Examining Factors that Affect Student Performance

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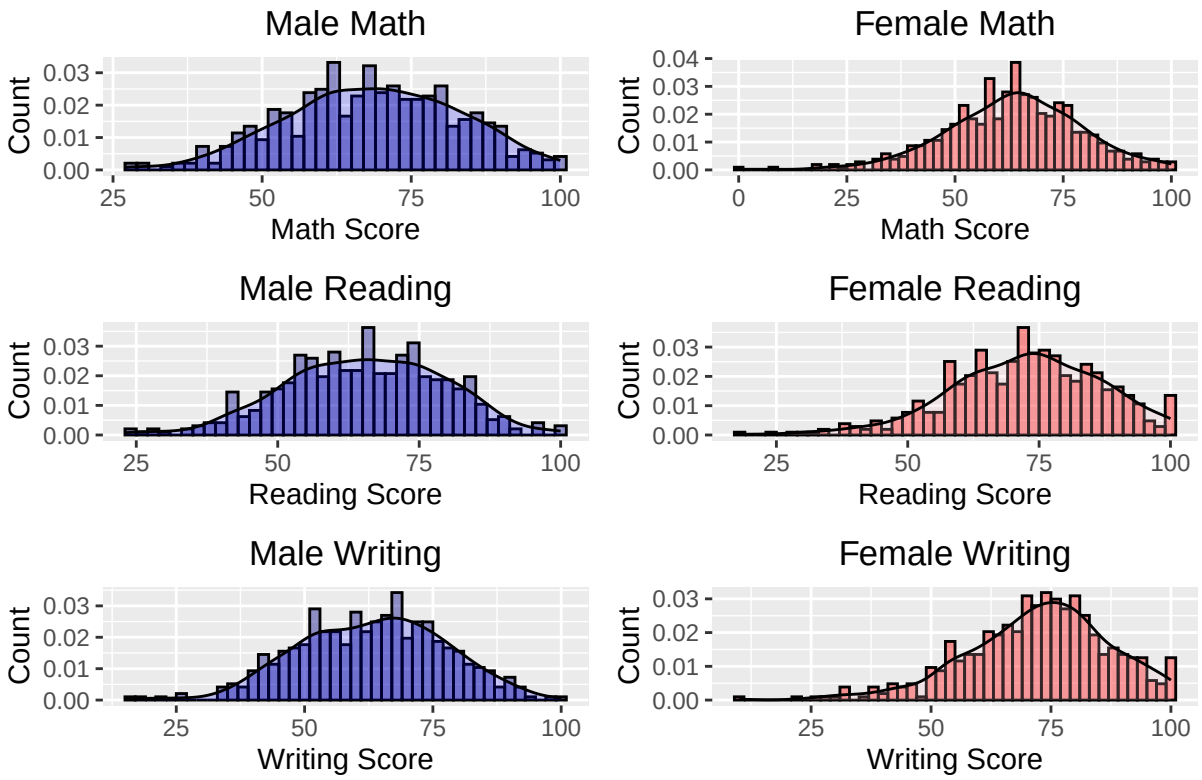
The goal of this project is to gain insight on classroom performance. We will begin with a series of visualizations and conclude with a predictive model.

We will first examine the distribution of subject specific scores across gender.

