PROJECT REPORT

ON

RESALE VALUE PREDICTION USING WATSON AUTO AI

BY

Tanishka Kohli (tanishka.kohli00@gmail.com)

Prathiksha (prathiksha20p@gmail.com)

Bharath Chandra (bharathchandra1909@gmail.com)

1. Introduction.....3
1.1 Overview..... 3
1.2 Purpose..... 3
2. Literature Survey 4
2.1 Existing Problem..... 4
2.2 Proposed Solution.....4
3. Theoretical Analysis.....5-9
3.1 Block Diagram.....5
3.2 Hardware / Software Designing.....6-9
4. Experimental Investigations..... 10-11
5. Flowchart 12
6. Result 13
7. Advantages & Disadvantages.....14
8. Applications.....14
9. Conclusion 14
10. Future Scope.....14
11. Bibliography 15
12.Appendix 15
A. Source code.....16-18

1. INTRODUCTION

1.1 Overview

In this project we will predict the resale value of cars using Watson Auto AI.We will be using IBM Cloud Services(Watson Auto Ai,Node-Red) to deliver an effective web based UI through which we can predict the price of the cars.
Project Requirements :IBM Cloud,IBM Watson Auto AI,Node-Red ,Node JS.
Functional Requirements :IBM Cloud.
Software Requirements :Watson Auto Ai,Node-Red.
Project deliverables :Resale value prediction using Watson Auto AI
Project team :Prathiksha ,Tanishka kohli and Bharath Chandra.

1.2 Purpose

The purpose of this project is to predict price of used cars as it is difficult with this economic condition to predict.The sale of second hand imported cars and used cars will increase and there will be lease between buyer and seller .After the lease is over, the buyer has possibility of buying the car at its residual valueso it is important to predict the residual value of the cars.

2. LITERATURE SURVEY

2.1. Existing problem:

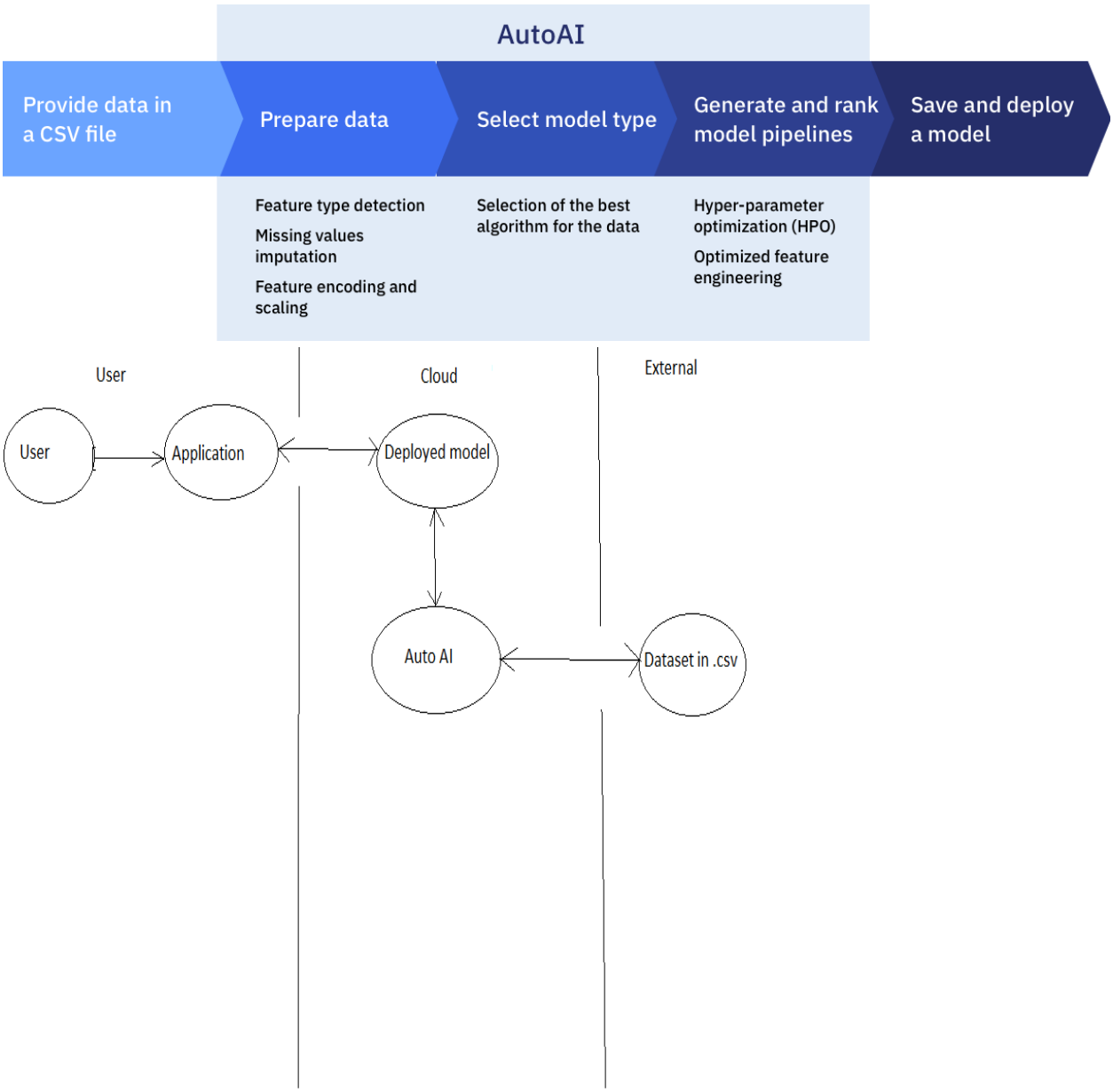
With difficult economic conditions, it is likely that sales of second-hand imported(reconditioned) cars and used cars will increase. In many developed countries, it is common tolease a car rather than buying it outright. A lease is a binding contract between a buyer and a seller (or a third party – usually 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.

