New-York City Air Quality Analysis

Problem Statement: NYC Air Quality Analysis

You have been given an air quality dataset for New York City containing detailed information on pollutant levels (NO_2, PM2.5, Ozone), emission sources, geographic regions, time periods, and related health impacts such as hospitalizations and emergency visits.

Your task is to analyze this dataset and develop actionable insights to help city planners, environmental agencies, and residents understand air quality patterns, health risks, and opportunities for improvement.

Create an interactive dashboard and answer the following key business questions to guide effective environmental policies and community awareness:

1. **Overall Air Quality Levels:** What are the average and peak levels of major pollutants (NO_2, PM2.5, Ozone) across NYC?
2. **Neighborhood Comparison:** Which neighborhoods consistently show the highest pollutant concentrations?
3. **Seasonal Trends:** How do pollutant levels change across different seasons and annual averages?
4. **Health Risk Analysis:** How are pollutant levels linked to asthma visits, hospitalizations, and related health cases?
5. **Source Impact:** Which emission sources (vehicles, boilers, outdoor toxics) contribute the most in specific areas?
6. **Long-Term Trends:** How have air quality and related health impacts changed over time (yearly and multi-year ranges)?
7. **Geographic Distribution:** Which boroughs or districts are most and least affected?
8. **Correlation Analysis:** Is there any significant relationship between vehicle miles traveled and local pollutant levels?

Deliverable:
Design a clear, interactive dashboard to visualize these insights and provide a concise summary report with recommendations for policymakers.