Introduction to LaTeX

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First Example

```
\documentclass[12pt]{article}
\usepackage{graphicx}

\title{Introduction to \LaTeX}
\author{your name}
\date{November 9, 2016}

\begin{document}
\maketitle

Hello World!

\end{document}
```

We can have different document classes including article, book, letter, thesis, etc. We can also add different formatting options including font size, one or two column document and orientation. We can also change the font of the document using one of the following:

- \rmfamily

  selects a roman (i.e., serifed) font family

- `\sffamily`

  selects a sans serif font family

- `\ttfamily`

  selects a monospaced (typewriter) font family

Here (https://www.tug.org/pracjourn/2006-1/schmidt/schmidt.pdf) is a good reference for changing fonts in the Latex document.

Lists

Numeric

```
\begin{enumerate}
\item point 1
\item point 2
\end{enumerate}
```

Itemized

```
\begin{itemize}
\item point 1
\item point 2
\end{itemize}
```

Nested Lists

```
\begin{enumerate}
\item point 1
\begin{enumerate}
\item nested point 1
\begin{enumerate}
\item nested nested point 1
\end{enumerate}
\end{enumerate}
\item point 2
\end{enumerate}
```

Figures

```
\usepackage{graphicx}
\begin{figure}[H]
 \centering
\includegraphics[scale=size]{filename}
\caption{}
\label{fig:label}
\end{figure}
```

Equations

```
\usepackage{amsmath}
\begin{equation}
f(x) = \frac{x^2 + 1}{5} \int x dx
\end{equation}
```

Inline Math Mode

We can use inline math such as $f(x) = 2x^3 + 5x$ in between text.

Here are a few math symbols in Latex:

```
\sqrt{x}                    : for square root
\frac{x}{y}                 : for fractions
\int ydy                    : integrals
\alpha,\beta, \gamma, \xi   : Greek letters
\frac{\partialf}{\partialx} : partial derivative
```

Tables

```
\begin{tabular}{| l l l |}
\hline
Column 1 & Column 2 & Column 3 \\ \hline
A & B & C \\ \hline
D & E & F \\ \hline
\end{tabular}
```

Bold/ Italic/ Underlined

```
\textbf{text}      :boldface text
\textit{text}      :italic text
\underline{text}  :underlined text
```

Cross-referencing

```
Use \label{} to give each tag a label. For instance, you can label an
equation with \label{eq: label_name}. Then, you may reference it
by using \ref{eq: label_name} wherever in the text.
You can use eq, sec and fig for equation, section and figure, respectively.
```

Bibliography

Method 1, inside the document

```
\begin{thebibliography}{}
\bibitem{reference 1}
\bibitem{reference 2}
\end{thebibliography}
```

Method 2, in a different file

Set these at the beginning of the document:

```
\usepackage{natbib}
\bibliographystyle{stylename}
```

Then have the following line just before closing the document:

```
\bibliography{filename}
```

We can use different styles for the bibliography including abbrvnat, humannat, plainnat, abbrvnat and more. A list of all the styles can be found here (https://www.sharelatex.com/learn/Natbib_bibliography_styles).