2.2 Proposed Solution:

Considering the main factors which would affect the resale value of a vehicle a regression model is to be built that would give the nearest resale value of the vehicle. The main factors are the time in which vehicle got registered, number of kms it drove, power, type of gear box, model of the car, any damage or repair, fuel type etc. and the model processing is been done in Auto AI services in IBM cloud and then the deployment is been done in Watson studio.

3. Theoretical Analysis

3.1 Block/flow diagram



3.2 Hardware /Software designing

Step 1:Create IBM Cloud account and create IBM Watson Studio .

Step 2:Build and Train the experiment

2.1 Specify basic experiment details

1.From the Assets page of your project, click Add to project and choose Auto AI Experiment.

2.In the page that opens, fill in the basic fields:

Specify a name and optional description for your new experiment.

Confirm that the IBM Watson Machine Learning service instance that you associate with your project is selected in the machine learning service selection.

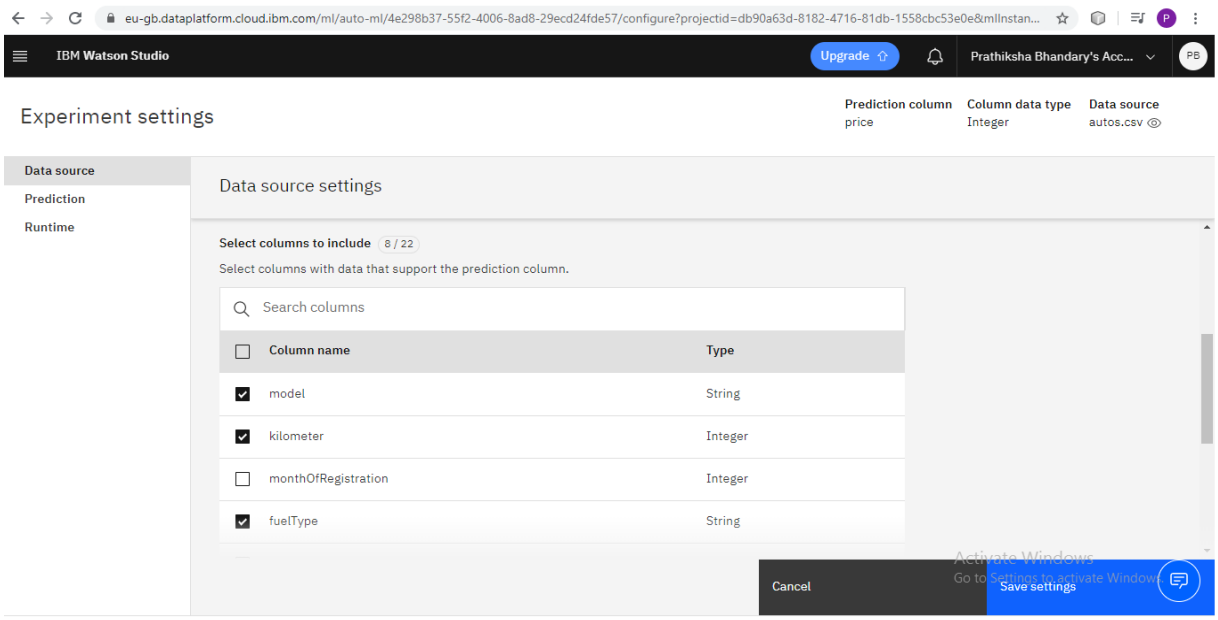
3.Click Create.

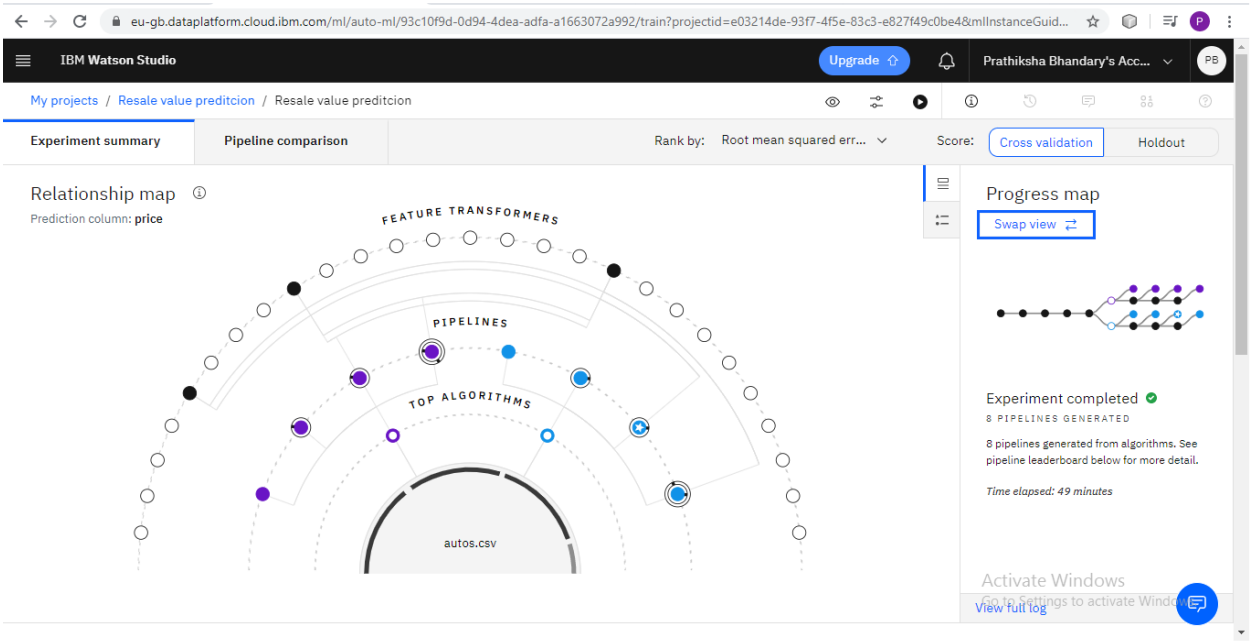
2.2 Add training data

Upload the training data file, auto.csv, from your local computer by dragging the file onto the data panel or by clicking browse and then following the prompts.

