Applied Data Science

Car Resale ValuePrediction

IBM Project– Team ID: PNT2022TMID12178

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ABSTRACT

This paper aims to build a model to predict used second hand cars reasonable price; based on multiple aspects, including vehicle mileage, year of manufacturing, fuel consumption, transmission, road tax, fuel type, and engine size. This model can benefit sellers, buyers, and car manufacturers in the used cars market.Upon completion, it can output a relatively accurate price prediction based on the information that user’s input. The model building process involves machine learningand data science.The dataset used was scrapedfrom listings of used cars. Various regression methods, including linear regression, polynomial regression, support vector regression, decision tree regression, and random forest regression, were applied in the researchto achieve the highest accuracy. Before the actualstart of model-building, this project visualized the data to understand the dataset better.The dataset was divided and modified to fit the regression, thus ensure the performance of the regression. To evaluate the performance of each regression, R-squarewas calculated. Amongall regressions in this project,random forest achieved the highest R-square of0.90416. Compared to previous research, the resulting model includes more aspects of used cars while also having a higher prediction accuracy.

LITERATURE REVIEW

SURVEY-1

Stefan Lessmann (2017)

"Car resale value prediction using regression method"

This paper study statistical models for forecasting the resale prices of used cars. An empirical studyis performed to explore the contributions of different degrees of freedom in the modelling process to the forecast accuracy. First, a comparative analysis of alternative predictionmethodsprovidesevidence that randomforest regression is particularly effective for resale price forecasting. Second,the empirical results demonstrate the presence ofheterogeneity in resale price forecasting and identify methods that can automatically overcome its detrimental effect on the forecast accuracy. Finally, the study confirms that the sellers of used cars possess informational advantages over market research agencies, which enable them to forecast resale prices more accurately. This implies that sellers have anincentive to invest in in-house forecasting solutions, instead of basingtheir pricing decisions on externally generated residual value estimates.

SURVEY-2

Doan Van Thai (2019)

"Car resale value prediction using quantify qualitative data and knowledge-based system"

Car pricing using machine learning has a strong relationship with the process of knowledge acquisition for expert systems. This model, the primary technique for knowledge acquisition has been the time-consuming process of recommendation, posting for car buying or selling on internetmarket websites. Afterdiscovering the data,It is divided into two types: structured and

unstructured that require knowledge-based analysis. This paperwill involve the techniques for extraction of meaning, data inference, and rules for qualitative data. The main purpose of the current research is to explore different data types of car data and the objective is to create an automatedtechnique to predict car prices.

SURVEY-3

Feng Wang(2021)

"Car resalevalue prediction basedon supervised learningtechniques"

In this approach feng wang used machine learning algorithms to predict the price of used carswithless human intervention to make the results more objective. This method is used to preprocess thedataset through Python's Pycaret package and compare the performance of each algorithm throughthe algorithm comparison function. Finally, the algorithm was optimized by using the hyperparameter function. The results show that R2 = 0.9807 obtained from extreme random numbers is the best performance. When new used car data flows into the used car system, used carprices will be automatically generated by this algorithm, which will make the workflow of the usedcarmarket faster and more competitive for that used car market.

SURVEY-4

Jaideep A Miley (2017)

"Prediction of used cars prices by using SAS EM"

The aim of jai deep is to analyse the market trend of used car industry and find out what are the factors that are important decide the price of a used car and finally predict the price of a used car. With the help of SAS Enterprise mine he has used statistical methods such asTransformations, Decision Trees,and Regression to identify the target variable.

SURVEY-5

Sameerchand Pudaruth (2014)

"Car resalevalue prediction using machine learning"

Sameerchand pudaruth is used supervised machine learning techniques to predict the price of used cars in Mauritius. The predictions are based on historical data collected from daily newspapers. Differenttechniques like multiplelinear regression analysis, k-nearest neighbours, naïvebayes and decisiontrees have been used to make the predictions. The predictions are then evaluated and compared in order to find those which provide the best performances. A seeminglyeasy problem turnedout to be indeed very difficult to resolve with high accuracyAll the four methods provided comparable performance.

