COMPREHENSIVE REVIEW OF 2017 NYC PARKING VIOLATION DATA

The **NYC Parking Tickets Dataset** contains detailed information about parking violations issued in New York City during the year 2017. This dataset provides key insights into various aspects of parking violations, including the type of vehicle involved, location, violation codes, issuing agency, and more.

Here is a brief overview of the main columns in the dataset:
1. Summons No: Unique identifier for each parking ticket issued.
2. Plate id: The vehicle's license plate number.
3. Registration State: The state where the vehicle is registered.
4. Plate Type: Type of vehicle plate (e.g., passenger, commercial).
5. Issue Date: The date when the ticket was issued.
6. Violation Code: Code indicating the specific parking violation.
7. Vehicle Body Type: The type of the vehicle's body (e.g., sedan, SUV).
8. Vehicle Make: The manufacturer or make of the vehicle (e.g., Ford, Toyota).
9. Issuing Agency: The agency responsible for issuing the parking ticket.
10. Street Code1, Street Code2, Street Code3: Codes that represent street locations for the violation.
11. Vehicle Expiration Date: The expiration date of the vehicle's registration.
12. Violation Location: The location of the violation (e.g., intersection, street address).
13. Violation Precinct: The precinct where the violation occurred.
14. Issuer Precinct: The precinct that issued the ticket.
15. Violation Time: The time when the violation occurred.
16. Violation County: The county where the violation took place.
17. House Number, Street Name: Address details where the violation occurred.
18. Date First Observed: The date when the violation was first observed.
19. Violation Description: A textual description of the violation (e.g., "No parking").
20. Vehicle Color: The color of the vehicle involved.
21. Unregistered Vehicle: Flag indicating whether the vehicle is unregistered.
22. Vehicle Year: The year of the vehicle's make.
23. Violation Post Code: The postal code for the location of the violation.
24. Hydrant Violation, Double Parking Violation: Flags for specific violation types (e.g., hydrant or double parking).

Dataset Overview and Analysis Report

1. Total Number of Tickets for the Year 2017

Query Result: In the year 2017, a total of 5,431,902 parking tickets were issued.

Business Insight: This significant volume of tickets indicates a high demand for efficient parking management and enforcement in New York City. Strategic solutions, such as expanding parking spaces or improving ticketing technology, can help address this issue.

2. Total Number of States to Which the Cars with Tickets Belongs

Query Result: The cars involved in the tickets belong to 96 distinct states.

Business Insight: The data shows a wide range of states, suggesting that many out-of-state drivers are either visiting or passing through New York City. This highlights the need for clear parking signage and enforcement that caters to both locals and visitors.

3. Tickets Without Addresses (Missing Street Codes)

Query Result: 50 tickets are missing address information (i.e., one of the street codes is null).
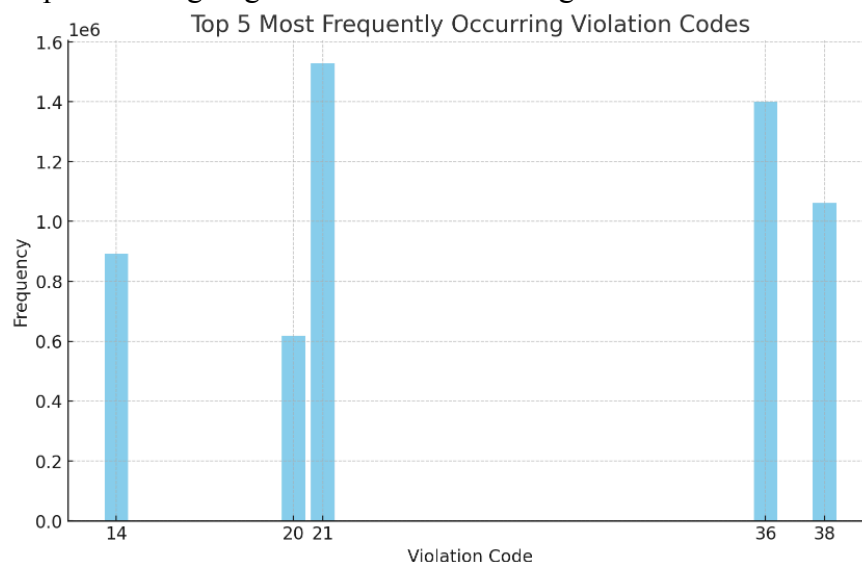
Business Insight: Missing address data can create challenges for tracking violations and managing enforcement efficiently. It's essential to improve data collection processes to ensure more accurate reporting and enforcement.

