

DTS201TC: Pattern Recognition Lab1:

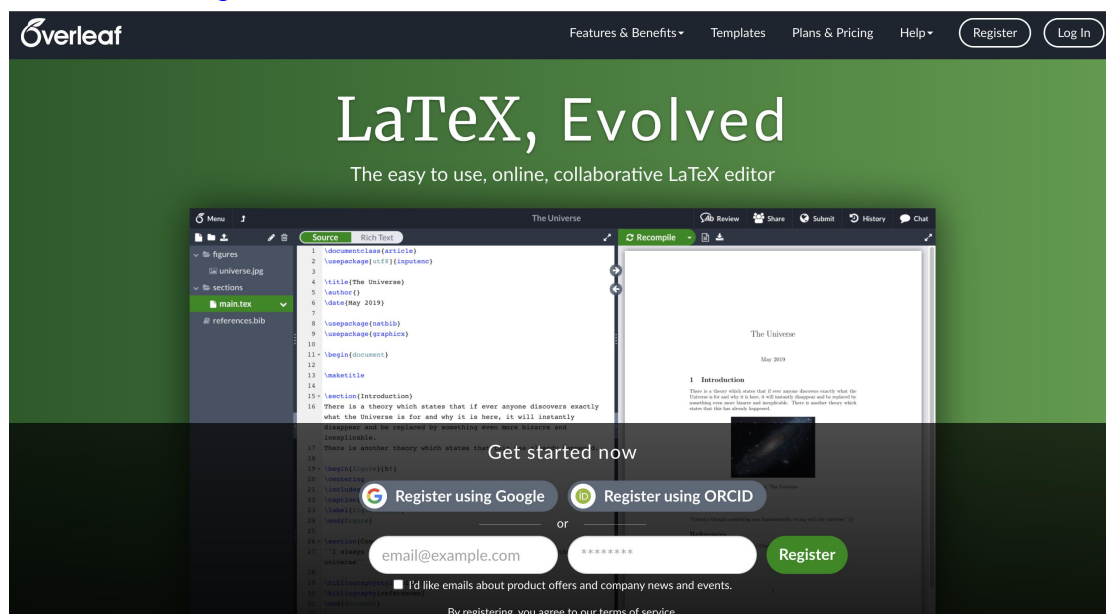
Task:

