NYC Public Schools SAT Performance Analysis

1. Objective

The project aims to analyze SAT performance across New York City's public schools to identify: - Which boroughs host the most schools - Which schools excel in mathematics - The top-performing schools overall - How boroughs differ in terms of SAT outcomes, including which borough shows the widest disparity

2. Dataset

The dataset `schools.csv` contains NYC public high school SAT results, including average scores in math, reading, and writing, school names, boroughs, and other attributes.

3. Methodology

- Data Exploration – Inspected the dataset's structure, missing values, and column types.
- Data Cleaning – Handled missing values in percent_tested using borough-wise median imputation.
- Analysis & Insights –
  • Schools by Borough: Counted the number of schools per borough.
  • Top Math Performers: Identified schools with math averages ≥ 640 (80% threshold).
  • Top 10 Schools: Calculated total SAT scores and ranked the top 10 schools.
  • Borough Analysis: Compared mean SAT scores per borough and calculated std deviations.
- Visualization – Used Seaborn & Matplotlib for bar charts.

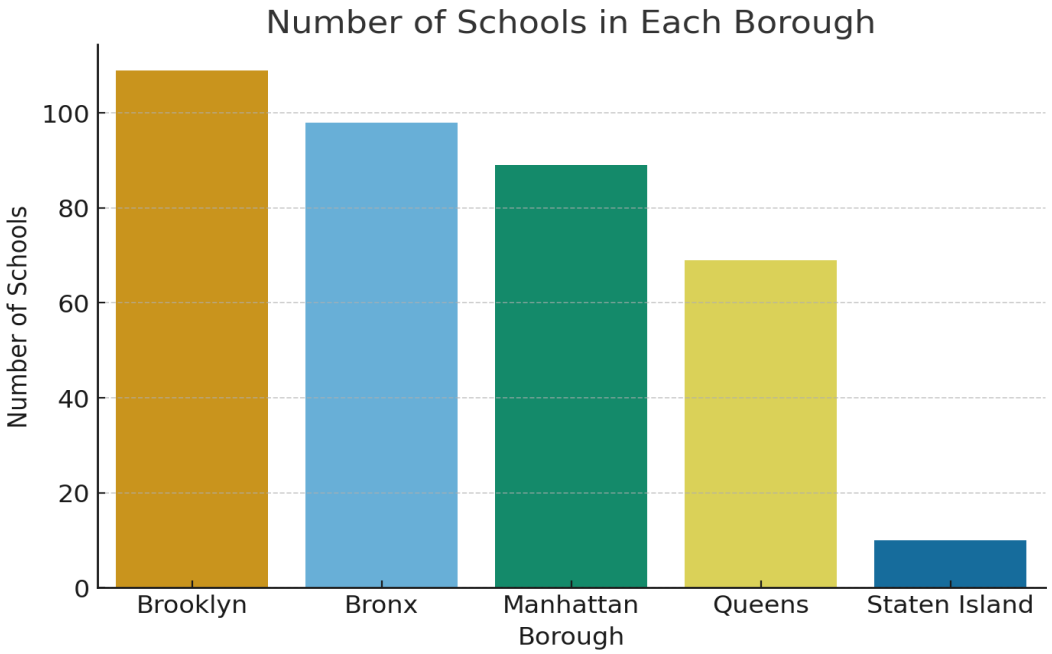
4. Key Findings

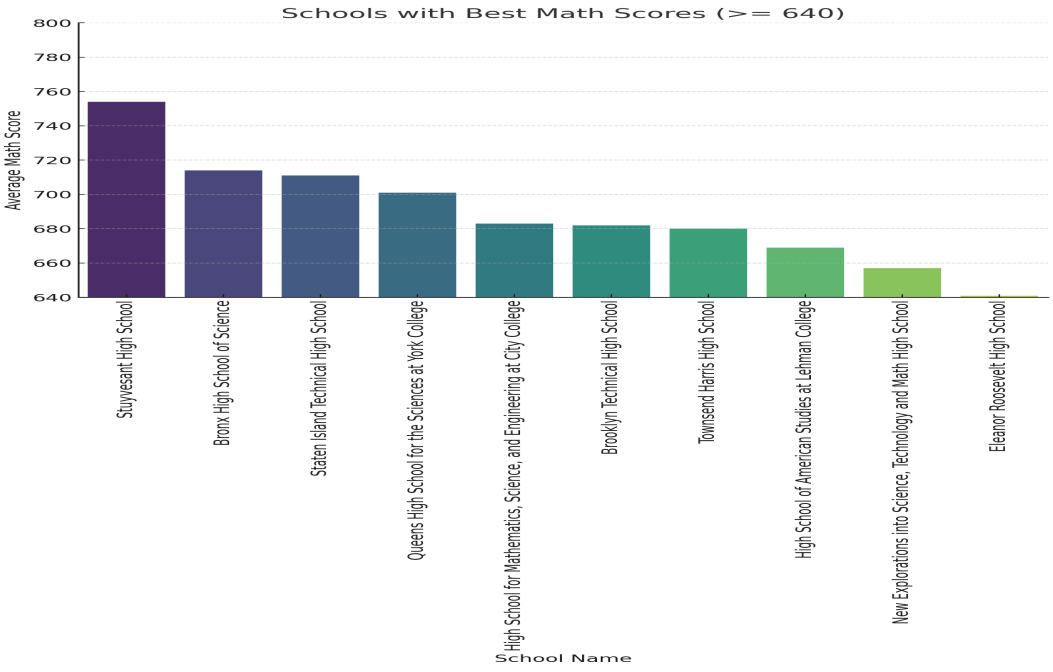
- School Distribution: Brooklyn and Queens host the highest number of schools, while Staten Island has the fewest.
- Top Math Schools: Several schools consistently score ≥ 640 in math, indicating strong STEM performance.
- Top 10 Overall: Elite schools with balanced excellence across all three SAT sections outperform others.
- Borough Variability: The Bronx exhibits the largest variability (highest standard deviation), suggesting inequality across schools.