`Distribution of Scores across Gender`



Mean Scores

Gender	Math	Reading	Writing
Male	68.73	65.47	63.31
Female	63.63	72.61	72.47

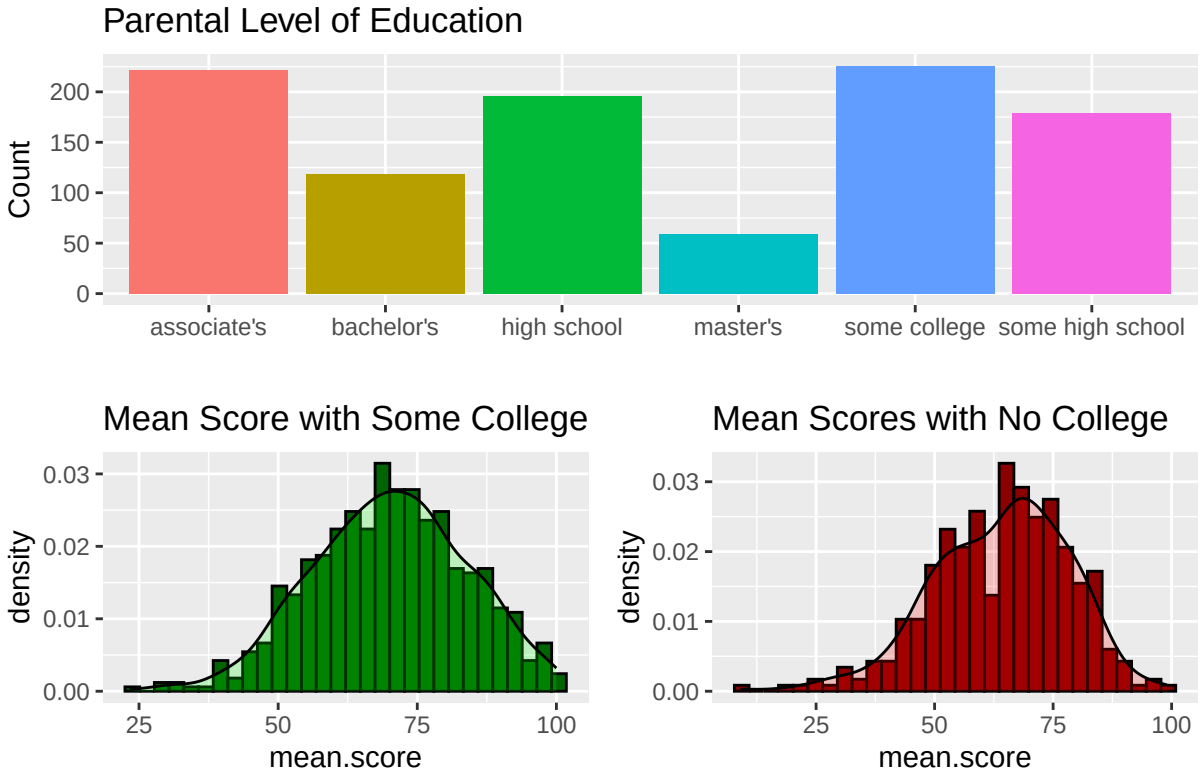
There are some interesting conclusion we can make:

- **Male's tend to score higher in Math.**
- **Female's tend to score higher in Reading and Writing.**
- **The distribution for the male group is relatively normal while the distribution for the female group is skewed to the right.**

Next, we want to look at the effect of parental level of education on subject scores.

parental.level.of.education	n	percent
associate's	222	22.2
bachelor's	118	11.8
high school	196	19.6
master's	59	5.9
some college	226	22.6
some high school	179	17.9

