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LITERATURE SURVEY

CAR RESALE VALUE PREDICTION

Abstract –

The price of a new car in the industry is fixed by the manufacturer with some additional costs incurred by the Government in the form of taxes. So, customers buying a new car can be assured of the money they invest to be worthy. But, due to the increased prices of new cars and the financial incapability of the customers to buy them, Used Car sales are on a global increase. Therefore, there is an urgent need for a Used Car Price Prediction system which effectively determines the worthiness of the car using a variety of features. Existing System includes a process where a seller decides a price randomly and buyer has no idea about the car and its value in the present-day scenario. In fact, seller also has no idea about the car's existing value or the price he should be selling the carat. To overcome this problem, we have developed a model which will be highly effective. Regression Algorithms are used because they provide us with continuous value as an output and not a categorized value. Because of which it will be possible to predict the actual price a car rather than the price range of a car. User Interface has also been developed which acquires input from any user and displays the Price of a car according to user's inputs.

Key Words: Linear Regression, used car Prediction,Ridge Regression, Lasso Regression, Decision Tree Regressor

1. INTRODUCTION

Determining whether the listed price of a used car is a challenging task, due to the many factors that drive a used vehicle's price on the market. The focus of this project is developing machine learning models that can accurately predict the price of a used car based on its features, in order to make informed purchases. We implement and evaluate various learning methods on a dataset consisting of the sale prices of different makes and models. We will compare the performance of various machine learning algorithms like Linear Regression, Ridge Regression, Lasso Regression, Elastic Net, Decision Tree Regressor and choose the best out of it. Depending on various parameters we will determine the price of the car. Regression Algorithms are used because they provide us with continuous value as an output and not a

categorized value because of which it will be possible to predict the actual price a car rather than the price range of a car. User Interface has also been developed which acquires input from any user and displays the Price of a car accordingto user's inputs.

1.1 Literature Survey

The first paper is Predicting the price of Used Car Using Machine Learning Techniques. In this paper, they investigate the application of supervised machine learning techniques to predict the price of used cars in Mauritius. The predictions are based on historical data collected from daily newspapers. Different techniques like multiple linear regression analysis, k-nearest neighbors, naïve bayes and decision trees have been used to make the predictions. The Second paper is Car Price Prediction Using Machine Learning Techniques. Considerable number of distinct attributes are examined for the reliable and accurate prediction. To build a model for predicting the price of usedcars in Bosnia and Herzegovina, they have applied three machine learning techniques (Artificial Neural Network, Support Vector Machine and Random Forest). The Third paper is Price Evaluation model in secondhand car system based on BP neural networks. In this paper, theprice evaluation model based on big data analysis is proposed, which takes advantage of widely circulated vehicle data and many vehicle transaction data to analyze the price data for each type of vehicles by using the optimized BP neural network algorithm. It aims to establish
a second-hand car price evaluation model to get the pricethat best matches the car.

1.2 Requirements

Hardware requirements

Operating system- Windows 7,8,10
Processor- dual core 2.4 GHz (i5 or i7 series Intel processoror equivalent AMD)
RAM-4GB
Software RequirementsPython
PyCharmPIP 2.7
Jupyter NotebookChrome

2. METHODOLGY

There are two primary phases in the system: 1. Training phase: The system is trained by using the data in the data set and fits a model (line/curve) based on the algorithm chosen accordingly. 2. Testing phase: the system is provided with the inputs and is tested for its working. The accuracy is checked. And therefore, the data that is used to train the model or test it, has to be appropriate. The system is designed to detect and predict price of used car and hence appropriate algorithms must be used to do the two different tasks. Before the algorithms are selected for further use, different algorithms were compared for its accuracy. The well-suited one for the task was chosen.

2.1 Objective

To develop an efficient and effective model which predicts the
price of a used car according to user's inputs.
To achieve good accuracy.
To develop a User Interface(UI) which is user-friendly andtakes input from the user and predicts the price.

3. PROPOSED SYSTEM

the process starts by collecting the dataset. The next step is to do Data Preprocessing which includes Data cleaning, Data reduction, Data Transformation. Then, using various machine learning algorithms we will predict the price. The algorithms involve Linear Regression, Ridge Regression and Lasso Regression. The best model which predicts the most accurate price is selected. After selection of the best modelthe predicted price is displayed to the user according to user's inputs. User can give input through website to for used car price prediction to machine learning model.

Linear Regression

Linear Regression attempt to model the relationship between two variables by fitting a linear equation to observed data. The other is dependentvariable. For Example: A modeler might want to relate weights of individuals to their heights using a linear regression model.

Linear Regression

Linear regression is useful for finding relationshipbetween multiple continuous variables
There are multiple independent variables and singleindependent variables

$y = m_1X_1 + m_2X_2 + .. + b$

m_1, m_2, m_3 ▢ slope

b ▢ y intercept

X_1, X_2, X_3 ▢ independent variables

y ▢ dependent variables.Ridge Regression

A Ridge regressor is basically a regularized version of Linear Regressor.

The regularized term has the parameter 'alpha' which controls the regularization of the model i.e., helps in reducingthe variance of the estimates.

Lasso Regression

The "LASSO" stands for Least Absolute Shrinkage

and Selection Operator. Lasso regression is a regularization technique. It is used over regression methods for a more accurate prediction. This model uses shrinkage. Shrinkage iswhere data values are shrunk towards a central point as themean. The lasso procedure encourages simple, sparse models (i.e., models with fewer parameters). This regression is well-suited for models showing high levels of multicollinearity or when you want to automate certain parts of model selection, like variable selection/parameter elimination.

4. FUTURE SCOPE

In future this machine learning model may bind with variouswebsite which can provide real time data for price prediction. Also, we may add large historical data of car pricewhich can help to improve accuracy of the machine learningmodel. We can build an android app as user interface for interacting with user. For better performance, we plan to judiciously design deep learning network structures, use adaptive learning rates and train on clusters of data rather than the whole dataset.

5. CONCLUSION

The increased prices of new cars and the financial incapability of the customers to buy them, Used Car sales areon a global increase. Therefore, there is an urgent need for a Used Car Price Prediction system which effectively determines the worthiness of the car using a variety of features. The proposed system will help to determine the accurate price of used car price prediction. This paper compares 3 different algorithms for machine learning: Linear Regression, Lasso Regression and Ridge Regression.

REFERENCES

[1]   Sameerchand Pudaruth, "Predicting the Price of UsedCars using Machine Learning Techniques"; (IJICT 2014)

[2] Enis gegic, Becir Isakovic, Dino Keco, Zerina Masetic, Jasmin Kevric, "Car Price Prediction Using MachineLearning"; (TEM Journal 2019)

[3]   Ning sun, Hongxi Bai, Yuxia Geng, Huizhu Shi, "Price Evaluation Model In Secondhand Car System Based OnBP Neural Network Theory"; (Hohai University Changzhou, China)

[4]   Nitis Monburinon, Prajak Chertchom, Thongchai Kaewkiriya, Suwat Rungpheung, Sabir Buya, PitchayakitBoonpou, "Prediction of Prices for Used Car by using Regression Models" (ICBIR 2018)

[5]   Doan Van Thai, Luong Ngoc Son, Pham Vu Tien, NguyenNhat Anh, Nguyen Thi Ngoc Anh, "Prediction car prices using qualify qualitative data and knowledge-based system" (Hanoi National University)