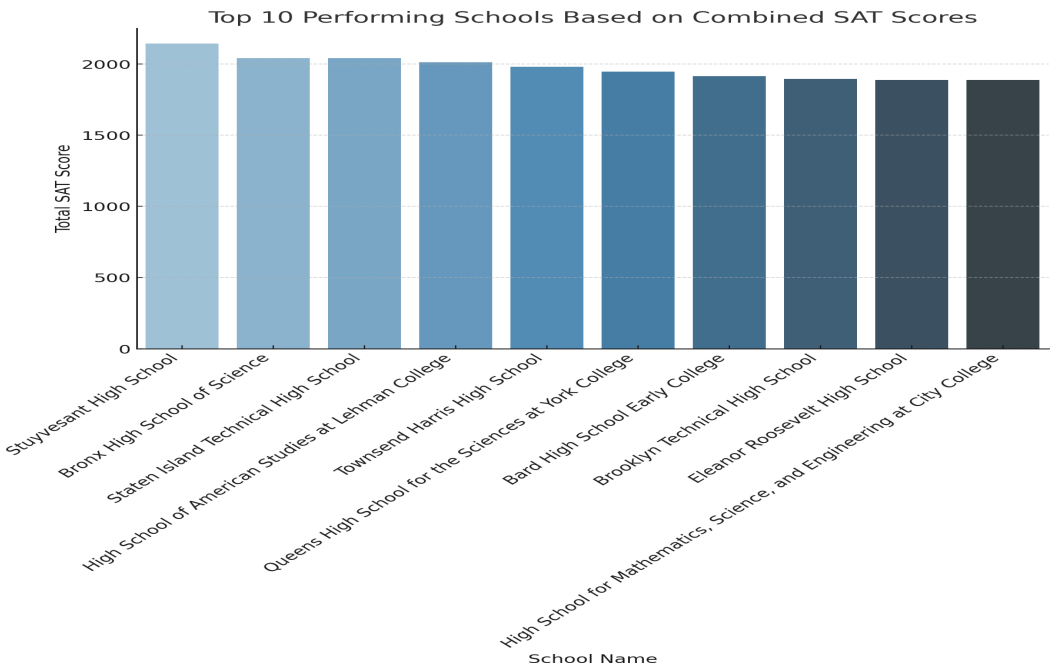
5. Recommendations

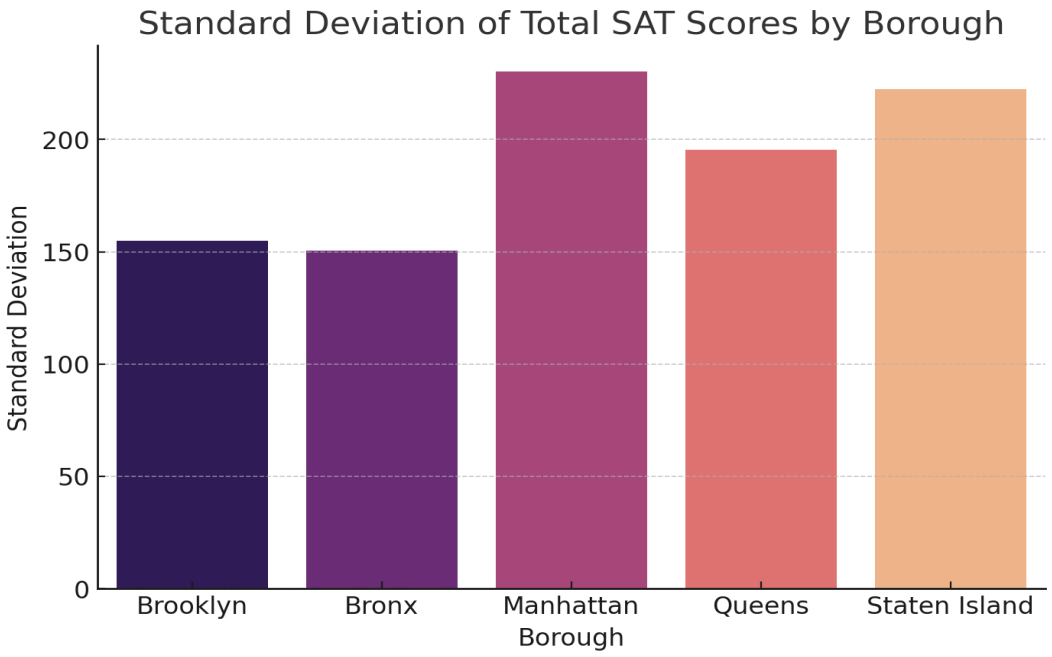
- Policy & Support: Target interventions in boroughs with wider disparities (e.g., Bronx).
- STEM Investment: Encourage replication of practices from top math-performing schools.
- Parental Guidance: Parents can use this analysis to identify high-performing schools.
- Further Research: Include socioeconomic factors, teacher-student ratios, and funding levels.

Visualizations


Number of Schools in Each Borough
Number of Schools
0
20
40
60
80
100
Brooklyn
Bronx
Manhattan
Queens
Staten Island
Borough


Schools with Best Math Scores (>= 640)
Average Math Score
640
660
680
700
720
740
760
780
800
Stuyvesant High School
Bronx High School of Science
Staten Island Technical High School
Queens High School for the Sciences at York College
High School for Mathematics, Science, and Engineering at City College
Brooklyn Technical High School
Townsend Harris High School
High School of American Studies at Lehman College
New Explorations into Science, Technology and Math High School
Eleanor Roosevelt High School
School Name


Top 10 Performing Schools Based on Combined SAT Scores
Total SAT Score
0
500
1000
1500
2000
Stuyvesant High School
Bronx High School of Science
Staten Island Technical High School
High School of American Studies at Lehman College
Townsend Harris High School
Queens High School for the Sciences at York College
Bard High School Early College
Brooklyn Technical High School
Eleanor Roosevelt High School
High School for Mathematics, Science, and Engineering at City College
School Name


Standard Deviation of Total SAT Scores by Borough
Standard Deviation
0
50
100
150
200
Brooklyn
Bronx
Manhattan
Queens
Staten Island
Borough