1. LaTeX
2. Install VSCode, Create virtual environment, install anaconda and run a piece of sample code.



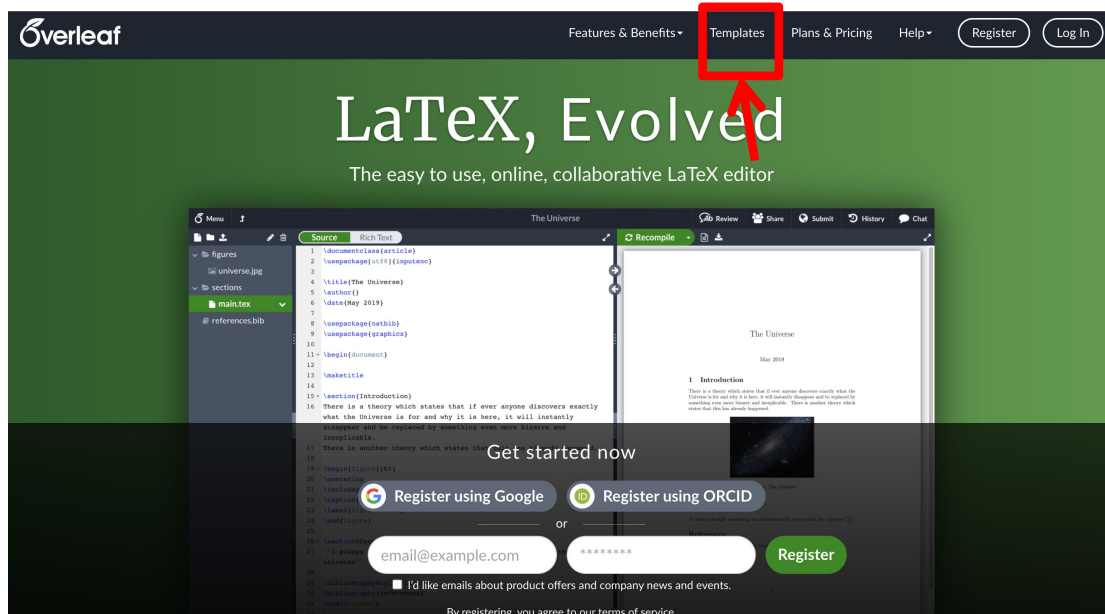
Task1: Use Overleaf

1.1 Website: <https://www.overleaf.com/>

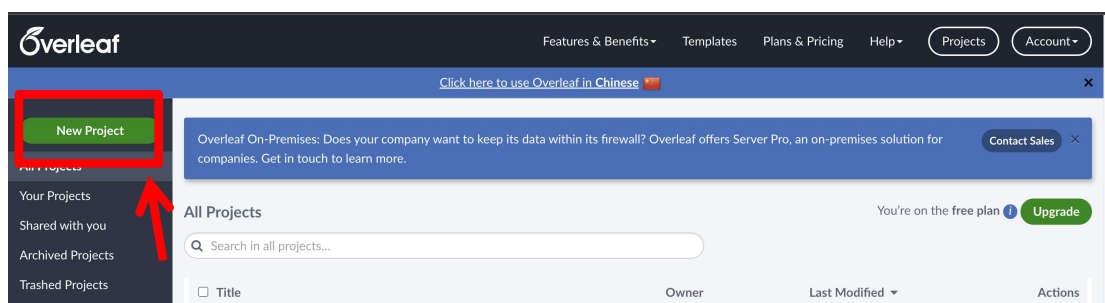


1.2 Where to find Templates

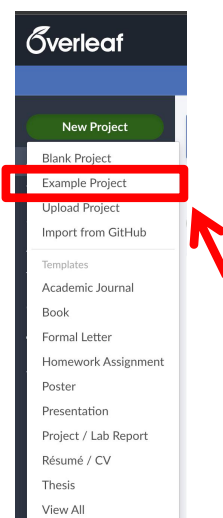
There are lots of templates for you to help you get a underlying structure. It may help you build your document easier.