SURVEY-6

Praful Rane, Deep Pandya, Dhawal Kotak (2021)

“USED CAR PRICE PREDICTION”

Praful rane and there team members are used regression algorithms because they provided them with continuous value as an output and not a categorized value. Because of which it will be possibleto 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 caraccording to user’s inputs.

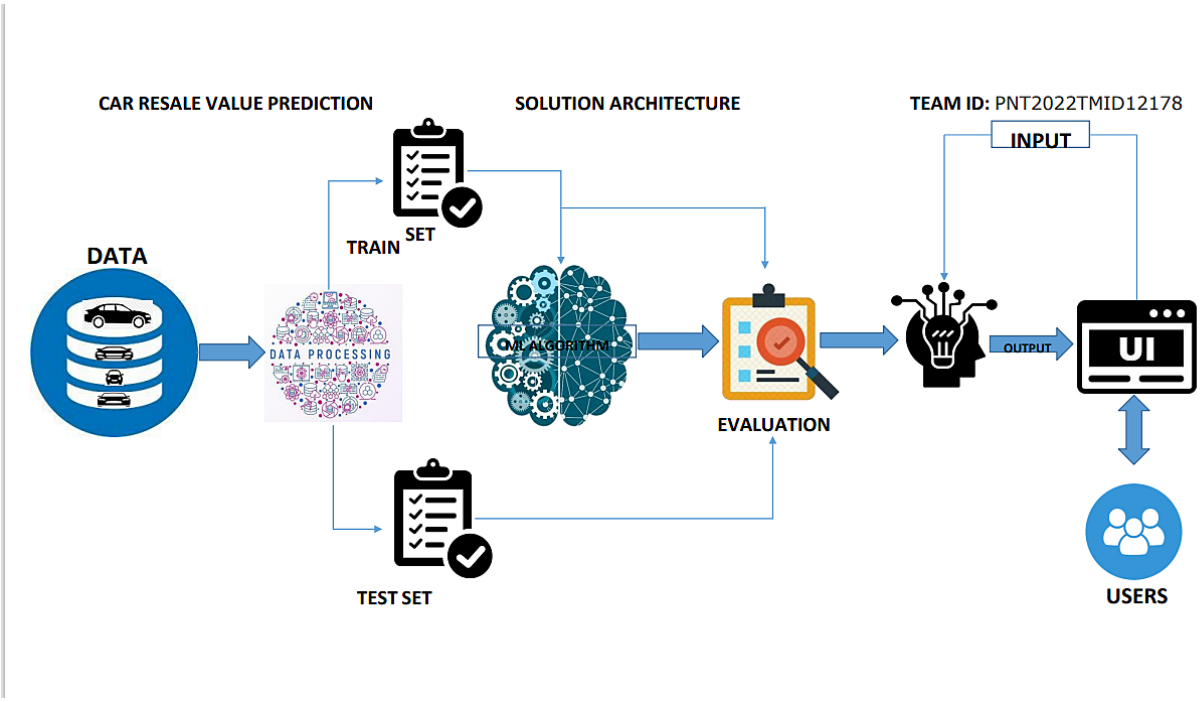
Problem statement:

Customer Problem Statement Used Second hand car is mostly used by all Peoples. So, the prediction of used car price becomes the significant and interesting area of analysis. The price of the used car depends on the factors like Kilometer driven, Engine Quality, External and Internal Damages, Model, Mileage and Number of seats. Car resale value evaluator is developed to predict the Accurate price to attain benefits to both buyer and seller.

1. A Person is an Auto Sales Representative who needs a way to accurately predict the value of used car because he needs to satisfies his customer.
2. 2. User needs a way to predict the value of used car by taking it's model name, Kilometer driven, Condition of the car andseller type because she doesn't want very old model cars and seller type is inguinal.
3. 3. Another Person needs a way to predict the value of used car because it's difficult to anticipate how much a used car will sell for.
4. 4. User is an explorer who needs a way to predict the value of used car based on mileage driven and transmission types because he wants to be low level petrol in run more kilometers and automatic types.
5. 5. User is an owner who needs a way to predict the accurate value of used car because he wants to know the actual worth of their car and to sell it.

