Global Economic and Demographic Trends Analysis: Business Requirement Document (BRD)

Project Overview: The objective of this project is to analyze and derive insights from global data covering population, GDP, country characteristics, and health-related indicators from multiple sources. The data comes from four different files, and you will use Power BI to connect these data sources (Excel and SQL), clean, transform, perform basic descriptive statistical analysis, and visualize insights. The final deliverable will be a comprehensive dashboard that highlights key insights derived from the data.

Key Tasks:

1. **Data Sources:**
    - **SQL Database (CountriesWorld file):**
        - This file will be given to you in SQL. It contains the following fields:
            - Country
            - Country Code
            - Region
            - Population
            - Area (sq. mi.)
            - Population Density (per sq. mi.)
            - Coastline (coast/area ratio)
            - Net migration
            - Infant mortality (per 1000 births)
            - GDP ($ per capita)
            - Literacy (%)
            - Phones (per 1000)
            - Arable (%)
            - Other (%)

        - Climate
        - Birthrate
        - Deathrate
        - Agriculture (% of GDP)
        - Industry (% of GDP)
        - Service (% of GDP)

- **Excel Files (PopulationPerCountry, MetaData, GDP by Country 1960-2016 files):**
    - **PopulationPerCountry** file contains the following columns:
        - Country Name
        - Country Code
        - Indicator Name
        - Indicator Code
        - Population data from 1960 to 2017 for various indicators.
    - **MetaData** file contains:
        - Country Code
        - Region
        - Income Group
        - Special Notes
        - Country Name
    - **GDP by Country 1960-2016** file contains:
        - Country Name
        - Country Code
        - Indicator Name
        - Indicator Code

- GDP data from 1960 to 2016.

2. **Objective:**
    - You are required to create a Power BI report and dashboard that gives meaningful insights from the provided datasets.
    - You will connect the **CountriesWorld** dataset from SQL and the remaining datasets from Excel to perform data analysis and present your findings.
    - The analysis should provide a clear understanding of various countries' economic, health, and demographic trends over time.
3. **Required Analysis:**
    - **Data Cleaning & Transformation:**
        - Import all data files into Power BI.
        - Clean and transform the data using Power Query Editor.
        - Make sure the data is consistent and structured for analysis (e.g., handling missing values, transforming data types, removing duplicates, etc.).
        - Merge and relate the tables based on common fields (such as Country Name and Country Code).
    - **Descriptive Statistical Analysis:**
        - Perform basic **descriptive statistical analysis** on the data to gain an understanding of key measures:
            - **Population Data:**
                - Calculate basic statistics (mean, median, mode, standard deviation) for population data across countries.
            - **GDP Analysis:**
                - Calculate the average GDP per capita by country and region.
                - Identify the countries with the highest and lowest GDP.

- **Infant Mortality:**
  - Analyze the distribution of infant mortality rates across countries.
  - Calculate the range (min, max) and standard deviation for infant mortality.
- **Literacy Rates:**
  - Calculate the average literacy rate across regions and countries.
- **Growth Trends:**
  - Analyze growth trends for key variables (e.g., population, GDP, infant mortality) over time (1960-2017).

- **DAX Calculations:**
  - Apply at least **DAX functions** to perform calculations, such as:
    - Calculating the population growth rate over time.
    - Calculating the GDP growth rate.
    - Creating calculated columns for GDP per capita.
    - Aggregating population or GDP data by region.
    - Deriving insights such as the correlation between literacy rates and GDP.
- **Data Visualizations:**
  - Create a **comprehensive dashboard** that includes various visualizations such as:
    - **Bar charts, Line charts, Area charts, Pie charts, Maps**, etc.
    - Include filters and slicers for users to interact with the data.
    - Include important visualizations such as:

- Population trends over time.
- GDP per capita by country.
- Population density by region.
- Infant mortality and GDP correlation.

- **Key Insights and Analysis:**
  - Derive insights based on the analysis:
    - Which regions have the highest population growth rates?
    - What is the relationship between GDP growth and literacy rates?
    - Which countries have the highest and lowest GDP per capita?
    - Are there any notable trends in infant mortality rates over time in different countries?
    - Identify regions with the most and least population density.
- **Power BI Report:**
  - Create a report with a clean layout showcasing key insights and findings.
  - Utilize **Power BI's Storytelling** features to highlight important results and provide a narrative for your analysis.

4. **Presentation & Documentation:**
   - Create a **PowerPoint presentation** that includes:
     - **Title Slide**: Include the project title, your name, and an overview of the analysis.
     - **Dataset Description**: Explain the datasets used, their sources, and key features.
     - **Dashboard Overview**: Show the Power BI dashboard and explain the key visualizations.

- **Key Insights**: Highlight the major findings and provide an analysis of what the data reveals.
- **Conclusion**: Summarize the analysis and provide any recommendations or next steps.

Constraints & Requirements:

- **Power BI Analysis:**
  - You must connect to at least **two different data sources**: SQL (CountriesWorld) and Excel (the remaining files).
  - Use **DAX** to create calculated measures or columns.
  - Perform **basic descriptive statistics** on key variables, such as population, GDP, infant mortality, and literacy.
  - Ensure that all data is properly cleaned, transformed, and merged into a single model.
  - The dashboard should contain at least **5 different visualizations** (e.g., bar charts, line charts, maps).
  - The dashboard must include **interactive elements** (filters, slicers, tooltips).
  - Ensure that the visualizations are properly formatted and easy to interpret.
- **File Naming & Submission:**
  - Submit the **Power BI .pbix file**.
  - Include the **PowerPoint presentation** summarizing your project.
  - Provide a written **report (analysis and insights)** based on the data visualized.

Evaluation Criteria for Power BI Milestone Project:

Evaluation Criteria	Marks
Data Cleaning & Transformation	**15**
Descriptive Statistical Analysis	**15**
DAX Calculations & Measures	**15**
Data Visualizations	**20**
Dashboard Design	**15**
Insights & Analysis	**10**
PowerPoint Presentation	**10**
Total	**100**