

Introduction to Overleaf

Learning how to use Overleaf and L^AT_EX

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KAUST Library

Overleaf and \LaTeX

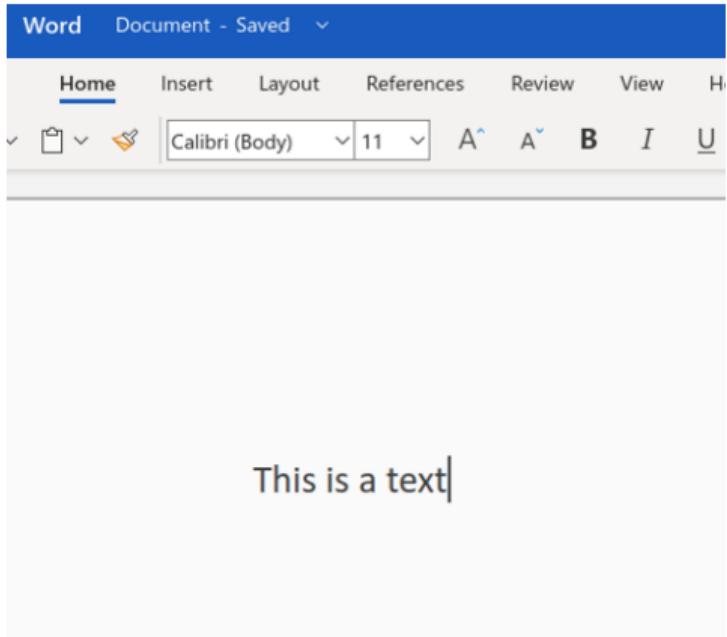
Overleaf in their own words: “Overleaf is a startup and social enterprise that builds modern collaborative authoring tools for scientists — like *Google Docs for Science*. Our primary product is an online, real time collaborative editor for papers, theses, technical reports and other documents written in the *\LaTeX markup language*.” Sounds good, but what is *\LaTeX markup language*?

Text Processor vs Text Editor

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

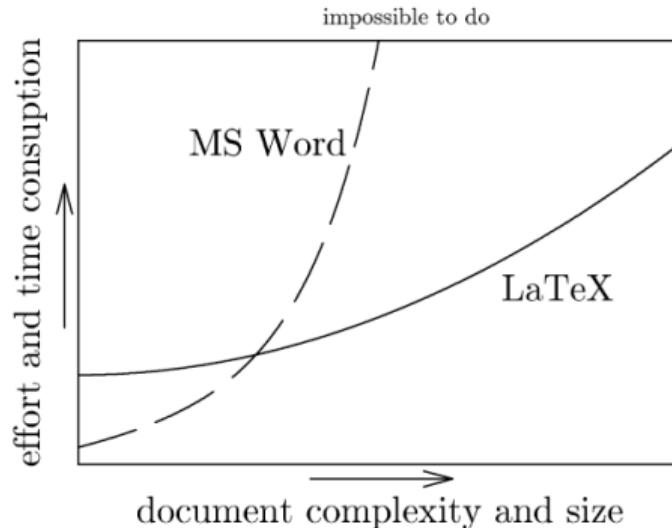
<h1>This is a Heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```



\LaTeX and MS-Word

Why to consider \LaTeX over Word?



Origins of \LaTeX

Donald E. Knuth created $\tau\varepsilon\chi$ (Tau Epsilon Chi) between 1977 and 1979.

- Unhappy how his book looked after publisher changed from hot metal typesetting (19th century tech) to phototypesetting in 1960s.
- Greek word “Tekne” means “art, skill, craft in work,” and it’s the root for the word “technology.”

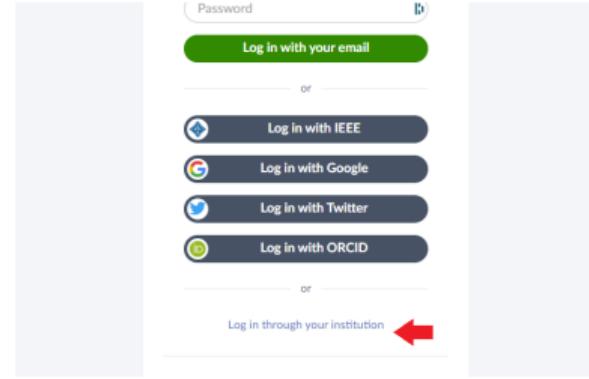
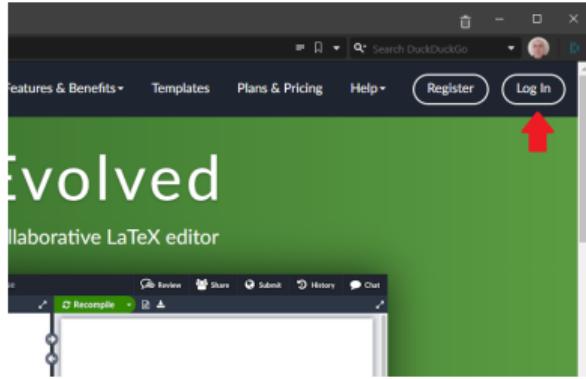


