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ALY 6010

Module 2 Practice

Assignment

The data set that is being introduced looks at a survey of 1000 students and focuses on five features that includes their age, gender, major, grade point average, and the amount of study hours per student. The data set essentially contains the same number of students for each gender and the students surveyed are from only four majors which are arts, sciences, commerce, and engineering and this is also fairly equal per major that were surveyed. The age range of the students is not just of the traditional college ages, ranging from 18 to 30. The focus of the data set is to see whether any of the categories among the students surveyed has any impact of their grade point average.

The best way to see how the categories can affect the students grade point average is to compare them individually. With the amount of study hours from 0 to 40, I tallied the average GPA per number of study hours and created a scatterplot with the best fit line to see visually if anything stands out. While there are a few outliers in the plot, the majority of the points are around the 3.0 grade point average with about 20 hours of study time as the average. The best fit line indicates surprisingly that the GPA seems to decline slightly with the more hours of study time.
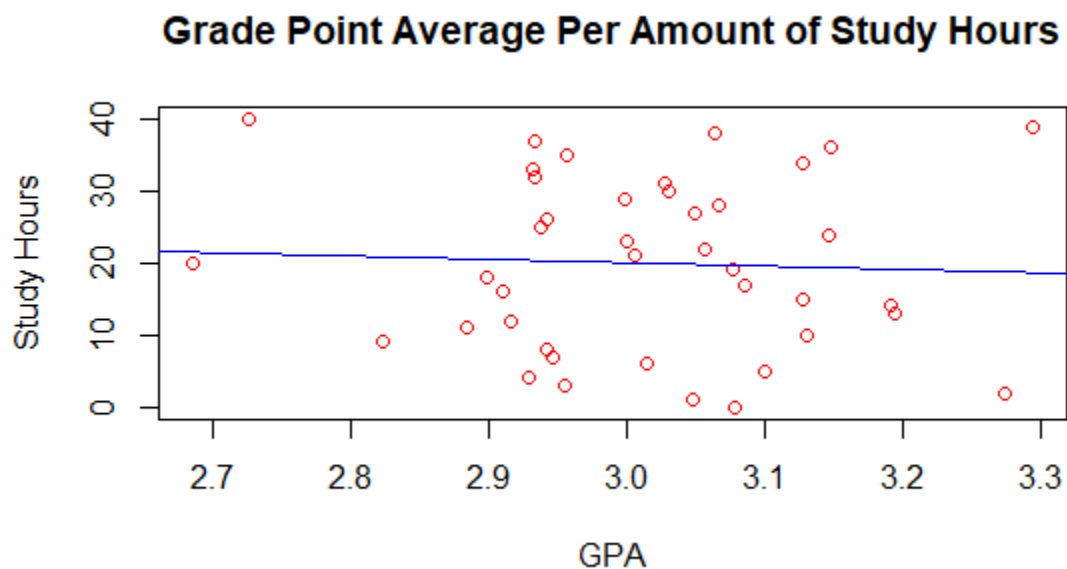
I compared the average study hours per age and then used a bar chart because of the smaller age range between 18 to 30 to see if age had any impact on how a student performs in the classroom. There seems to more consistency among younger students in study hours while the older students show some higher but also lower totals in study hours depending on the age. This comparison stands out in that traditional college students may have more academic success than a non-traditional student because of the more consistent study habits.

Average Study Hours Per Age
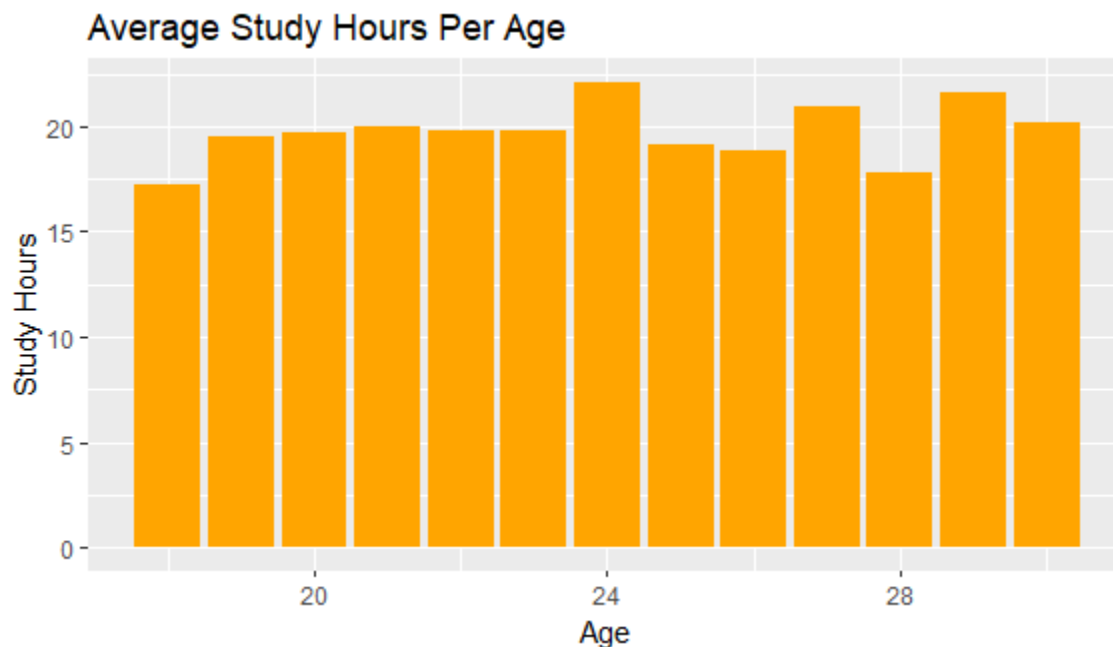
Looking at how grade point average and total study hours compares per gender, I created two boxplots to see the genders side by side. The female students surveyed have a higher mean grade point average than the males with less outliers and showing more consistency in academic performance.

