

# **Data Analysis Project using A.I by Satish Dhawale**

## ***(AI Prompt Engineering for GUI-Based Data Analysis Software)***

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### ◆ **ROLE SETTING (Very Important)**

You are an expert Python software developer and data analyst.

You have strong experience in:

- Pandas for data analysis
- Tkinter for GUI applications
- Matplotlib for charts
- Building corporate-ready desktop automation tools

### ◆ **PROJECT CONTEXT**

I want to build a professional desktop software (GUI-based) for corporate users.

The software should allow non-technical users to analyze Excel or CSV data without writing any Python code.

### ◆ **FUNCTIONAL REQUIREMENTS**

Write a complete Python program using Tkinter and Pandas that does the following:

#### **1) File Selection & Reading**

- Allow the user to browse and select a CSV or Excel file.
- Add a separate "Read" button.
- When the Read button is clicked:
  - Read the full dataset
  - Display:
    - Total number of rows
    - Total number of columns
    - All column headings

#### **2) Dynamic Column Detection**

- Automatically detect:

- Text columns (object/string dtype)
- Numeric columns (int/float or numeric-looking text)

### **③ Report Builder (Interactive Analysis)**

- Provide dropdowns for:
  1. Group By Column (only text columns)
  2. Aggregation Method (sum, mean, average, max, min, count, median)
  3. Value Column (only numeric columns)
- When user clicks "Preview Report":
  - Apply GroupBy + selected aggregation
  - Sort results in descending order
  - Display the result table inside the GUI (not Excel)

### **④ Export Report**

- Add an Export button.
- Allow export format selection:
  - Excel (.xlsx)
  - CSV (.csv)
- Export the report automatically into the same folder where the input file is located.

### **⑤ Chart Builder (GUI-Based Visualization)**

- Provide a dropdown to select chart type:
  - Bar chart
  - Column chart
  - Line chart
  - Pie chart
- When user clicks "Preview Chart":
  - Generate the selected chart using the report data

- Display the chart inside the GUI window
- Add "Export Chart" option:
  - Export chart as PNG image
  - Save it in the same folder as the input file

## **6 Usability & Error Handling**

- Show proper error messages if:
  - File is not selected
  - Read button is not clicked
  - Dropdowns are not selected
- Reset previous outputs when a new report is generated
- Keep the GUI clean, professional, and easy to use

### **♦ TECHNICAL CONSTRAINTS**

- Use Tkinter for GUI
- Use Pandas for data processing
- Use Matplotlib for charts
- Write clean, readable, well-commented code
- Structure the code so it can be converted into a .EXE using PyInstaller
- Do not require the end user to install Python

### **♦ DELIVERABLE FORMAT**

- Provide the full Python code in one single block
- Ensure the program is production-ready
- Do not omit any required functionality