**EXTENSION PLAN**

**Motivation**

In Part 1 of my project, I observed that the Smoke Impact Score I developed did not exhibit a strong linear relationship with AQI values. This suggests that other factors, beyond wildfire proximity and size, significantly influence air quality and health outcomes. I aim to explore the direct impact of wildfire smoke on respiratory health outcomes in Glendale, Arizona, using the existing Smoke Impact Score.

This analysis is potentially interesting and useful because it addresses a real public health concern. Wildfire smoke poses significant health risks, and understanding its impact on respiratory health can help city officials and residents prepare and respond more effectively.

Through this extension, I hope to learn how the Smoke Impact Score correlates with hospital admission rates for respiratory conditions. My goal is to provide insights that can inform public health strategies and policies to protect the community.

**Impact Focus**

**Health Care**

I will focus on the health care impacts of wildfire smoke, specifically:

* **Increase in Hospitalizations:** Analyzing trends in hospital admissions for respiratory conditions during periods of high Smoke Impact Score.
* **Vulnerable Populations:** Examining how different demographics (e.g., children, elderly, individuals with pre-existing respiratory conditions) are affected.
* **Public Health Preparedness:** Providing data-driven recommendations for healthcare resource allocation and community advisories during wildfire events.

This focus is important to the community because it directly relates to the health and well-being of Glendale residents. By understanding the relationship between wildfire smoke and health outcomes, the city can better protect its citizens.

**Data or Model to Be Used**

**Additional Data I Plan to Use:**

1. **Health Data:**
   * **Description:** Hospital admission records for respiratory conditions (e.g., asthma, bronchitis) in Glendale over the past decade.
   * **Source:** Arizona Department of Health Services, local hospitals, or public health databases such as the CDC's National Environmental Public Health Tracking Network.
   * **Link:** [CDC Tracking Network](https://ephtracking.cdc.gov/DataExplorer/)
   * **License/Terms of Use:** I will ensure compliance with HIPAA regulations and use publicly available, de-identified data as necessary.

**Model Adaptation:**

* I will use the existing Smoke Impact Score from Part 1.
* I plan to perform statistical analyses, such as regression analysis, to correlate the Smoke Impact Score with hospital admission rates for respiratory conditions.
* Time-series analysis may also be used to account for temporal trends and lag effects between smoke exposure and health outcomes.

**Unknowns and Dependencies**

**Factors Outside My Control:**

1. **Data Accessibility:**
   * Access to detailed health records may be limited due to privacy laws. Aggregated data may lack the granularity needed.
   * **Mitigation:** I will use publicly available, de-identified, and aggregated health data to ensure compliance with privacy regulations.
2. **Data Quality and Completeness:**
   * Health data and AQI data may have gaps or inconsistencies, which could affect the analysis.
   * **Mitigation:** I will cross-reference multiple data sources to verify data accuracy and fill any gaps.
3. **Model Limitations:**
   * The Smoke Impact Score may not fully capture all factors influencing air quality and health outcomes since it does not include variables like wind patterns.
   * **Mitigation:** I will acknowledge the limitations in the analysis and consider discussing potential factors not included in the model.
4. **Time Constraints:**
   * The project timeline is tight, and unexpected delays may occur.
   * **Mitigation:** I will prioritize essential tasks and be prepared to adjust the scope if necessary to meet deadlines.

**Timeline to Completion**

**Week 1: Data Collection and Preparation**

* **Task 1:** Obtain health data on hospital admissions for respiratory conditions.
  + **Time Allocation:** 2 days
* **Task 2:** Clean and preprocess all datasets.
  + **Time Allocation:** 1 day

**Week 2: Data Analysis**

* **Task 4:** Perform statistical analysis correlating the Smoke Impact Score with hospital admissions and AQI values.
  + **Time Allocation:** 1 days
* **Task 5:** Create visualizations to represent findings.
  + **Time Allocation:** 1 days

**Week 3: Interpretation and Model Refinement**

* **Task 6:** Interpret results and identify any patterns or significant findings.
  + **Time Allocation:** 1 days
* **Task 7:** If necessary, refine the Smoke Impact Score model based on findings.
  + **Time Allocation:** 1 days

**Week 4: Documentation and Presentation Preparation**

* **Task 8:** Begin writing the project report and prepare presentation slides.
  + **Time Allocation:** 1 days
* **Task 9:** Revise and finalize the project report (Course Project, Part 4).
  + **Time Allocation:** 1 days

**Week 5: Finalization**

* **Task 10:** Practice and deliver the presentation (Course Project, Part 3).
  + **Time Allocation:** 1 day preparation, presentation as scheduled
* **Task 11:** Organize the project repository with code, data, and documentation.
  + **Time Allocation:** 1 days

**Note:** I will allocate additional time for peer feedback (Course Project, Part 5) as required.

**Summary**

My extension will focus on the Health Care impact area to research how the existing Smoke Impact Score correlates with respiratory health outcomes in Glendale. Informed by analysis of hospital admission rates and AQI data, the Smoke Impact Score will yield illuminating insights into public health planning, not requiring wind data. I know that the possible challenges may relate to the accessibility of data and time constraints; based on this, I try to outline appropriate strategies in order to reduce their impact. The timeline is drawn in a way that I can finish on time, with some time left for preparation of my presentation and final report.

**Next Steps:**

* **Confirm Data Availability:** I will ensure that I can access the required health and AQI data before proceeding.
* **Consult with Instructors:** If I anticipate any issues with data or scope, I will discuss them with the instructional staff early on.
* **Begin Data Collection Early:** Given potential delays in obtaining data, I will start this process as soon as possible.