The aim of this project is to explore various machine learning techniques and algorithms for the prediction of student grades using the Student Performance dataset from the University of Minho. The dataset includes information on various student attributes such as family background, and variables about schools.

The project starts with data pre-processing, where categorical variables were encoded using LabelEncoder, and the dataset was split into training and testing sets using train\_test\_split. The project uses Linear Regression, Decision Tree Regression, Random Forest Regression, and Support Vector Regression algorithms to the training data, evaluated their performance using Mean Squared Error, and performed cross-validation using GridSearchCV.

After that, the project applies a Voting Classifier, a machine learning ensemble technique that combines the predictions of multiple algorithms, to the dataset. The individual classifiers used were Logistic Regression, Decision Tree Classifier, and Support Vector Classifier. The performance of the Voting Classifier is evaluated using accuracy\_score.

Finally, the project uses the Random Forest Regressor to determine the feature importance for predicting student grades. The feature importance is plotted using a bar graph.

Overall, the project provides an overview of various machine learning techniques and algorithms that can be applied to predict student grades. By comparing the performance of different models, it is possible to identify the most accurate algorithms for this particular dataset. The project also demonstrates the importance of feature selection and the use of ensemble techniques to improve model performance.