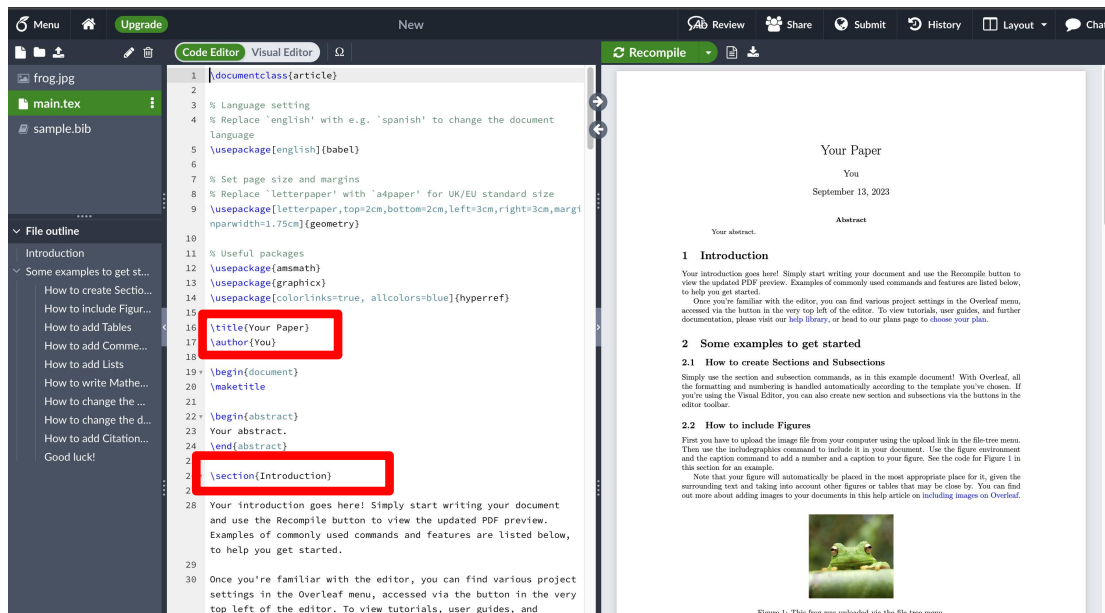
1.3 Prepare your first Latex document



There is a very useful example. You can click the example project. Then you can see a comprehensive document about how to add images, build a list or create a table.



You can see a example about how to fill your contents in the LaTeX code. Such as ‘\title’, ‘\author’ and ‘\section’.



1.3 Lists and Tables

1.3.1 Lists:

Lists in LaTeX are mainly of three types:

- **Unordered Lists:** Created using the `itemize` environment. Each item starts with the `\item` command.

```
1 \begin{itemize}
2   \item Item 1
3   \item Item 2
4   \item Item 3
5 \end{itemize}
```

This produces a bulleted list.

- **Ordered Lists:** Created using the `enumerate` environment. Again, each item starts with the `\item` command.

```
1 \begin{enumerate}
2   \item First Item
3   \item Second Item
4   \item Third Item
5 \end{enumerate}
```

This produces a numbered list.

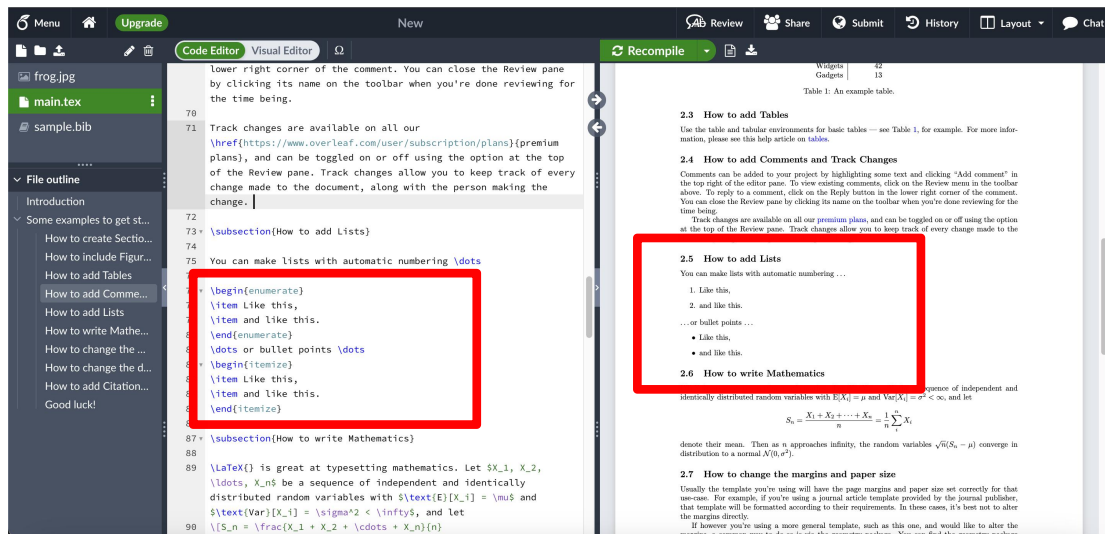
- **Description Lists:** Created using the description environment. Items are labeled, making them ideal for glossaries or simple definitions.

```

1 \begin{description}
2   \item[Label 1] Item 1
3   \item[Label 2] Item 2
4   \item[Label 3] Item 3
5 \end{description}

```

The template has an example:



1.3.2 Tables:

Tables in LaTeX are generally created using the tabular environment. The table structure is defined by specifying column alignments, and the rows are filled in accordingly.

