SDA Project Phase1

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Overview:

This project processes country-wise GDP data, filters it by continent and year, performs aggregation, and generates visualizations like pie charts, bar charts, line graphs, and scatter plots to explore GDP trends.

Programming Language: Python

Github link: https://github.com/Byte-Ibrahim/SDA-Project-Phase1

Features:

- Load GDP data dynamically from CSV
- Filter data by **continent** and **year**
- Aggregate GDP data per region
- Generate **multiple charts**:
    - Pie chart → share of GDP by region
    - Bar chart → total GDP per region
    - Line chart → top 10 countries GDP trend
    - Scatter plot → GDP distribution

1. Loader.py
Loads GDP CSV data, removes global totals, and transforms country-year data into a clean list of dictionaries for analysis.

2.   Filter.py
Filters GDP data by continent and year based on `config.json` and validates the configuration for correctness.

3. **Manipulation.py**

Aggregates GDP by continent (sum or average) using functional programming, returning a summary dictionary.

4. **Charts.py**

Generates visualizations (Pie, Bar, Line, Scatter) for regions and top countries, saving charts as PNG files.

5. **Main.py**

Controls the workflow: loads data, filters, aggregates GDP, generates charts, and displays results.

6.Visualization.py

It generates multiple plots to analyze GDP trends **region-wise** and **year-wise**, enabling intuitive visual insights into economic patterns. The module follows a **functional programming approach**, where each visualization is implemented as a separate function operating on immutable input data.

7. Dashboard.py

The **Dashboard module** serves as the **presentation layer** of the system. It combines **statistical results** with **graphical visualizations** to provide a complete analysis of the processed GDP data.

Usage:

Ensure `gdp.csv` and `config.json` are present in the project directory

- Run the main program:
- `python` `Main.py`

- View printed statistics in the console
- Generated charts will be displayed and saved in the project folder