4. Top 5 Most Frequently Occurring Violation Codes

Query Result:

Violation Code	Frequency
21	1,528,576
36	1,400,614
38	1,062,302
14	893,493
20	618,592

Business Insight: Violation codes 21, 36, and 38 appear most frequently, which likely indicates common parking issues in the city. Analysing these violations further could reveal patterns that help in creating targeted enforcement strategies.
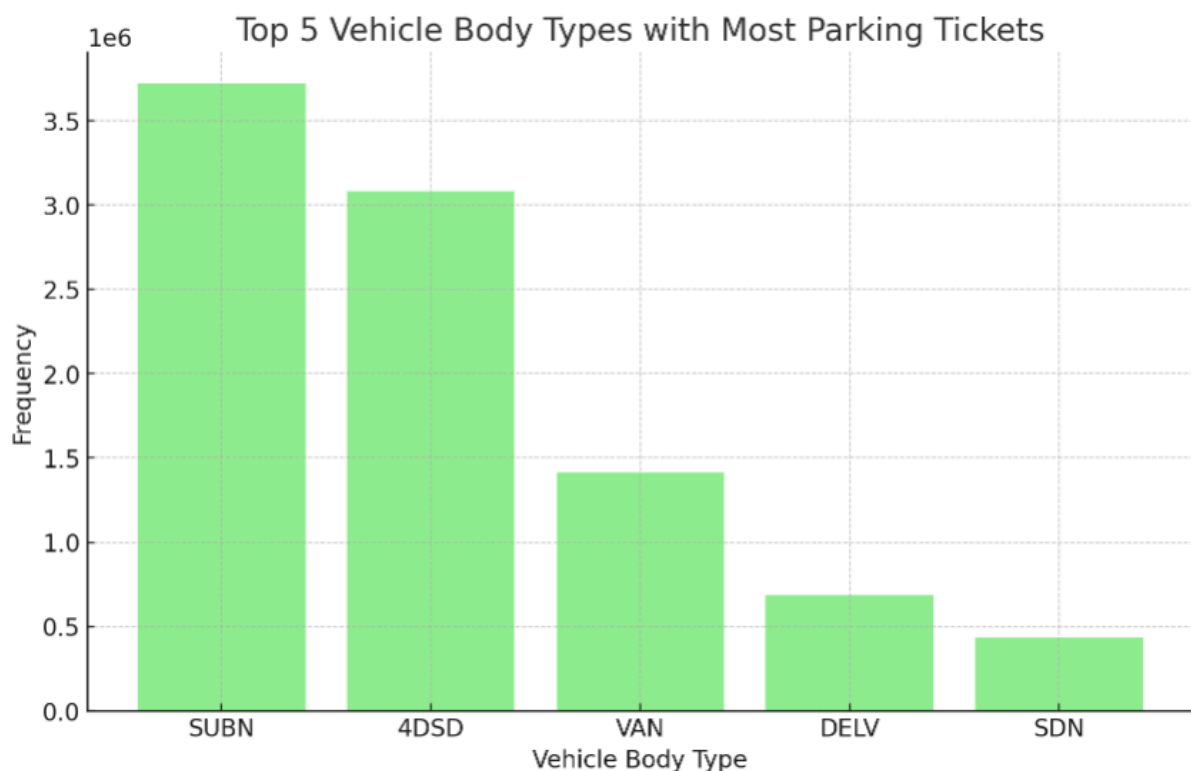
5. Top 5 Vehicle Body Types with the Most Parking Tickets
Query Result:

Vehicle Body Type	Frequency
SUBN	3719795
4DSD	3082006
VAN	1411964
DELV	687324
SDN	438191

