Power BI Inflation Analysis: Journeying Through Global Economic Terrain

Introduction--

1·1 Project Overview

Inflation remains one of the most pivotal indicators influencing global economic health. Its effects ripple across sectors—shaping purchasing power, investment strategies, and policy formulation. For multinational corporations (MNCs) operating across varied geographic markets, understanding and navigating inflationary trends is essential to maintaining profitability, mitigating risks, and making sound strategic decisions.

This project, titled *"Power BI Inflation Analysis: Journeying Through Global Economic Terrain,"* leverages the capabilities of Power BI to perform a comprehensive analysis of inflation data from multiple regions. It aims to uncover patterns, visualize trends, and highlight actionable insights for corporate stakeholders. By integrating and modeling inflation datasets from diverse countries, the project seeks to build a unified platform that supports data-driven decision- making tailored to local and global economic contexts.

1·2 Objectives

The key objectives of this project are:

- ***To Collect and Integrate Global Inflation Data***
- ***To Identify and Visualize Regional Inflation Trends***
- ***To Analyze Historical Patterns for Strategic Insights***
- ***To Provide Actionable Recommendations***

2·Project Initialization and Planning Phase

2·1 Define Problem Statement

In a globalized economy, multinational corporations face significant challenges in understanding and responding to inflation trends across different countries· The absence of standardized reporting formats, inconsistent data availability, and lack of historical records make it difficult to build a unified view of global inflation· Furthermore, the intricate interdependencies among economies complicate the analysis of inflation drivers and their impact on business operations· Without a centralized analytical system, companies struggle to draw meaningful, data-driven insights to guide pricing, investment, and expansion strategies·

2·2 Project Proposal (Proposed Solution)

To address these challenges, we propose building a comprehensive Power BI dashboard that consolidates inflation data from various global sources into a standardized, interactive format. This solution will include:

- **Integration of inflation datasets across countries into a single model**
- **Interactive visualizations to explore country-wise and global inflation trends**
- **Insights into regional inflation drivers and their global impact**
- **Custom recommendations for strategic planning based on data insights**

2·3Initial Project Planning

- **Data Collection**
  Collect the dataset,
  Connect Data with Power BI

- **Data Preparation**
  Prepare the Data for Visualization

- **Data Visualizations**
  Visualizations

- **Dashboard**
  Responsive and Design of Dashboard

- **Report**
  Report Creation

- **Performance Testing**
  Amount of Data Rendered to DB
  Utilization of Data Filters
  No. of Calculation fields
  No. of Visualizations/Graphs

3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified

Data Collection Plan--For this project, the inflation data has been sourced from **Kaggle**, a well-known platform for open datasets used in data science and analytics projects.

Raw Data Sources Identified--Kaggle – Global Inflation Dataset

- **Description:** Contains annual inflation rate data for multiple countries from 1980 onward.
- **Fields:** Country Name, Indicator Name, and yearly inflation percentages.

3.2. Data Quality Report

Data Source---Dataset is from Kaggle

Data Quality Issue --The Inflation dataset had several issues that needed to be addressed before analysis. Firstly, the data was in a wide format, with each year from 1980 to 2024 as a separate column, There were also missing or null values in some years for certain countries, which could affect accuracy some columns had incorrect data types, like years or

inflation rates being stored as text.Fixing these issues helped make the dataset clean, structured, and ready for proper analysis in Power BI.

Resolution Plan---resolve the issues in the Inflation dataset, several technical steps were applied using Power Query in Power BI. First, the data was transformed from a wide to a long format by unpivoting the year columns

1. Missing or null inflation values were filtered out to ensure data accuracy.
2. Data types were corrected to ensure Year was a whole number and Inflation Rate was a decimal.
3. duplicate records were eliminated to maintain data integrity
4. These transformations prepared the dataset for accurate analysis and visualization in Power BI