2.3 Train the model

Choose the column you want to predict and also in add experiment select the columns withe the data that supports prediction column save it and select run the experiment

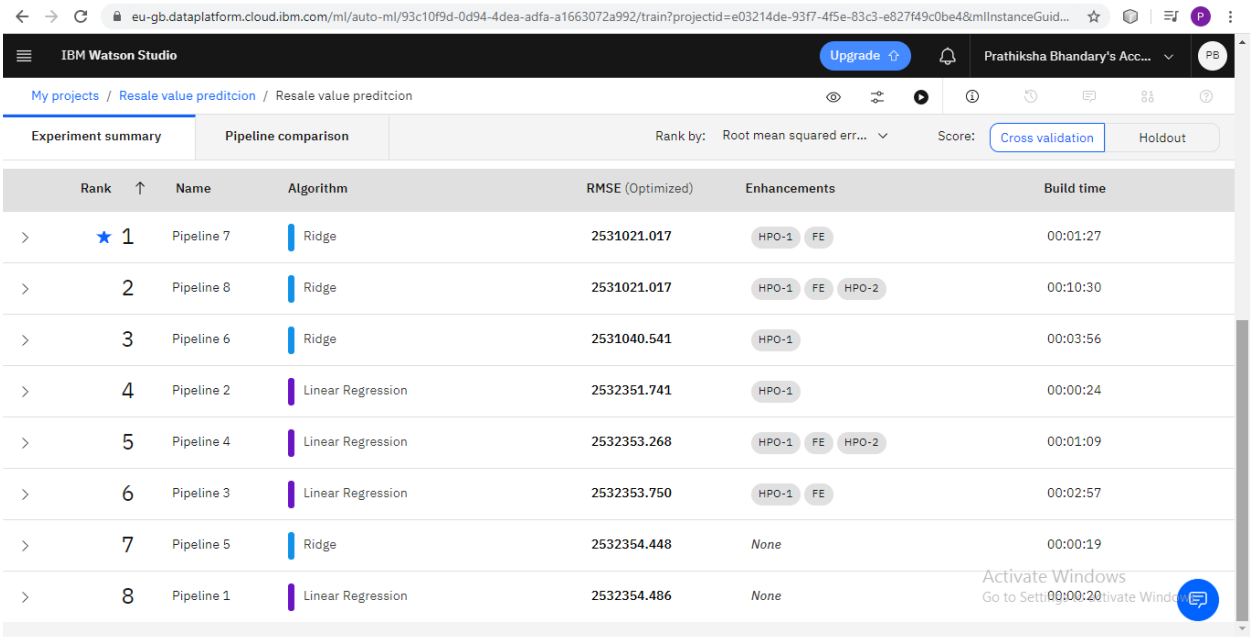




As the model trains, you will see an infographic that shows the process of building the pipelines.

2.4 Choose a pipeline

Once the pipeline creation is complete, you can view and compare the ranked pipelines in a leaderboard.



Choose Save model from the action menu for Pipeline 7. This saves the pipeline as a Machine Learning asset in your project.

Step 3 :Deploy the Model

Before you can use your trained model to make predictions on new data, you must deploy the model.Clicking on the model name in the notification displayed when you save the model

From the model details page:

Click the Deployments tab.

Click Add Deployment.

In the page that opens, fill in the fields:

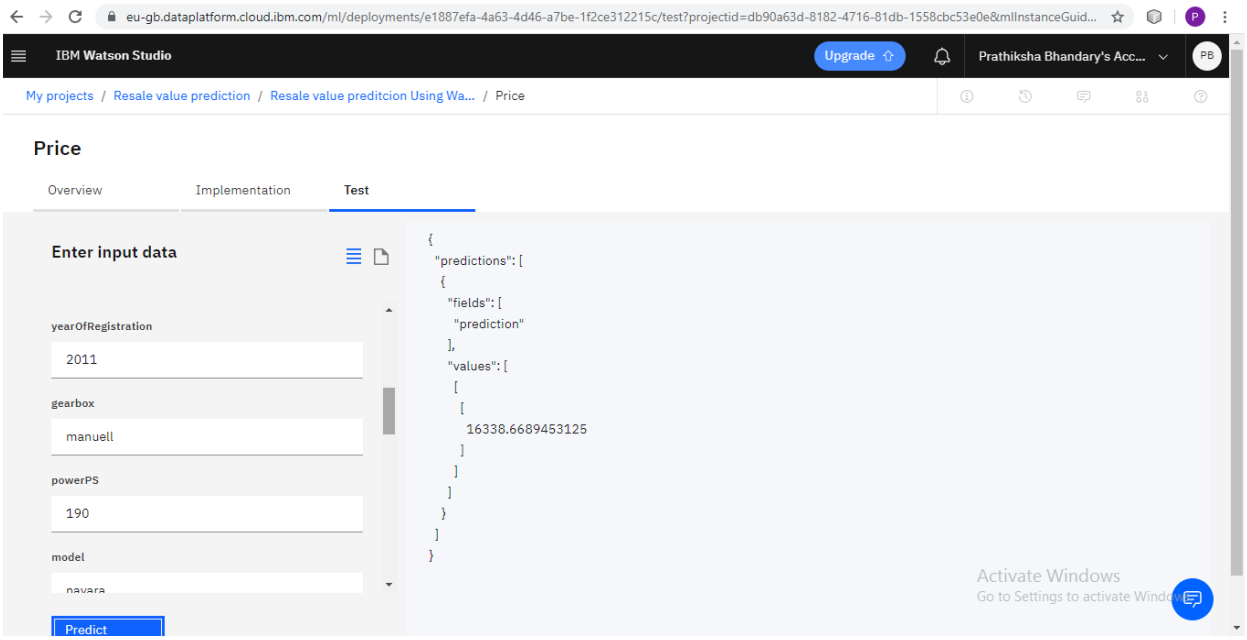
Specify a name for the deployment.

