**Excel Report Generator - Documentation**

***1. Introduction***

The Excel Report Generator is a Python-based application designed to automate the creation of professional Excel reports from CSV data. It transforms raw data into structured reports with pivot tables, charts, and summary statistics, saving time for data analysts, business professionals, and researchers.

**Key Features:**

CSV Data Loading: Supports importing data from CSV files.

Pivot Table Generation: Automatically creates pivot tables for data analysis.

Chart Integration: Embeds bar charts for visual representation.

Summary Statistics: Computes mean, median, standard deviation, and more.

User-Friendly GUI: Built with Tkinter for easy interaction.

Excel Styling: Applies professional formatting (colors, fonts, alignment).

***2. Abstract***

This project simplifies the process of converting raw CSV data into structured Excel reports. It uses:

-Pandas for data manipulation and pivot tables.

- OpenPyXL for Excel file generation and styling.

- Matplotlib(via OpenPyXL charts) for visualizations.

- Tkinter for a simple graphical interface.

**The tool is useful for:**

Business reporting

Data analysis automation

Financial summaries

Sales performance tracking

***3. Tools Used***

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| **Tool** | **Purpose** |
| Python | Core programming language |
| Pandas | Data loading, cleaning, and pivot tables |
| OpenPyXL | Excel file creation, styling, and chart embedding |
| Tkinter | Graphical user interface (file selection, buttons) |
| Matplotlib | Chart generation (used indirectly via OpenPyXL) |

***4. Steps Involved in Building the Project***

**Step 1: Load CSV Data**

- Use `pandas.read\_csv()` to import data.

- Validate file format and handle errors.

**Step 2: Generate Pivot Tables**

- Automatically detect numeric columns.

- Create pivot tables (e.g., sales by category, monthly trends).

**Step 3: Create Charts**

- Use `openpyxl.chart.BarChart` for visualization.

- Embed charts next to pivot tables.

**Step 4: Add Summary Statistics**

- Compute key metrics (mean, median, min, max, std dev).

- Display in a structured format.

**Step 5: Apply Excel Styling**

- Format headers with colors and bold text.

- Adjust column widths dynamically.

**Step 6: Build the GUI**

- Load CSV Button: File picker dialog.

- Generate Report Button: Save dialog for Excel output.

- Error Handling: Show alerts for invalid files.

**Step 7: Test with Sample Data**

- Auto-generate a sample CSV if none exists.

- Verify Excel output formatting.

***5. Conclusion***

The Excel Report Generator successfully automates the conversion of CSV data into structured Excel reports.