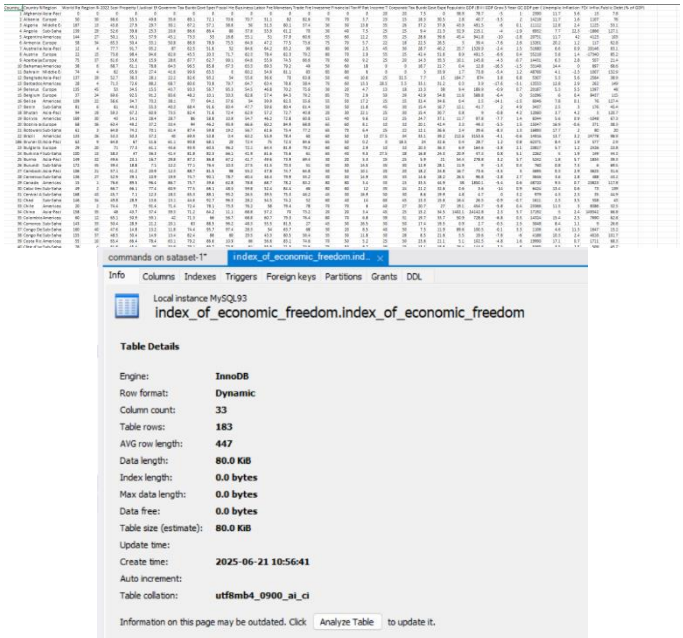
Project Development Phase
Model Performance Test

Date	21 June 2025
Team ID	LTVIP2025TMID49899
Project Name	Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis
Maximum Marks	

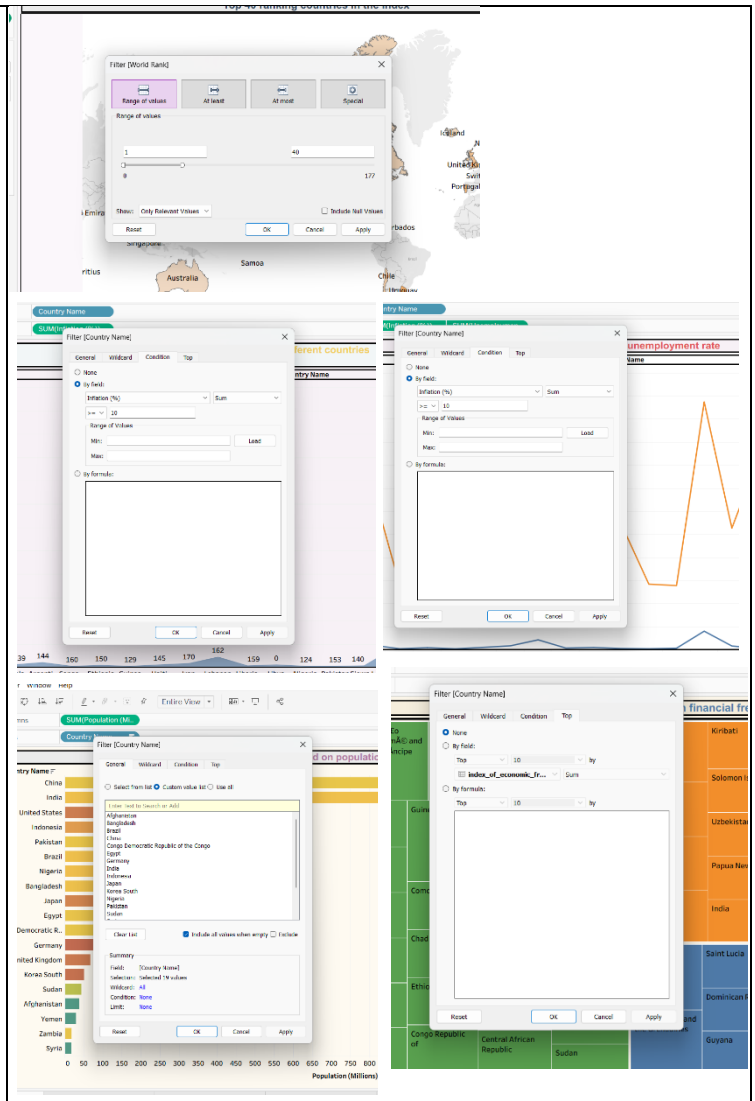
Model Performance Testing:

