Student Grade Predictor

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Background

Dataset is from Kaggle and contains comprehensive information on 2,392 high school students, detailing their demographics, study habits, parental involvement, extracurricular activities, and academic performance. The target variable, GradeClass, classifies students' grades into distinct categories, providing a robust dataset to use for this project to ultimately predict a student's grade
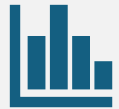
Datasets contains a total of 15 columns with 12 continuous features and 3 discrete features including the target variable GradeClass

Purpose

Going to observe and identify which are the most important features when it comes to what impacts a student's grade

Want to compare and analyze these features to ultimately be incorporated into our classification model

In the end we'll have a classification model that will accurately predict the final grade a student receives in their class and recommendations on how to improve
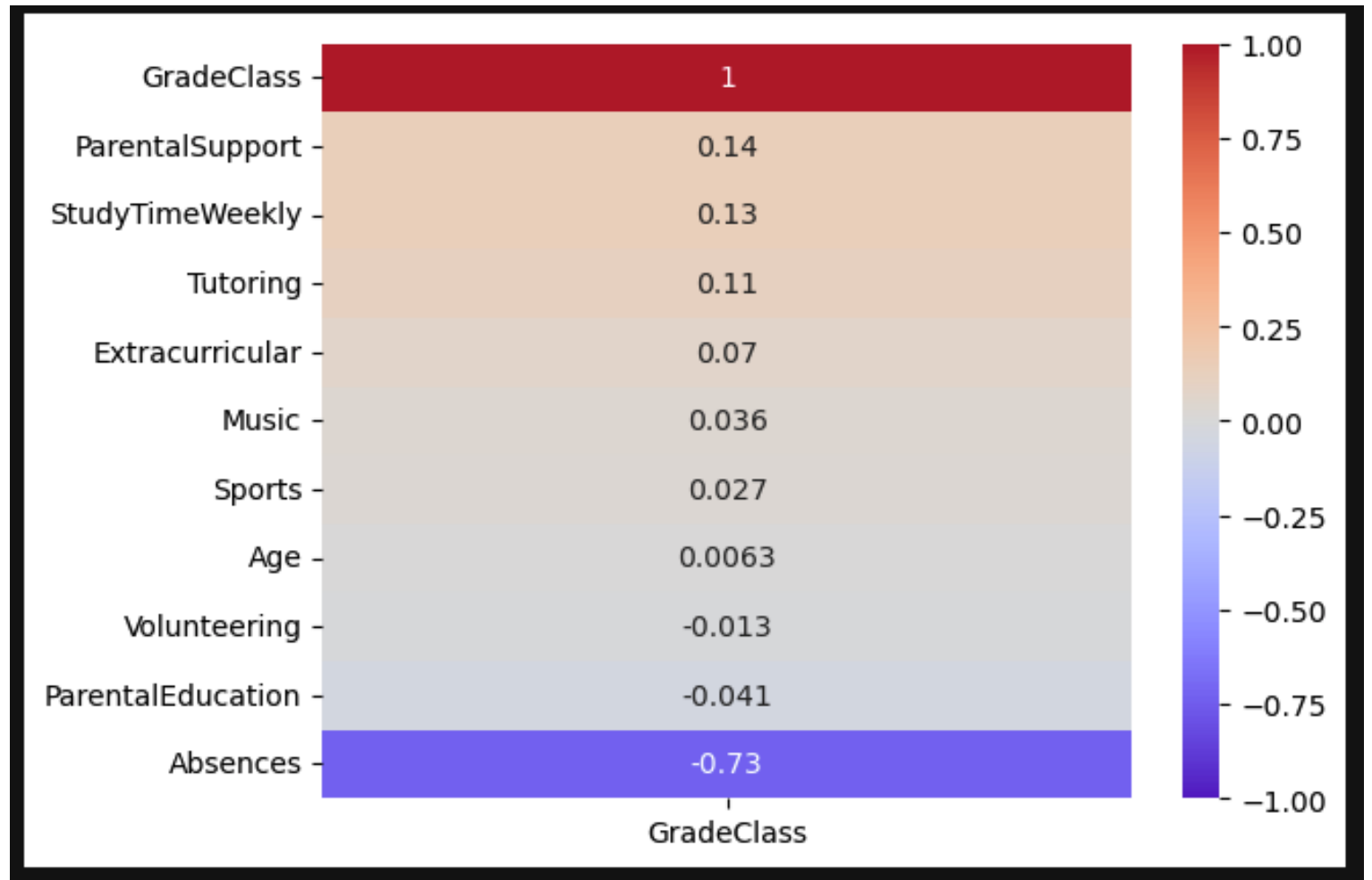
Data Overview

```
df['GradeClass'] = df['GradeClass'].map({0 : 'F', 1 : 'D', 2 : 'C', 3 : 'B', 4 : 'A'})
```
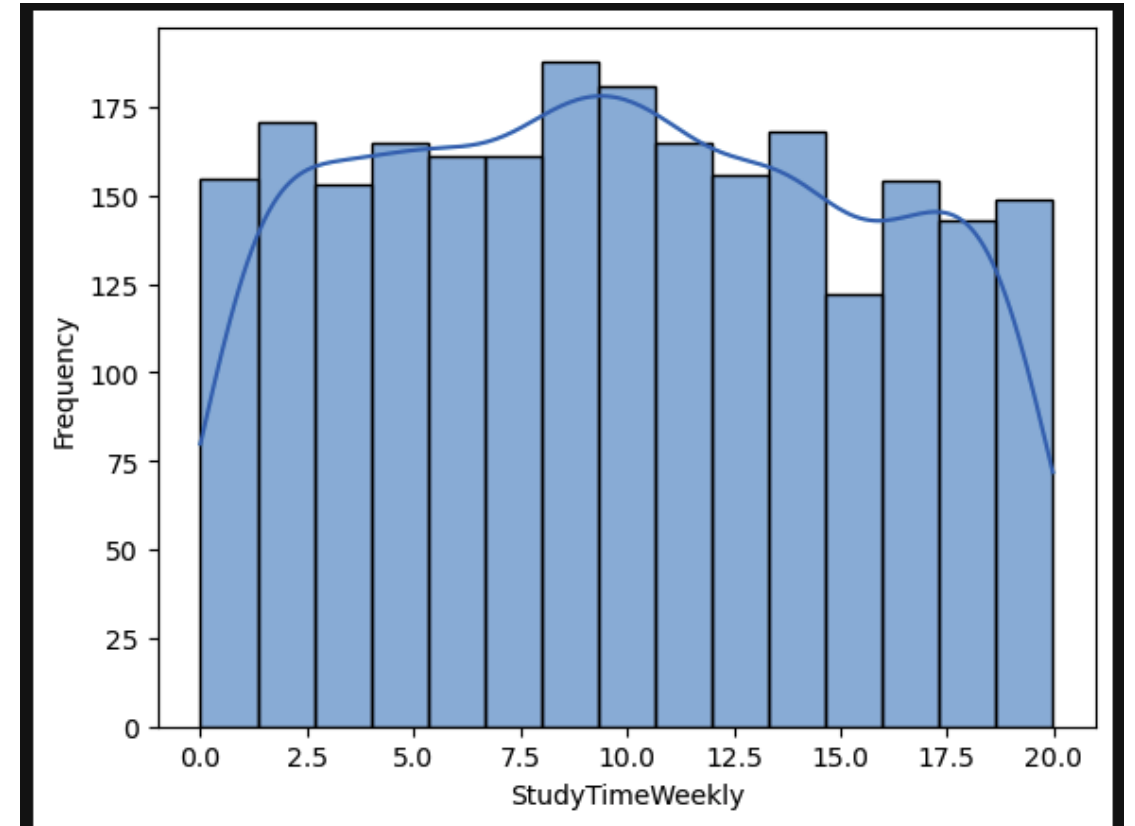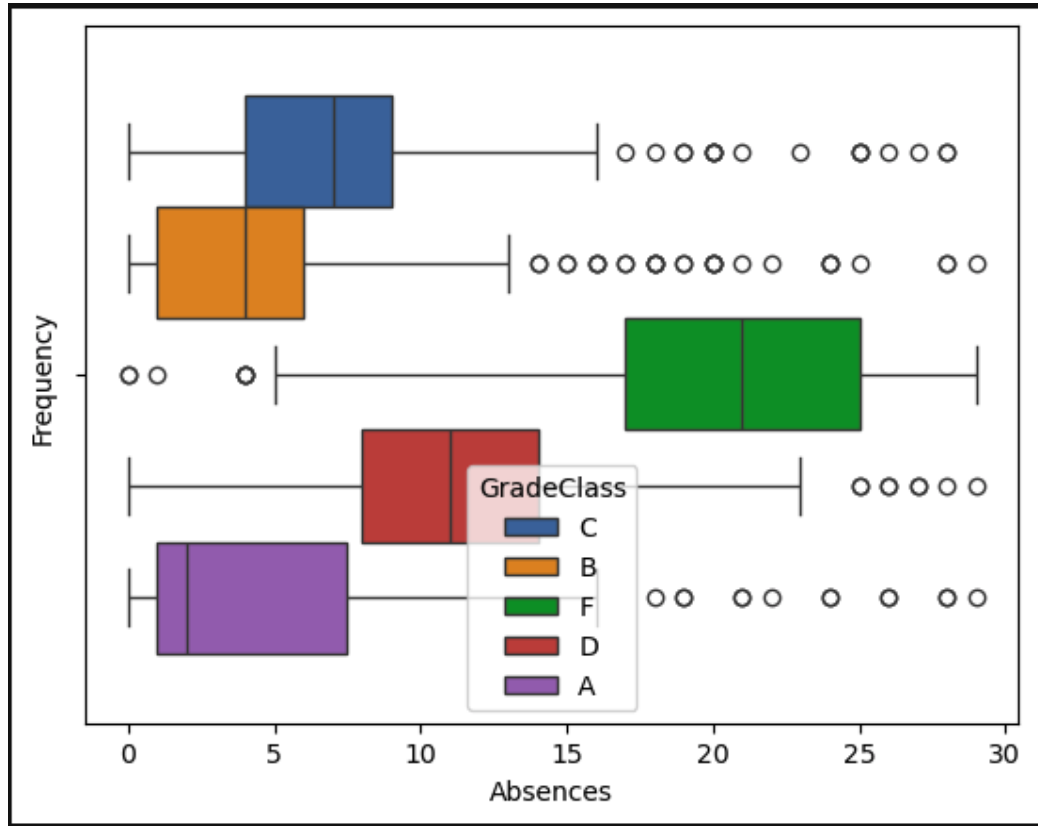
```
df.head()
```

