

LECTURE -II

Introduction to Latex In Overleaf

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What is Latex?

- LaTeX (pronounced LAY-tek or LAH-tek) is a tool used to create professional-looking documents.
- Based on the WYSIWYM (what you see is what you mean) idea
 - You only have to focus on the contents of your document and the computer will take care of the formatting.
- Users can enter plain text and let LaTeX take care of the formatting (Unlike MS word).

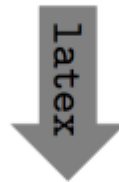
Why use LaTeX?

- LaTeX is used all over the world for scientific documents, books, as well as many other forms of publishing.
- Can create beautifully typeset documents.
- Enables the user to tackle the complicated parts of typesetting like
 - Inputting mathematics.
 - Creating tables of contents.
 - Referencing and creating bibliographies and many more.
- Has a number of open source packages providing endless formatting possibilities.

How does it work?

- You write your document in plain text with **commands** that describe its structure and meaning.
- The LaTeX program processes your text and commands to beautifully formatted document.

The rain in Spain falls `\emph{mainly}` on the plain.



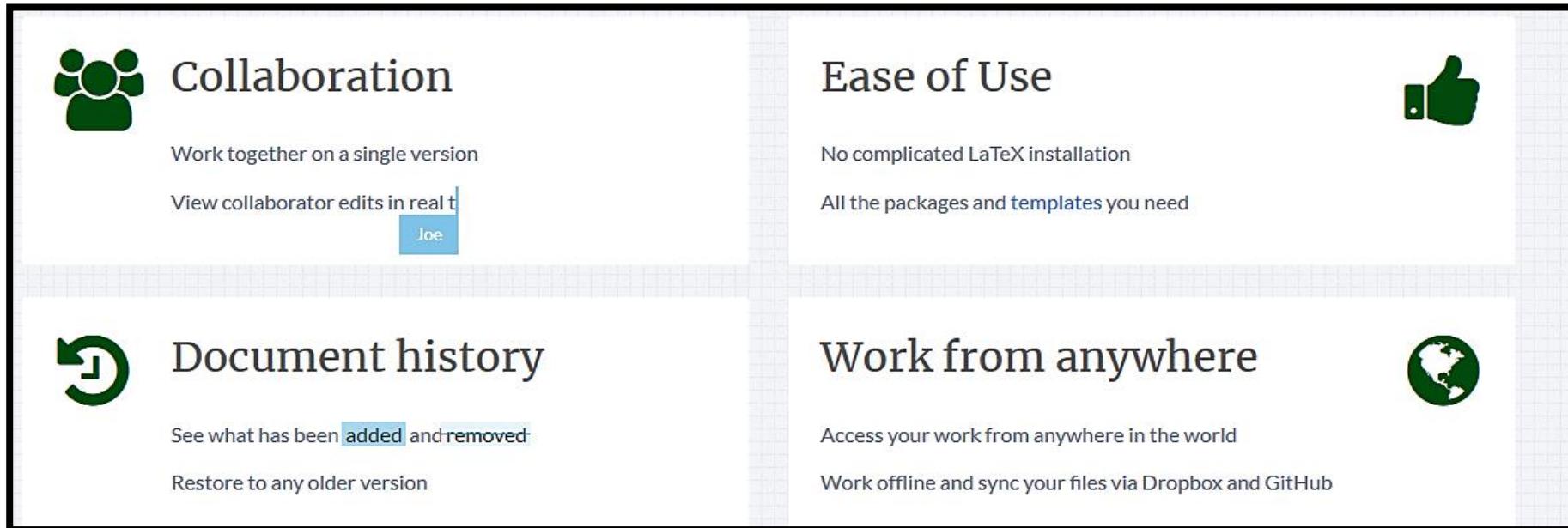
The rain in Spain falls *mainly* on the plain.

LaTeX modes of Usage

- LaTeX can be used either in offline mode or online mode.
- For using LaTeX offline, you need to install softwares like MiKTeX (backend-runs all the packages) and text editors like TeXstudio, WinEdt, TexNic (front end- where you write all your LaTeX code).
- For online mode, Overleaf is used.
- Overleaf is an online LaTeX editor that is easy to use. No installation, real-time collaboration, hundreds of LaTeX templates, and more.