Here is a simple table with three columns:

```

1 \begin{tabular}{|c|c|c|}
2   \hline
3   Column 1 & Column 2 & Column 3 \\
4   \hline
5   A & B & C \\
6   D & E & F \\
7   \hline
8 \end{tabular}

```

Column 1	Column 2	Column 3
A	B	C
D	E	F

- The `|c|c|c|` part specifies that there are three centered (c) columns, and vertical lines (|) will be drawn between them.
- The `\hline` command adds horizontal lines.

- Each row's content is specified after the `\hline`, with columns separated by `&` and rows ended by `\\`.
- **Advanced Features:**
 - Column Spanning:** To span multiple columns, use the `\multicolumn{num}{col}{text}` command.
 - Row Spanning:** To span multiple rows, use the `\multirow{num_rows}{width}{text}` command. The `multirow` package needs to be included for this.

Here's an example with both column and row spanning:

```

1 \begin{tabular}{|c|c|c|}
2   \hline
3   \multicolumn{2}{|c|}{Span Two Columns} & Column 3 \\
4   \hline
5   \multirow{2}{*}{Span Two Rows} & B & C \\
6   & D & E \\
7   \hline
8 \end{tabular}

```

Span Two Columns		Column 3
2*Span Two Rows	B	C
	D	E

The template also has an example:

The screenshot shows the Overleaf editor interface. On the left, the 'Code Editor' pane displays LaTeX code for a document. A red box highlights the code for creating a table:

```

\begin{table}
\centering
\begin{tabular}{|l|r|}
\hline
Item & Quantity \\
\hline
Widgets & 42 \\
Gadgets & 13 \\
\hline
\end{tabular}
\caption{\label{tab:widgets}An example table.}
\end{table}

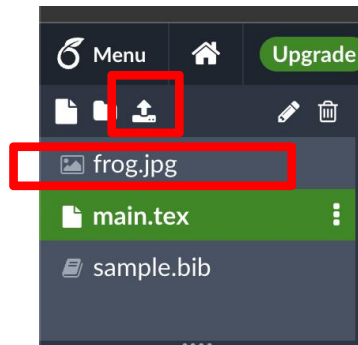
```

On the right, the 'Recompile' pane shows the rendered output. A red box highlights the resulting table:

Item	Quantity
Widgets	42
Gadgets	13

Below the table, the caption reads: 'Table 1: An example table.'

1.4 Figures



```
1 \begin{figure}
2 \centering
3 \includegraphics[width=0.25\linewidth]{frog.jpg}
4 \caption{\label{fig:frog}This frog was uploaded via the file-tree menu.}
5 \end{figure}
```

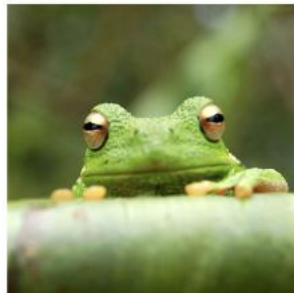


Figure 1: This frog was uploaded via the file-tree menu.