Project Design Phase-1

Solution Architecture:



Proposed Solution

PROJECT OBJECTIVES:

- To understand the problem to classify if it is a regression or a classification kind of problem. • To know how to pre-process/clean the data using different data pre-processing techniques.
- Applying different algorithms according to the dataset
- To know how to evaluate the model.
- To build web applications using the Flask framework.

Proposed Solution:

S. No	Parameter	Parameter
1	Problem Statement (Problem to be solved)	The main aim of this project is to predict the price of used cars using the various Machine Learning (ML) models. The project should take parameters related to used car as inputs and enable the customers to make decisions by their own.
2	Idea / Solution description	The model is to be built that would give the nearest resale value of the vehicle. By using these best accuracy value will betaken as a solution and it will be integrated to the webbased application where the user is notified with the statusof his product.
3	Novelty / Uniqueness	Used car price prediction is effectively used to determine the worthiness of the car by their own within few minutes by using various features such as year, model, mileage(km), etc.
4	Social Impact / Customer Satisfaction	Became obsessed with customer feedback, Create a sense of convenience, Deliver fast responses, satisfaction is the company – wide focus. • Customer Satisfaction • Look and Style • Fuel consumption • Pulling Power • Seating

		Capacity • Riding Comfort • Safety Features • Speed • Shock Absorbs & transmission • Tyre condition & mileage
5	Business Model (Revenue Model)	t helps users to predict the correct valuation of the car remotely with perfect valuation and without human intervention like car dealers in the process to eliminate biased valuation predicted by the dealer
6	Scalability of the Solution	The size of the used car market in India was over 4.4 million units in 2020, according to Statista. The starts up has managed to strive ahead by leveraging a robust managed marketplace business model, while proving that it is economically viable and independent of scale due to the use of technology, economy of scale, economy of scope, asset light, and network effects

Project Design Phase-II

Solution Requirements

Functional Requirements:

Following are the functional requirements ofthe proposed solution.

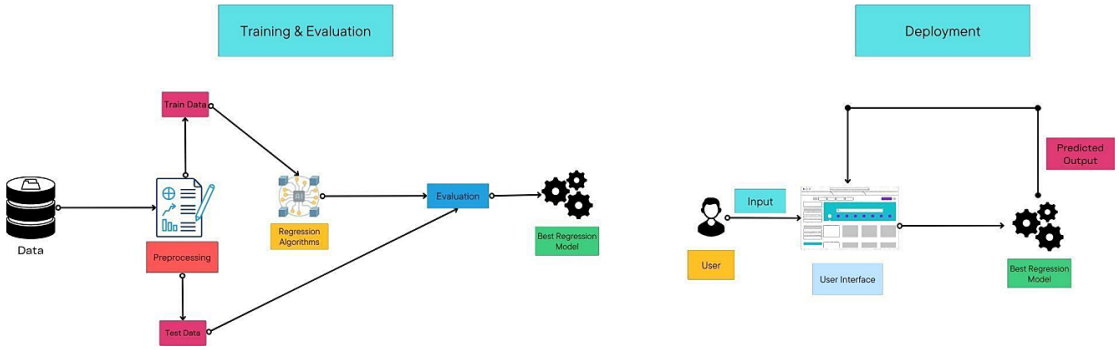
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Website
FR-2	User Confirmation	Confirmation via website
FR-3	Car Registration	Registering the car details
FR-4	Value Prediction	Predicting the car resale value

Non-functional Requirements:

