FBI Time Series Forecasting Using Power BI

1. **Introduction**

Time series forecasting is crucial in crime analysis, helping law enforcement predict future incidents and allocate resources effectively. This project utilizes Power BI to analyse FBI crime data and forecast trends using historical data.

2. **Objective**

- To analyse historical crime data and identify trends.
- To forecast future crime rates based on historical patterns.
- To visualize insights using Power BI dashboards.

3. **Dataset Overview**

The dataset includes records of various crime incidents categorized by year, month, and type. The primary dataset consists of:

- Year and month of crime occurrence.
- Categories of crime.
- Number of reported incidents per category.

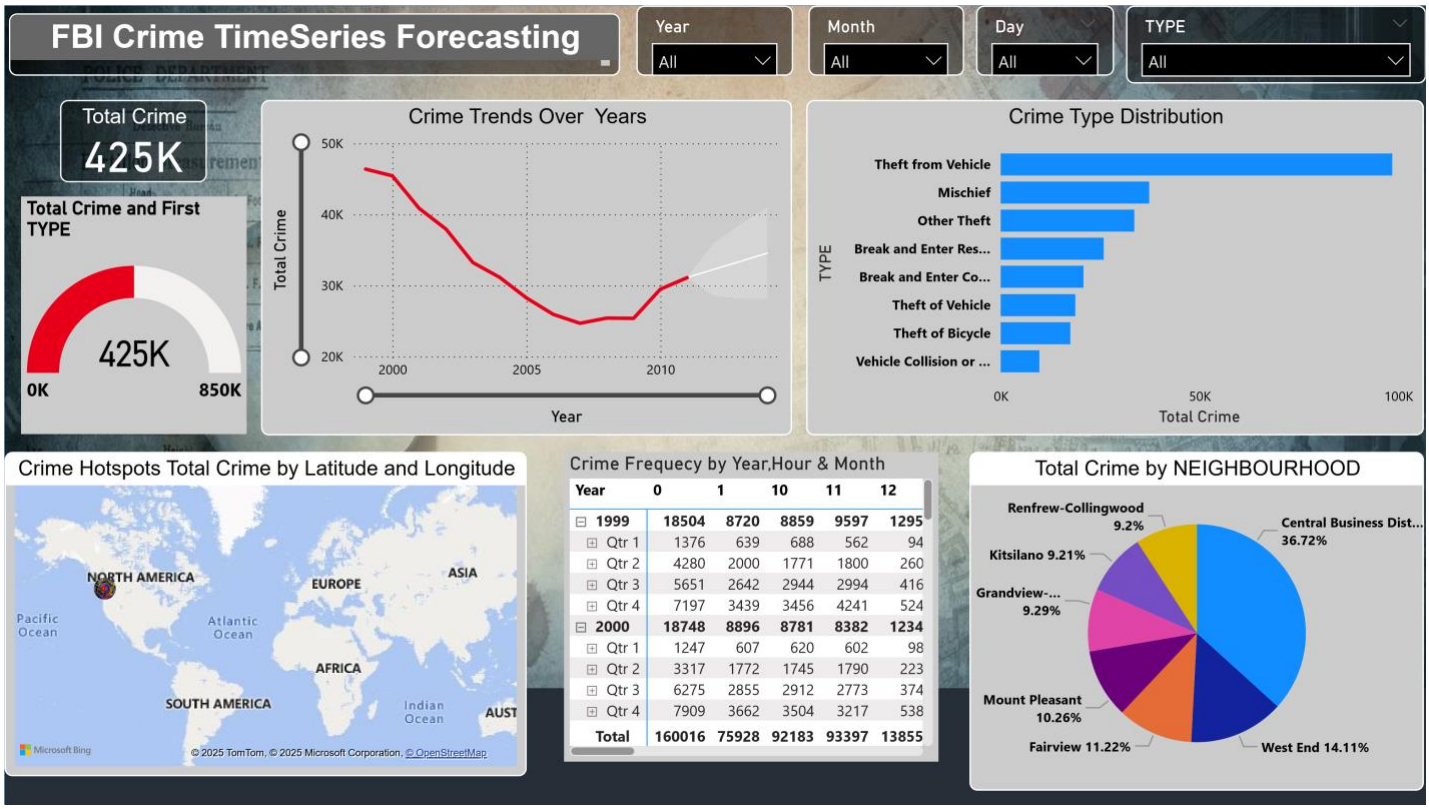
4. **Methodology**

- Data Preprocessing: The dataset was cleaned in Power BI, handling missing values and ensuring consistency.
- Exploratory Data Analysis (EDA): Identified trends, seasonality, and crime distributions.
- Time Series Forecasting: Used Power BI's built-in forecasting model to predict future crime rates.
- Visualization: Designed interactive dashboards displaying historical trends and predictions.

5. **Key Findings**

- Seasonal trends observed in certain crimes, with spikes in specific months.
- Theft-related crimes showed a consistent increase over the years.
- Forecasting models predicted a potential rise in specific crime categories in upcoming months.

6. **Power BI Dashboards and Graphs Explanation**
the Power BI report includes:



Crime Trend Over Time (Line Chart)

- Displays fluctuations in crime incidents over time.
- Identifies seasonal patterns and long-term trends.
- Helps forecast future crime rates using historical data.

Crime Type Distribution (Bar Chart/Pie Chart)

- Shows the proportion of different crime types.
- Highlights the most common crimes, such as theft and assault.
- Helps law enforcement allocate resources effectively.

Crime Heatmap (Matrix Chart)

- Visualizes crime intensity across different months and years.
- Identifies peak crime periods for strategic planning.
- Assists in trend analysis for law enforcement agencies.

Crime Forecasting (Line Chart with Forecasting Model)

- Uses Power BI's forecasting feature to predict future crime occurrences.

- Helps anticipate crime surges and allocate resources accordingly.

- Supports data-driven decision-making for proactive law enforcement.

Geographic Crime Distribution (Map Visualization)

- Displays crime occurrences based on location.

- Identifies high-crime neighbourhoods for targeted interventions.

- Helps in designing crime prevention policies.

- Monthly Incident Comparison (Clustered Column Chart)

- Compares crime incidents across months.

- Highlights high-crime months for better crime prevention strategies.

- Can correlate crime spikes with external factors like weather and holidays.

7**. Recommendations**

- Law enforcement should allocate resources during peak crime periods.

- Implement targeted prevention strategies for rising crime categories.

- Continuous monitoring and updating of forecasting models to improve accuracy.

8. **Conclusion**

Power BI's robust visualization and forecasting tools provide valuable insights into crime trends. These insights can aid law enforcement agencies in proactive decision-making and crime prevention strategies.

9. Submission Link

FBI Time series Analysis.pbix