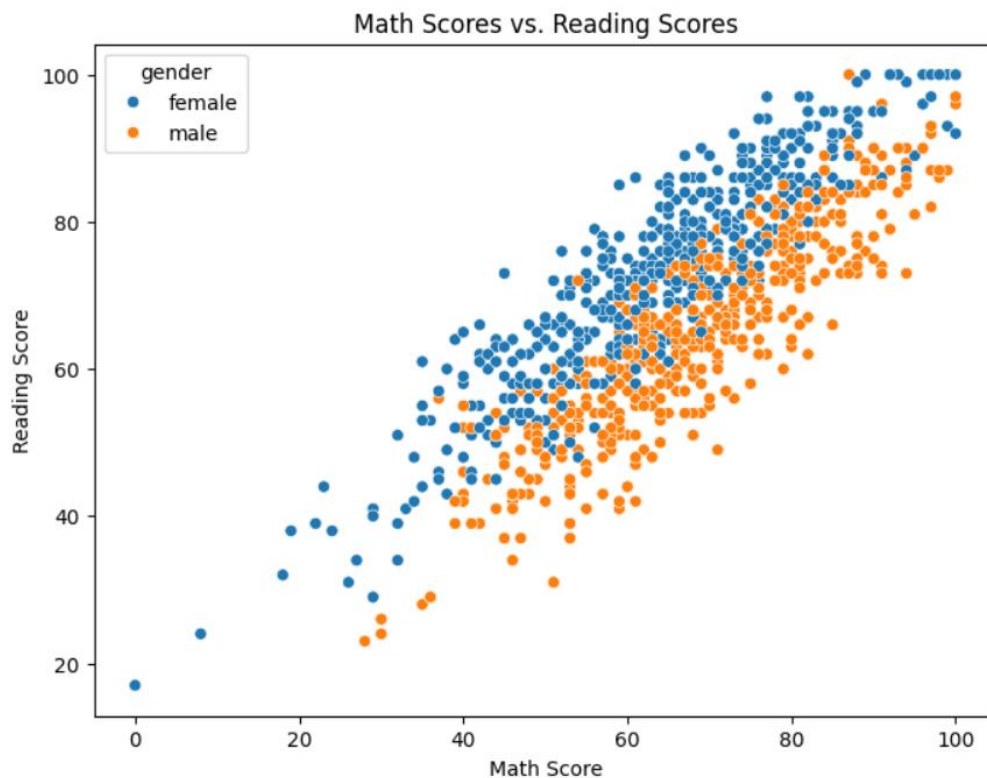


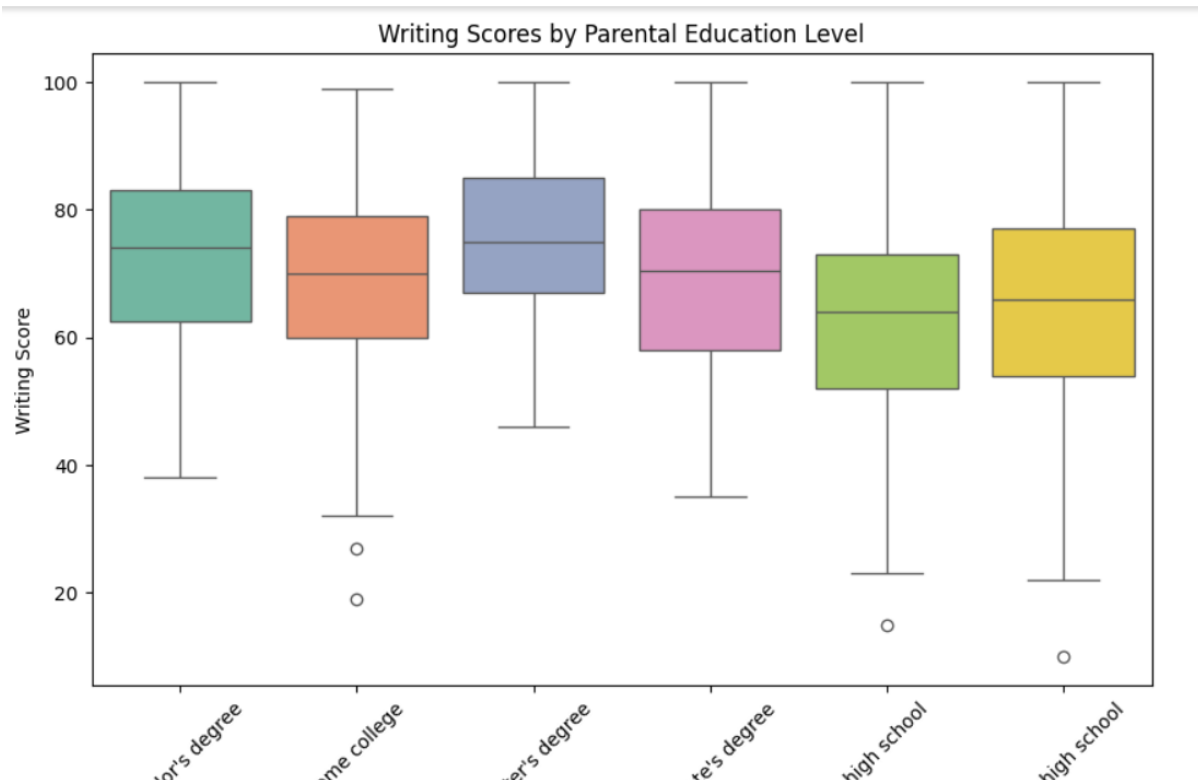
1. Histogram of Math Scores

- **Visualization:** Distribution of math scores.
- **Analysis:**
 - **Central Tendency:** Determine which math score range is most typical (for example, do most students fall between 60 and 80)
 - **Spread:** Recognize how math scores vary; for example, are they broadly distributed or closely clustered
 - **Outliers:** Detect any unusual scores (e.g., very high or very low scores).
- **Example:** If the histogram shows a peak around 70-80, it indicates that most students perform well in math.



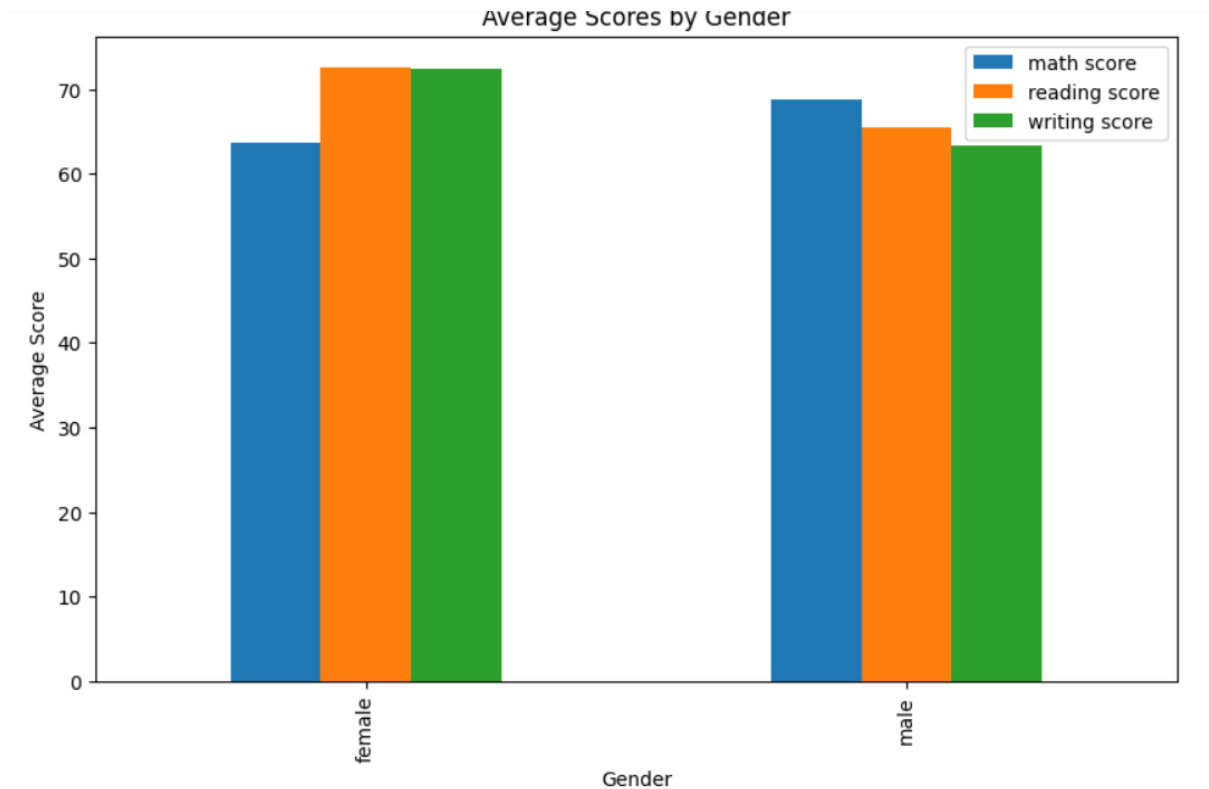
2. Scatter Plot of Math vs. Reading Scores

- **Visualization:** Relationship between math and reading scores, colored by gender.
- **Analysis:**
 - **Correlation:** Find out whether reading and math scores are related (i.e., do children who do well in arithmetic also do well in reading).
 - **Gender Differences:** Determine whether gender affects performance (for example, do men or women typically perform better in both subjects).
 - **Outliers:** Find pupils who do extraordinarily well or poorly in one subject relative to another.
- **Example:** If the scatter plot shows a positive trend, it indicates that students who score high in math also tend to score high in reading.