3.3. Data Exploration and Preprocessing

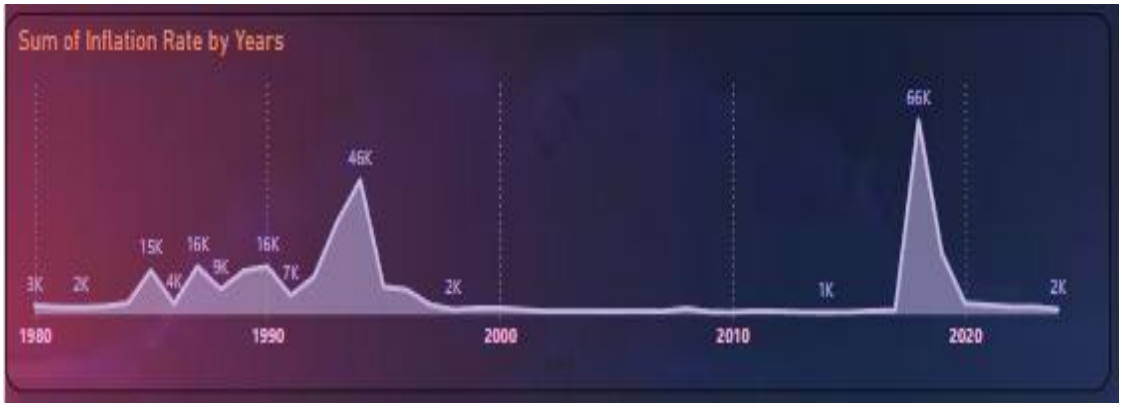
Data Overview---The Inflation dataset provides a comprehensive view of annual inflation trends across various countries from the year 1980 to 2024. Each row in the dataset represents a unique combination of a country and an inflation-related indicator,

- **Data Cleaning---**Remove Irrelevant Rows,Handle Missing Values, rename column, Remove Duplicate, Promote Headers, Unpivot Year Columns
- **Data Transformation**---Use of Power Query for filter, sort, Unpivot Columns, add column and DAX measure
- **Data Type Conversion----**Rectifying Datatype like year column is in text convert into whole number
- **Merging --** merge columns
- **Data Modeling--** Define relationships
- **Save Processed Data----**Save the cleaned data

4. Data Visualization

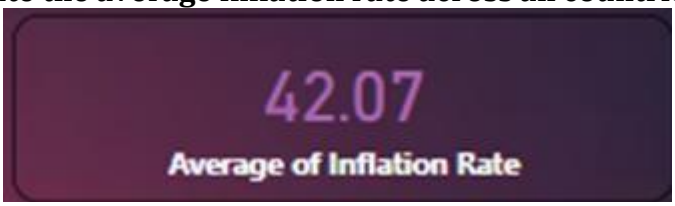
4.1. Framing Business Questions

Ques--What is the total (sum) of inflation rates across all countries for each year?



Ques--calculate the total (sum) of Inflation Rates grouped by Inflation Rate Category in Power BI?

Ques--calculate the average inflation rate across all countries



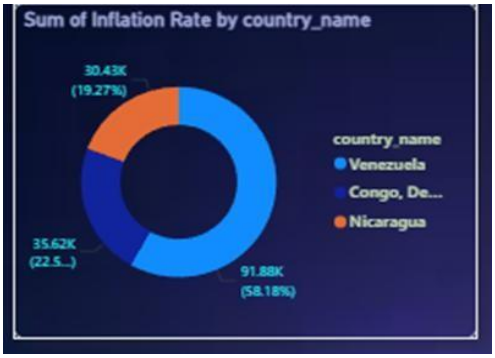
Ques--find the maximum inflation rate recorded in the dataset

Ques--count the number of distinct regions represented in my global inflation dataset in Power BI?"

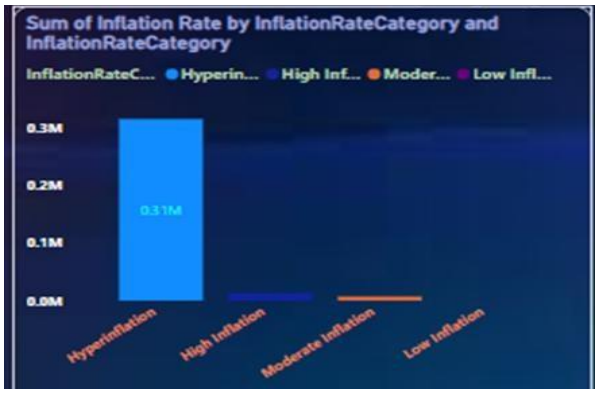
Ques--calculate the total (sum) of year-over-year inflation rate changes across all countries or regions in Power BI?"

