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Case Study: Assessing the Financial Impact of Tornadoes in Minnesota Using Time Series Data

Situated North of what is considered "Tornado Alley" in the United States, Minnesota still gets its fair share of tornadoes and severe weather. The first Wednesday of each month, there is a state-wide tornado siren drill to test the functionality of the state's various tornado sirens. According to Minnesota Public Radio, climate change has been linked to increased severe weather and rising home insurance rates in the state of Minnesota. Marshalltown, for example, a smaller lower-income migrant community of Minnesota recently got hit by a tornado in 2024, and a lot of those people did not have insurance. Expected tornado property damage impacts how much insurance companies charge people, and so investigating whether there is a specific trend in tornado frequency and property damage due to tornadoes in Minnesota is important for future financial planning.

<u>Deliverables:</u>

This case study requires you to investigate how tornado frequency and property damage due to tornadoes has evolved overtime in Minnesota. This study also requires that you use a model such as the ARIMA model to forecast tornado frequency and property damage for at least the next 10 years. The case study will provide you with the data from NOAA's National Weather Service Storm Prediction Center. The data provided contains data on the 71,398 tornadoes that have been recorded by NOAA from 1950 to 2023 in US States and Territories. A good project will provide compelling analyses on past and future tornado frequencies and property damage due to tornadoes leveraging data cleaning, time series models, and the 29 variables in the NOAA dataset on each tornado. You will deliver a written report and reflection as well as a GitHub repository link.