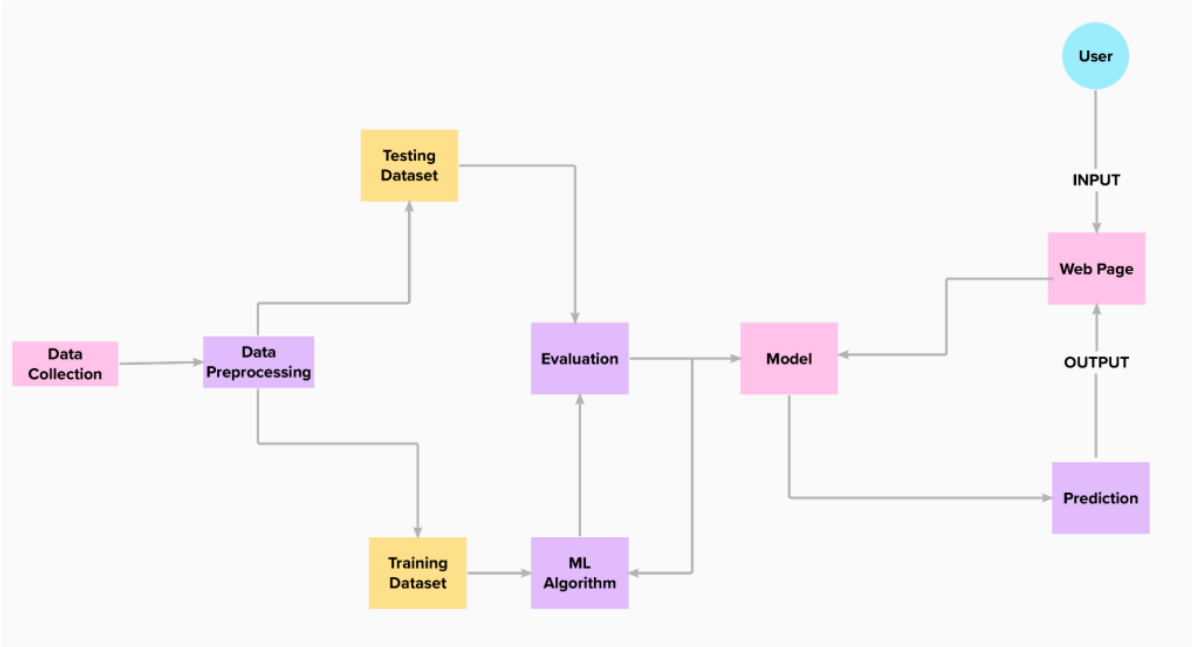
Following are the non-functional requirements of the proposed solution.

FR-1	**Non-Functional requirements**	**Description**
NFR-1	Usability	Predicting the resale value
NFR-2	Security	Providing security to the website
NFR-3	Reliability	different types of cars
NFR-4	Performance	Providing high performance by using somemachine learning techniques
NFR-5	Availability	It is used for all types of cars
NFR-6	Scalability	Predicting valuesfor different types of cars

Technology Architecture:



Data Flow Diagram:



User Type	Functional requirement(Epic)	User Story number	User story/task	Acceptanccriteria	Priority	Release
Customer (Mobile user)	Data Entry	USN-1	As a user, I can enter the car details in the application.	I can enter the car details	Medium	Sprint-1
Customer (Mobile user)	Obtain output	USN-2	As a user, I will receive car resale value in the application.	I can receive my carresale value	High	Sprint-1
Customer (Mobile user)	data Entry	USN-3	As a user, I can enter the car details in the application	I can enter the car details	Medium	Sprint-1
Customer (Mobile user)	Obtain output	USN-4	As a user, I will receive car resale value in the application.	I can receive my carresale value	High	Sprint-1

Project Development Phase

Source Code:

Home Page:

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
  <head>
    <meta charset="utf-8">
    <title>Car resale value </title>
    <link rel="stylesheet" href="../static/css/style.css">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
  </head>
  <body>

    <div class="topnav" id="myTopnav">
      <a href="#home" class="active">Home</a>
      <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\review.html">Review</a>
      <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\contact.html">Contact</a>
      <a href="https://aboutpage11.nicepage.io/?version=4fe492b6-c34a-4273-a015-
96e7e73644b8&uid=dc98e9fe-5c0a-469b-bfb3-412034d3ee39">About</a>
      <a href="javascript:void(0);" class="icon" onclick="myFunction()">
        <i class="fa fa-bars"></i>
      </a>
    </div>

    <section class="header">
      <nav class="logo">


      </nav>

        <div class="text-box">
          <h><b>Team Id: PNT2022TMID12178</b></h>
          <h1 class="heading">Car Resale Value Predictor</h1><br>
          <div><p1><b>Sell your car at the best price</b></p1></div><br>
```

```
        <div><a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\value.html" class="visit-btn "><b>Check price</b></a></div>
        </div>

    </section>



    <script>
      function myFunction() {
        var x = document.getElementById("myTopnav");
        if (x.className === "topnav") {
          x.className += " responsive";
        } else {
          x.className = "topnav";
        }
      }
      </script>