Leslie Lamport extended TeX

- While using TeX he noticed could expand with macros
- Released his LaTeX macros between 1984 and 1985. He handed the control of \LaTeX in 1989.



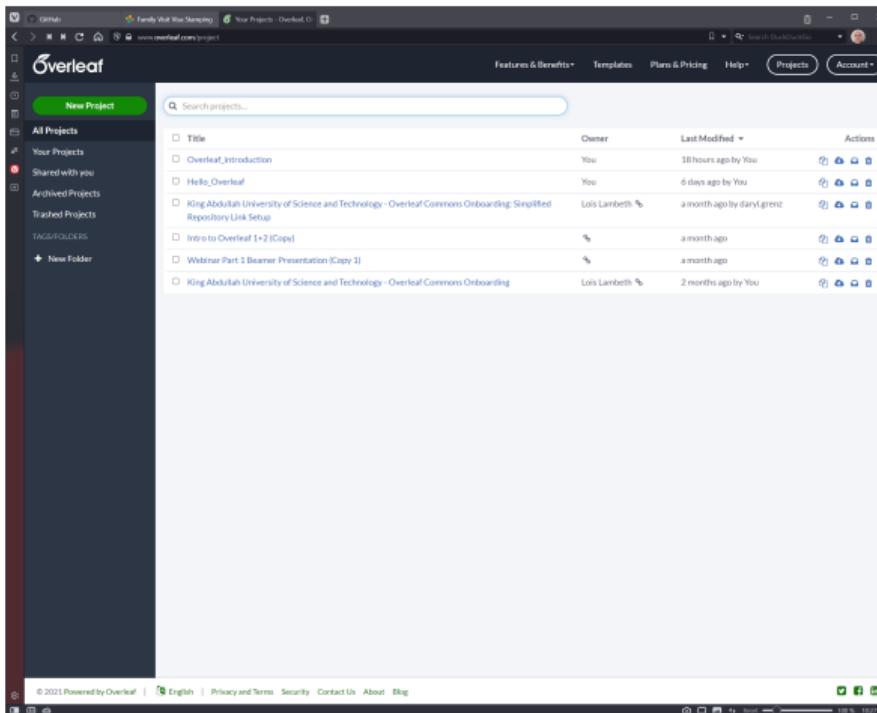
Logging in Overleaf



You will need your KAUST credentials for the login.

Projects Overview

“Home” page of the account. You will return to this page, if explore the online help from Overleaf, and decide to return to your projects. It’s a shortcut.



