Project Synopsis

Title: EcoTrack – GDP Analysis

Name: Ankit Girdhar Bohare

Roll No: MC - I - 20

Objective

The objective of this project is to analyze and visualize the Gross Domestic Product (GDP) of all countries, with a focus on providing insights into global economic trends, disparities, and growth patterns. By leveraging data analysis and visualization techniques, the project aims to create an interactive system that showcases the economic health of countries around the world, enabling users to easily explore key economic indicators and their relationships.

Scope of the System

The system will cover the following aspects:

- **Global Coverage**: It will encompass GDP data from all countries worldwide.

- **Data Analysis**: The system will provide an analysis of GDP statistics, including average GDP, top GDP countries, and the distribution of GDP across different regions.

- **Trends and Growth**: The system will track and visualize GDP growth trends over the years for different countries.

- **Visualizations**: It will feature interactive and static visualizations, including bar charts, histograms, box plots, and choropleth maps, to help users understand global economic trends.

- **User Interactivity**: Users will be able to filter countries, select specific time periods, and view detailed comparisons between countries or regions.

Proposed System

The proposed system will be a data-driven tool that provides a detailed, visual representation of GDP data for all countries. It will include:

- **Data Processing**: Importing and cleaning GDP data from reliable sources like the World Bank and IMF.

- **Analysis Module**: Tools for performing statistical analysis on the GDP dataset, including correlation analysis, growth trends, and ranking countries by GDP.

- **Visualization Module**: Charts, graphs, and maps for visualizing GDP across countries, regions, and over time.

- **User Interface**: An intuitive interface that allows users to interact with the data by filtering, sorting, and viewing the results in different formats.

Project Modules

1. **Data Collection and Preprocessing**:
   - Collection of GDP data from sources like the World Bank and IMF.
   - Cleaning, standardization, and normalization of the data.
   - Handling missing values and ensuring consistency across data points.

2. **Exploratory Data Analysis (EDA)**:
   - Descriptive analysis of GDP statistics (mean, median, standard deviation).
   - Identification of outliers and anomalies in the data.
   - Visualization of GDP distributions, trends, and patterns.

3. **GDP Trend Analysis**:
   - Analysis of year-over-year GDP growth for individual countries.
   - Visual representation of GDP growth over time for different nations.

4. **Visualization Module**:
   - Bar charts, pie charts, histograms, and boxplots to represent GDP data.
   - Geospatial visualizations (choropleth maps) to display GDP by country on a world map.

5. **User Interface**:
   - A simple, interactive web interface that allows users to filter countries and visualize the data.
   - Integration with interactive dashboards for real-time data updates.

Hardware and Software Requirements

Hardware Requirements:

- **Processor**: Intel Core i3 or higher

- **RAM**: 4 GB minimum (8 GB recommended)

- **Storage**: Minimum 2 GB free space

- **Internet**: Stable internet connection for data fetching

Software Requirements:

- **Operating System**: Windows 10 or higher / Linux / macOS

- **Programming Languages**: Python (Primary), HTML/CSS (for front-end), JavaScript (for interactive visualizations)

- **Libraries and Frameworks**:

    - Pandas, NumPy (for data manipulation)

    - Matplotlib, Seaborn (for static visualizations)

    - Plotly, Geopandas (for interactive and geospatial visualizations)

    - Flask / Django (for web application development)

    - Scikit-learn (for statistical analysis)

- **Database**: SQLite (for storing GDP data locally)

- **IDE**: VS Code / Jupyter Notebooks / PyCharm