Click Save.

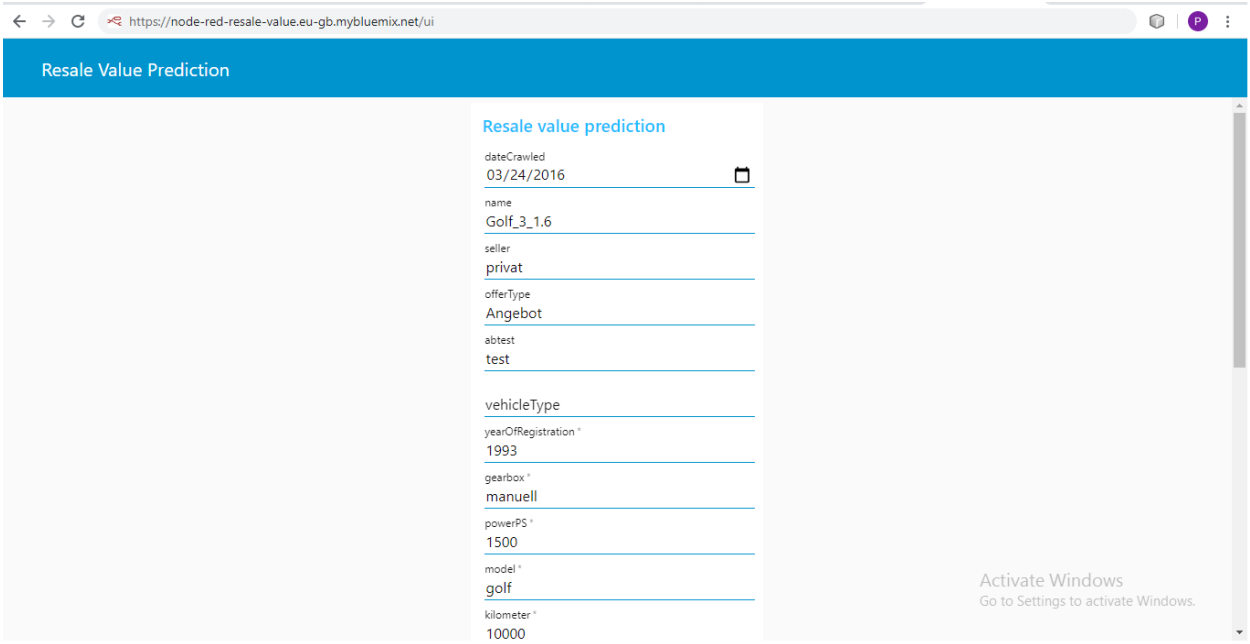
After you save the deployment, click on the deployment name to view the deployment details page.