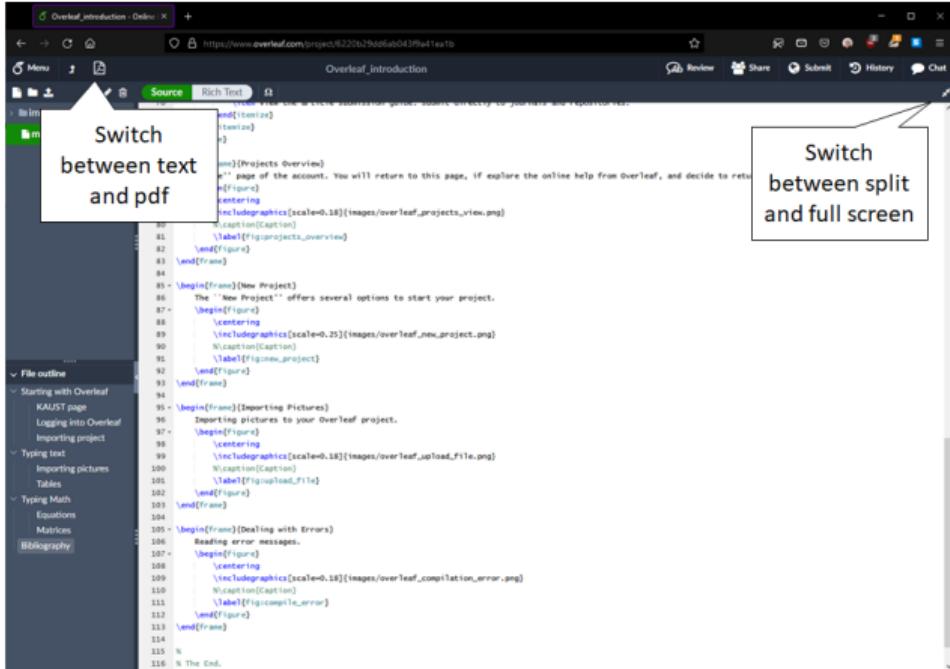
The screenshot shows the Overleaf web interface. At the top, there's a navigation bar with links for Features & Benefits, Templates, Plans & Pricing, Help, Projects (which is highlighted in blue), and Account. On the left, a sidebar menu includes options like New Project, All Projects, Your Projects (which is selected and highlighted in red), Shared with you, Archived Projects, Trashed Projects, and TAGS/FOLDERS. Below the sidebar is a search bar labeled "Search projects...". The main content area displays a table of projects with columns for Title, Owner, Last Modified, and Actions. The table lists several projects, including "Overleaf_Introduction" by You (modified 10 hours ago), "Hello_Overleaf" by You (modified 6 days ago), "King Abdullah University of Science and Technology - Overleaf Commons Onboarding: Simplified Repository Link Setup" by Lois Lambeth (modified a month ago), "Intro to Overleaf 1+2 (Copy)" by % (modified a month ago), "Webinar Part 1 Beamer Presentation (Copy 3)" by % (modified a month ago), and "King Abdullah University of Science and Technology - Overleaf Commons Onboarding" by Lois Lambeth (modified 2 months ago). Each project row has a set of icons for actions like edit, delete, and share.

| Title | Owner | Last Modified | Actions |
|--|----------------|-----------------------------|---------|
| Overleaf_Introduction | You | 10 hours ago by You | |
| Hello_Overleaf | You | 6 days ago by You | |
| King Abdullah University of Science and Technology - Overleaf Commons Onboarding: Simplified Repository Link Setup | Lois Lambeth % | a month ago by daryl.greenz | |
| Intro to Overleaf 1+2 (Copy) | % | a month ago | |
| Webinar Part 1 Beamer Presentation (Copy 3) | % | a month ago | |
| King Abdullah University of Science and Technology - Overleaf Commons Onboarding | Lois Lambeth % | 2 months ago by You | |

At the bottom of the page, there's a footer with links for "Powered by Overleaf", "English", "Privacy and Terms", "Security", "Contact Us", "About", and "Blog". On the far right, there are icons for social media and a "Logout" button. The Overleaf logo is also present in the footer.

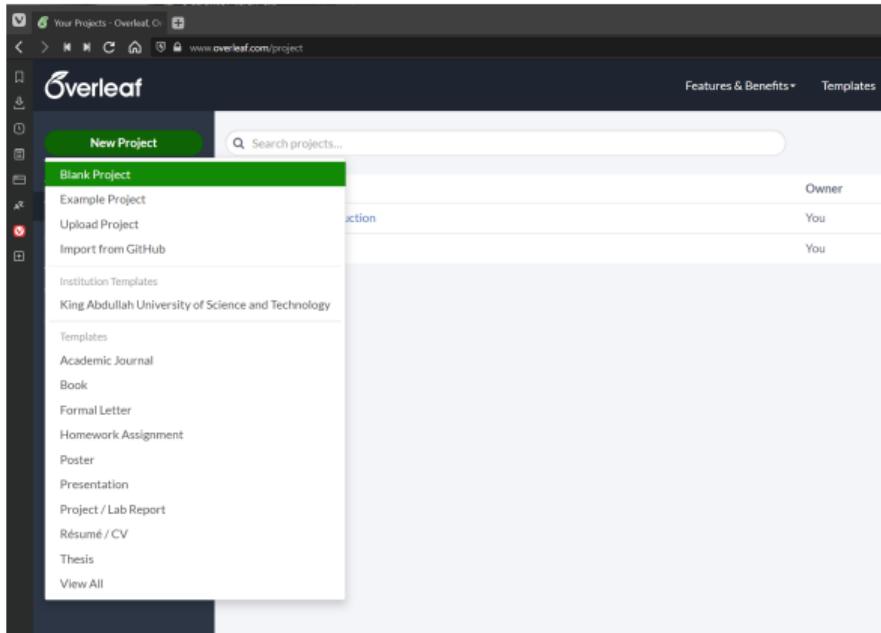
Split or Full Screen

Switching between split and full screen.