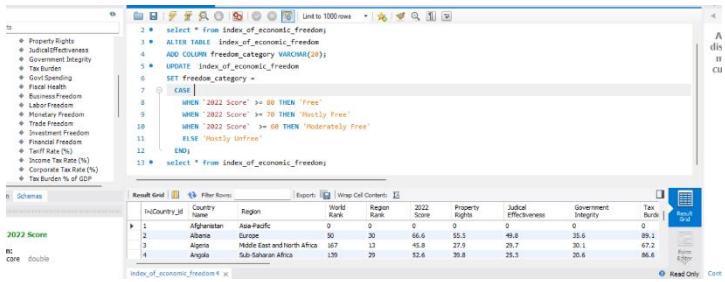
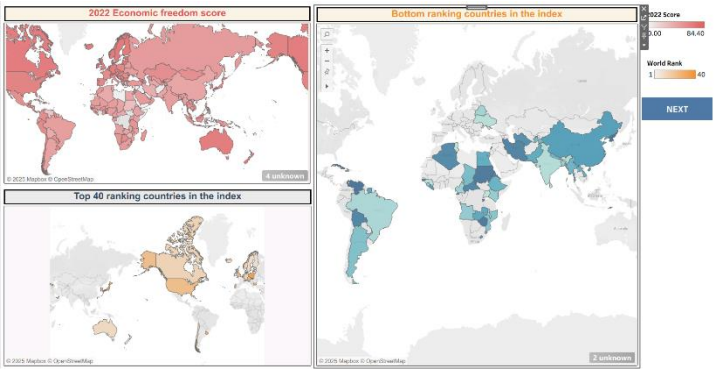
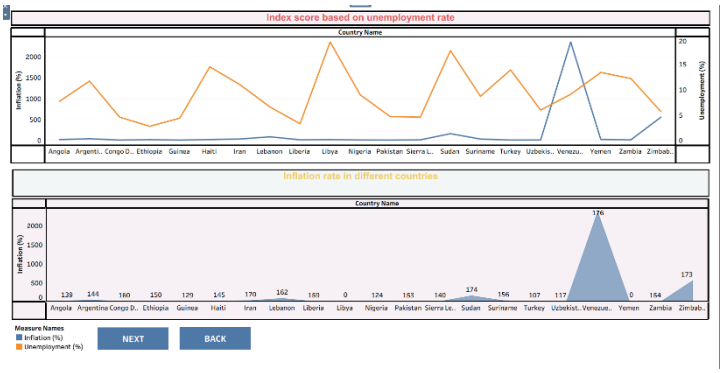
Project team shall fill the following information in model performance testing template.

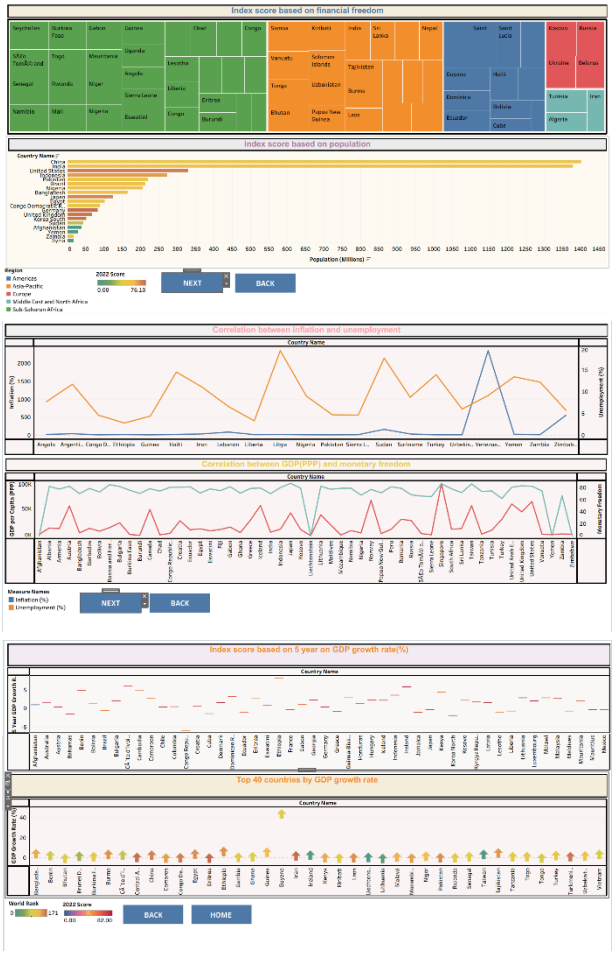
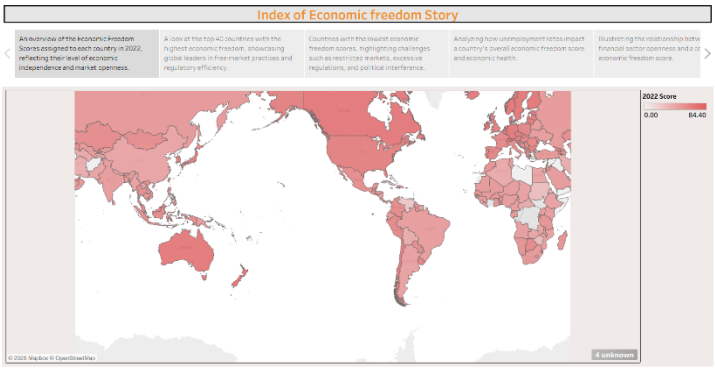
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	The dataset used in this project is based on the **Index of Economic Freedom**, primarily sourced from the **Heritage Foundation**, supplemented with data on GDP, unemployment, inflation, FDI, and public debt. It contains **177 rows**, each representing a country, and approximately **32 columns** capturing various economic and governance indicators. Key attributes in the dataset include: • **Country Name** and **Region** (e.g., Asia-Pacific, Europe, Sub-Saharan Africa) • **World Rank** and **Region Rank** • **2022 Economic Freedom Score** – the main index measuring economic liberty on a scale of 0 to 100. • **Property Rights**, **Judicial Effectiveness**, **Government Integrity** – used to assess the rule of law. • **Tax Burden**, **Government Spending**, **Fiscal Health** – used to measure government size and financial discipline. • **Business Freedom**, **Labor Freedom**, **Monetary Freedom** – showing regulatory efficiency. • **Trade Freedom**, **Investment Freedom**, **Financial Freedom** – assessing open markets. • **Economic Indicators**: 1. **Population (Millions)** 2. **GDP (Billions USD)** 3. **GDP Growth Rate (%)** 4. **GDP per Capita (PPP)** 5. **Unemployment Rate (%)** 6. **Inflation Rate (%)** 7. **Public Debt (% of GDP)** 8. **FDI Inflows (Millions USD)**