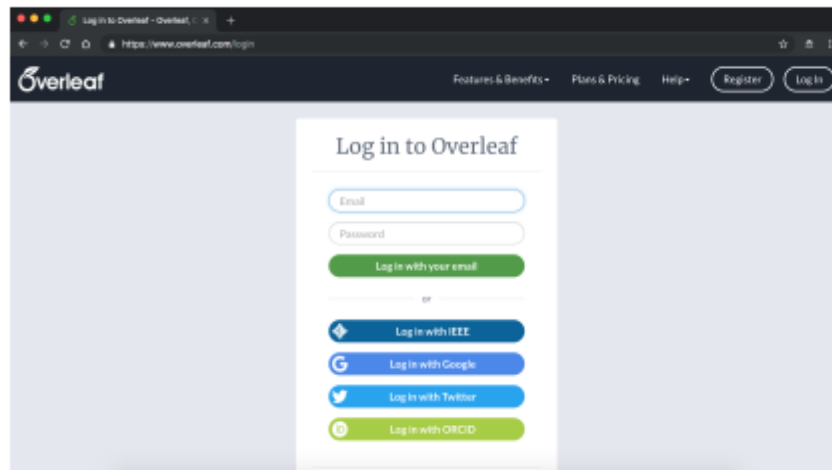
Overleaf

- Templates for papers, presentations, newsletters, syllabi, books.
- Online collaboration platform.
- Output: nice PDF files.