## Boxplot Comparison of GPA For Both Genders
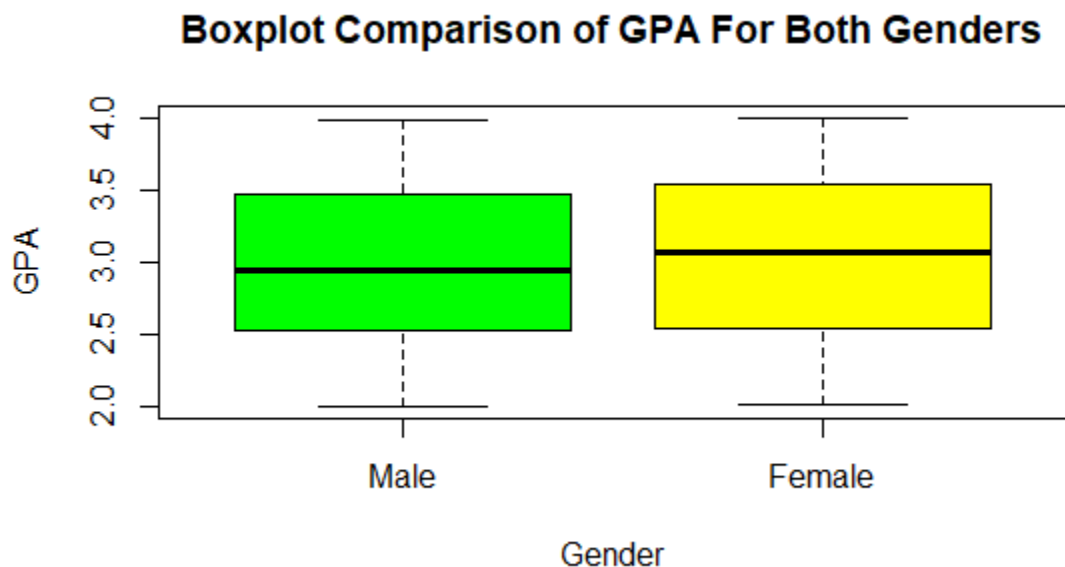
When showing the study hours between genders though, there seems to be a slightly higher mean in study hours for males and a noticeable difference in outliers than females.

Overall females do better in the classroom despite the fact that they study less than males. A suggestion is to look at other factors besides study time that could indicate why females do better than males.