  </body>
</html>
```

Value Allocation Page:

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
<head>
<link rel="stylesheet" href="../static/css/value.css">

<title>Car resale value</title>

</head>
<body>



    <div class="topnav" id="myTopnav">
        <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\car.html" class="active">Home</a>
        <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
```

```
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\review.html">Review</a>
      <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE
PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build
HTML Page\templates\contact.html">Contact</a>
      <a href="https://aboutpage11.nicepage.io/?version=4fe492b6-c34a-4273-a015-
96e7e73644b8&uid=dc98e9fe-5c0a-469b-bfb3-412034d3ee39">About</a>
      <a href="javascript:void(0);" class="icon" onclick="myFunction()">
        <i class="fa fa-bars"></i>
      </a>
    </div>


  <section class="form"><div><h><b>Team Id: PNT2022TMID12178</b></h></div>
  <form action="http://localhost:500/predict" method="GET">
  <table border="0" align="center">
  <tbody>
    <h1>Get Accurate Price To Your Car</h1>
  <tr>
  <td><label for="year" padding:10px>Registration year : </label></td>
  <td><input id="year" maxlength="50" name="regyear" type="text" />
  <br>
  <br>
  </td>
  </tr>

  <tr>
  <td><label for="month">Registration Month : </label></td>
  <td><input id="month" maxlength="50" name="regmonth" type="text" />
  <br>
  <br>
  </td>
  </tr>

  <tr>
  <td><label for="power">Power of car in PS: </label></td>
  <td><input id="power" maxlength="50" name="powerps" type="text" />
  <br>
  <br>
  </td>
  </tr>
```

```
<tr>
<td><label for="kilometer">Kilometers that car have driven : </label></td>
<td><input id="kilometer" maxlength="50" name="kms" type="text" />
<br>
<br>
</td>
</tr>

<tr>
<td><label for="geartype">Gear type : </label></td>
<td><input type="radio" name="geartype" value="manual"/> Manual
<input type="radio" name="geartype" value="automatic"/> Automatic
<input type="radio" name="geartype" value="not-declared"/> Not declared
<br>
<br>
</td>
</tr>

<tr>
<td><label for="damage">Your car is repaired or damaged : </label></td>
<td><input type="radio" name="damage" value="yes"/> Yes
<input type="radio" name="damage" value="no"/> No
<input type="radio" name="damage" value="not-declared"/> Not declared
<br>
<br>
</td>
</tr>

<tr>
<td><label for="model">Model Type : </label></td>
<td>
<select name="model" id="model">
<option value="" disabled selected hidden>Choose Model Name...</option>
<option value="golf">Golf </option>
<option value="grand">Grand </option>
<option value="fabia">Fabia </option>
<option value="3er">3er </option>
<option value="2_reihe">2 Reihe </option>
<option value="andere">Andere </option>
<option value="c_max">C Max </option>
```

<option value="3_reihe">3 Reihe </option>
<option value="passat">Passat </option>
<option value="navara">Navara </option>
<option value="ka">Ka </option>
<option value="polo">Polo </option>
<option value="twingo">Twingo </option>
<option value="a_klasse">A klasse </option>
<option value="scirocco">Scirocco </option>
<option value="5er">5er </option>
<option value="meriva">Meriva </option>
<option value="arosa">Arosa </option>
<option value="c4">C4 </option>
<option value="civic">Civic </option>
<option value="transporter">Transporter </option>
<option value="punto">Punto </option>
<option value="e_klasse">E Klasse </option>
<option value="clio">Clio </option>
<option value="kadett">Kadett </option>
<option value="kangoo">Kangoo </option>
<option value="corsa">Corsa </option>
<option value="one">One </option>
<option value="fortwo">Fortwo </option>
<option value="1er">1er </option>
<option value="b_klasse">B Klasse </option>
<option value="signum">Signum </option>
<option value="astra">Astra </option>
<option value="a8">A8 </option>
<option value="jetta">Jetta </option>
<option value="fiesta">Fiesta </option>
<option value="c_klasse">C Klasse </option>
<option value="micra">Micra </option>
<option value="vito">Vito </option>
<option value="sprinter">Sprinter </option>
<option value="156">156 </option>
<option value="escort">Escort </option>
<option value="forester">Forester </option>
<option value="xc_reihe">Xc Reihe </option>
<option value="scenic">Scenic </option>
<option value="a4">A4 </option>
<option value="a1">A1 </option>
<option value="insignia">Insignia </option>