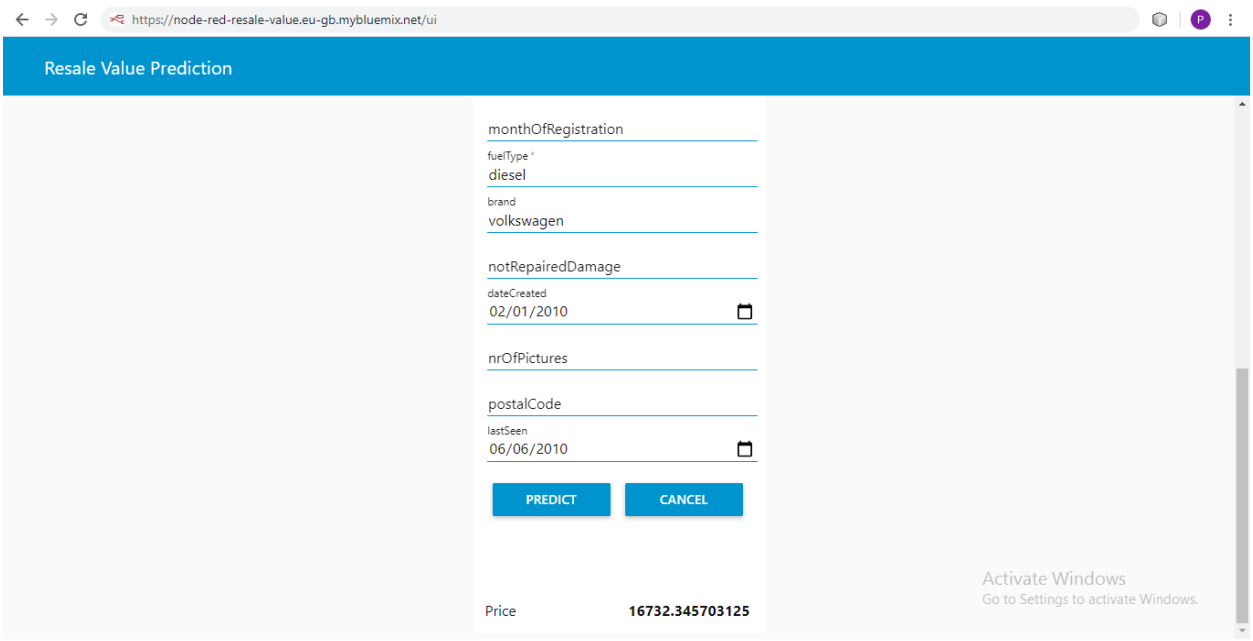
Step 4:Test the Deployed model

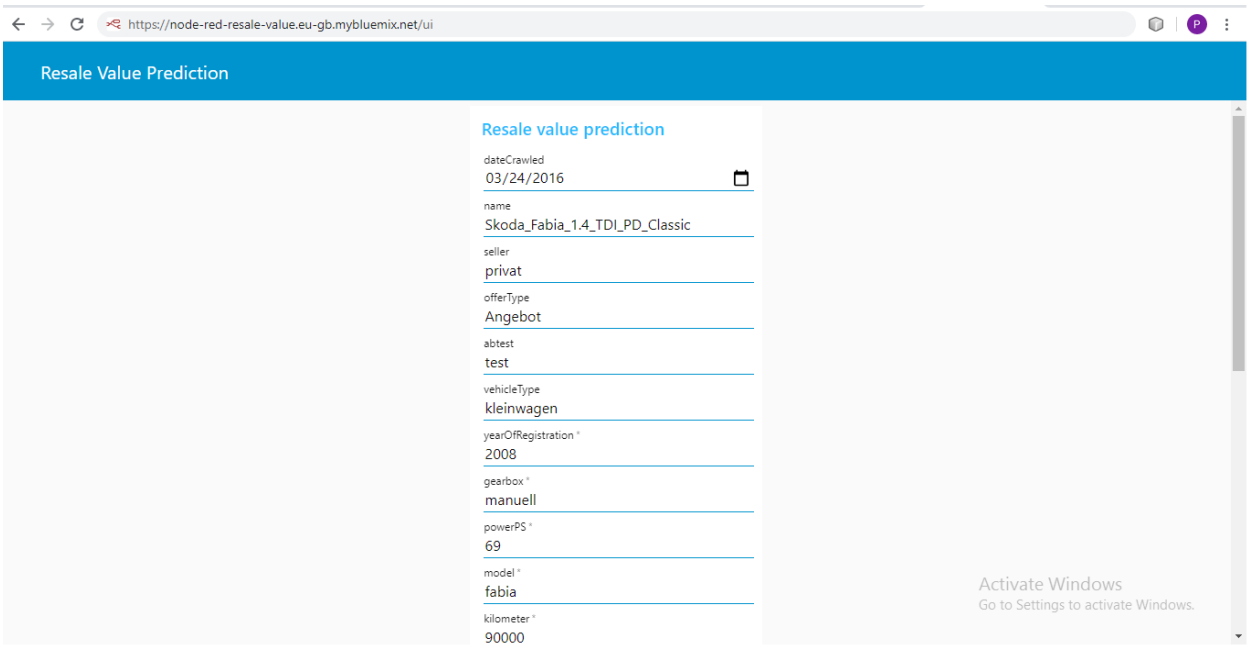
You can test the deployed model from the deployment details page:
On the Test tab of the deployment details page, either fill out the form with test values, or enter the following JSON test data.
Click predict to predict the price .

