

PROJECT REPORT

Resale value preditcion Using Watson Auto AI

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1.INTRODUCTION

a.Overview

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 across cities in the United States. Our results show that Random Forest model and K-Means clustering with linear regression yield the best results, but are compute heavy. Conventional linear regression also yielded satisfactory results, with the advantage of a significantly lower training time in comparison to the aforementioned methods.

b.Purpose

Deciding whether a used car is worth the posted price when you see listings online can be difficult. Several factors, including number of km it drove, power, fuel type, time in which vehicle got registered, model of the car etc can influence the actual worth of a car. From the perspective of a seller, it is also a dilemma to price a used car appropriately. Based on existing data, the aim is to use machine learning

algorithms in Auto AI services of IBM cloud to develop models for predicting used car prices and for deployment watson studio in IBM cloud is used. Application UI is build using Nodered service.

2.LITERATURE SURVEY

2.1 Existing Problem

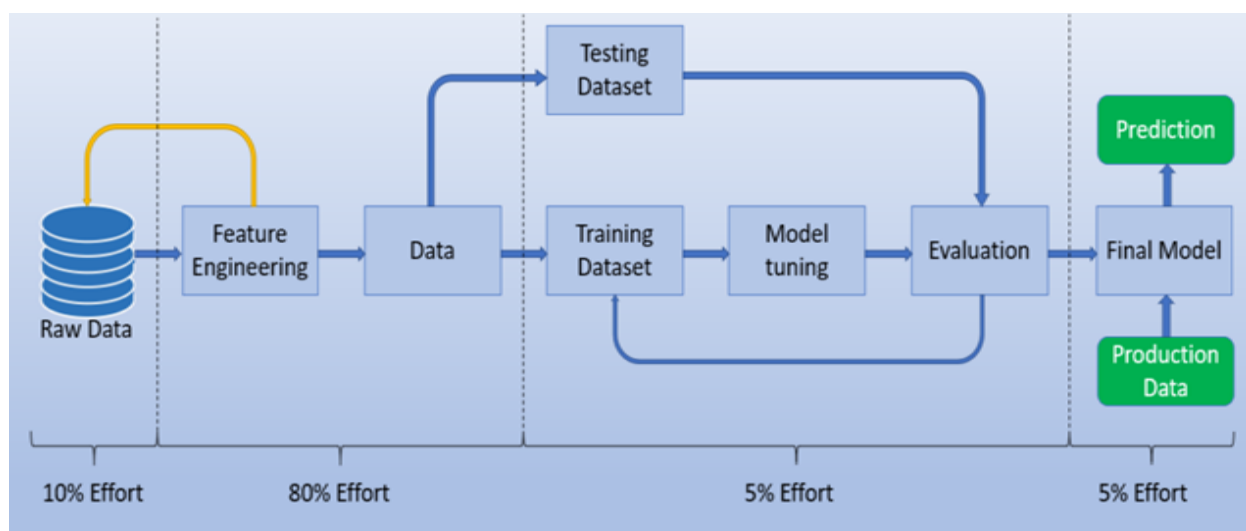
With difficult economic conditions, it is likely that sales of second-hand imported (reconditioned) cars and used cars will increase. In many developed countries, it is common to lease a car rather than buying it outright. A lease is a binding contract between a buyer and a seller (or a third party – usually a bank, insurance firm or other financial institutions) in which the buyer must pay fixed instalments for a pre-defined number of months/years to the seller/financer. After the lease period is over, the buyer has the possibility to buy the car at its residual value, i.e. its expected resale value. Thus, it is of commercial interest to seller/financers to be able to predict the salvage value (residual value) of cars with accuracy. Since we are using large number of data which become difficult for human to understand and analyse.so predicting the price of car by considering all factors out of n number of cars is difficult.

2.2 Proposed Solution

Based on the factors in dataset the resale value prediction project built in IBM cloud which is user friendly and make our work easier. For this project Machine Learning Service, IBM Watson Studio Auto AI Service are used. The model is deployed on IBM cloud to get value of certain vehicle that is it give scoring end-point which can be used as API in mobile or web application building. We are developing the web application using Nodered service.