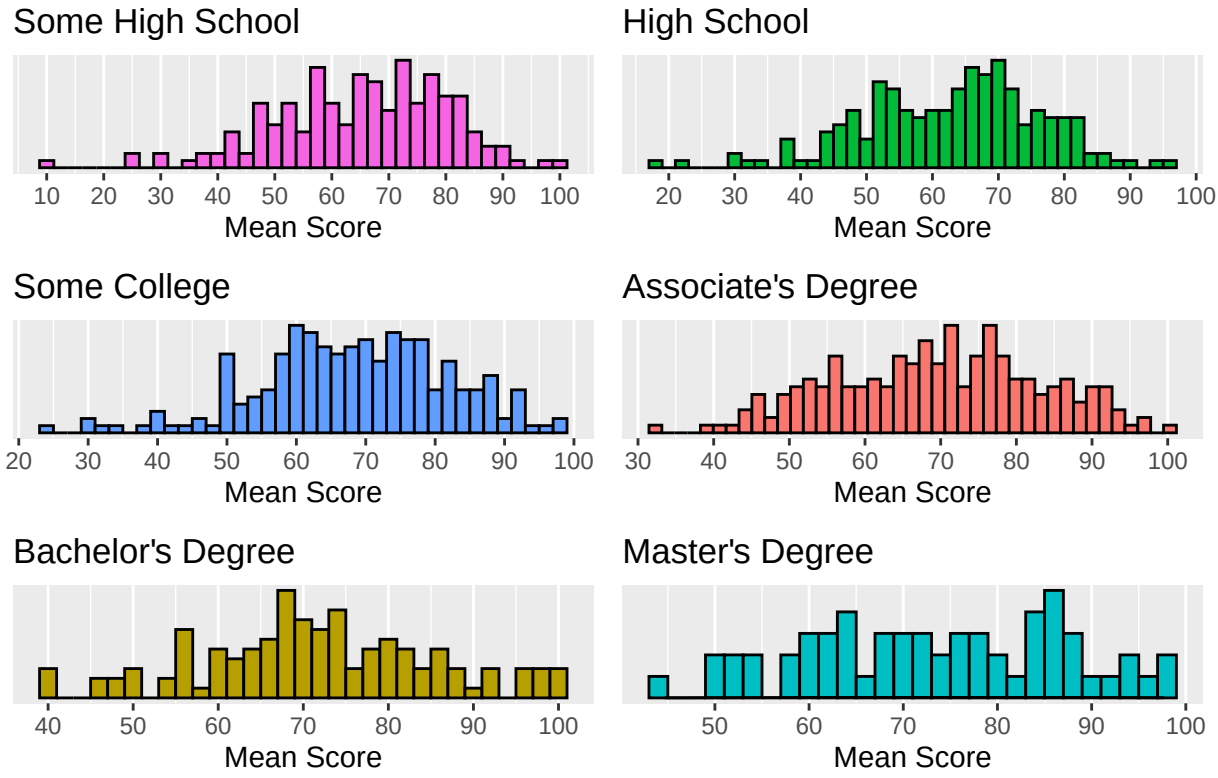
Distribution of Mean Scores & Some College vs. No College



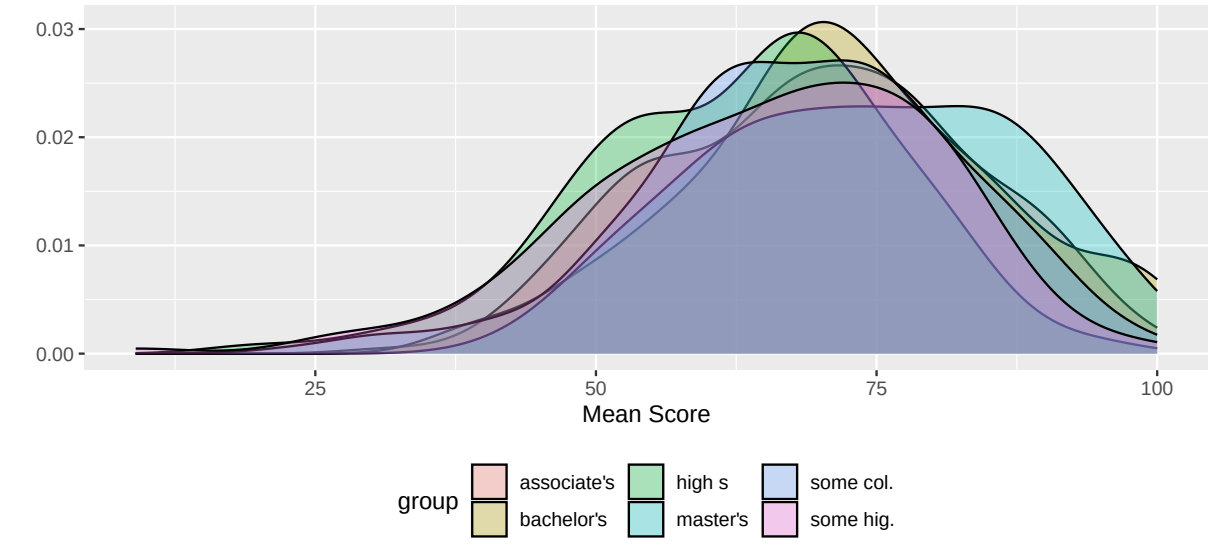
There are a few things to notice:

- **Most students have parents who achieved some level of college** (62.5%).
- **The median score for students whose parents achieved some level of college is** 70.3%.
- **The median score for kids whose parents did not reach college is** 65.7%.