Ques--calculate and display the average inflation rate by region in Power BI?"

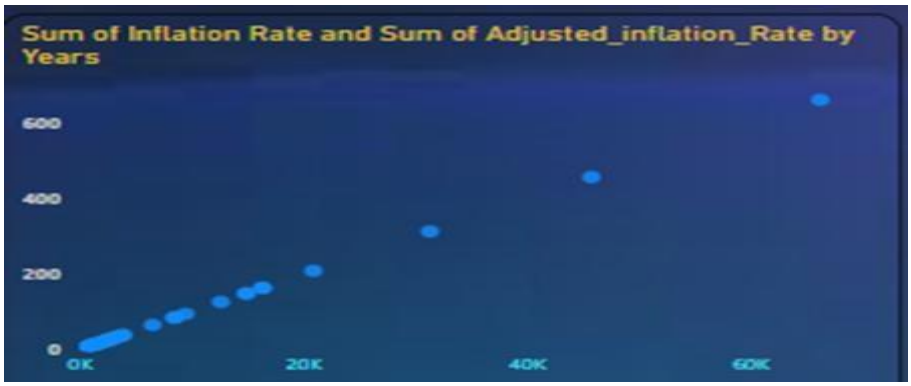
Ques--calculate the sum of inflation rates by country and display the top 3 countries with the highest total inflation in Power BI?"



Ques--calculate the total (sum) of inflation rates grouped by Inflation Rate Category in Power BI?"

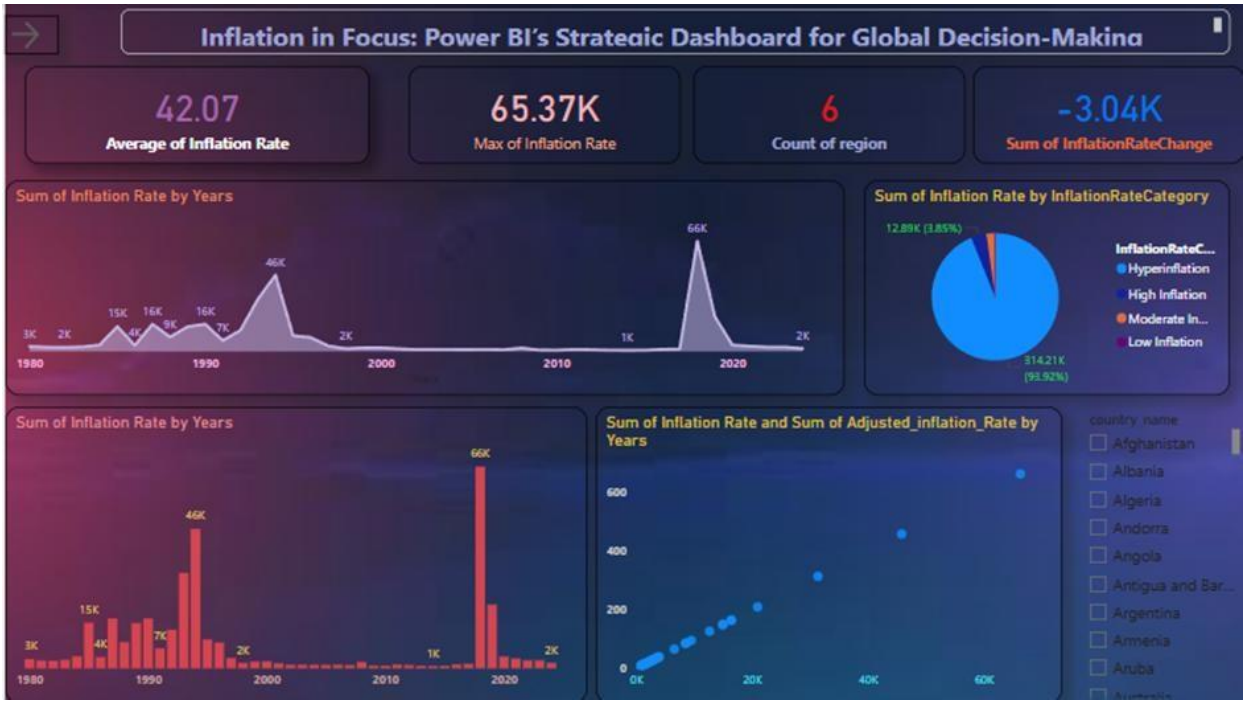


Ques--calculate the sum of Inflation Rate and Adjusted Inflation Rate grouped by Year in Power BI?"