Boxplot Comparison of Study Hours For Both Genders
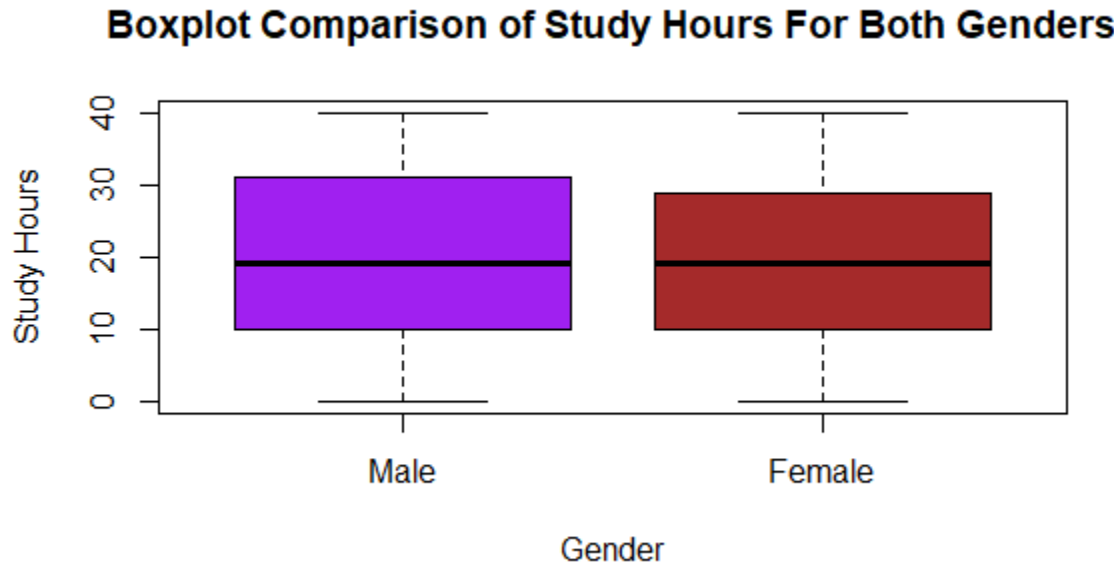
I used a jitter plot to show some of the categorical data from the data set and compared how the majors of each student affects their grade point average. Because the GPA's per major were very similar, the plotting of the comparison doesn't show anything that stands out per major in a jitter plot.

Jitter Plot Comparing Average GPA Per Major
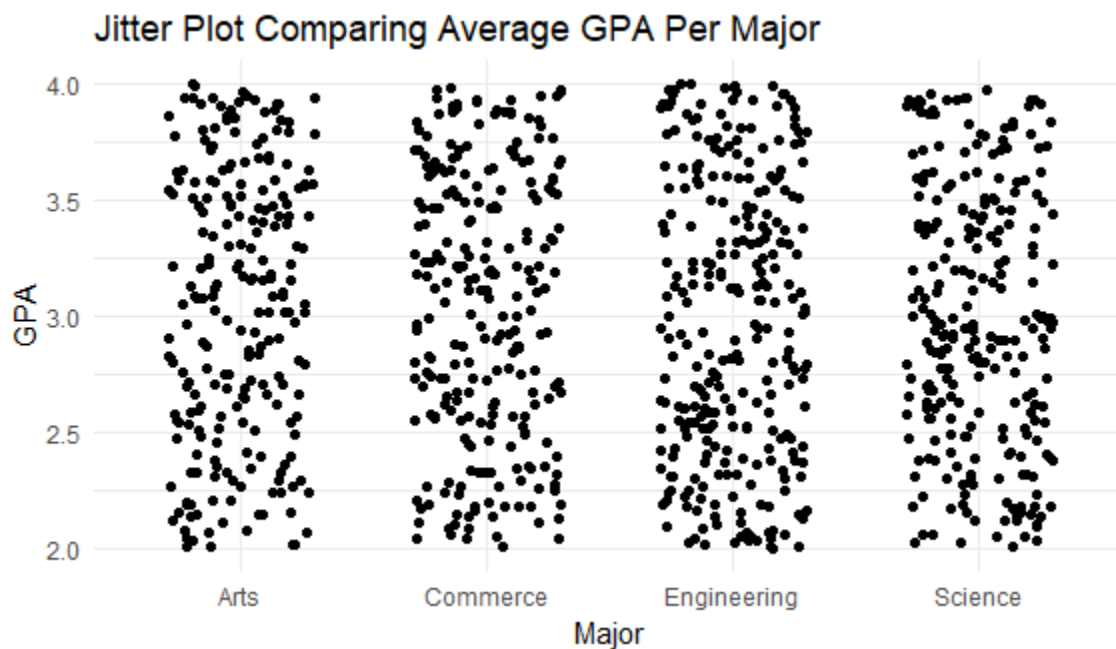
Looking at the data from all angles and comparisons it seems that there are not many outstanding indicators that would show who would benefit the most in having a better grade point average. If you are older than the traditional college student the data shows that perhaps more maturity would not impact your grade point average and there also wouldn't be an increase in study hours. Gender also doesn't so much of a difference in grade point average performance, as females do better than males but only by a slight margin but spend less time studying than males. The degree of difficulty in the major you choose also doesn't seem to affect your grade point average as its also identical to the range that is shown among genders. The amount of study hours shouldn't be the only indicator of how you perform in school, as students all learn in different ways that leads to strong academic performance. A follow-up survey is suggested to show different methods of learning per student and how it affects their grade point average.

References:

Bluman, A. G. (2017). *Elementary Statistics: A Step by Step Approach.* 10th edition. McGraw-Hill Education.

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