Data set overview: Rows=1000+ Students
Columns:8
Source:Kaggle Dataset

Objective: Analysis of data to find ways to increase the performance of students.

Data Cleaning and Preparation: Verified all numeric columns for proper number format.
Checked for missing value ,found none.
Prepared categorical column for analysis(Gender, Lunch,Test prep)

Stats Summary:

Metric	Math Score	Reading Score	Writing Score
Mean	66.089	69.169	68.054
Median	66	70	69
Mode	65	72	74
Minimum	0	17	10
Maximum	100	100	100
Q1	57	59	57.75

Label	Low(MIN)	Open(Q1)	Close (Q3)	High(MAX)	Median
Math Scores	0	57	77	100	66

	Math	Reading	Writing
Math	1	0.8175796637	0.8026420459
Reading	0.8175796637	1	0.9545980771
Writing	0.8026420459	0.9545980771	1

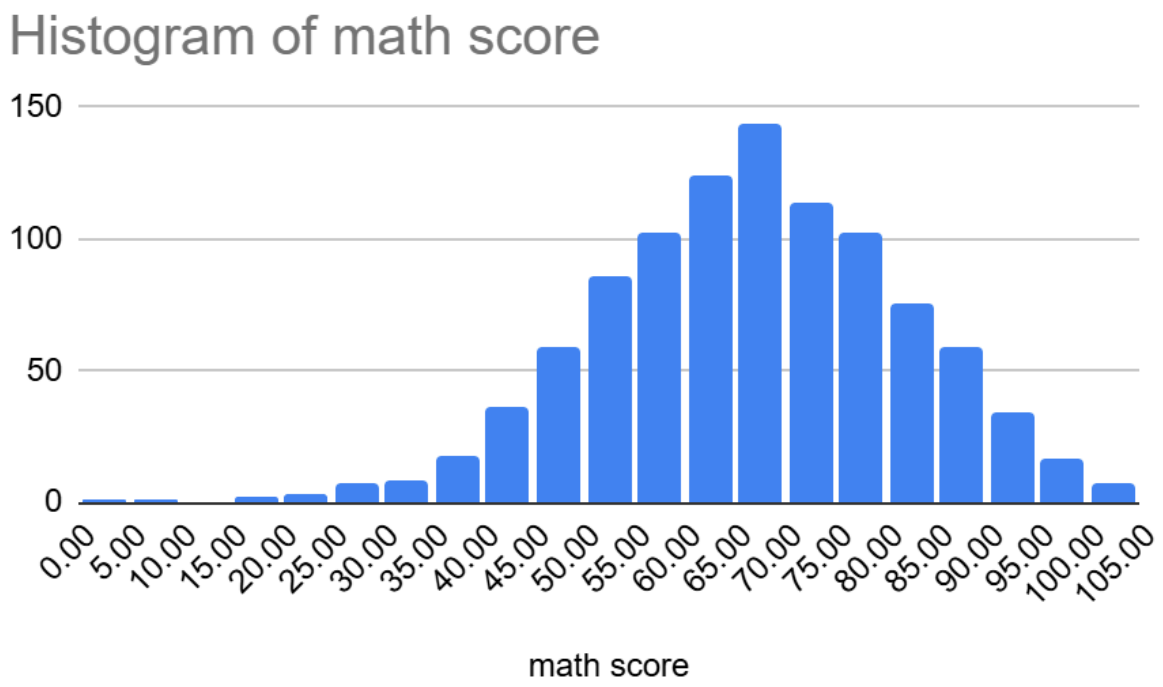
Subject Pair	Value	Interpretation
Math-Reading	>0.7	Strong positive correlation
Math -Writing	>0.7	Strong positive correlation
Reading-Writing	>07	Strong positive correlation