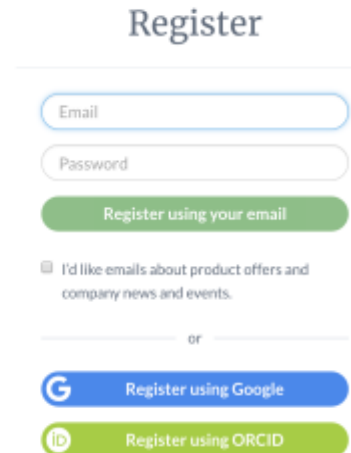


Login/Signup with Overleaf

Login or Register with Overleaf - <https://www.overleaf.com/>

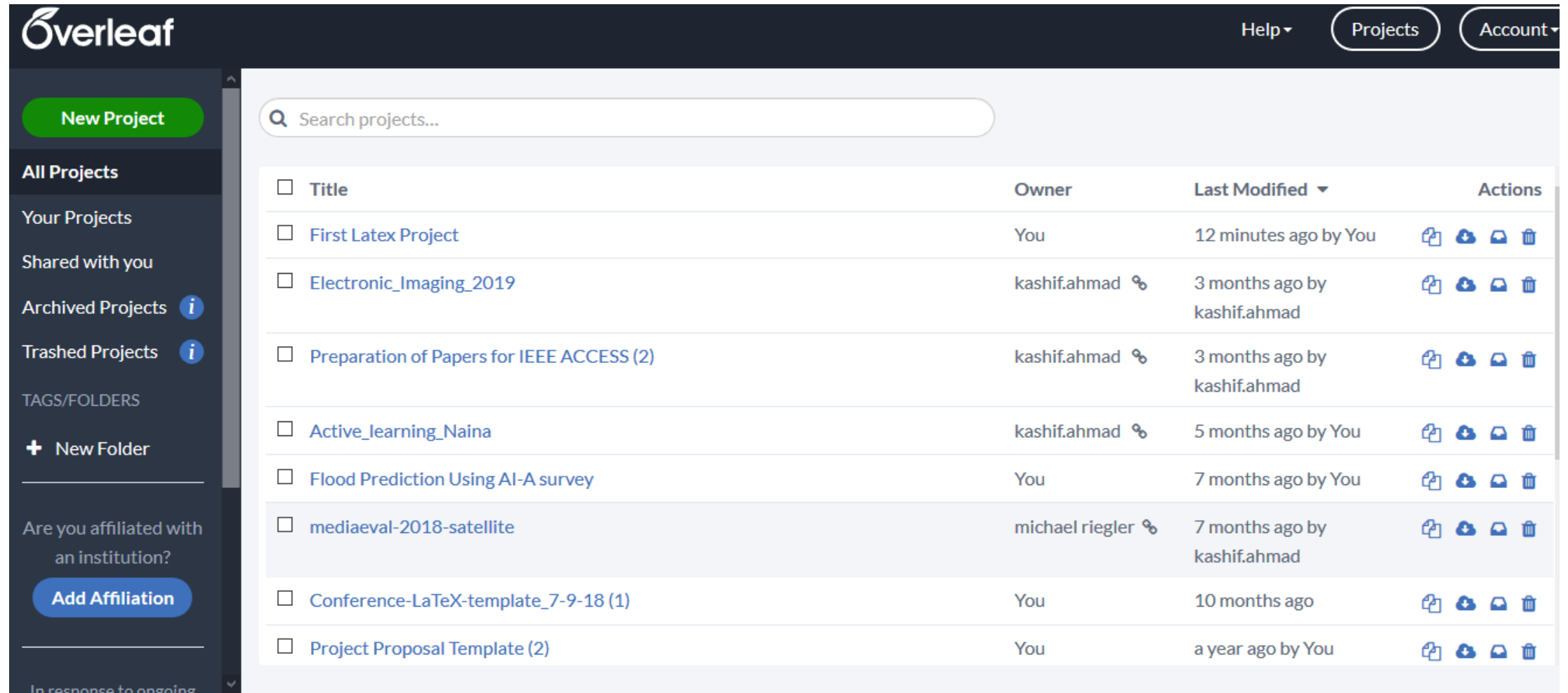


A screenshot of the Overleaf login page. The browser address bar shows 'https://www.overleaf.com/login'. The Overleaf logo is in the top left. Navigation links for 'Features & Benefits', 'Plans & Pricing', and 'Help' are in the top right, along with 'Register' and 'Log In' buttons. The main content area is titled 'Log in to Overleaf' and contains a form with 'Email' and 'Password' input fields, a 'Log in with your email' button, and an 'or' separator. Below the separator are four social login buttons: 'Log in with IEEE', 'Log in with Google', 'Log in with Twitter', and 'Log in with ORCID'.



A screenshot of the Overleaf register page. The title is 'Register'. It features a form with 'Email' and 'Password' input fields, followed by a 'Register using your email' button. Below this is a checkbox labeled 'I'd like emails about product offers and company news and events.' and an 'or' separator. At the bottom are two social registration buttons: 'Register using Google' and 'Register using ORCID'.

Overleaf Structure



The screenshot displays the Overleaf web interface. The top navigation bar includes the Overleaf logo, a 'Help' dropdown, and buttons for 'Projects' and 'Account'. The left sidebar contains a 'New Project' button, a list of project categories (All Projects, Your Projects, Shared with you, Archived Projects, Trashed Projects), and a 'TAGS/FOLDERS' section with a 'New Folder' button. Below this is a section for institutional affiliation. The main content area features a search bar and a table of projects.

<input type="checkbox"/> Title	Owner	Last Modified ▾	Actions
<input type="checkbox"/> First Latex Project	You	12 minutes ago by You	
<input type="checkbox"/> Electronic_Imaging_2019	kashif.ahmad	3 months ago by kashif.ahmad	
<input type="checkbox"/> Preparation of Papers for IEEE ACCESS (2)	kashif.ahmad	3 months ago by kashif.ahmad	
<input type="checkbox"/> Active_learning_Naina	kashif.ahmad	5 months ago by You	
<input type="checkbox"/> Flood Prediction Using AI-A survey	You	7 months ago by You	
<input type="checkbox"/> mediaeval-2018-satellite	michael riegler	7 months ago by kashif.ahmad	
<input type="checkbox"/> Conference-LaTeX-template_7-9-18 (1)	You	10 months ago	
<input type="checkbox"/> Project Proposal Template (2)	You	a year ago by You	

Creating a project in Overleaf

Select New Project > Blank Project > Give it a name > Create

The screenshot shows the Overleaf web interface. A 'New Project' dialog box is open in the center, with a text input field containing 'First Latex Project' and two buttons: 'Cancel' and 'Create'. The background is slightly dimmed, showing the 'All Projects' section with a list of projects. The left sidebar contains navigation options like 'New Project', 'All Projects', 'Your Projects', 'Shared with you', 'Archived Projects', 'Trashed Projects', 'TAGS/FOLDERS', and 'New Folder'. The top right has links for 'Help', 'Projects', and 'Account'.