Distribution of Mean Scores across Parental Education Level



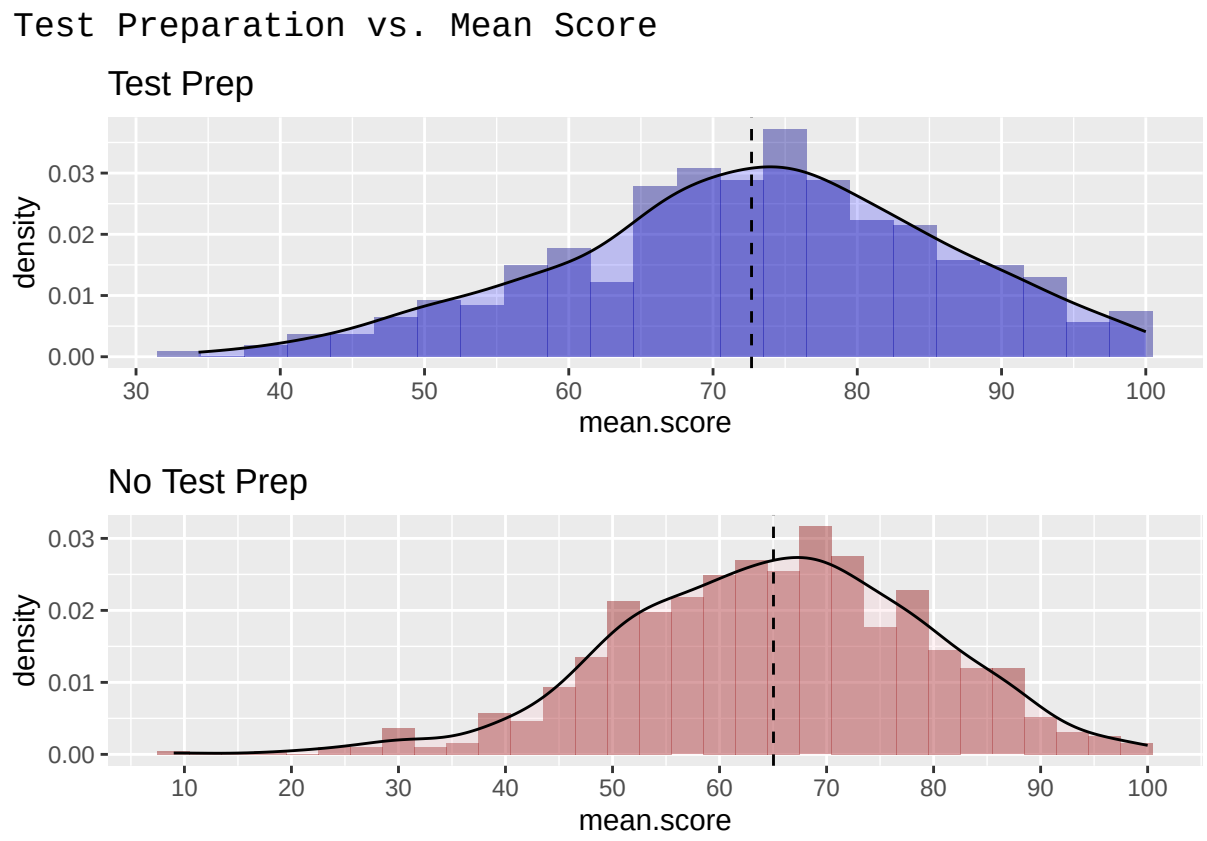
Overlayed Density Plot of Mean Scores



We see that student's whose parents achieved beyond a bachelor's degree are more likely to score beyond 80%. On the other hand, student's whose parents did not attend college are more likely to score below 60%. Otherwise, it appears to be difficult to differentiate between different levels of parental education.

Test Preparation Courses

The following charts compare the effect of a test preparation course on mean exam score.