3. Box Plot of Writing Scores by Parental Education Level

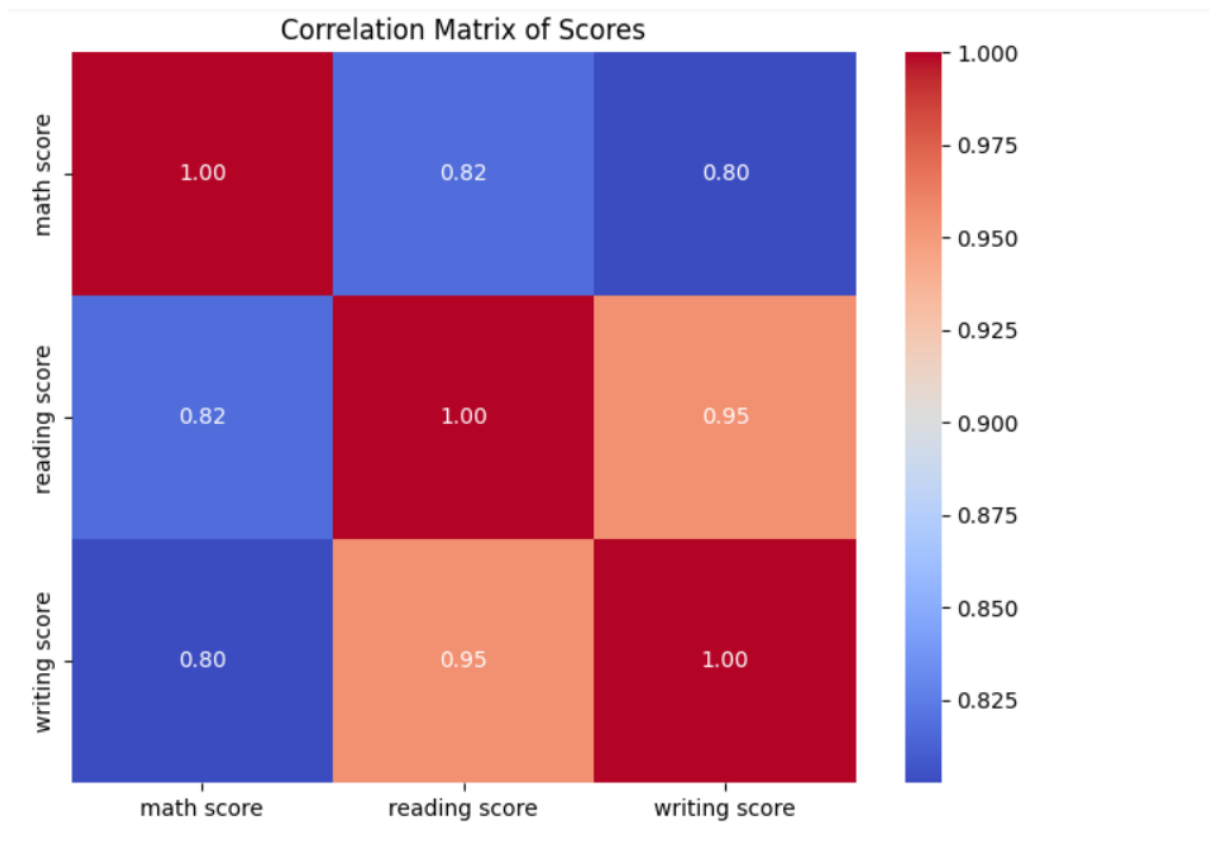
- **Visualization:** Distribution of writing scores based on parental education level.
- **Analysis:**
 - **Impact of Parental Education:** Find out if children's writing performance is influenced by the educational attainment of their parents (i.e., do students with more educated parents perform better).
 - **Variability:** Compare the spread of writing scores across different parental education levels.
 - **Outliers:** Identify students who perform exceptionally well or poorly within each group.
- **Example:** If the box plot shows higher median scores for students with parents who have a master's degree, it suggests that parental education positively impacts writing performance.



4. Bar Plot of Average Scores by Gender

- **Visualization:** Average math, reading, and writing scores by gender.
- **Analysis:**
 - **Gender Comparison:** Examine how well men and women perform overall in each subject.
 - **Subject-wise Performance:** Identify which subject has the highest or lowest average scores for each gender.
 - **Trends:** Check to see if one gender performs better than the other in every subject.

Example: It indicates gender-based performance disparities if women perform better on average in reading and writing but worse in arithmetic.



5. Heatmap of Correlation Matrix

- **Visualization:** Correlation between math, reading, and writing scores.
- **Analysis:**
 - **Inter-subject Relationships:** Determine whether the three topics have strong or weak correlations with one another (e.g., are reading and math results strongly correlated).
 - **Subject Dependencies:** Find out if there is a correlation between a student's performance in one area and their performance in another (for example, if pupils who do well in arithmetic also do well in writing).
 - **Insights for Interventions:** When creating focused interventions, use correlations. For example, if reading and arithmetic are closely related, then enhancing one could benefit the other.
- **Example:** If the heatmap shows a strong positive correlation between reading and writing scores, it indicates that students who perform well in reading also tend to perform well in writing.