Title	Last Modified	Actions
<input type="checkbox"/> Title		
<input type="checkbox"/> First Latex Project	12 minutes ago by You	
<input type="checkbox"/> Electronic_Imaging_2019	3 months ago by kashif.ahmad	
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<input type="checkbox"/> Conference-Latex-template_7-9-18 (1)	10 months ago	
<input type="checkbox"/> Project Proposal Template (2)	a year ago by You	

Writing your first piece of LaTeX

```
\documentclass{article}

\begin{document}
This is our first LaTeX document for technical writing class.

\end{document}
```

This is our first LaTeX document for technical writing class.

Understanding the first piece of Latex

- Class declares the type of the document.
 - Controls the overall appearance of the document.
 - Different types of documents will require different classes i.e. a CV/resume will require a different class than a scientific paper.
 - In this case, the class is article, the simplest and most common LaTeX class.
 - **Report** or **book** are some other type of classes.
- The content of our document is enclosed inside the `\begin{document}` and `\end{document}` tags.
- This is known as the body of the document.

The preamble of a document

- Everything in your .tex file before the `\begin{document}` tag is called the preamble.
- In the preamble you define
 - The type of document you are writing.
 - The packages you would like to use.
 - Several other elements.
- Example shows LaTeX document of font size 12 (default 10), paper size letterpaper and encoding utf8.

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

Adding Author, Date and Title

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

```
\title{Enter Document Name Here}  
\author{Enter Author Name Here}  
\date{Enter Date Here}  
\begin{document}
```

```
\maketitle
```

We have now added a title, author and date to our LaTeX document!

```
\end{document}
```

Adding Comments

```
\begin{document}
```

```
\maketitle
```

We have now added a title, author and date to our first Latex document!

% This line here is a comment. It will not be printed in the document.

```
\end{document}
```

Bold, Italics and Underline

```
\begin{document}
```

```
\maketitle
```

```
Some of the \textbf{greatest}  
discoveries in \underline{science}  
were made by \textbf{\textit{accident}}.
```

```
\end{document}
```

Adding Images

```
\documentclass{article}  
\usepackage{graphicx}  
\graphicspath{ {images/} }
```

```
\begin{document}
```

The universe is immense and it seems to be homogeneous,
in a large scale, everywhere we look at.

```
\includegraphics{universe}
```

Here is picture of a cat.

```
\end{document}
```


Captions, labels and references

```
\documentclass{article}
\usepackage{graphicx}
\graphicspath{ {images/} }

\begin{document}
\begin{figure}[h]
  \centering
  \includegraphics[width=0.25\textwidth]{mesh}
  \caption{a nice plot}
  \label{fig:mesh1}
\end{figure}
```

As you can see in the figure \ref{fig:mesh1}, the function grows near 0. Also, in the page \pageref{fig:mesh1} is the same example.

```
\end{document}
```

Unordered List

```
\begin{itemize}  
  \item The individual entries are indicated with a black dot, a so-  
called bullet.  
  \item The text in the entries may be of any length.  
\end{itemize}
```

Ordered List

```
\begin{enumerate}  
  \item This is the first entry in our list  
  \item The list numbers increase with each entry we add  
\end{enumerate}
```

Adding Math to Latex

Inline

In physics, the mass-energy equivalence is stated by the equation $E=mc^2$, discovered in 1905 by Albert Einstein.

Displayed

The mass-energy equivalence is described by the famous equation

$$E=mc^2$$

discovered in 1905 by Albert Einstein.

In natural units ($c = 1$), the formula expresses the identity

$$E=m$$

Sections

```
\documentclass{article}
\begin{document}
This is our first LaTeX document for technical writing class.
\section{Introduction}
\section{Background}
\section{Literature Review}
\end{document}
```

Subsections

```
\documentclass{article}
\begin{document}
This is our first LaTeX document for technical writing class.
\section{Introduction}
\section{Background}
\section{Literature Review}
\subsection{Subsection 1 of Lit Review}
\subsection{Subsection 2 of Lit Review}
\end{document}
```

Latex : Endless Possibilities

- There are endless things you can do with LaTeX.
- Explore more on the official site of overleaf : <https://www.overleaf.com/>