Nationwide Encounters Analysis.

The current crisis at the U.S. border is one of the most pressing issues today. Using predictive analysis to understand and manage this situation is a priority for many data analytics institutions focused on national security. Our approach utilizes Nationwide Encounters data from U.S. Customs and Border Protection (CBP). This data encompasses U.S. Border Patrol Title 8 apprehensions, Office of Field Operations Title 8 inadmissibilities, and all Title 42 expulsions from fiscal year 2020 to the present. It includes encounter data for the Northern Land Border, Southwest Land Border, and Nationwide encounters (air, land, and sea modes of transportation).

We employ Time Series Forecasting to predict future encounter counts. This analysis is crucial for anticipating workload, allocating resources, and planning policies based on historical trends.

Source: Nationwide Encounters | U.S. Customs and Border Protection (CBP.gov)

Step-by-Step Setup and Execution for Time Series Forecasting:

1. **Data Preparation:**
    - **Extract Year:** Use a regular expression to extract the four-digit year from the "Fiscal Year" column.
    - **Convert to Integer:** Convert the extracted year to integer format.
    - **Create Date Index:** Use the cleaned year along with the month to create a datetime index.
2. **Visualize the Data:** Plot the time series data to identify trends, seasonality, or patterns.
3. **Check for Stationarity:** Apply the Augmented Dickey-Fuller (ADF) test to determine if the time series is stationary.
4. **Fit a Model:** Based on the results of the stationarity test, fit an ARIMA or SARIMA model.
5. **Make Predictions:** Forecast future encounter counts and visualize the results.

This structured approach enables effective forecasting and supports strategic planning in addressing border-related challenges.