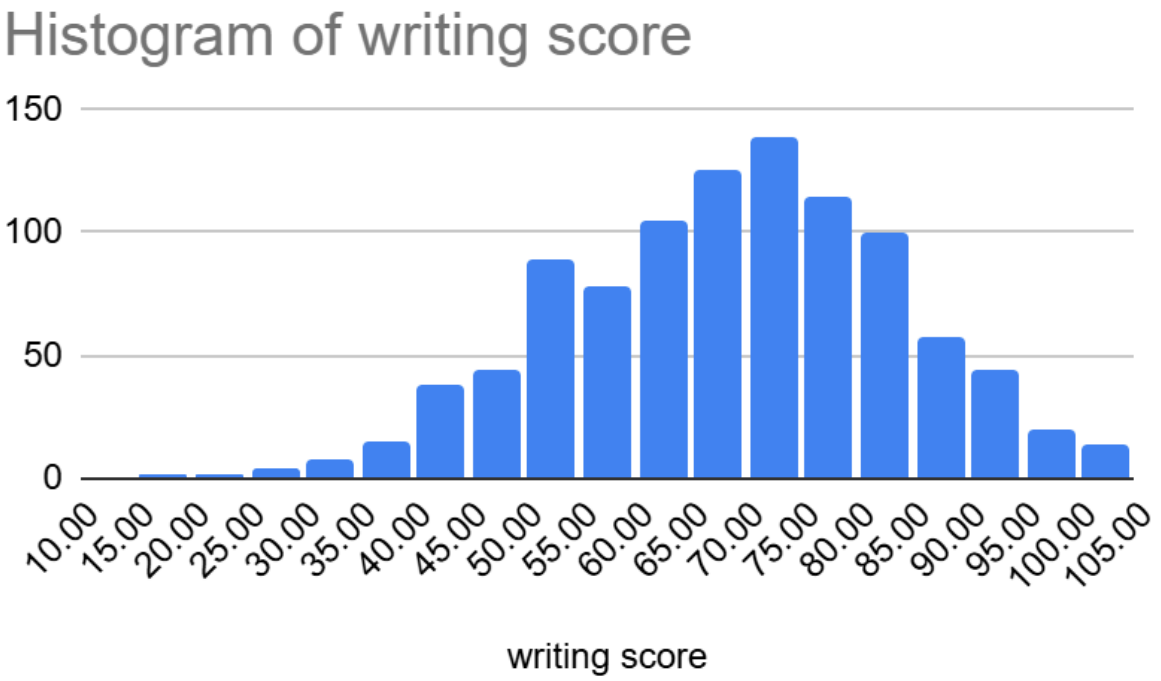
Gender	Math Average	Reading Average	Writing Average
Female	63.63320463	72.60810811	72.46718147
Male	68.72821577	65.47302905	63.31120332

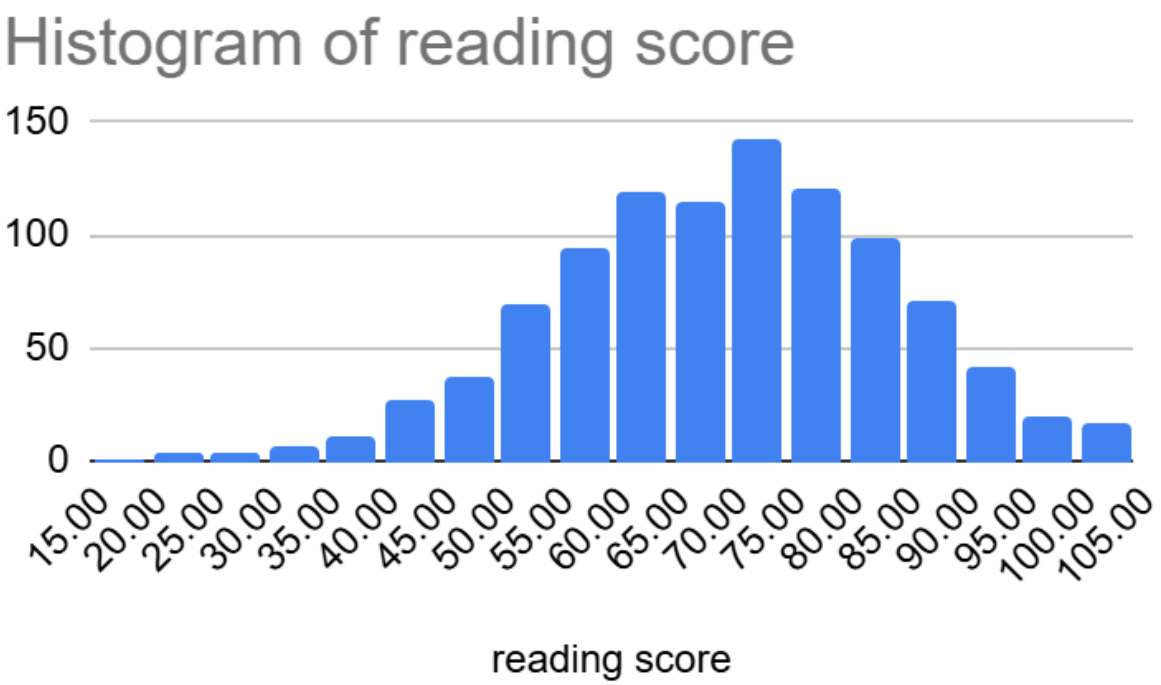
Lunch Type	Avg Math	Avg Reading	Avg Writing
Standard	70.03410853	71.65426357	70.82325581
Free/Reduced	58.92112676	64.65352113	63.02253521