3.THEORETICAL ANALYSIS

3.1 Block Diagram



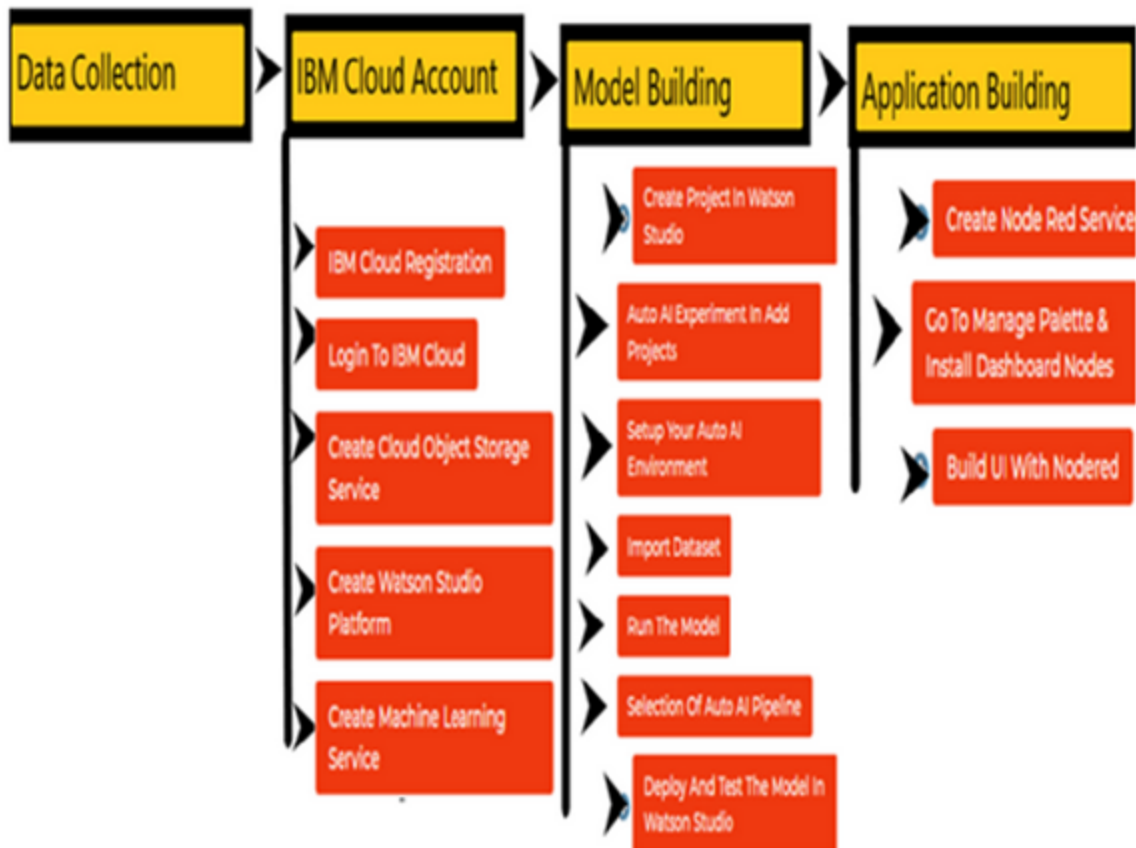
3.2 Hardware/Software Designing

The project has been done using IBM cloud in which machine learning, watson studio and cloud storage for storing the dataset are created using the option in catalog. Watson Auto AI uses eight different pipeline to predict the best one which has least RMSE value. Node Red App service is required to get authentication easily and get predicted grade on Node Red Dashboard or building UI Application.

4.EXPERIMENTAL INVESTIGATION

The project resale value prediction consider dataset consist of factors such as DateCrawled, Name, SellerOfferType, Abtest, Vehicle, TypeYearOfRegistration, Gearbox, PowerPS, Model, Kilometer, MonhOfRegistration, FuelType, Brand, NotRepairedDamage, DateCreated, NrOfPictures, PostalCode, LastSeen. These data are collected and formatted in a proper way. Then it is uploaded in Watson Studio Auto AI Experiment. After it is uploaded to cloud storage service, it become ready and then implemented. Based on these implementation, the resale value of used car using the data from dataset. Then the application is built using Nodered Service.

