Creating a Latex Document

In this document we are using Overleaf to create a document. Code for Latex is similar for most of the platforms.

Working with Overleaf:

- Need to register in overleaf which is free https://www.overleaf.com/
- Once you have account for you please login to your account.
- Once you logged in you will see New Project option on top left of the page.
- You have various options to create a document like blank project to create project from scratch. Example project is projects overleaf offers and upload project is to upload your own existing project. We can also upload projects from GitHub.
- As we are creating new project we are going to take blank project.
- Enter your project name and click on create.

Now that we have created a document, let's create some simple working examples:

```
\documentclass{article}

\begin{document}
Content of the document
\end{document}
```

The first line of code declares the type of document, in this case it is an article. Then, between the \begin{document} \end{document} tags you must write the text of your document.

In this example we have more command over the presentation of the document as follows.

```
\documentclass[12pt, letterpaper]{article}
\usepackage[utf8]{inputenc}

\title{Test document}
\author{Auther name }
\date{July 2019}
```

For the article to complete we need to combine above examples.

```
\documentclass[12pt, letterpaper]{article}
\usepackage[utf8]{inputenc}

\title{Test document}
\author{Auther name }
\date{July 2019}

\begin{document}
```

```
\begin{titlepage}
\maketitle
\end{titlepage}

Content of the document
\end{document}
```

We created a basic Latex document from here on we just need to specify parameters to LaTeX. For example if we want to first two paragraphs to abstract for your paper we just need to specify it.

```
\begin{document}

\begin{titlepage}
\maketitle
\end{titlepage}

\begin{abstract}
Abstract here.

If you want to comment anything in the document we just need to
comment out using % at starting of the line.

Content of the document
\end{document}
```

Tables

Below you can see the simple working example of a table:

```
\begin{center}
\begin{tabular}{ |c|c|c| }
 \hline
 cell1 & cell2 & cell3 \\
 cell4 & cell5 & cell6 \\
 cell7 & cell8 & cell9 \\
 \hline
\end{tabular}
\end{center}
```

```
\begin{tabu} to 0.8\textwidth { | X[l] | X[c] | X[r] | }
 \hline
 item 11 & item 12 & item 13 \\
 \hline
```

```
 item 21   & item 22   & item 23   \\
\hline
\end{tabu}
```

The parameter inside braces | X[l] | X[c] | X[r] | sets the alignment of each column: the first one to left, the second one to center and the third one to right.

Mathematical expressions:

The feature that makes LATEX the right editing tool for scientific documents is the ability to render complex mathematical expressions.

Below are some examples

```
$E=mc^2$
\[ f(x)=\frac{P(x)}{Q(x)} \ \ \textrm{and}
\ \ f(x)=\textstyle\frac{P(x)}{Q(x)} \]


A & = \frac{\pi r^2}{2} \\
 & = \frac{1}{2} \pi r^2


\begin{multline*}
p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3\\
- 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3
\end{multline*}
```