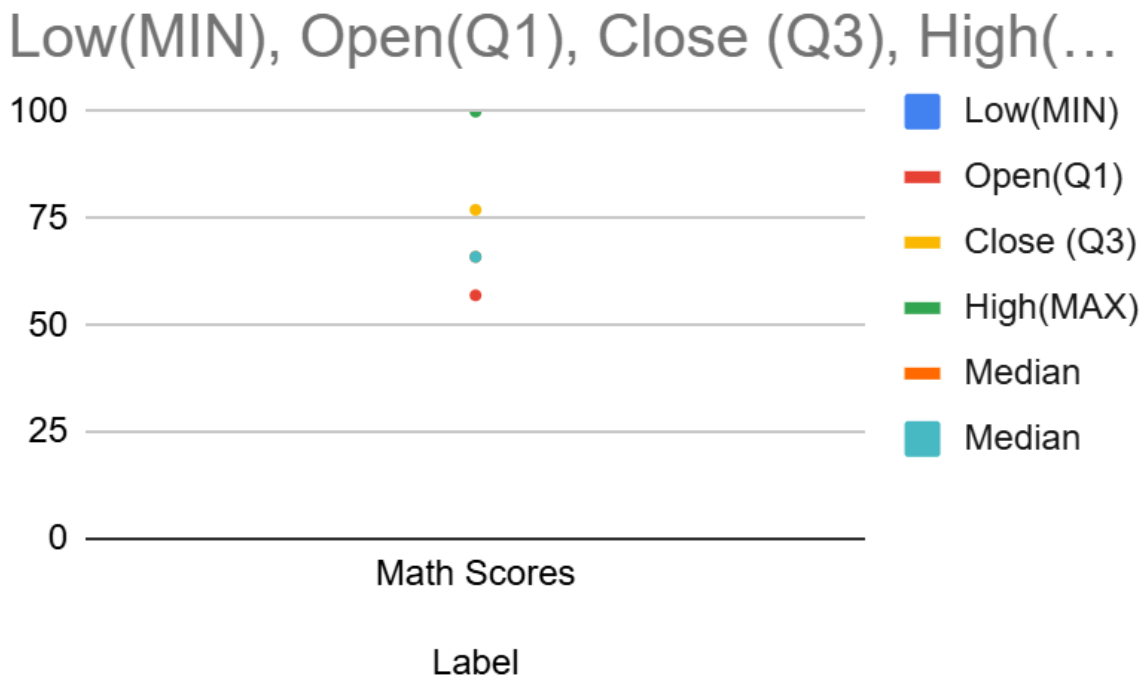
Test Prepration	Avg Math	Avg Reading	Avg Writing
Completed	69.69553073	73.89385475	74.41899441
None	64.07788162	66.53426791	64.5046729

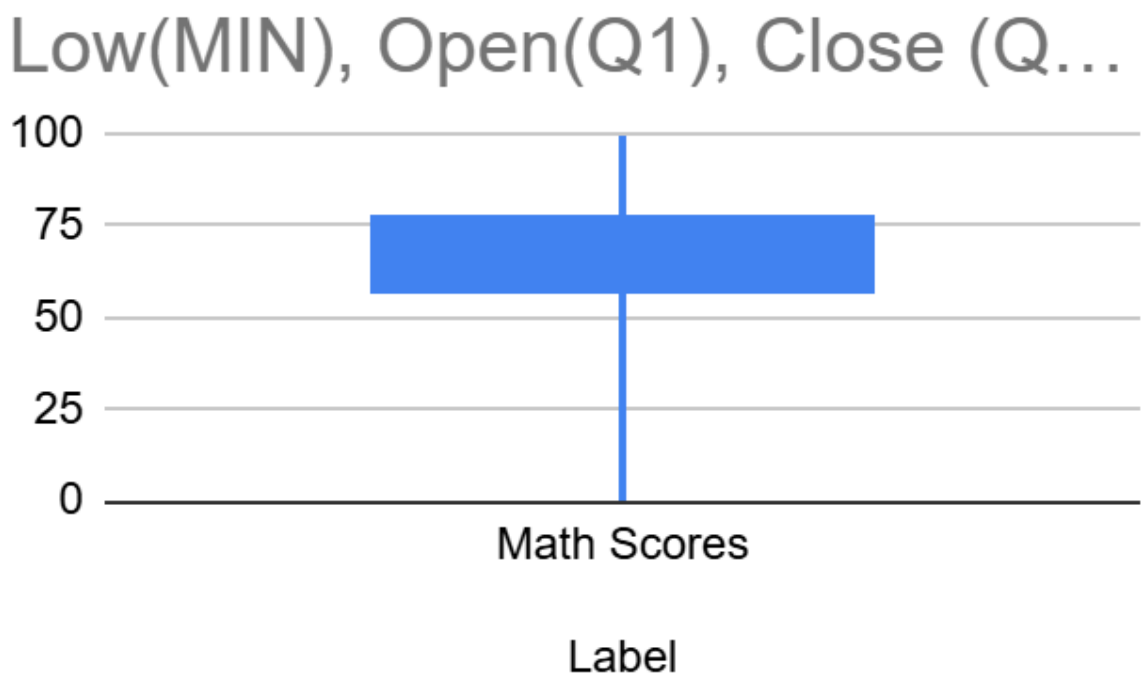
Chart and Visualization:

