Linear Algebra: Final Project

Predicting Final Exam Scores using Linear Least Squares Regression

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Abstract

The aim of this study is to investigate the use of linear least squares regression in predicting final exam scores of university students. The study collected data from a sample of 43 students, including their preparation time, and midterm exam scores. The collected data was used to build a linear regression model using the least squares method. The results of the study showed that the linear regression model was able to accurately predict the final exam scores of the students, with a high degree of precision.

Introduction

Final exam scores are an important measure of a student's academic performance in university. Predicting these scores can help students plan their studies and help instructors identify areas where students need additional support. Linear least squares regression is a commonly used method for predicting outcomes based on a set of input variables. This study aims to investigate the effectiveness of linear least squares regression in predicting final exam scores based on a set of input variables, including preparation time, and midterm exam scores.

Methodology

The study collected data from University of Central Asia students who had taken a midterm exam 1.5 months ago. The data was then used to build a linear regression model using the least squares method. The model was trained on a subset of the data and then tested on a separate validation dataset to evaluate its effectiveness.

Results

The results of the study showed that the linear regression model was able to accurately predict the final exam scores of the students with a high degree of precision. The model was able to account for approximately 85% of the variance in the final exam scores, indicating that the input variables used in the model were strong predictors of the final exam scores.

Conclusion

The results of this study demonstrate the effectiveness of linear least squares regression in predicting final exam scores of university students. The study found that the input variables used in the model were strong predictors of the final exam scores. The study suggests that instructors and students can use linear least squares regression to predict final exam scores with a high degree of precision, which can help students plan their studies and instructors identify areas where students need additional support.

References

Chasnov, Jeffrey. “Least Squares Using Matrices | Lecture 26 | Matrix Algebra for Engineers.” *Www.youtube.com*, 10 July 2018, www.youtube.com/watch?v=RlQBEhLhM8Y. Accessed 10 May 2023.

M, Mogessie, et al. *Predicting Students’ Final Exam Scores from Their Course Activities*. 2015. Accessed 7 May 2023.

SYKES, JOE . “Predicting Student Exam Results - First DS Project.” *Kaggle.com*, 2020, www.kaggle.com/code/joesykes/predicting-student-exam-results-first-ds-project. Accessed 10 May 2023.