New Project

The “New Project” offers several options to start your project.



Document Structure

Structure of a \LaTeX document.

```
\documentclass{...}
\usepackage{...}
...
```

preamble

```
\begin{document}
```

```
\title{...}
\author{...}
\date{...}
\maketitle
```

top matter

```
\begin{abstract}
...
\end{abstract}
```

abstract

```
\section{...}
```

body

```
\section{...}
```

```
\begin{thebibliography}{9}
```

bibliography

```
...
\end{thebibliography}
```

```
\end{document}
```

The Preamble and Top Matter

The preamble and top matter of the document

- The `\documentclass[parameter]{class}` command marks the beginning of the document.

- Parameter (optional): font and paper size, like `10pt` or `a4paper`
 - Class: the class of the document *book*, *report*, *article*, *letter*, etc.
 - For example, the KAUST template document class

```
\documentclass[onecolumn, 12 pt, doublespace, fullpage, a4paper]{report}
```

- To combine more than one author use `\and`, like `\author{John \and Mary}`.
- You can control the date that is displayed by giving an explicit date, like `\date{1st January 1970}`, or `\date{\today}`, or `\date{}` for no date.

Working with Text

- Several levels of sectioning: section, subsection, subsubsection, etc.
- Several font families

| Specifier | Switches To |
|---------------|------------------------------|
| \textnormal{} | normal document text |
| \emph{} | <i>emphasis</i> |
| \texttt{} | Typewriter style font family |
| \textit{} | <i>italic text</i> |
| \textbf{} | bold text |
| \textrm{} | Roman font family |
| \textsf{} | Sans-serif font family |

Example of Lists

```
\begin{itemize}
    \item We have the bullet list
    \begin{itemize}
        \item A nested list
    \end{itemize}
\end{itemize}
\begin{enumerate}
    \item We have numbered list
    \begin{enumerate}
        \item Another nested list
    \end{enumerate}
\end{enumerate}
\begin{description}
    \item[itemize:] is an unordered list
    \item[enumerate:] is an ordered list
\end{description}
```

■ We have the bullet list

■ A nested list

1. We have numbered list

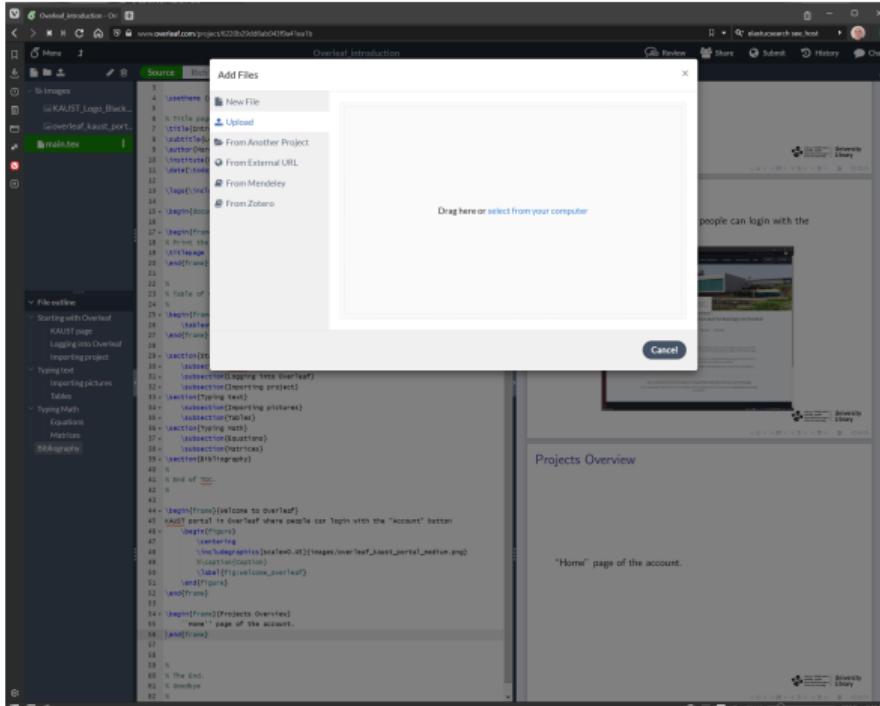
1.1 Another nested list

itemize: is an unordered list

enumerate: is an ordered list

Importing Pictures

Importing pictures to your Overleaf project.