		
2.	Data Preprocessing	**1. Handling Missing and Invalid Values:** The dataset was thoroughly examined for missing, null, or zero values. Numerical fields such as GDP growth, inflation, and public debt were cleaned using mean or median imputation, while missing categorical fields were assigned neutral defaults such as "Unknown" or 0 where applicable. Completely unusable records were removed to maintain data quality. **2. Column Renaming and Standardization:** All column names were standardized for consistency and readability. For example, 2022 Score was renamed to freedom_score, and GDP (Billions) was converted to gdp_billion_usd. Inconsistent formats, such as percentage strings, were converted to numeric types. **3. Feature Engineering:** A new column called freedom_category was created to classify each country based on its economic freedom score. Using defined thresholds, countries were categorized as Free (≥ 80), Mostly Free (70–79.9), Moderately Free (60–69.9), or Mostly Unfree (< 60). Additional calculated fields were generated to support filtering and segmentation.
3.	Utilization of Filters	In the **Index of Economic Freedom** dashboard, multiple interactive filters were implemented to provide a dynamic, user-driven experience. These filters empower users such as policy makers, economists, and analysts to extract meaningful insights tailored to specific interests or regional contexts. **1. Region Filter**

		• **Type**: Dropdown or checkbox filter • **Field Used**: Region • **Purpose**: Allows users to focus on a specific geographical area, such as **Asia-Pacific**, **Europe**, **Sub-Saharan Africa**, **Middle East**, or **Americas**. • **Use Case**: Helps compare economic freedom indicators within a region and spot regional policy patterns or anomalies. **2. GDP per Capita Filter** Type: Slider or grouped range (Low/Medium/High) Field Used: GDP per Capita (PPP) Purpose: Filters countries based on economic prosperity levels. Use Case: Study if higher GDP per capita correlates with higher freedom scores. **3. Unemployment Rate Filter** • **Type**: Slider filter • **Field Used**: Unemployment (%) • **Purpose**: Helps analyze which freedom categories or regions are facing higher or lower employment challenges. • **Use Case**: Understand how economic freedom may impact job markets. **4. Inflation Rate Filter** • **Type**: Numeric range filter • **Field Used**: Inflation (%) • **Purpose**: Enables comparison of inflation control among countries with varying freedom scores. • **Use Case**: Reveal monetary policy strength across regions or freedom categories. **5. GDP Growth Rate Filter** • **Type**: Numeric slider • **Field Used**: GDP Growth Rate (%) • **Purpose**: Allows users to focus on fast-growing or struggling economies. • **Use Case**: Determine how freedom levels influence economic growth. **6. World/Region Rank Filter** • **Type**: Numeric range • **Fields Used**: World Rank, Region Rank • **Purpose**: Isolate top or bottom performers globally or regionally. • **Use Case**: Benchmark high performers or identify countries needing policy reform.

		
4.	Calculation fields Used	The freedom_category is a derived field that classifies countries into four groups—**Free**, **Mostly Free**, **Moderately Free**, and **Mostly Unfree**—based on their Economic Freedom Score. This categorization simplifies the analysis by grouping countries with similar economic conditions, helping users quickly compare economic performance, identify patterns, and focus on regions needing policy improvements.

		
5.	Dashboard design	No of Visualizations / Graphs – 11 1. 2022 Economic Freedom Score 2. Top 40 Ranking Countries In The Index 3. Bottom Ranking Countries In The Index 4. Index Score Based On Unemployment Rate 5. Index Score Based On Financial Freedom 6. Index Score Based On Population 7. Index Score Based On 5 Year On GDP Growth Rate(%) 8. Inflation Rate In Different Countries 9. Correlation Between Inflation And Unemployment 10. Correlation Between GDP(PPP) And Monetary Freedom 11. 20Top 40 Countries By GDP Growth Rate  

		
6	Story Design	No of Visualizations / Graphs -11 The story presents a structured view of global economic freedom using interactive visualizations. It starts with overall scores, followed by top/bottom rankings and key economic indicators like GDP, inflation, and unemployment. The narrative helps users draw insights through comparisons and correlations across countries.