

Project-1

Car Price Prediction

In this project, we trained and tested a Random Forest Regressor to predict Car price. The model achieved an R2 Score of 83% on the test set, indicating its potential to predict car price. Finally, we tested the final model with new data

Introduction

The goal of this project was to build a machine learning model that could accurately predict car price. The dataset used for training and testing was obtained and it consists of car details and its actual price such as 'fuel-type', 'aspiration', 'number-of-doors', 'body-style', 'drive-wheels', 'engine-location', 'wheel-base', 'length', 'width', 'height', 'curb-weight', etc.,

Data Preprocessing

Before training the model, we preprocessed the data by removing unnecessary features and replace missing values with mean values. Then, we converting categorical variables to numerical ones using one-hot encoding. We also split the dataset into training and test sets, with 80% of the data used for training and 20% for testing.

Model Selection

After experimenting with different models, we decided to use three models to tune parameters . Three models are Gradient Boosting Regressor, Random Forest Regressor, SGD Regressor for car price prediction. Finally, We chose Random Forest Regressor model because it gives best R2score and less error compared to other model. And also it can handle a large number of features and can identify the most important features for prediction.

Model Training

The model was trained using the training set with a maximum depth of 6 and 100 trees in the forest. We also used grid search to find the optimal hyperparameters for the model.

Model Evaluation

The trained model was evaluated on the test set, achieving an R2 score of 83%, mean absolute error of 1291.81, mean squared error of 2489119.39, and then comparing with train score of 96%. We also tested this final model to predict a new car data and the actual price is 13495 and predicted price is 14715

Conclusion

Overall, the trained Random Forest Regressor achieved an R2 score of 83% on the test set, indicating its potential to predict the car price.

Project-2

Car Class Prediction

In this project, we trained and tested a Logistic Regression to predict Car Class. The model achieved an accuracy of 81% on the test set, indicating its potential to predict car class. Finally, we tested the final model with new data

Introduction

The goal of this project was to build a machine learning model that could accurately predict car class. The dataset used for training and testing was obtained and it consists of car details and its actual class such as 'ID', 'Comp', 'Circ', 'D.Circ', 'Rad.Ra', 'Pr.Axis.Ra', 'Max.L.Ra', 'Scat.Ra', 'Elong', 'Pr.Axis.Rect', 'Max.L.Rect', 'Sc.Var.Maxis', 'Sc.Var.maxis', 'Ra.Gyr', 'Skew.Maxis', 'Skew.maxis', 'Kurt.maxis', 'Kurt.Maxis', 'Holl.Ra'

Data Preprocessing

Before training the model, we preprocessed the data by removing unnecessary features and scale the values using standard scalar. And removing outliers to get better performance. We also split the dataset into training and test sets, with 80% of the data used for training and 20% for testing.

Model Selection

After experimenting with different models, we decided to use three models to tune parameters . Three models are Gradient Boosting Classifier, Random Forest Classifier, Logistic Regression for car class prediction. Finally, We chose Logistic Regression model because it gives best accuracy and F1 Score compared to other model. And also it can handle a large number of features and can identify the most important features for prediction.

Model Training

The model was trained using the training set with a C Value of 2 and 200 maximum iteration. We also used grid search to find the optimal hyperparameters for the model.

Model Evaluation

The trained model was evaluated on the test set, achieving an accuracy score of 81%, precision of average of 80%, recall of average 80%, and F1 score of 81%. We also tested this final model to predict a new car data and the actual class is 0 whereas the predicted class is also 0. We also generated confusion matrix for visual performance.

Conclusion

Overall, the trained Random Logistic Regression achieved an F1 score of 81% on the test set, indicating its potential to predict the car price.