**Parking Violation Data Analysis for Policy Development**

**Project Objective:**

The objective of this project is to analyze parking violation data from September 2024 to identify key insights that can help design and implement new policy controls aimed at reducing parking violations. The goal is to explore patterns in the data that can help answer questions related to parking violations'. The insights derived from the analysis will guide policy interventions and enforcement strategies for better parking management.

**Data Understanding and Exploration:**

Data was sourced from Data.gov (https://catalog.data.gov/dataset/parking-violations-issued-in-september-2024)

1. **Data Structure:**

The dataset contains 31 fields, including details about the ticket (ticket number, violation type, issue time and date), geolocation (latitude, longitude), the issuing agency, and penalties. The structure includes both categorical (e.g., violation type, issuing agency) and numerical data (e.g., penalties, coordinates).

1. **Quality of the Data:**

Some columns have missing or incomplete data (e.g., latitude, longitude for some records).

There are mixed data types in certain columns, which may need standardization for analysis (e.g., penalty columns).

The data appears to be consistent with no obvious outliers, but deeper checks for duplication, missing values, and data integrity are necessary.

**Questions to Drive New Policy Controls:**

**Question 1: What are the top locations for parking violations?**

Identifying hotspots where most parking violations occur can allow for targeted interventions such as improved signage, more stringent enforcement, or changes to parking rules to deter violations.

**Question 2: Are certain times of day or days of the week more prone to violations?**

Time-based patterns can inform when to deploy parking enforcement officers and which hours require the most oversight. Additionally, policy controls (e.g., parking restrictions) can be adjusted to minimize violations at peak times.

**Question 3: What types of violations are most common?**

Understanding which violations are most prevalent allows city planners to focus resources on preventing those specific behaviours.

**Challenges and Questions the Data May Not Address:**

Missing or incomplete geolocation data: Some records lack geospatial information, which limits the ability to perform a complete geographical analysis.

Historical comparison: This dataset only includes violations for one month (September 2024). A large time scope might be needed to identify long-term trends or seasonal variations.

**Audience for These Insights:**

**City Planner:** These stakeholders would benefit from the insights to make decisions about traffic and urban planning, such as revising parking regulations and allocating resources to high-violation areas.

**Law Enforcement:** Insights about violation hotspots, peak times, and types can help law enforcement allocate officers efficiently.

**Transportation Department:** They can use the analysis to develop better infrastructure and signage to prevent parking violations.

**Project Milestones:**

**Milestone 1: Data Cleaning and Preparation**

Address missing geolocation data, standardize time formats, and handle mixed data types.

Output: Cleaned and pre-processed dataset ready for analysis.

**Milestone 2: Exploratory Data Analysis (EDA) and Visualization**

Perform initial data exploration to identify trends, patterns, and outliers.

Output: Visualizations and summaries of parking violation trends, such as hotspot maps and time-based violation frequencies.

**Milestone 3: Policy Recommendations**

Based on the analysis, draft policy recommendations focused on enforcement, urban planning, and community outreach.

Output: A report with actionable insights and policy suggestions aimed at reducing parking violations.