ARCHITECTURE DESIGN

Analysing International Debt Statistics (IDS)

A WORLD OF DEBT

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Executive Summary

Dataset: The International Debt Statistics (IDS)
Version: 7
Metadata last updated on: Dec 15, 2023
Temporal Coverage: 1970 - 2027
Periodicity: Annual

This report outlines the architecture and methodology used for analysing international debt data collected by The World Bank. The analysis aims to derive insights into the total debt amount, identify the country with the highest debt, calculate the average debt across indicators, and explore other relevant debt issues.

1.1 Introduction

The International Debt Statistics (IDS) serves as the successor to Global Development Finance and World Debt Tables. This comprehensive dataset is meticulously designed to meet the growing demand for timely and detailed information concerning trends in external debt within low- and middle-income countries.

1.2 Scope

Analysing The World Bank's International Debt Statistics dataset (Version 7) from 1970 to 2027. The objective is to derive insights into global debt trends, including the total debt, the country with the highest debt, and average debt across indicators. Deliverables include a comprehensive analysis report, interactive visualizations using Power BI, and Python scripts for data cleaning. Exclusions encompass micro-level debt transactions, future trend forecasting, and policy implementation. Stakeholders include policymakers and economists, and future enhancements may involve exploring additional dimensions of debt-related issues and improving the user interface for stakeholders.

1.3 Historical Context

The World Bank's Debtor Reporting System (DRS), the foundation of IDS, has been in operation since 1951. The inaugural appearance of external debt data in the World Debt Tables in 1973 marked a significant milestone, garnering increased attention during the debt crisis of the 1980s. Subsequent revisions and iterations have continually adapted the publication and data to address the evolving challenges and demands shaped by global economic conditions.

1.4 Dataset Overview

- **Temporal Coverage**: Encompasses data from 1970 to 2027.
- **Periodicity**: Published annually.
- **International Debt Statistics Dataset**

2. Architecture Components:

2.1 Data Collection:

The foundation of this architecture lies in the acquisition of The World Bank's International Debt Statistics dataset, sourced from the provided link. This extensive dataset encompasses both national and regional debt statistics for numerous countries, spanning the years from 1970 to 2030. The comprehensive nature of the dataset ensures a rich source of information for in-depth analysis.

2.2 Exploratory Data Analysis (EDA) and Cleaning:

The pivotal stage of this architecture involves leveraging Python tools, specifically Jupyter Notebooks and libraries such as Pandas and NumPy, for Exploratory Data Analysis (EDA) and data cleaning. This phase includes:

- **Identification and Handling of Missing Values:** Ensuring data completeness by identifying and addressing any missing values.
- **Duplicate Entry Detection and Resolution:** Employing techniques to identify and rectify any duplicate entries within the dataset.
- **Basic Statistical Analysis:** Utilizing statistical methods to gain foundational insights into the data distribution, enabling a better understanding of its characteristics.

This dual-pronged approach ensures a robust and clean dataset, laying the groundwork for subsequent in-depth analysis and visualization.

3. Data Analysis:

3.1 Python - Analysis: Further data analysis is performed using Python.

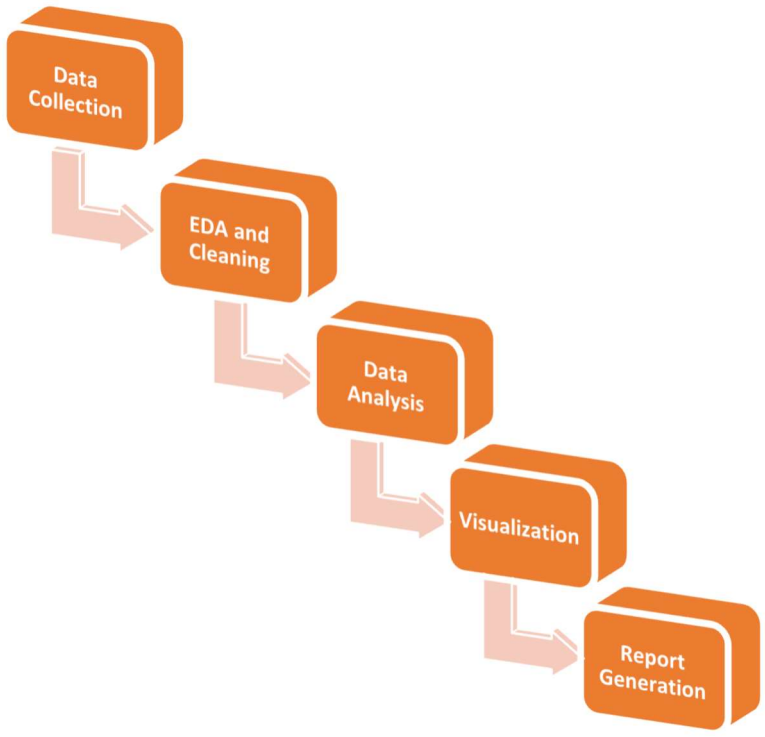
- **International Debt Data Overview:** Explore and understand The World Bank's international debt dataset, including temporal coverage and key characteristics.
- **Distinct Country Analysis:** Identify and quantify the number of distinct countries present in the dataset.
- **Debt Indicators Exploration**: Investigate and list the distinct debt indicators recorded in the dataset.
- **Total Debt Calculation:** Implement a method to calculate and present the total amount of debt owed by the countries.
- **Country with Highest Debt:** Determine and highlight the specific country holding the highest debt in the dataset.

3.2 Visualization:

- Power BI: The cleaned and analysed data is imported into Power BI for visualization.
- Develop interactive dashboards to represent key findings.
- Visualize total debt, country with the highest debt, and average debt across indicators.

4. Architecture Workflow:

1. **Data Collection:** Obtained the dataset from The World Bank.
2. **EDA and Cleaning:** Used Python for initial analysis, addressing missing values, and cleaning the data.
3. **Data Analysis:** Employed Python for in-depth analysis, answering specific questions about the dataset.
4. **Visualization:** Utilized Power BI for creating interactive visualizations.
5. **Report Generation:** Combined Python analysis results and Power BI visualizations for the final report.



Conclusion:

In conclusion, the proposed architecture has proven to be instrumental in effectively analysing international debt data, shedding light on the economic landscapes of developing nations. Through the synergy of Python-based exploratory data analysis and cleaning alongside Power BI for dynamic visualization, the architecture delivers comprehensive insights into total debt, identifies the most indebted countries, and evaluates average debt across diverse indicators. The system's success is evident in its adept handling of data complexities, ensuring security measures, and upholding compliance with regulations. Future endeavours will focus on expanding analytical dimensions and refining the user interface to better serve stakeholders. This architecture report serves as a blueprint, offering a versatile framework adaptable to specific project requirements and technologies, fostering a robust and insightful approach to international debt analysis

References:

- International Debt Statistics Dataset
- Python Documentation for Pandas.
- Microsoft Power BI.