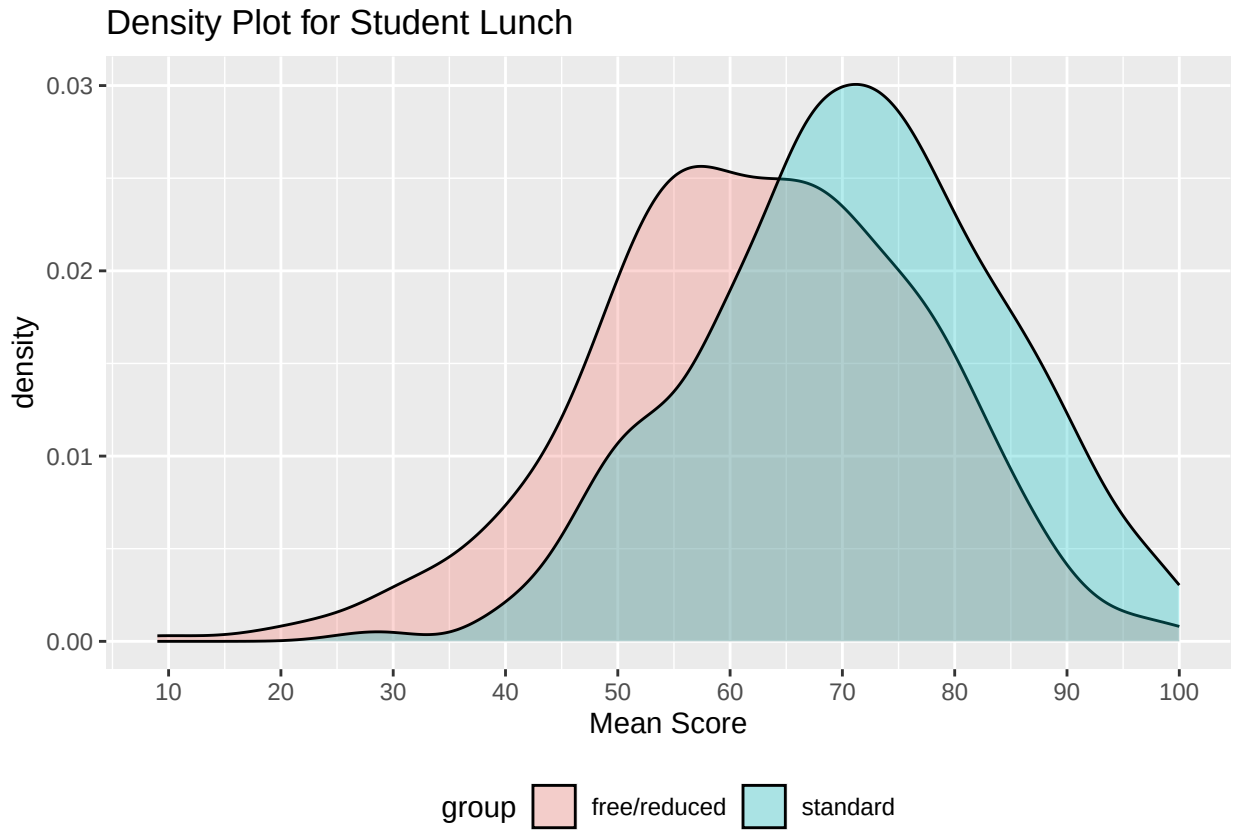
Prep vs. No Prep Exam Scores

Subject	Prep	No_Prep
Math	69.70	64.08
Reading	73.89	66.53
Writing	74.42	64.50
Mean	72.67	65.04

We see that a single test preparation course has a significant effect on exam scores. In fact, taking part in a test preparation course leads to an 11.7% increase in mean exam score. We will examine this further when we construct our model.

Lunch

The next piece of our data we will examine is student lunches. The chart below compares two levels of lunches: free/reduced and standard.



Lunch Type vs. Exam Scores

Subject	Standard	Free
Math	70.03	58.92
Reading	71.65	64.65
Writing	70.82	63.02
Mean	70.84	62.20