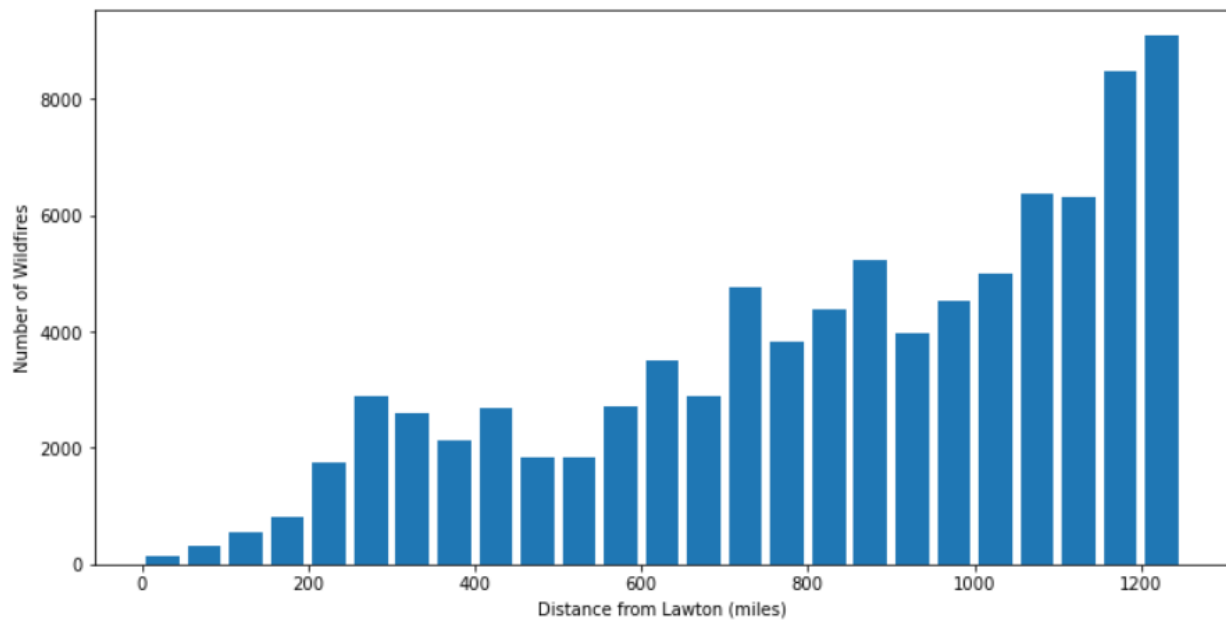**Visualication**

This histogram displays the frequency of fires at intervals of every 50 miles from Lawton city, extending up to 1250 miles. On the x-axis, the distance from Lawton city is represented, while the y-axis illustrates the number of wildfires that occurred in the past 50 years. Notably, the graph reveals a positive correlation between the distance from Lawton and the occurrence of wildfires. The count of wildfires presented in this graph encompasses all instances over the past 50 years, including both prescribed fires and wildfires. The distances are calculated based on the average distance from the wildfire ring.
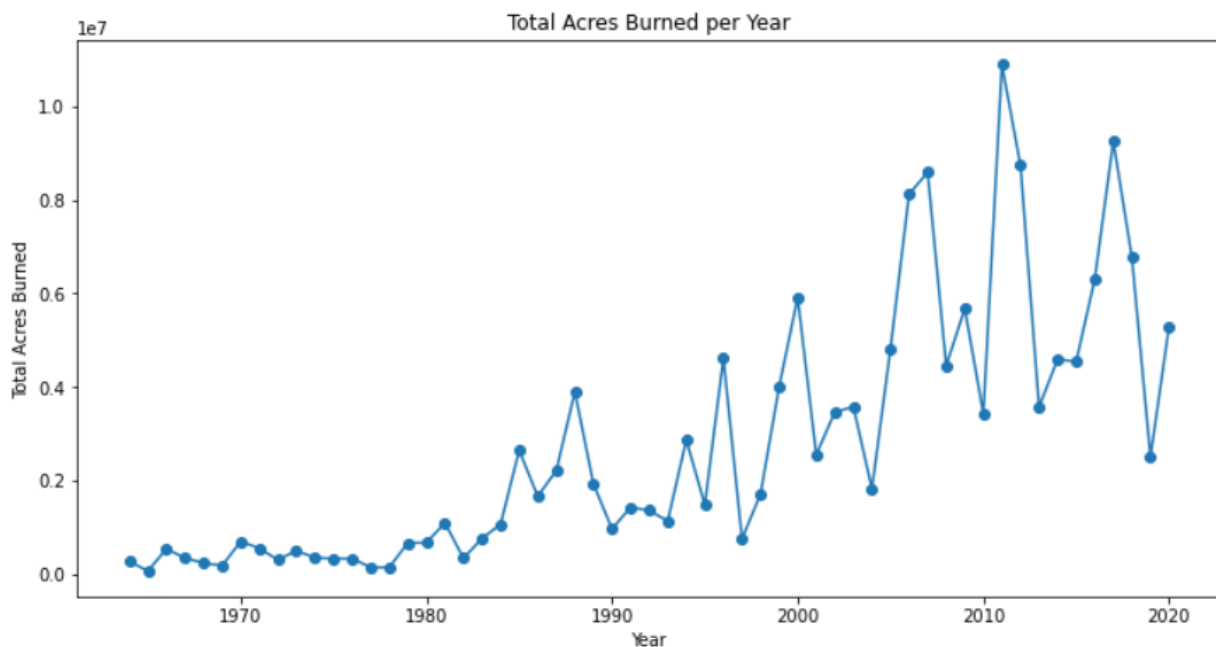
This time series graph depicts the annual total acres burned for fires within a specified distance from Lawton. The x-axis represents each of the past 50 years, while the y-axis illustrates the corresponding total acres burned in that particular year. Notably, the graph highlights a discernible upward trend in the total acres burned over the past five decades. Similar to the information presented in the previous graph, this visualization encompasses both wildfires and prescribed fires. The data on acres burned is sourced from the GIS_Acres in the USGS dataset.
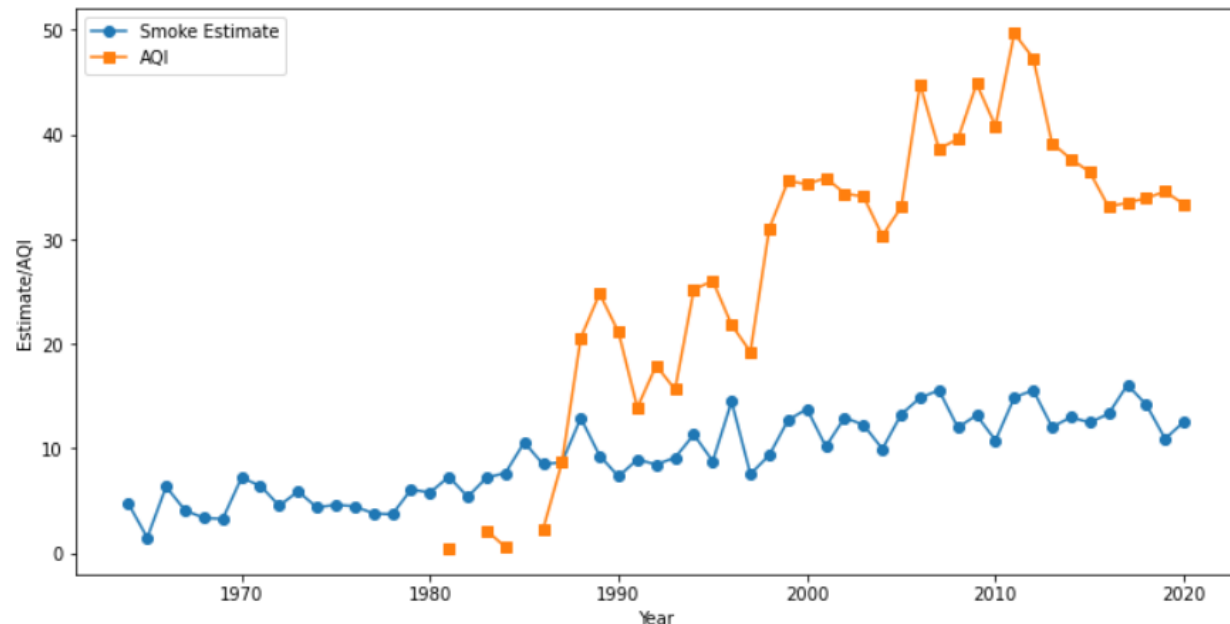
This time series graph illustrates the annual estimates of fire smoke and Air Quality Index (AQI) for Lawton over the past 50 years. The x-axis denotes each year, while the y-axis represents the numeric values of the AQI and smoke estimate. Smoke estimates are derived from factors such as the distance from the city and the total acres burned in each fire. The displayed smoke estimate in this graph reflects the average of all wildfires and