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Knowledge Mining Project Proposal

I. Introduction

Numerous studies have confirmed the incidence of climate change, as evidenced by more frequent severe weather events like high temperatures and heavy rainfall. On a much smaller geographic and time scale, we can experience such changes anecdotally in our own regional climates. This project hopes to realize these intuitions by producing regional climate change insights that illustrate the effects of climate change on a local scale.

II. Research Statement

This project aims to answer the following questions: What patterns exist as microcosms of climate change in the major regions of the United States (Northeast, Midwest, South, and West)? How can we use knowledge mining to estimate and visualize regional weather changes over the last 50 years (within a human lifetime)?

III. Methodology

Previous climate change studies have focused on large-scale consequences and critical environmental regions like the Amazon rainforest. While valuable for agriculture and resource planning, insights produced by these studies are difficult to relate to the average person and the urban/suburban regions where they live. This project will instead focus on the regional consequences of climate change on the human scale. I plan to utilize web scraping, text mining, sentiment analysis, time-series analysis, and visualization with historic weather data and reports from Wunderground and NOAA Climate Data Online. Relevant data will be scraped from these sites for cities in each of the major U.S. regions over the last 50 years. Next, text processing and keyword extraction will be used to estimate trends in the frequency of and sentiment towards severe weather events. Finally, time-series analysis in R and visualization in Python will be used to quantify and substantiate the regional effects of climate change.