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### Mini-Project 1 - Research Question

With a recent rising number of political events happening around the world, understanding the dynamics of human behavior, particularly in response to socio-political events, is important. One such behavior that reflects societal reactions and adaptations is the patterns of daily travel and mobility. Every day, millions of individuals make decisions about when, where, and how they travel, influenced by a mix of factors ranging from personal preferences to external circumstances.

The motivation behind this research project stems from a fundamental curiosity about the variability in travel patterns among individuals and communities, especially in the face of disruptive events. **The analysis seeks to examine how political violence events influence the daily number of trips at the state level from January 2020 to June 2021, while controlling for the effects of the COVID-19 pandemic.** Understanding this relationship can provide valuable insights into informing policy decisions and contribute to the development of more resilient and adaptive transportation systems. Following the main research question, more detailed insights can be extracted by asking the below questions:

- How do type of political violence events influence the frequency and patterns of daily trips undertaken by individuals within affected regions?
- What are the variations in the relationship between political violence events and trip volumes across different states and time periods, and how do these variations correlate with the severity and temporal dynamics of the COVID-19 pandemic?
- If there is a statistically significant impact of political events on the number of trips, is it a leading or lagging effect?

Central to our analysis are linear and nonlinear regression models, which examine the linear relationships between political events and trip volumes while accommodating nonlinear interactions. Complementing these techniques, time series forecasting methods such as ARIMA enable us to model the temporal patterns and seasonality inherent in daily trip volumes, providing insights into short-term fluctuations and long-term trends. Moreover, using the popular robustness feature of random forest regression, we can further investigate complex nonlinear relationships and interactions between political violence events and trip volumes. Throughout our models, cross-validation and feature importance analysis will be implemented to ensure robustness and reliability in the findings.

Our study shows how important it is to understand how politics can change everyday life, like how we decide regarding traveling needs. By knowing more about these patterns across states, people can make better decisions about things like transportation and safety, especially during uncertain times. It is a small piece of the bigger puzzle of how societies respond to challenges, but an important one, nonetheless.