<option value="combo">Combo </option>
<option value="focus">Focus </option>
<option value="tt">Tt </option>
<option value="a6">A6 </option>
<option value="jazz">Jazz </option>
<option value="omega">Omega </option>
<option value="slk">Slk </option>
<option value="7er">7er </option>
<option value="80">80 </option>
<option value="147">147 </option>
<option value="glk">Glk </option>
<option value="100">100 </option>
<option value="z_reihe">Z Reihe </option>
<option value="sportage">Sportage </option>
<option value="sorento">Sorento </option>
<option value="v40">V40 </option>
<option value="5er">5er </option>
<option value="ibiza">Ibiza </option>
<option value="3er">3er </option>
<option value="mustang">Mustang </option>
<option value="eos">Eos </option>
<option value="touran">Touran </option>
<option value="getz">Getz </option>
<option value="a3">A3 </option>
<option value="almera">Almera </option>
<option value="megane">Megane </option>
<option value="7er">7er </option>
<option value="1er">1er </option>
<option value="lupo">Lupo </option>
<option value="r19">R19 </option>
<option value="zafira">Zafira </option>
<option value="caddy">Caddy </option>
<option value="2_reihe">2 Reihe </option>
<option value="mondeo">Mondeo </option>
<option value="cordoba">Cordoba </option>
<option value="colt">Colt </option>
<option value="impreza">Impreza </option>
<option value="vectra">Vectra </option>
<option value="berlingo">Berlingo </option>
<option value="80">80 </option>
<option value="m_klasse">M Klasse </option>

<option value="tiguan">Tiguan </option>
<option value="i_reihe">I Reihe </option>
<option value="espace">Espace </option>
<option value="sharan">Sharan </option>
<option value="6_reihe">6 Reihe </option>
<option value="panda">Panda </option>
<option value="up">Up </option>
<option value="seicento">Seicento </option>
<option value="ceed">Ceed </option>
<option value="5_reihe">5 Reihe </option>
<option value="yeti">Yeti </option>
<option value="octavia">Octavia </option>
<option value="mii">Mii </option>
<option value="rx_reihe">Rx Reihe </option>
<option value="6er">6er </option>
<option value="modus">Modus </option>
<option value="fox">Fox </option>
<option value="matiz">Matiz </option>
<option value="beetle">Beetle </option>
<option value="c1">C1 </option>
<option value="rio">Rio </option>
<option value="touareg">Touareg </option>
<option value="logan">Logan </option>
<option value="spider">Spider </option>
<option value="cuore">Cuore </option>
<option value="s_max">S Max </option>
<option value="a2">A2 </option>
<option value="x_reihe">X Reihe </option>
<option value="a5">A5 </option>
<option value="galaxy">Galaxy </option>
<option value="c3">C3 </option>
<option value="viano">Viano </option>
<option value="s_klasse">S Klasse </option>
<option value="1_reihe">1 Reihe </option>
<option value="avensis">Avensis </option>
<option value="sl">Sl </option>
<option value="roomster">Roomster </option>
<option value="q5">Q5 </option>
<option value="kaefer">Kaefer </option>
<option value="santa">Santa </option>
<option value="cooper">Cooper </option>