Business Insight: The majority of tickets are issued to SUBN (subcompact) and 4DSD (4-door sedan) vehicles. It could be beneficial to focus enforcement in areas where these types of vehicles are most often parked.
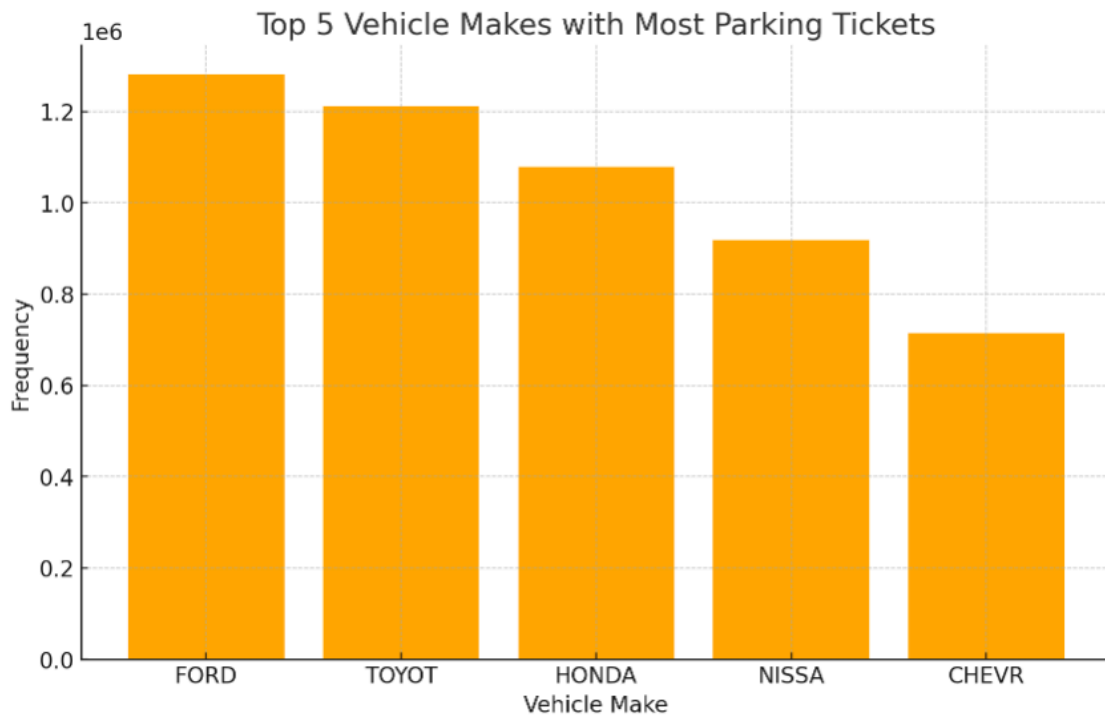

6. Top 5 Vehicle Makes with the Most Parking Tickets

Query Result:

Vehicle Make	Frequency
FORD	1280956
TOYOT	1211447
HONDA	1079237
NISSA	918590
CHEVR	714654

Business Insight: FORD, TOYOTA, and HONDA are the top vehicle makes. A specific focus on these popular vehicle brands may help prioritize enforcement and targeted outreach for parking compliance.
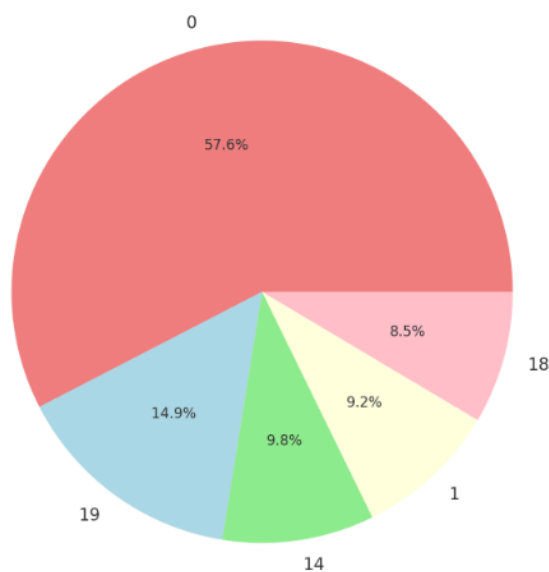
Top 5 Vehicle Makes with Most Parking Tickets

7. Top 5 Violating Precincts by Frequency

Query Result:

Violation Precinct	Frequency
0	2072400
19	535671
14	352450
1	331810
18	306920

Business Insight: Precinct 0 has the highest frequency of violations, which could indicate higher traffic or more active enforcement in that area. Enforcement strategies can be tailored to these precincts to reduce violations.