prescribed fires that occurred in each respective year. The AQI data utilized in this graph was sourced from the Environmental Protection Agency (EPA) website. The AQI presented in the graph is an average of gaseous and particulate AQI. Notably, the graph reveals a robust correlation between smoke estimates and AQI, particularly evident after the year 1990. This correlation implies that the AQI tends to be higher (worse) in years with elevated smoke estimate values. Overall, the graph suggests a noteworthy association between fire smoke and AQI levels in Lawton.

Reflection

In addressing the research question, I deepened my understanding of working with GeoJSON data. Dr. David W. McDonald's provided notebook proved invaluable, particularly in guiding me on extracting the largest wildfire boundary and exploring diverse methods to calculate the distance between the fire and a given location.

While exploring the relationship between AQI, smoke estimates, and wildfires, I observed a positive correlation to some extent. However, it became apparent that the AQI and smoke estimates do not consistently increase or decrease solely based on wildfire occurrences. This suggests that AQI is influenced by multiple factors beyond wildfires.

Collaboration with classmates further enriched my insights. Initially, my consideration for smoke estimates focused solely on distance and acres burned. A classmate highlighted the significance of incorporating the temporal element, emphasizing that the year itself plays a crucial role in these estimates. Recognizing the importance of data quality and relevance, I adjusted my approach to weigh more recent years more heavily in the smoke estimate score, aligning it with the occurrence of wildfires during those years.