripts are done using `^` and `_` characters. For example `$\log_{10} x^2$` produces $\log_{10} x^2$.

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- Modular arithmetic can be done via either `$3+6 \equiv 2 \pmod{7}$` or `$3+6 \equiv 2 \bmod{7}$` command, which give $3 + 6 \equiv 2 \pmod{7}$ and $3 + 6 \equiv 2 \bmod 7$.

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- $\neq, \geq$ and $\leq$ are `\neq`, `\geq` and `\leq`.
- Dot product is `\cdot`. For example `$\vec{a} \cdot \vec{b}$` produces $\vec{a} \cdot \vec{b}$.

Typing vectors

- To type vectors, Geoffrey, Johnny and I designed this following command to be added to the preamble:

```
1 \newcommand*\cvec[3][]{\begin{pmatrix}\ifx\relax#1\relax\
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- On the other hand, typing `$\cvec[0]{1}{2}$` will give $\begin{pmatrix}0\\1\\2\end{pmatrix}$.

Summation and piecewise functions

Source:

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$$\sum_{i=1}^{\infty} \frac
    {1}{2^i} = 1$$
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- Note that you can also use the inline mode `$..$` by adding a `\displaystyle` in front of it.
- But typing the word *displaystyle* everytime is tiring! Don't worry, I will show you how to define your own command.

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- For example, you can type `$\dis \int_a^b f(x)\, dx$` to get the integral inline: $\int_a^b f(x)\, dx$.
- The best way to master LaTeX is to learn by doing something! If you don't know how to type something, just ask or search on the internet!