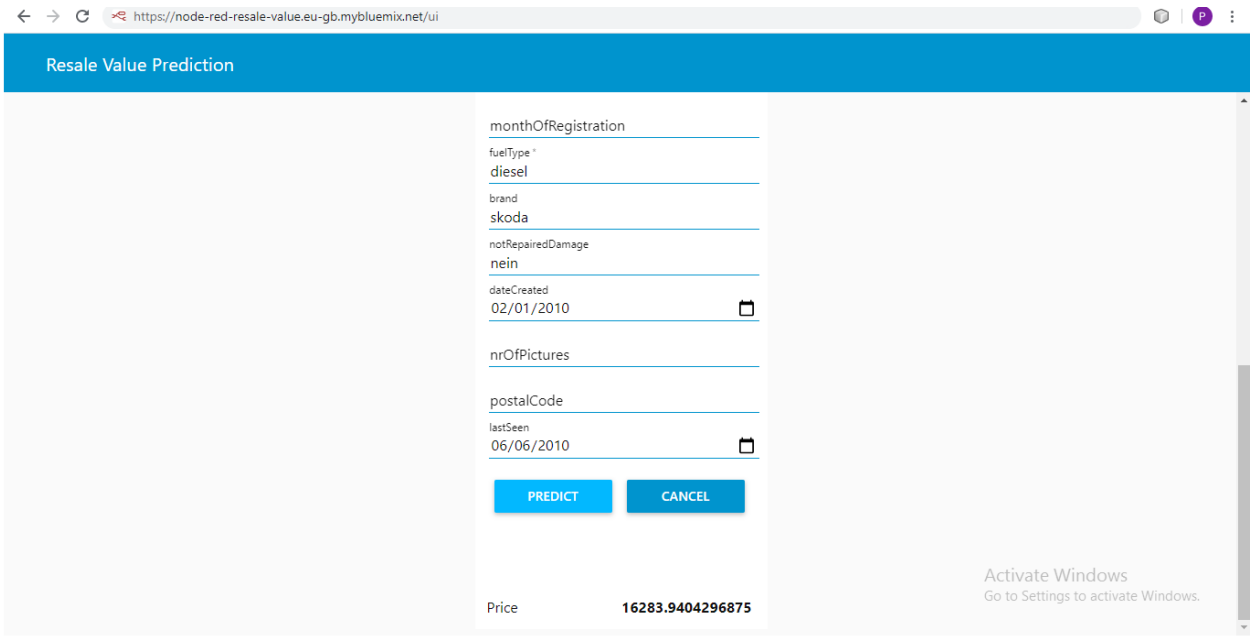


4. Experiment Investigation





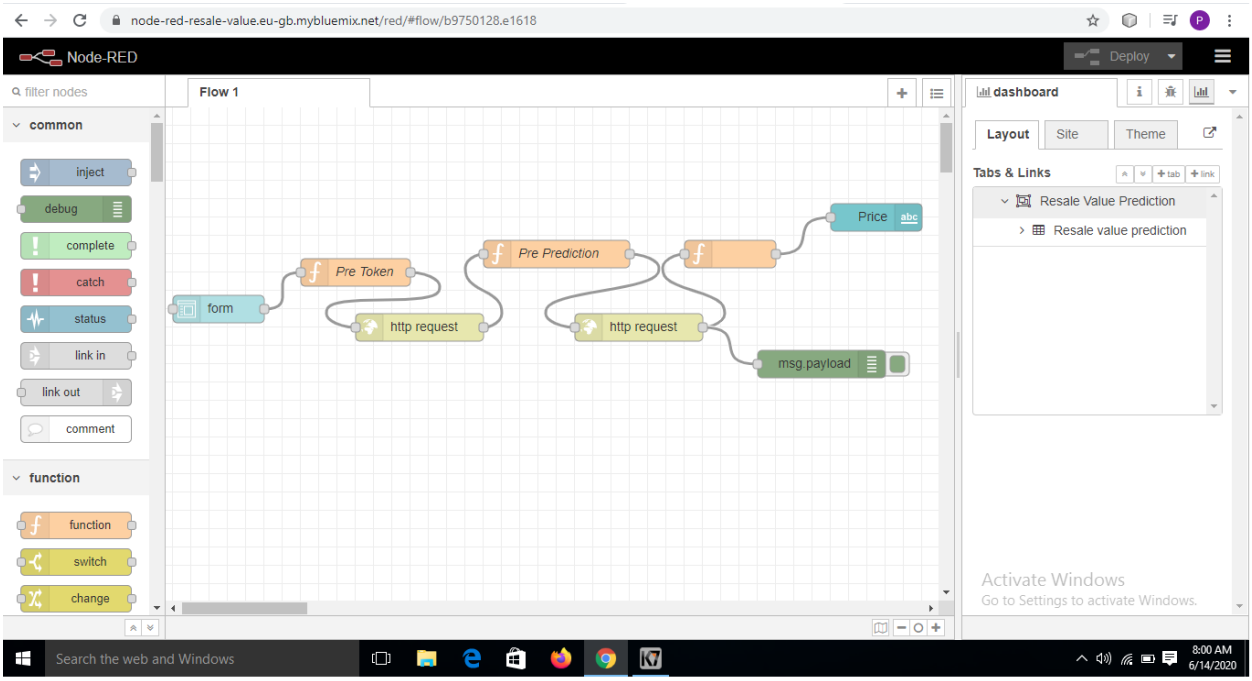

https://node-red-resale-value.eu-gb.mybluemix.net/ui
Resale Value Prediction
Resale value prediction
dateCrawled
03/24/2016
name
Skoda_Fabia_1.4_TDI_PD_Classic
seller
privat
offerType
Angebot
abtest
test
vehicleType
kleinwagen
yearOfRegistration *
2008
gearbox *
manuell
powerPS *
69
model *
fabia
kilometer *
90000
Activate Windows
Go to Settings to activate Windows.


https://node-red-resale-value.eu-gb.mybluemix.net/ui
Resale Value Prediction
monthOfRegistration
fuelType *
diesel
brand
skoda
notRepairedDamage
nein
dateCreated
02/01/2010
nrOfPictures
postalCode
lastSeen
06/06/2010
PREDICT
CANCEL
Price
16283.9404296875
Activate Windows
Go to Settings to activate Windows.

5. Flowchart

Insert the following nodes into the flow in Node-Red.

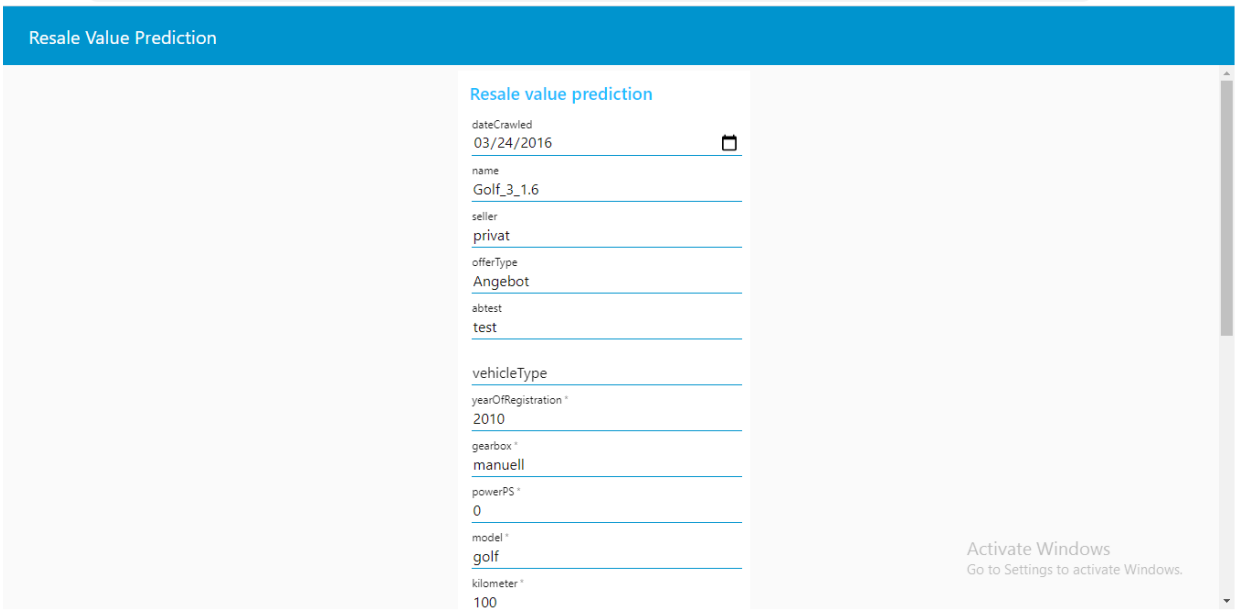
- ui_Form
- Input
- Function
- Http request
- Text
- Debug

