

Project 4

Analytical Questions

1. **Average GPA by Class:** What is the average GPA for each class?
2. **Gender Performance Comparison:** How do male and female students compare in terms of average GPA?
3. **Race Performance Analysis:** What is the average GPA for students of different races?
4. **Course Performance:** How do students perform in different courses (Algebra, Calculus1, Calculus2, Statistics, Probability, Measure, Functional_analysis)?
5. **Correlation with GPA:** What is the correlation between GPA and performance in individual courses?
6. **Performance Distribution:** What is the distribution of GPAs across all students?
7. **Top Performers:** Who are the top 10 students in terms of GPA?
8. **Course Difficulty:** Which courses have the lowest average scores, indicating higher difficulty?
9. **Impact of From Columns:** How do the 'from1', 'from2', 'from3', and 'from4' columns impact the GPA?
10. **Predictive Analysis:** Can we predict the 'y' value based on GPA and course scores?

Visualization Questions

1. **GPA Distribution:** Create a histogram showing the distribution of GPAs.
2. **Average GPA by Gender:** Create a bar chart comparing average GPA between male and female students.
3. **Average GPA by Race:** Create a bar chart comparing average GPA across different races.
4. **Course Score Trends:** Create line charts for the average scores in Algebra, Calculus1, Calculus2, Statistics, Probability, Measure, and Functional_analysis.
5. **Correlation Heatmap:** Create a heatmap to visualize the correlation matrix of GPA and course scores.
6. **Box Plot of GPA by Class:** Create a box plot to show the distribution of GPAs for each class.
7. **Scatter Plot of GPA vs. Course Scores:** Create scatter plots to show the relationship between GPA and each course score.
8. **Course Difficulty:** Create a bar chart to show the average scores of each course, highlighting the most challenging courses.

9. **Impact of 'From' Columns:** Create a series of box plots to show the impact of 'from1', 'from2', 'from3', and 'from4' on GPA.
- 10.