	Age	Gender	Ethnicity	ParentalEducation	StudyTimeWeekly	Absences	Tutoring	ParentalSupport	Extracurricular	Sports	Music	Volunteering	GPA	GradeClass
0	17	Female	Caucasian	2	19.833723	7	1	2	0	0	1	0	2.929196	C
1	18	Male	Caucasian	1	15.408756	0	0	1	0	0	0	0	3.042915	B
2	15	Male	Asian	3	4.210570	26	0	2	0	0	0	0	0.112602	F
3	17	Female	Caucasian	3	10.028829	14	0	3	1	0	0	0	2.054218	D
4	17	Female	Caucasian	2	4.672495	17	1	3	0	0	0	0	1.288061	F

Features Heatmap

Feature Plots

Conclusion

- The model beat the baseline of a 50% chance that student received an F if one were to randomly choose someone from this dataset with each of the three different models tested performed with over 90% accuracy in categorizing students who received an F
    - The other grades beat their baselines as well but did not perform well overall
    - Dataset was filled with half of the students getting an F which gave a rather limited sample size for the remaining grades.

- If you're a parent trying to help your child get a better grade in school, it starts with being in attendance as much as possible
    - A missed class in our model could affect a student's grade on average by about 0.75 points which is almost a full letter grade

- Study habits are of high significance when it comes to getting a better grade as well
    - Having solid study habits as well as a higher-than-average parental support will be key in getting your child to receive a higher grade