5. Dashboard

5.1. Dashboard Design File



Key KPI Insights:

Average of Inflation Rate:
42.07 — Suggests that the average inflation rate across all countries and years is relatively high, possibly due to extreme inflation in specific regions.

Max of Inflation Rate:
65.37K — An extremely high value, possibly due to hyperinflation

Count of Region:
6 — Indicates data is distributed across 6 distinct regions

Sum of Inflation Rate Change:
–3.04K --- This shows that in many countries, inflation is **going down over time**.

Visual insights---

Sum of Inflation Rate by Year

- Big spikes in **1990 and 2020** suggest **economic crises** happened around those years.
- Lower values in other years show more **stable inflation**.

Inflation Rate Categories (Pie Chart)

- Most of the data (about **94%**) shows **low inflation**.
- A few countries show **high or hyperinflation**, but they are not common.

Adjusted vs. Actual Inflation

- One chart compares **actual inflation** with **adjusted inflation**.
- This helps show what inflation would look like if we adjust for factors like currency value or global averages.
- The values grow together — showing a **strong link** between actual and adjusted rates.

6. Report

6.1. Story Design File

1. Average Inflation Rate by Region

- The world map shows the **average inflation rate** across continents.
- Larger circles represent higher average inflation.
- **Africa and South America** show relatively larger inflation circles, indicating higher average inflation rates in these regions.

2. Inflation Rate by Country

- A **table** lists countries with their inflation rate in the year **1980** along with the **change in inflation**.
- For example:
    - **Tonga** had the highest rate listed here at **7.3%** in 1980.

- Most countries show a decrease of **-0.38%**, suggesting a common decline in that year.

3. Sum of Inflation Rate by Country

- **Venezuela**, **Congo (Democratic Republic)**, and **Nicaragua** are the top 3 countries with the **highest total inflation**.
- Venezuela stands out with the **largest share** (over 50% in the pie chart and 92K in the bar chart).

4. Inflation by Category

- Inflation is divided into four categories:
  - **Hyperinflation**
  - **High Inflation**
  - **Moderate Inflation**
  - **Low Inflation**
- Most of the total inflation is in the **Hyperinflation** category, with over **0.31 million** in value.
- This indicates that a few countries are experiencing extreme inflation levels.

Key Insights

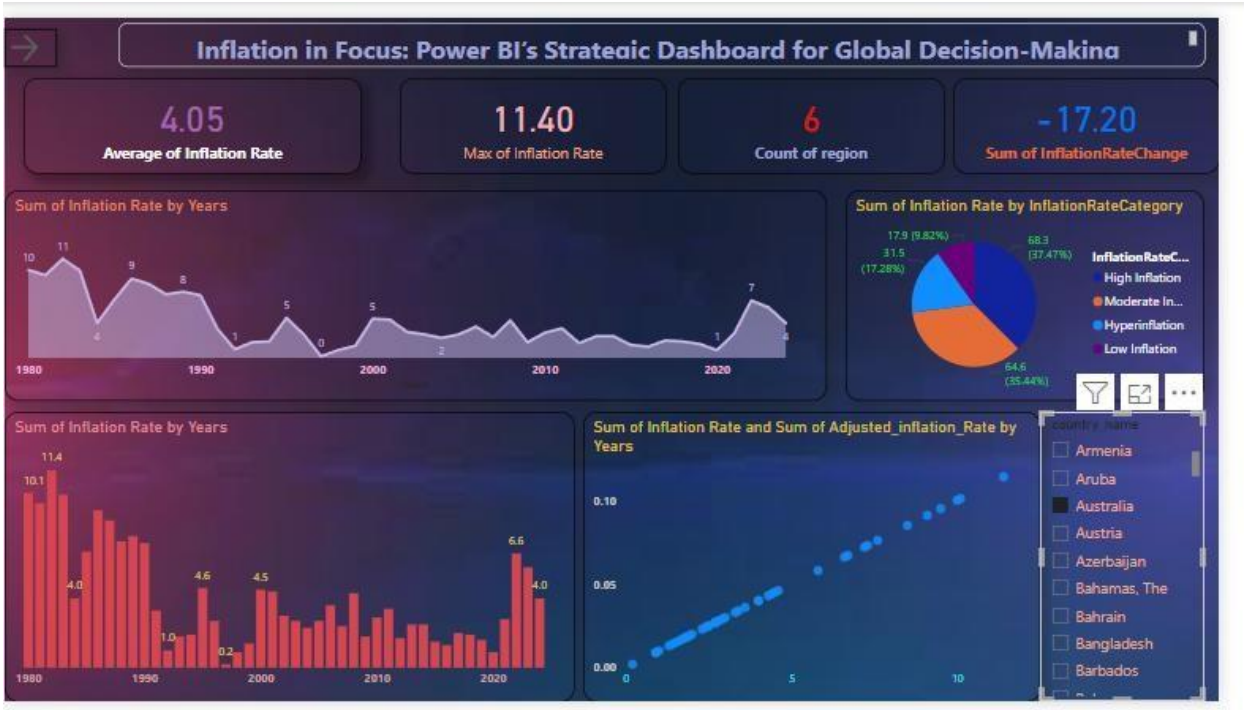
- **Venezuela** leads in total inflation rate, highlighting a severe economic situation.
- The **global distribution** of inflation varies, with **Africa and South America** showing higher average rates.
- A significant portion of inflation comes from countries facing **hyperinflation**.

