# 📝 Student Marks Analysis (Excel → Python → Visualization)

A Python mini-project to automate the analysis of student marks stored in an Excel sheet.

The program calculates averages, identifies top and bottom scorers, and visualizes results with clear charts.

A simple GUI (Tkinter) makes it easy to run without touching the code.

## 📂 Project Overview

This project demonstrates:

- Reading and cleaning real-world data from an Excel file using **Pandas**.

- Calculating each student's **average marks** across multiple subjects.

- Identifying the **highest** and **lowest** scoring students automatically.

- Visualizing:

  - Top and bottom student's subject-wise scores.

  - Average marks per subject for the entire class.

- Running all of the above from a simple Python **GUI**.

## 🛠️ Tech Stack / Libraries

| Library | Purpose

| **Pandas** | Read Excel file, clean/transform data, compute averages |

| **Matplotlib** | Visualize top/bottom student performance and subject averages |

| **Tkinter**  | Build a minimal GUI so the program runs without command-line |

## 📊 Dataset

The code works on any Excel file with this format:

| Name | Subject1 | Subject2 | Subject3 |

| Ali | 80 | 75 | 92 |

| Sara | 65 | 90 | 88 |

- First column: **Student Name**

- Following columns: **Subject Marks**

Example datasets you can use:

- [Kaggle: Student Performance / Marksheet datasets](https://www.kaggle.com/search?q=student+marksheet)

- Or any Excel file with similar structure.

## 🚀 How to Run

1. **Clone this repository**

   ```bash

   git clone https://github.com/YourUsername/student-marks-analysis.git
   ```

cd student-marks-analysis

2. **Install required libraries**
3. pip install pandas matplotlib
4. **Place your Excel file** (e.g. marksheet.xlsx) in the same folder.
5. **Run the program**
6. python main.py
7. A **GUI window** will appear:
    - Shows the calculated averages.
    - Buttons to display bar charts for top & bottom student.
    - Button to display average marks per subject.

## 🖥️ Features

- ✅ Automatic reading of Excel file
- ✅ Cleaning and conversion of marks to numeric
- ✅ Calculation of student averages
- ✅ Identify top and bottom scorer
- ✅ Bar charts for both individual and subject-wise averages
- ✅ Simple GUI for non-technical users

## 📈 Insights You'll Learn

- Loading and cleaning Excel data with Pandas.
- Vectorized average calculations (faster and cleaner).
- Creating bar charts with Matplotlib.
- Wrapping analysis & visualization into a GUI for easy use.

### 📝 Example Output

- **Console:** Table of students with averages, top/bottom student.
- **Chart 1:** Top student's marks by subject.
- **Chart 2:** Bottom student's marks by subject.
- **Chart 3:** Average marks of the class per subject.

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### 🔗 References


- Pandas Documentation
- Matplotlib Documentation
- Tkinter Documentation
- Student Marksheet datasets on Kaggle