Working with Pictures

Adding caption and setting the size of pictures

- Import the package `graphicx` to enable pictures in the document.
- You can specify the size of the pictures by scaling the pictures, like 10% of the original size, or by explicitly setting dimension.
- Give “hints” of the picture placement, with `h` for *here* or `t` for *top*.
- Use the caption to explain the picture
- By labeling the picture, you can reference it later in the document.

Example of Picture

```
\begin{figure}[ht]
\centering
\includegraphics[width=0.5\textwidth] <break>
{bombetoka_aster_23aug00_lrg}
\caption{An Otherworldly-Looking Bombetoka Bay,
Madagascar}
\label{fig:Bombetoka_Bay}
\end{figure}
```



Figure: An Otherworldly-Looking Bombetoka Bay, Madagascar

Working with Equations

Here is where \LaTeX really shines! This is a huge topic, and we will cover only the basics.

- Load the packages `amssymb` and `latexsym`
- Inline math can type between the `$...$`, like `$\sqrt{5}$` will produce $\sqrt{5}$.
- Equations will be in the equation environment

```
\begin{equation}
    x = \sqrt{5}
\end{equation}
```

- Big and complex formulas require some planning

Examples of Equations

```
\begin{equation}\label{E:firstInt}
\int_0^{\pi} \sin x \, dx = 2
\end{equation}
```

$$\int_0^\pi \sin x \, dx = 2 \quad (1)$$

```
\begin{aligned}
r^2 &\leq s^2 + t^2, & \text{\label{E:Pyth}} \\
2u + 1 &\leq v + w^{\alpha}, & \text{\label{E:alpha}} \\
x &\leq \frac{y + z}{\sqrt{s + 2u}}; & \text{\label{E:frac}}
\end{aligned}
```

$$r^2 = s^2 + t^2, \quad (2)$$

$$2u + 1 = v + w^{\alpha}, \quad (3)$$

$$x = \frac{y + z}{\sqrt{s + 2u}}; \quad (4)$$

```
\[
f(x) =
\begin{cases}
-x^2, & \text{if } x < 0; \\
\alpha + x, & \text{if } 0 \leq x \leq 1; \\
x-2, & \text{otherwise.}
\end{cases}
\]
]
```

```
\[
\overbrace{a + b + \cdots + z}^n
\]
```

$$f(x) = \begin{cases} -x^2, & \text{if } x < 0; \\ \alpha + x, & \text{if } 0 \leq x \leq 1; \\ x - 2, & \text{otherwise.} \end{cases}$$

$$\overbrace{a + b + \cdots + z}^n$$

Working with Tables

Creating tables in L^AT_EX

- Start simple with the `tabular` environment
- Define the alignment of columns, left (`l`), center (`c`) or right (`r`).
- Then add borders with `\hline` for horizontal lines and for vertical lines, define together with the header, like
`{||c c c c||}`
- Add the `table` environment
- Finally finish the table environment by defining the adding caption and label.

Example Table

```
\begin{table}[h!]
\centering
\begin{tabular}{||c c c c||}
\hline
Col1 & Col2 & Col2 & Col3 \\
\hline\hline
1 & 6 & 87837 & 787 \\
2 & 7 & 78 & 5415 \\
3 & 545 & 778 & 7507 \\
4 & 545 & 18744 & 7560 \\
5 & 88 & 788 & 6344 \\
\hline
\end{tabular}
\caption{Table to test captions and labels}
\label{table:data}
\end{table}
```

| Col1 | Col2 | Col2 | Col3 |
|------|------|-------|------|
| 1 | 6 | 87837 | 787 |
| 2 | 7 | 78 | 5415 |
| 3 | 545 | 778 | 7507 |
| 4 | 545 | 18744 | 7560 |
| 5 | 88 | 788 | 6344 |

Table: Table to test captions and labels

Bibliography

- Add the package `biblatex`
- Specify the file with the bibliography entries
- You reference the citation with `\cite{...}`
- Several supported entries: books, articles, patents, proceedings, conference, etc
- Several styles of bibliography are supported: numeric, alphabetic authoryear, etc
- Specific bibliography style for some magazines like Nature, IEEE, Science, and others.
- Where do you want the bibliography list to appear, add the command
`\printbibliography`.