7. Performance Testing

7.1 Utilization of Data filters

Filters help you focus only on the data you need by hiding the rest. They show information that matches specific conditions, making it easier to analyze what's important.

--Selected country Australia



7.2 No of Calculation Field

*In Power BI, a **measure** is a calculation create to analyze your data. It uses a special formula language called **DAX** . Measures help get meaningful insights from your data.*

```
InflationRateCategory =
SWITCH(
    TRUE(),
    'global_inflation_data'[Inflation Rate] < 2, "Low Inflation",
    'global_inflation_data'[Inflation Rate] >= 2 && 'global_inflation_data'[Inflation Rate] < 5, "Moderate Inflation",
    'global_inflation_data'[Inflation Rate] >= 5 && 'global_inflation_data'[Inflation Rate] < 10, "High Inflation",
    'global_inflation_data'[Inflation Rate] >= 10, "Hyperinflation",
    "Unknown"
)

```

```
InflationRateChange =
VAR CurrentYear = MAX('global_inflation_data'[Years])
VAR CurrentInflationRate =
    CALCULATE(
        MAX('global_inflation_data'[Inflation Rate]),
        ALL('global_inflation_data'),
        'global_inflation_data'[Years] = CurrentYear
    )
VAR PreviousInflationRate =
    CALCULATE(
        MAX('global_inflation_data'[Inflation Rate]),
        ALL('global_inflation_data'),
        'global_inflation_data'[Years] = CurrentYear - 1
    )
RETURN
    IF(
        ISBLANK(PreviousInflationRate),
        BLANK(),
        (CurrentInflationRate - PreviousInflationRate) / PreviousInflationRate
    )
```

7.3 No of Visualization

1. Average InflationRate
2. Maximum Inflation Rate.
3. Number of regions.
4. Inflation Rate Change Over years.
5. Distribution Of Inflation Rate category.
6. Filter applied On Country Column.
7. Average Inflation Rate Change by Country.
8. Inflation And AdjustedInflation rates change over years.
9. Inflation rate Distribution.
10. Inflation rate Distribution of regions by Country.
11. Top 3 InflationRate Countries

8. Conclusion

- **The data reveals that inflation rates vary widely by region and country, with *Venezuela* experiencing extreme levels of inflation.**
- ***Hyperinflation* contributes the most to the global inflation sum, indicating that economic instability in a few countries has a significant global impact.**
- **Regions like *Africa* and *South America* show consistently higher average inflation rates compared to other parts of the world.**

9. Future Scope

- ***Time Series Analysis*: observe how inflation has changed over the decades and identify trends or anomalies.**
- ***Country-wise Deep Dive*: Analyze the causes of inflation in the top-affected countries like Venezuela and Congo.**
- ***Economic Impact Study*: Correlate inflation data with unemployment, GDP, interest rates, and purchasing power to understand broader economic implications.**