

Student Performance Analysis Summary

Project Summary

This project presents a comprehensive analysis of student performance across three academic subjects Math, Reading, and Writing using both Exploratory Data Analysis (EDA) in Python and interactive data visualization in Tableau. The dataset includes various demographic and social factors such as gender, race/ethnicity, parental level of education, lunch type, and test preparation course completion. The objective was to explore patterns and correlations to understand what factors influence academic performance.

Key Objectives

- Analyze student performance across different subjects.
- Explore the effect of gender, lunch, race, and parental education.
- Investigate the impact of test preparation on scores.
- Check correlation among math, reading, and writing scores.
- Visualize insights using Tableau and Python.

Key Insights

1. Gender Differences:

- Females outperform males in reading and writing.
- Males slightly outperform females in math.

2. Test Preparation Course:

- Students who completed test prep scored 5-7points higher on average in each subject.

3. Lunch Type:

- Students receiving standard lunch consistently performed better than those with free/reduced lunch.

4. Parental Education:

- Higher levels of parental education (Bachelor's/Master's degrees) are associated with higher student scores.

5. Race/Ethnicity:

- Group E showed the highest average scores.
- Group A had the lowest performance among the five race/ethnicity groups.

6. Subject Correlation:

- There is a strong positive correlation between scores in math, reading, and writing.
- High performers in one subject tend to do well in others.

7. Combined Score Patterns:

- Students with standard lunch, test preparation, and parents with higher education had the highest total average scores.

Tools Used

- Python (Google Colab): For EDA using Pandas, Seaborn, and Matplotlib.
- Tableau Public: For creating dashboards and interactive visualizations.
- GitHub: For project hosting, version control, and presentation.

Dataset Source

Kaggle: Student Performance in Exams <https://www.kaggle.com/datasets/spscientist/students-performance-in-exams>