Comparing Versions

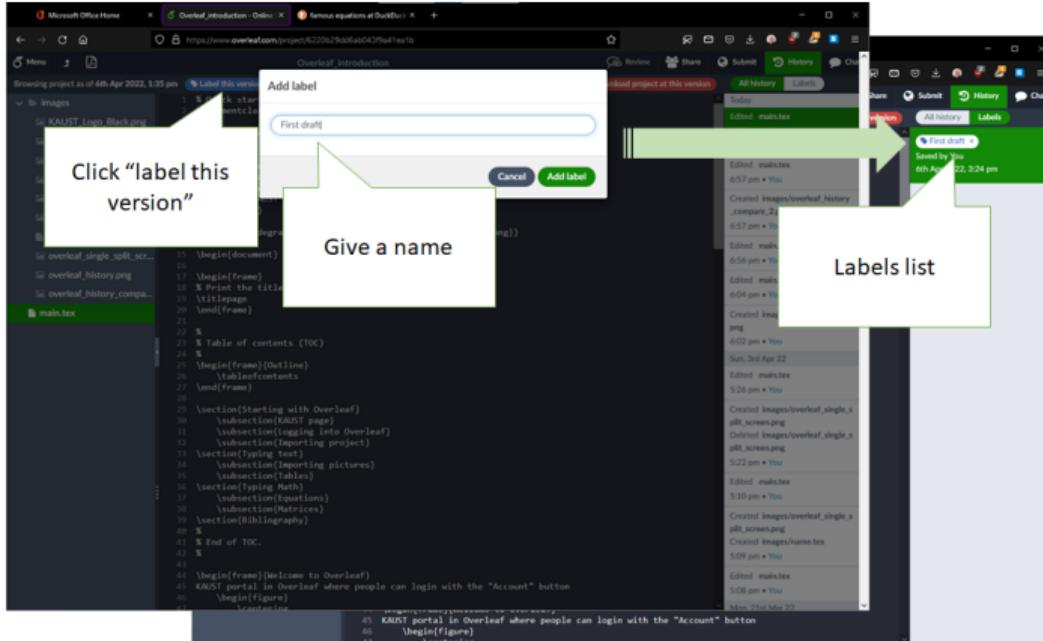
You can compare different versions of the document using the “History”.

The screenshot shows a Microsoft Edge browser window displaying an Overleaf project titled "Overleaf_introduction - Online". The main area shows the LaTeX code for the document, with a callout box pointing to the first few lines of code. The callout box contains the text: "To return to the ‘normal’ mode". Another callout box points to the right margin of the code editor, containing the text: "Drag the bar to mark the versions". To the right of the code editor is the "History" panel, which lists the following file operations:

| Operation | Date | User |
|--|---------|------|
| Edited main.tex | 6:02 pm | You |
| Created images/overleaf_history.png | 6:02 pm | You |
| Sent 3rd Apr 22 | | |
| Edited main.tex | 5:26 pm | You |
| Created images/overleaf_single_splt_screen.png | 5:26 pm | You |
| Deleted images/overleaf_single_splt_screen.png | 5:26 pm | You |
| Edited main.tex | 5:26 pm | You |
| Created images/overleaf_single_splt_screen.png | 5:26 pm | You |
| Created images/name.tex | 5:09 pm | You |
| Edited main.tex | 5:08 pm | You |
| Mon, 21st Mar 22 | | |
| Edited main.tex | 6:22 pm | You |
| Edited main.tex | 4:08 pm | You |
| Edited main.tex | 3:49 pm | You |
| Edited main.tex | 3:44 pm | You |
| Mon, 14th Mar 22 | | |

Using Tags

Tag your versions to mark special versions.



Working Offline

- Working offline or with a collaborator that doesn't have Overleaf.
- Options for Dropbox, Git and Github.
- Using Github as example
 - 1. Create the project in Github
 - 2. Import into Overleaf as new project
 - 3. Remember to synchronize the two projects!! (Not automatic)

Dealing with Errors

Reading error messages.

The screenshot shows the Overleaf LaTeX editor interface. On the left, the LaTeX code for a document titled "Overleaf_introduction" is displayed. On the right, the "Recompile" pane shows two error messages:

- File 'logos/overleaf_kauet_portal.png' not found; using draft setting.**

The compiler cannot find the file you want to include. Make sure that you have uploaded the file and specified the file location correctly.
- File 'logos/overleaf_kauet_portal.png' not found on input line 46.**

The compiler cannot find the file you want to include. Make sure that you have uploaded the file and specified the file location correctly.

Below the errors, the "Raw logs" section shows the terminal output of the LaTeX compilation process, including the command used and the file paths being processed.