Top 5 Violating Precincts by Frequency

8. Top 5 Issuer Precincts by Frequency

Query Result:

Issuer Precinct	Frequency
0	2388475
19	521513
14	344977
1	321170
18	296554

Business Insight: Issuer Precinct 0 has issued the highest number of tickets, suggesting that this area may require additional resources or focus to ensure better parking management.

9. Violation Code Frequency Across the Top 3 Precincts with Highest Ticket Issues

Query Result:

Violation code	Issuer Precinct
19	966
37	974
40	994

Business Insight: These precincts show higher occurrences of specific violations. This information can be used to create precinct-specific strategies, such as increased patrols or signage to prevent these violations.
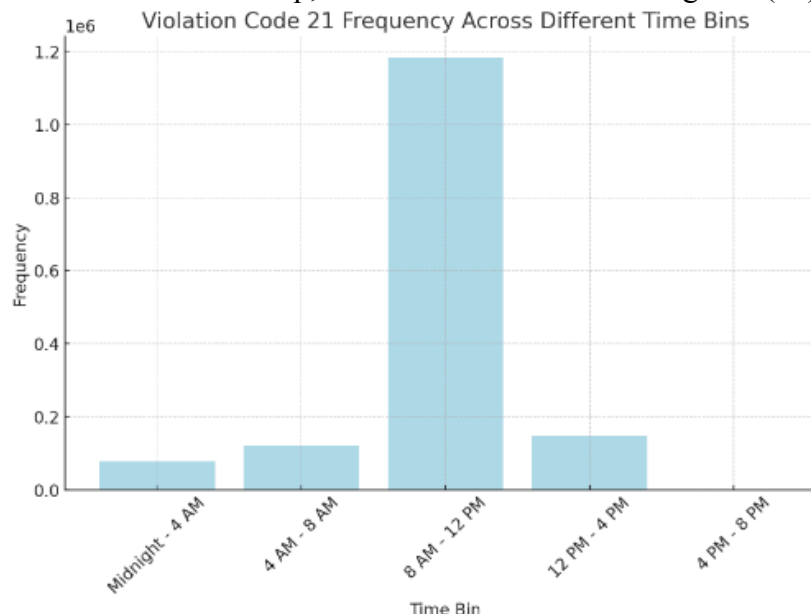
10. Parking Violations Across Different Times of the Day

Query Result: Violations are distributed across different times of the day. The following are some key findings:

Midnight - 4 AM: Violation Code 3 has the highest frequency (173).

4 AM - 8 AM: Violation Code 21 is the most frequent (35).

8 AM - 12 PM: Violations drop, with the most common being null (34).

Business Insight: The data shows that violations peak during the late-night to early morning hours, which may require targeted enforcement during these hours.

11. Top 3 Most Common Violation Codes by Time Bin
Query Result:

Time bin	Violation code	Frequency
Midnight 4am	94	57
4am- 8am	21	35
8am – 12pm	null	34

Business Insight: Violation Code 21 occurs most frequently during the 8 AM - 12 PM period, suggesting that targeted enforcement during this time could help reduce the frequency of this violation.

Strategic Insights and Recommendations
1. Focus on Common Violations: Violation Codes 21, 36, and 38 should be prioritized in enforcement strategies.
2. Target Precincts with High Violations: Precinct 0 and Issuer Precinct 0 should be a focus for enforcement, as they have the highest frequency of violations.
3. Timing of Enforcement: Increased enforcement during the 8 AM - 12 PM window could be beneficial as violations peak during this time.
4. Address Missing Data: The 50 tickets with missing address data should be further analyzed to improve ticketing accuracy and enforcement.

Conclusion:
In analysing New York City's parking violations for 2017, we observe that certain violation codes, vehicle body types, and vehicle makes account for a significant portion of the tickets issued. For instance, violation code 21 alone represents a major share of all violations, primarily occurring in specific precincts and during the morning hours, which highlights potential hotspots and peak enforcement periods. Vehicles such as subcompact cars and 4-door sedans, along with popular makes like Ford and Toyota, appear more frequently in ticket data, suggesting that these types of vehicles may be particularly susceptible to parking infractions. Moreover, precincts like 0, 19, and 14 show high ticket volumes, indicating areas of focused enforcement or greater parking challenges. These insights can inform strategic adjustments in city parking policy and enforcement practices, targeting the busiest zones and addressing common violation patterns to optimize resource allocation and enhance compliance.