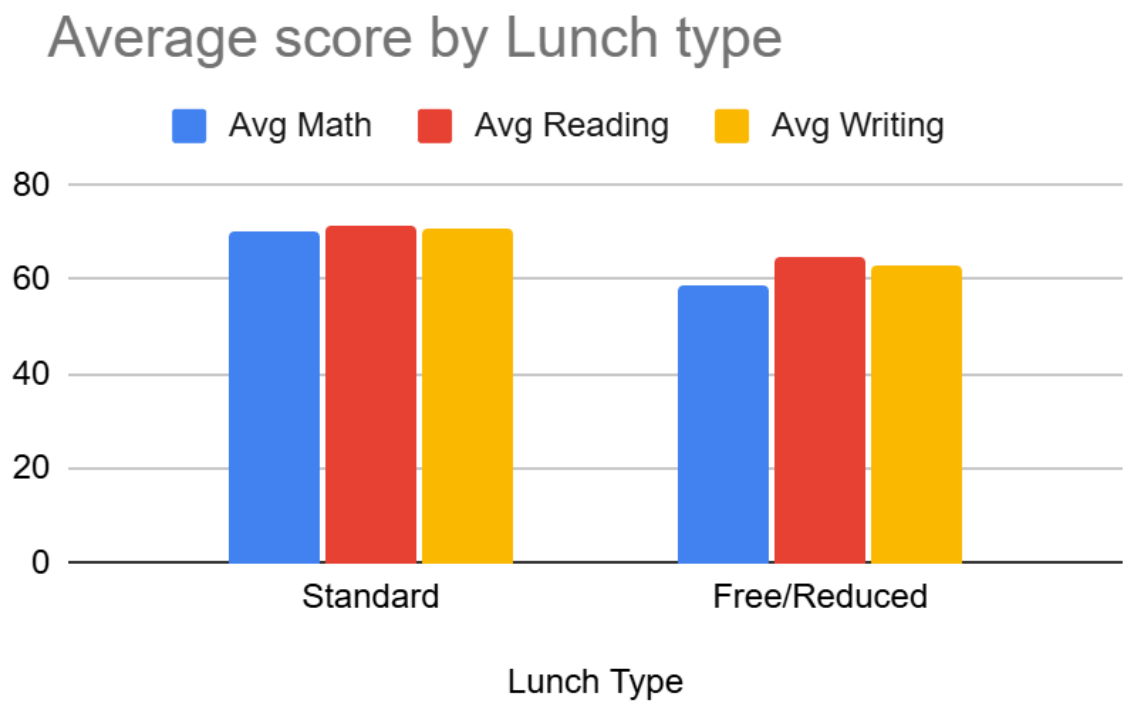


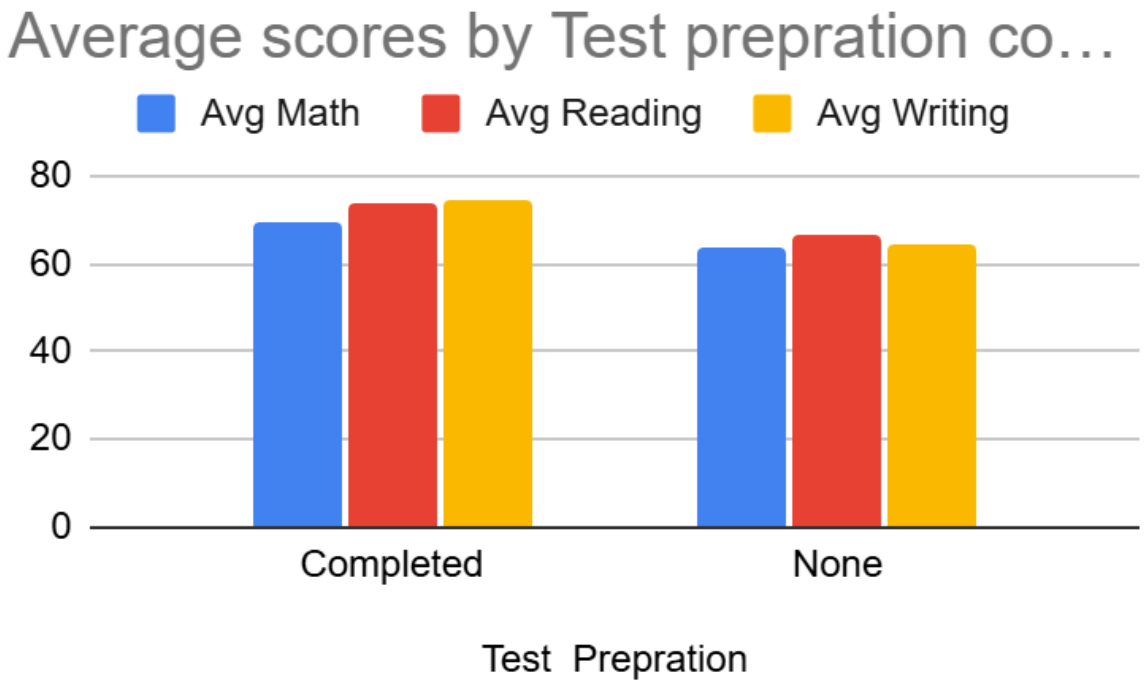

Histogram of writing score
150
100
50
0
10.00
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00
65.00
70.00
75.00
80.00
85.00
90.00
95.00
100.00
105.00
writing score


Histogram of reading score
150
100
50
0
15.00
20.00
25.00
30.00
35.00
40.00
45.00
50.00
55.00
60.00
65.00
70.00
75.00
80.00
85.00
90.00
95.00
100.00
105.00
reading score


Low(MIN), Open(Q1), Close (Q3), High(…
100
75
50
25
0
Math Scores
Label
Low(MIN)
Open(Q1)
Close (Q3)
High(MAX)
Median
Median


Low(MIN), Open(Q1), Close (Q…
100
75
50
25
0
Math Scores
Label





Descriptive Statistics and Observation:
Descriptive Statistics and Observations-Students Performance
The average scores for students across Math,Reading and Writing are approximately 66, 69, and 68 respectively, with median values closely matching the mean. The score distributions indicate a relatively balanced performance, with minimum scores as low as 0–10 and maximum scores reaching 100 across subjects.The standard deviation for each subject is around 15, suggesting moderate variability in student performance.Quartile analysis shows

that 50% of students score within the ranges of 57–77 (Math), 59–79 (Reading), and 58–79 (Writing). Overall, the data suggests a moderate spread in scores with a tendency toward higher performance in Reading.

KEY OBSERVATIONS:
Gender Comparison:
Female students outperform male students in Reading and Writing, while Math scores are relatively similar between genders.This suggests potential subject preferences or differences in strengths between genders.

Lunch Type:
Students with Standard lunch tend to have slightly higher average scores across all subjects compared to those with Free/Reduced lunch.
This may indicate socioeconomic factors influencing academic performance.

Test Preparation Course:
Students who completed the Test Preparation course consistently score higher across Math, Reading, and Writing.This highlights the positive impact of preparation on academic performance.

Score Distribution:
Most students cluster around the mean, but there are a few low outliers (scores near 0–10) and high achievers (scores near 100).
This emphasizes the importance of targeted interventions for students at the lower end.

Quartile Insights:
The interquartile range (Q1–Q3) for each subject shows that the middle 50% of students are performing fairly well, with Math slightly lower than Reading and Writing

Patterns Across Categories:
Categorical analysis shows that factors like gender, lunch type, and test preparation have noticeable effects on performance, which could be considered in future studies or predictive models.

Conclusion:
Conclusion: This exploratory data analysis of student performance provides a comprehensive understanding of trends and patterns in Math,Reading and Writing scores.The analysis highlights differences in performance based on gender,lunch type, and test preparation course, showing that these factors can influence academic outcomes.Overall, the majority of students perform around the average,with some high achievers and low outliers.These insights can help educators and policymakers make data-driven decisions,focus on areas needing improvement to support students effectively.The project demonstrates the application of data cleaning, descriptive statistics, and visualization techniques to extract meaningful insights from real-world data.