5. FLOWCHART



The resale value prediction project can be implemented in four steps.

1. The first step include collection of dataset with all parameters.
2. The second step is in IBM Cloud. Here the steps consist of IBM cloud registration i.e. Login to account and then create cloud object service to store collected

data, then create Watson studio platform and machine learning service.

3. The third step is model building. It includes create the project in Watson studio, set up Auto AI Environment. Import dataset and run the model. Select and save the Auto AI pipeline which has least RMSE value. And then deploy and test model in Watson studio.

4. The fourth step is application building. It consist of creating Node Red service. Then go to 'Manage Palette' and install required nodes. Later build UI with Node Red.

6.RESULT

After implementation, deployment of project the result that is predicted price of used car can be seen in Node Red UI. The predicted value depends on different parameters in the dataset. The Node Red UI provide us easierway to get the result of Auto AI Experiment.

The predicted price of used car by Node Red UI is as follows:

Resale Value Prediction

Resale value preditcion

DateCrawled *

4/4/2016 17:36

Name *

BMW_316_e3

Seller *

privat

OfferType *

Angebot

Abtest *

Test

VehicleType *

limousine

YearOfRegistration *

1995

Gearbox *

manuell

PowerPS *

102

Resale Value Prediction

Model *

3er

Kilometer *

150000

MonthOfRegistration *

10

FuelType *

Benzin

Brand *

bmw

NotRepairedDamage *

ja

DateCreated *

4/4/2016 0:00

NrOfPictures *

0

PostalCode *

33775

LastSeen *

4/6/2016 19:17



Voi) LTE 81% 11:53 am



w.eu-gb.mybluemix.net

3



Resale Value Prediction

Model *

3er

Kilometer *

150000

MonthOfRegistration *

10

FuelType *

Benzin

Brand *

bmw

NotRepairedDamage *

ja

DateCreated *

4/4/2016 0:00

NrOfPictures *

0

PostalCode *

33775

LastSeen *

4/6/2016 19:17

7.ADVANTAGES & DISADVANTAGES

Advantage:

1. can handle multi-dimensional and multi-variety data
2. human intervention not needed
3. easy to implement repeatedly and easily recognise trends as well as patterns
4. fastly accessible
5. continuous improvement and wide application

Disadvantage:

1. dependence of provider or networks
2. take more time and resources
3. loss of control of data and interpretation of results
4. lack of security and high error susceptibility

8.APPLICATIONS

Using The Auto AI Experiment, you can build and deploy a machine learning model with sophisticated training features and no coding. The tool does most of the work for you. In this project , the UI model building can help buyers to predict the value of used car by giving value for few factors. The Node Red service provide us a better user interface through which anyone can deploy machine learning model and get predicted price of used car.

9. CONCLUSION

By performing different models, it was aimed to get different perspectives and eventually compared their performance. With this study, it purpose was to predict prices of used cars by using a dataset that has 19 predictors and more than 3lakh observations. With the help of the data visualizations and exploratory data analysis, the dataset was uncovered and features were explored deeply. The relation between features were examined. By considering all four metrics it can be concluded that XGBoost the best model for the prediction for used car prices. XGBoost gave the best MAE, MSE and RMSE values. By using IBM Cloud the model processing is been done in Auto AI services in IBM cloud and then the deployment is been done in Watson studio and application is build using Nodered service which has been successful as we are able to get the desired output.

10. FUTURE SCOPE

Since the growth of Auto AI and machine learning algorithms are continuous which make them a great source of information and predicted results, the Models can be used to improve our performance in different fields and will reduce human efforts. The Auto AI Experiments also have a big job opportunity. For better performance, we plan to judiciously design deeplearning network structures, use adaptive learning rates and train on clusters of data rather than the whole dataset. The resale value prediction project can lead to provide dedicated support to buyer who is in need of buying used car.

11.BIBILOGRAPHY

Appendix

A.Source Code

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