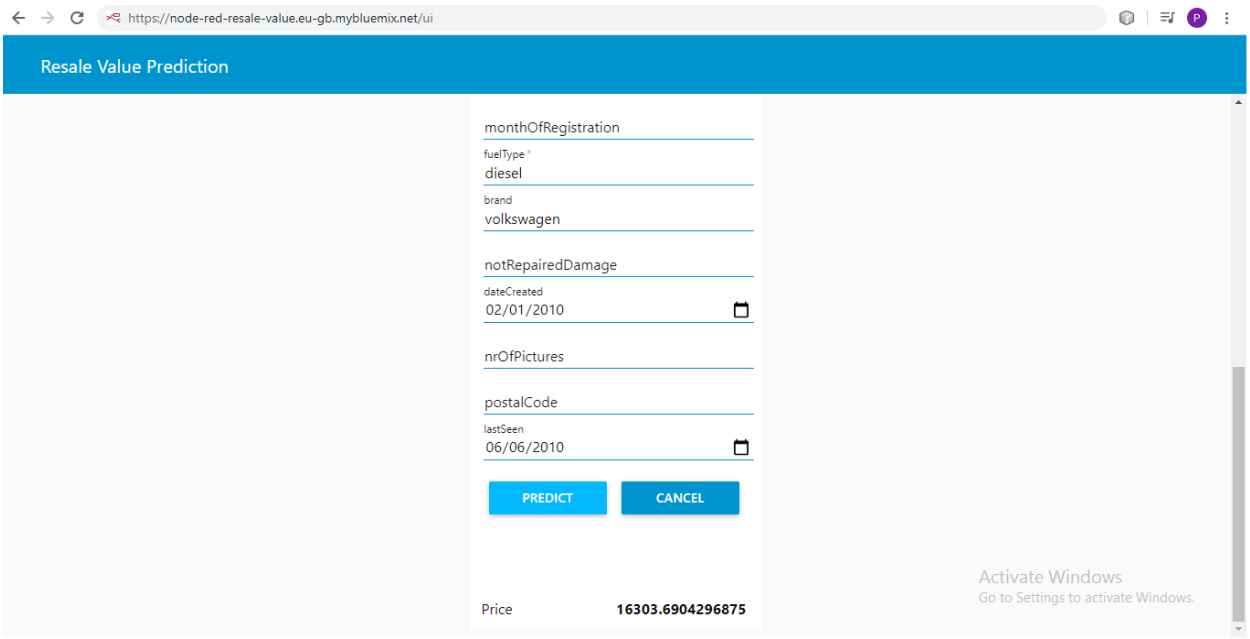


6. Result

Web based UI was developed by integrating all the sevices using NODE-RED

URL for UI dashboard : https://node-red-resale-value.eu-gb.mybluemix.net/ui





7. Advantages and Disadvantages

Advantages

1. Reduces Humans work
2. Faster decisions
3. Reduction in human errors
4. Cost efficient

Disadvantages

1. Error susceptable
2. Utilizes resource to build

8. Applications

- Byer and Seller (or a third party – usually a bank, insurance firm or other financial institutions)can deploy this to predict price.
- Can be used in second hand/ used car Showrooms.

9. Conclusion

A Resale value preditcion is created using watson auto ai and application is built using Node-Red

10. Future Scope

As future work, we intend to collect more data and to use more advanced techniques like artificial neural networks,image recognisation, fuzzy logic and genetic algorithms to predict cars.

11. Bibilography

11. Bibliography

1.Auto AI with IBM Watson studio :
https://www.ibm.com/in-en/cloud/watson-studio/autoai

2.Node-RED starter application :
https://developer.ibm.com/tutorials/how-to-create-a-node-red-starter-application/

12. Appendix

Our github repository :

https://github.com/tkohli/Resale-value-preditcion-Using-Watson-Auto-AI

tkohli/Resale-value-preditcion-Using-Watson-Auto-AI

URL for UI dashboard :

https://node-red-resale-value.eu-gb.mybluemix.net/ui

A. Source Code

Node-RED Flow code

[{"id":"b9750128.e1618","type":"tab","label":"Flow 1","disabled":false,"info":""},{"id":"4caa8268.26f83c","type":"ui_form","z":"b9750128.e1618","name":"","label":"","group":"1d84a555.18b5fb","order":1,"width":0,"height":0,"options":[{"label":"dateCrawled","value":"dc","type":"date","required":false,"rows":null},{"label":"name","value":"na","type":"text","required":false,"rows":null},{"label":"seller","value":"se","type":"text","required":false,"rows":null},{"label":"offerType","value":"ot","type":"text","required":false,"rows":null},{"label":"abtest","value":"ab","type":"text","required":false,"rows":null},{"label":"vehicleType","value":"vt","type":"text","required":false,"rows":null},{"label":"yearOfRegistration","value":"ye","type":"number","required":true,"rows":null},{"label":"gearbox","value":"gb","type":"text","required":true,"rows":null},{"label":"powerPS","value":"ps","type":"number","required":true,"rows":null},{"label":"model","value":"md","type":"text","required":true,"rows":null},{"label":"kilometer","value":"km","type":"number","required":true,"rows":null},{"label":"monthOfRegistration","value":"mr","type":"text","required":false,"rows":null},{"label":"fuelType","value":"ft","type":"text","required":true,"rows":null},{"label":"brand","value":"bd","type":"text","required":false,"rows":null},{"label":"notRepairedDamage","value":"rd","type":"text","required":false,"rows":null},{"label":"dateCreated","value":"dce","type":"date","required":false,"rows":null},{"label":"nrOfPictures","value":"npc","type":"number","required":false,"rows":null},{"label":"postalCode","value":"pc","type":"number","required":false,"rows":null},{"label":"lastSeen","value":"ls","type":"date","required":false,"rows":null}],"formValue":{"dc":"","na":"","se":"","ot":"","ab":"","vt":"","ye":"","gb":"","ps":"","md":"","km":"","mr":"","ft":"","bd":"","rd":"","dce":"","npc":"","pc":"","ls":""},"payload":"","submit":"Predict","cancel":"cancel","topic":"","x":70,"y":220,"wires":[["7c42ae1.81dd15"]]},{"id":"7c42ae1.81dd15","type":"function","z":"b9750128.e1618","name":"Pre Token","func":"global.set(\"dc\",msg.payload.dc)\nglobal.set(\"na\",msg.payload.na)\nglobal.set(\"se\",msg.payload.se)\nglobal.set(\"ot\",msg.payload