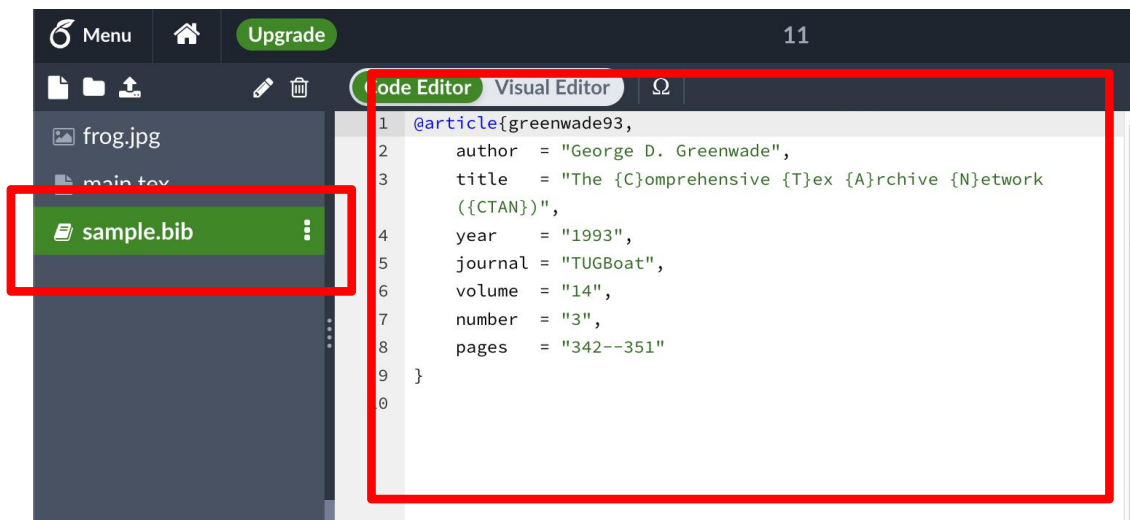
1.5 References and Citations

1.5.1 Installing the Required Package

In the preamble (the part before the start of your document) of your Overleaf project, you need to add the biblatex package. If you're using BibTeX, also add the biber package. Here's an example:

```
1 \documentclass{article}
2 \usepackage{biblatex}
3 \addbibresource{your_database.bib}
4 \begin{document}
```

1.5.2 Creating a Bibliography Database



Specific steps are as follows:



1.5.3 Inserting Citations

To insert a citation, you can use the `\cite{}` command. For example, 'In this study, `\cite{greenwade93}`.'

For a tool such as JabRef, you can use the command like this: `\cite{greenwade93}`. Just copy the command and paste it into your document, as well as the filename

Task2: Install VSCode

2.1 MacOS

Link:

<https://code.visualstudio.com/docs/setup/mac>

1. Download VSCode for macOS. Select **Intel Chip / Apple Silicon (m1/m2 chip)**.
2. Open the browser's download list and locate the downloaded app or archive.
3. If archive, extract the archive contents. Use double-click for some browsers or select the 'magnifying glass' icon with Safari.
4. Drag **Visual Studio Code.app** to the **Applications** folder, making it available in the macOS Launchpad.
5. Open VS Code from the **Applications** folder, by double clicking the icon.
6. Add VS Code to your Dock by right-clicking on the icon, located in the Dock, to bring up the context menu and choosing **Options, Keep in Dock**.

2.2 Windows

Link:

<https://code.visualstudio.com/docs/setup/windows>

- 1、 Download the Visual Studio Code installer for **Windows**.
- 2、 Once it is downloaded, run the installer (VSCodeUserSetup-{version}.exe). This will only take a minute.

By default, VS Code is installed under C:\Users\{Username}\AppData\Local\Programs\Microsoft VS Code.

2.3 Linux

Link:

<https://code.visualstudio.com/docs/setup/linux>

Task3: Create virtual environment, install anaconda and run a piece of sample code.

Create virtual environment using virtual environment, Click this link for more information:

<https://packaging.python.org/en/latest/guides/installing-using-pip-and-virtual-environments/>

3.1 macOS/Linux


```
1 # 1. Installing virtualenv
2 python3 -m pip install --user virtualenv
3 # or (pip/pip3)
4 pip install virtualenv
5 # 2. Creating a virtual environment
6 python3 -m venv env
7 # 3. Activating a virtual environment
8 source env/bin/activate
9 # Check python version & path, it should be '.../env/bin/python'
10 which python
11 whereis python
12 # 4. Leaving the virtual environment
13 deactivate
```

3.2 Windows

```
1 # 1. Installing virtualenv
2 py -m pip install --user virtualenv
3 # or (pip/pip3)
4 pip install virtualenv
5 # 2. Creating a virtual environment
6 py -m venv env
7 # 3. Activating a virtual environment
8 .\env\Scripts\activate
9 # Check python version, it should be '...\env\Scripts\python.exe'
10 where python
11 # 4. Leaving the virtual environment
12 deactivate
```