**Common Academic Correlations**

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**Introduction**

The purpose of this project is to find a relationship among common academic factors and their effect on college GPA. We collected data from 48 university level students through an anonymous survey that asked questions about high school GPA, number of AP classes taken, SAT/ACT score, number of clubs/sports participated in, and number of hours of sleep, and was used to determine a model to predict college GPA based on these factors of a student’s academic, extracurricular, and personal life. We hope that this model proves that high school performance and personal life is strongly correlated with college performance in order to motivate high school students to work hard at all stages of their high school career.

Some problems that were not accounted for was grade inflation as certain schools, potentially such as community colleges or lower level state schools. Naturally, some universities are harder than others and will produce students with lower GPAs. Furthermore, some majors are easier than others which can create a little inaccuracy in GPA prediction.

We found that high school performance such as SAT/ACT score and number of AP classes taken influence college GPA the greatest.

**Methodology**

We collected data using an anonymous survey and we received 48 responses.Our initial variables were high school GPA, number of AP classes taken, SAT/ACT score (which we converted ACT to its SAT score equivalent), number of clubs/sports participated in, and number of hours of sleep, which were all used to determine a model to predict college GPA. We determined which variables to eliminate based on eliminating values with high p-values that skewed our model in order to maximize the adjusted R2 value.

Some assumptions we made were that undergraduate programs tend to be roughly the same difficulty level (at least initially), that each college did not grade inflate or grade deflate, and that each respondent answered truthfully and did not make up their data.

**Results/Discussion**

Our final model to predict college GPA was:

|  |  |  |
| --- | --- | --- |
| **Name** | **Variable** | **Unit** |
| College GPA |  | GPA points |
| AP Courses |  | Number of classes |
| SAT/ ACT |  | Score Points |

The adjusted R2 value for our relationship was a maximum of .419 which is decent for collected data from the real world, with accepted confounding variables. There were outliers in our data but that is most likely due to the fact that some colleges grade inflate and some majors are harder than others which could affect college GPA significantly.

In an attempt to get a variety of results, we collected data from a wide range of schools. But in retrospection, we should focus on one school because of the wide variety in curriculum at different schools, as well as GPA inflation or deflation.

This is our fitted values vs. standardized residuals plot. There is not obvious pattern or relation and most of the data is clumped around the 0 residual value mark. However, there is a large amount of samples that are about or below the 0 residual value. This indicates our model is not the best however it is a decent model considering our confounding variables. Next time, the same school should be used to prevent confounding of variables.

See Appendix A for the predicted college GPA vs. observed college GPA. This graph provides a rich visualization of the R2 value, to show “the goodness of fit” our data is (Appendix A).

**Conclusion**

This model does show a relationship between high school performance and college GPA. AP classes do prepare students for college and the SAT/ACT is a good indicator of academic performance at the college level.

High school level teachers should use this data with their students to show that taking AP classes is worth it, not just for the potential college credit, but for the increase in academic performance. Additionally, teachers and parents should use this data to encourage students to study hard on the skills for the SAT and ACT because those skills will set the foundation for academic performance in college. Being a well-rounded student such as being involved in clubs and other activities is not as important as being involved in academics; however, a student definitely shouldn’t neglect their activities!

If this experiment were to be done again, to reduce the confounding of variables, we should focus on one school because many schools have grade inflation or deflation, as well as potentially focus on one academic field or study as different academic fields have varying degrees of difficulty in curriculum.

Appendix A: Predicted GPA vs. Actual