.ot)\nglobal.set(\"ab\",msg.payload.ab)\nglobal.set(\"vt\",msg.payload.vt)\nglobal.set(\"ye\",msg.payload.ye)\nglobal.set(\"gb\",msg.payload.gb)\nglobal.set(\"ps\",msg.payload.ps)\nglobal.set(\"md\",msg.payload.md)\nglobal.set(\"km\",msg.payload.km)\nglobal.set(\"mr\",msg.payload.mr)\nglobal.set(\"ft\",msg.payload.ft)\nglobal.set(\"bd\",msg.payload.bd)\nglobal.set(\"rd\",msg.payload.rd)\nglobal.set(\"dce\",msg.payload.dce)\nglobal.set(\"npc\",msg.payload.npc)\nglobal.set(\"pc\",msg.payload.pc)\nglobal.set(\"ls\",msg.payload.ls)\nvar apikey=\"DtV2w_p5MNtfcUO40ub-S621uHM0YjlrPkU7k3B2P4qT\"\nmsg.headers={\"Content-Type\":\"application/x-www-form-urlencoded\"}\nmsg.payload={\"grant_type\":\"urn:ibm:params:oauth:grant-type:apikey\",\"apikey\":apikey}\nreturn msg;","outputs":1,"noerr":0,"x":220,"y":180,"wires":[["f1c6bd2b.e729b"]]},{"id":"f1c6bd2b.e729b","type":"http request","z":"b9750128.e1618","name":"","method":"POST","ret":"obj","paytoqs":false,"url":"https://iam.bluemix.net/identity/token","tls":"","persist":false,"proxy":"","authType":"","x":290,"y":240,"wires":[["795b65c4.a0cf1c"]]},{"id":"795b65c4.a0cf1c","type":"function","z":"b9750128.e1618","name":"Pre Prediction","func":"var dc=global.get('dc')\nvar na=global.get('na')\nvar se=global.get('se')\nvar ot=global.get('ot')\nvar ab=global.get('ab')\nvar vt=global.get('vt')\nvar ye=global.get('ye')\nvar gb=global.get('gb')\nvar ps=global.get('ps')\nvar md=global.get('md')\nvar km=global.get('km')\nvar mr=global.get('mr')\nvar ft=global.get('ft')\nvar bd=global.get('bd')\nvar nd=global.get('nd')\nvar dce=global.get('dce')\nvar npc=global.get('npc')\nvar pc=global.get('pc')\nvar ls=global.get('ls')\nvar token=msg.payload.access_token\nvar instance_id=\"ba33b218-b91c-4d6a-a425-7c72f12e50be\"\nmsg.headers={\n'Content-Type': 'application/json',\"Authorization\": \"Bearer\"+token,\"ML-Instance-ID\": instance_id}\nmsg.payload={\"input_data\": [{\"fields\": [\"dateCrawled\", \"name\", \"seller\", \"offerType\", \"abtest\", \"vehicleType\", \"yearOfRegistration\", \"gearbox\", \"powerPS\", \"model\", \"kilometer\", \"monthOfRegistration\",

\"fuelType\", \"brand\", \"notRepairedDamage\", \"dateCreated\", \"nrOfPictures\", \"postalCode\", \"lastSeen\", \"Unnamed: 20\", \"Unnamed: 21\"],\"values\": [[dc,na,se,ot,ab,vt,ye,gb,ps,md,km,mr,ft,bd,nd,dce,npc,pc,ls]]}]}\nreturn msg;","outputs":1,"noerr":0,"x":440,"y":160,"wires":[["4ee66edd.29417"]]},{"id":"4ee66edd.29417","type":"http request","z":"b9750128.e1618","name":"","method":"POST","ret":"obj","paytoqs":false,"url":"https://eu-gb.ml.cloud.ibm.com/v4/deployments/e1887efa-4a63-4d46-a7be-1f2ce312215c/predictions","tls":"","persist":false,"proxy":"","authType":"","x":530,"y":240,"wires":[["91696764.f1add8","b4176e7.e180c9"]]},{"id":"b4176e7.e180c9","type":"debug","z":"b9750128.e1618","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","x":730,"y":280,"wires":[]},{"id":"91696764.f1add8","type":"function","z":"b9750128.e1618","name":"","func":"msg.payload=msg.payload.predictions[0].values[0][0][0]\nreturn msg;","outputs":1,"noerr":0,"x":630,"y":160,"wires":[["44908edc.1ffee"]]},{"id":"44908edc.1ffee","type":"ui_text","z":"b9750128.e1618","group":"1d84a555.18b5fb","order":2,"width":0,"height":0,"name":"","label":"Price","format":"{{msg.payload}}","layout":"row-spread","x":790,"y":120,"wires":[]},{"id":"1d84a555.18b5fb","type":"ui_group","z":"","name":"Resale value prediction","tab":"254012f8.5c13be","order":1,"disp":true,"width":"6","collapse":false},{"id":"254012f8.5c13be","type":"ui_tab","z":"","name":"Resale Value Prediction","icon":"dashboard","disabled":false,"hidden":false}]