DATA 512
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Part 2 - An Extension Plan

1. Motivation Statement

The objective of this analysis is to explore the relationship between air quality, and its economic impacts on Micron Technology, one of the largest corporations in Boise, and the Boise economy. The increasing frequency and severity of wildfires in recent years have significantly impacted air quality across many regions, including Boise, Idaho. As a community that hosts Micron Technology, understanding the implications of poor air quality on both health and economic vitality is crucial. This analysis aims to explore the intricate relationship between smoke exposure and its economic impacts, particularly focusing on how air quality affects Micron's stock performance and the Boise economy.

Scientific and Practical Relevance

From a scientific perspective, this analysis is relevant for several reasons. First, it contributes to the body of research examining the effects of environmental factors on corporate performance. Understanding how air quality impacts investor sentiment and stock valuation can provide insights into the resilience of local businesses in the face of environmental stressors.

Practically, this analysis holds significant implications for policymakers, city managers, and local stakeholders. Poor air quality can lead to various health issues, including respiratory problems, which can subsequently decrease workforce productivity. This reduction in productivity may affect Micron's operational efficiency and profitability, leading to broader economic ramifications for the Boise community. Additionally, fluctuations in Micron's stock performance during periods of poor air quality may indicate a need for strategies to mitigate investor concerns and bolster economic resilience.

Learning Objectives

Through this analysis, we hope to learn several key points:

1. **Impact on Stock Performance**: By analyzing the correlation between periods of smoke exposure and Micron's stock prices, we aim to identify patterns that may reflect investor sentiment and corporate health. Understanding these trends could inform strategies for investor relations and risk management.
2. **Regional Economic Effects**: By examining the relationship between air quality and Boise's GDP, we hope to uncover how environmental factors can shape economic outcomes in the region. This understanding can aid in crafting policies that promote economic resilience in the face of climate-related challenges.
3. **Informed Policy Decisions**: Ultimately, the findings from this analysis will help inform local policymakers about the potential economic implications of air quality issues. By

providing concrete evidence of the relationship between smoke exposure and economic performance, we can advocate for policies that address air quality concerns, such as enhanced wildfire management strategies and public health initiatives.

Importance to the Community

The importance of this analysis to the Boise community cannot be overstated. As wildfires become increasingly common, the effects on air quality will likely continue to pose significant challenges. By investigating these impacts, we can equip local stakeholders with the necessary knowledge to make informed decisions that protect public health, enhance economic stability, and foster community resilience. Understanding the links between environmental quality and economic performance is essential for developing strategies that safeguard both the health of residents and the vitality of local businesses in an ever-changing climate landscape.

2. Impact Focus

This analysis will focus on the economic impact of air quality on local businesses and the broader community, specifically investigating how fluctuations in air quality correlate with stock market performance and regional GDP. We will examine the following specific areas:

- **Micron Technology's Stock Performance:** Analyze changes in Micron's stock prices during periods of smoke exposure, aiming to identify any correlations with air quality indices.
- **Regional GDP Fluctuations:** Investigate the impact of air quality on Boise's economic output, focusing on key sectors most affected by poor air quality.

By understanding these relationships, we can draw insights into broader economic trends related to environmental quality, ultimately benefiting the local economy welfare.

3. Data or Model to be Used

For this analysis, we will leverage multiple datasets to investigate the economic impacts of air quality, specifically during periods of smoke exposure, on Micron Technology and the Boise economy. The primary datasets will include historical stock price data for Micron Technology, and GDP data for Boise.

- **Stock Price Data:** Historical stock price data for Micron Technology will be sourced from Yahoo Finance. This dataset will include daily closing prices and trading volumes over the past years. This data is crucial for understanding how air quality impacts investor sentiment and stock performance. The link to access this data is Yahoo Finance - Micron Technology. Yahoo Finance allows for the use of their data for educational and research purposes; however, users must ensure compliance with specific terms regarding data usage for commercial purposes.

- **GDP Data:** The GDP dataset will provide economic data specific to Boise, Idaho. It will include metrics related to the Gross Domestic Product, allowing us to correlate changes in GDP with periods of poor air quality. This correlation will help us understand the broader economic implications of air quality issues. The link to this dataset is USAFacts - GDP Data for Idaho.The USAFacts dataset is publicly available and can be used for research and educational purposes, provided that appropriate citations are made. This dataset is shared under a Creative Commons license; please credit USAFacts when using our curated material.

4. Unknowns and Dependencies

Several factors may impact the ability to conduct this analysis effectively:

- **Market Fluctuations:** External market conditions unrelated to air quality may influence Micron's stock performance, complicating the analysis. Understanding the broader economic context is crucial, as various factors can impact stock prices beyond environmental concerns.
- **External Influences:** Other external factors, such as government policy changes, economic downturns, or significant events affecting the city could impact the results and complicate the correlation analysis.

5. Timeline to Completion

The timeline for the extension will include the following milestones and tasks, allowing for thorough analysis and preparation of the final report and presentation:

Week 1 (Nov 1 - Nov 7): Data Collection

Milestone: Completion of data collection and storage in a structured format.

- Gather historical stock price data for Micron Technology from Yahoo Finance.
- Collect GDP data for Boise from USAFacts.
- Retrieve air quality data from a reputable source

Week 2 (Nov 8 - Nov 14): Data Cleaning and Preparation, Initial Analysis

Milestone 1: Finalized datasets ready for analysis; EDA report completed, highlighting initial insights.

- Clean and preprocess the collected datasets to ensure consistency and accuracy.
- Handle missing values and outliers in the air quality data.
- Merge datasets based on relevant timeframes for comparative analysis.

Milestone 2: Perform exploratory data analysis to understand trends and relationships within the data.

- Conduct time-series analysis to examine stock performance and air quality over time.
- Identify key correlations between air quality and stock price fluctuations.

Week 3 (Nov 15 - Nov 24): Model Building, Results Visualization, and Documentation

Milestone: Final report and presentation materials ready for submission.

- Develop a regression model to analyze the relationship between air quality and economic impacts.
- Finalize the model parameters and validate it using historical data.
- Create visualizations to illustrate the findings from the analysis.
- Write the final report detailing methodology, analysis, findings, and recommendations.
- Prepare a presentation summarizing the analysis and findings.