

LLM Usage Log

Prompt-1:

For my project i need to create a document using latex on overleaf. The report should be in IEEE format. Can you give me latex code for below structure.

1)Introduction

2)Abstract

3)Problem statement-1

->Problem statemet

->Abstraction

->Polynomial Reduction to Network Flow

-> Algorithem

-> Experimental Validation

4)Conclusion

Result:

Below is a clean IEEE-style LaTeX template you can paste directly into Overleaf.

It follows the structure you listed and uses standard IEEE formatting via the

IEEEtran class.

```
\documentclass[conference]{IEEEtran}
```

```
% *** PACKAGES ***
```

```
\usepackage{amsmath,amssymb}
```

```
\usepackage{graphicx}
```

```
\usepackage{cite}
```

```
\usepackage{hyperref}
```

```
\begin{document}
```

```
% -----
```

```
% Title & Author
```

```
% -----
```

```
\title{Your Project Title Here}
```

```
\author{
```

```
\IEEEauthorblockN{Your Name}
```

```
\IEEEauthorblockA{
```

```
Department / Institution \\
```

```
Email: your.email@example.com}
```

```
}
```

```
\maketitle
```

```
% -----
```

```
% Abstract
```

```
% -----
```

```
\begin{abstract}
```

This document presents an overview of the project, outlining the motivation, methodology, theoretical foundations, and results. The structure includes introduction, problem statement, abstraction, polynomial reduction to network flow, algorithmic approach, and experimental validation.

```
\end{abstract}
```

```
\begin{IEEEkeywords}
```

Network Flow, Polynomial Reduction, Algorithms, Experimental Validation

```
\end{IEEEkeywords}
```

% -----

% Introduction

% -----

\section{Introduction}

Write your introduction here. Describe the motivation, relevance, and goals of the project. Provide background and connect it to related work if needed.

% -----

% Problem Statement Section

% -----

\section{Problem Statement-1}

\subsection{Problem Statement}

Describe the problem being addressed. Define all necessary inputs, constraints, and the desired output.

\subsection{Abstraction}

Provide the abstract mathematical or conceptual representation of the problem. Explain how real-world elements are mapped into the model.

\subsection{Polynomial Reduction to Network Flow}

Explain how the problem is reduced to a network flow formulation.

Include definitions of:

\begin{itemize}

\item Graph construction

\item Capacities

```
\item Source and sink nodes  
\item Valid flow constraints  
\end{itemize}
```

\subsection{Algorithm}

Describe the algorithm used to solve the reduced problem.

You may include pseudocode:

```
\begin{verbatim}  
Algorithm 1: Example Algorithm  
Input: Graph G(V, E)  
Output: Maximum Flow
```

```
1: Initialize all flows to 0  
2: while there exists an augmenting path do  
3:   Find the path  
4:   Augment the flow  
5: end while
```

```
\end{verbatim}
```

\subsection{Experimental Validation}

Describe experiments, datasets, results, and evaluation metrics.

You may include figures:

```
\begin{figure}[h]  
\centering
```

```
\includegraphics[width=0.45\textwidth]{example-figure}  
\caption{Sample experimental result plot.}  
\end{figure}
```

% -----

% Conclusion

% -----

```
\section{Conclusion}
```

Summarize the overall contribution, key observations, and future scope of the project.

% -----

% References

% -----

```
\begin{thebibliography}{00}
```

```
\bibitem{ref1} Author, "Title," Journal/Conference, Year.
```

```
\end{thebibliography}
```

```
\end{document}
```

Prompt-2:

How to make part of text as bold and italic.

Result:

Bold + Italic (Both)

There are two common ways:

Method 1: Using nested commands

```
\textbf{\textit{This is bold and italic}}
```

Method 2: Using \textit inside \textbf or vice-versa

Both work:

```
\textit{\textbf{Bold and italic}}
```

Shortcuts (math mode only)

If you are inside math mode (like equations), you can use:

- `\mathbf{}` → bold math letters (not italics)
- `\mathit{}` → italic math letters
- `\boldsymbol{}` → bold italic math symbols

Example:

```
\boldsymbol{x}
```

Example in a sentence

In this paper, we propose `\textbf{\textit{a novel algorithm}}` for optimization.

If you want, I can also show you how to underline, highlight, or color text in LaTeX.

Prompt-3:

Can you give me script to plot the graphs from an excel.

Result:

Python Script to Plot Graphs from Excel

This works with any .xlsx file.

Requirements

Install packages:

```
pip install pandas matplotlib openpyxl
```

Python Code

```
import pandas as pd  
import matplotlib.pyplot as plt
```

```
# --- Load Excel file ---  
df = pd.read_excel("data.xlsx") # Replace with your file name
```

```
# --- View the first few rows ---  
print(df.head())
```

```
# --- Example 1: Plot two columns ---  
plt.figure()  
plt.plot(df['X'], df['Y'], marker='o')  
plt.xlabel("X")  
plt.ylabel("Y")  
plt.title("X vs Y Graph")  
plt.grid(True)  
plt.show()
```

```
# --- Example 2: Multiple columns on same plot ---  
plt.figure()  
plt.plot(df['Time'], df['Value1'], label='Value1')  
plt.plot(df['Time'], df['Value2'], label='Value2')  
plt.xlabel("Time")  
plt.ylabel("Values")  
plt.title("Multiple Line Plot")  
plt.legend()  
plt.grid(True)  
plt.show()
```

```
# --- Example 3: Bar Chart ---  
  
plt.figure()  
plt.bar(df['Category'], df['Count'])  
plt.xlabel("Category")  
plt.ylabel("Count")  
plt.title("Bar Chart")  
plt.show()
```

What you need to change

- Replace "data.xlsx" with your file name.
 - Replace column names like "X", "Y", "Time", "Value1" with your actual Excel column headers.
-

2. MATLAB Script to Plot from Excel

If you're using MATLAB:

```
% Read Excel file  
  
data = readtable('data.xlsx');
```

```
% Example 1: Line plot  
  
figure;  
plot(data.X, data.Y, '-o');  
xlabel('X');  
ylabel('Y');  
title('X vs Y Plot');  
grid on;
```

```
% Example 2: Multiple columns  
figure;  
plot(data.Time, data.Value1, 'LineWidth', 2);  
hold on;  
plot(data.Time, data.Value2, 'LineWidth', 2);  
xlabel('Time');  
ylabel('Values');  
legend('Value1', 'Value2');  
title('Multiple Line Plot');  
grid on;
```

```
% Example 3: Bar chart  
figure;  
bar(data.Category, data.Count);  
xlabel('Category');  
ylabel('Count');  
title('Category Count Bar Chart');
```

If you want, tell me:

- ✓ Your Excel file name
- ✓ The column names
- ✓ The type of graph (line, bar, scatter, etc.)

...and I will generate a custom plotting script tailored for your data.