<option value="leon">Leon </option>
<option value="4_reihe">4 Reihe </option>
<option value="500">500 </option>
<option value="laguna">Laguna </option>
<option value="ptcruiser">Ptcruiser </option>
<option value="clk">Clk </option>
<option value="primera">Primera </option>
<option value="exeo">Exeo </option>
<option value="159">159 </option>
<option value="transit">Transit </option>
<option value="juke">Juke </option>
<option value="qashqai">Qashqai </option>
<option value="carisma">Carisma </option>
<option value="accord">Accord </option>
<option value="corolla">Corolla </option>
<option value="lanos">Lanos </option>
<option value="phaeton">Phaeton </option>
<option value="boxster">Boxster </option>
<option value="verso">Verso </option>
<option value="swift">Swift </option>
<option value="rav">Rav </option>
<option value="kuga">Kuga </option>
<option value="picanto">Picanto </option>
<option value="kalos">Kalos </option>
<option value="superb">Superb </option>
<option value="stilo">Stilo </option>
<option value="alhambra">Alhambra </option>
<option value="911">911 </option>
<option value="mx_reihe">Mx Reihe </option>
<option value="m_reihe">M Reihe </option>
<option value="roadster">Roadster </option>
<option value="ypsilon">Ypsilon </option>
<option value="cayenne">Cayenne </option>
<option value="galant">Galant </option>
<option value="justy">Justy </option>
<option value="90">90 </option>
<option value="sirion">Sirion </option>
<option value="crossfire">Crossfire </option>
<option value="6_reihe">6 Reihe </option>
<option value="agila">Agila </option>
<option value="duster">Duster </option>

<option value="cr_reihe">Cr Reihe </option>
<option value="v50">V50 </option>
<option value="discovery">Discovery </option>
<option value="c_reihe">C Reihe </option>
<option value="v_klasse">V Klasse </option>
<option value="yaris">Yaris </option>
<option value="c5">C5 </option>
<option value="aygo">Aygo </option>
<option value="cc">Cc </option>
<option value="carnival">Carnival </option>
<option value="fusion">Fusion </option>
<option value="bora">Bora </option>
<option value="forfour">Forfour </option>
<option value="100">100 </option>
<option value="cl">Cl </option>
<option value="tigra">Tigra </option>
<option value="156">156 </option>
<option value="300c">300c </option>
<option value="100">100 </option>
<option value="147">147 </option>
<option value="q3">Q3 </option>
<option value="spark">Spark </option>
<option value="v70">V70 </option>
<option value="x_type">X Type </option>
<option value="5_reihe">5 Reihe </option>
<option value="ducato">Ducato </option>
<option value="s_type">S Type </option>
<option value="x_trail">X Trail </option>
<option value="toledo">Toledo </option>
<option value="altea">Altea </option>
<option value="7er">7er </option>
<option value="voyager">Voyager </option>
<option value="calibra">Calibra </option>
<option value="bravo">Bravo </option>
<option value="range_rover">Range Rover </option>
<option value="antara">Antara </option>
<option value="tucson">Tucson </option>
<option value="q7">Q7 </option>
<option value="citigo">Citigo </option>
<option value="jimny">Jimny </option>
<option value="cx_reihe">Cx Reihe </option>

<option value="wrangler">Wrangler </option>
<option value="lybra">Lybra </option>
<option value="range_rover_sport">Range Rover Sport </option>
<option value="lancer">Lancer </option>
<option value="159">159 </option>
<option value="freelander">Freelander </option>
<option value="captiva">Captiva </option>
<option value="c2">C2 </option>
<option value="500">500 </option>
<option value="range_rover_evoque">Range Rover Evoque </option>
<option value="sandero">Sandero </option>
<option value="note">Note </option>
<option value="900">900 </option>
<option value="147">147 </option>
<option value="defender">Defender </option>
<option value="cherokee">Cherokee </option>
<option value="clubman">Clubman </option>
<option value="samara">Samara </option>
<option value="2_reihe">2 Reihe </option>
<option value="1er">1er </option>
<option value="3er">3er </option>
<option value="601">601 </option>
<option value="3_reihe">3 Reihe </option>
<option value="4_reihe">4 Reihe </option>
<option value="5er">5er </option>
<option value="6_reihe">6 Reihe </option>
<option value="legacy">Legacy </option>
<option value="pajero">Pajero </option>
<option value="auris">Auris </option>
<option value="niva">Niva </option>
<option value="5_reihe">5 Reihe </option>
<option value="s60">S60 </option>
<option value="nubira">Nubira </option>
<option value="vivaro">Vivaro </option>
<option value="g_klasse">G Klasse </option>
<option value="lodgy">Lodgy </option>
<option value="850">850 </option>
<option value="serie_2">Serie 2 </option>
<option value="6er">6er </option>
<option value="charade">Charade </option>
<option value="croma">Croma </option>

```
<option value="outlander">Outlander </option>
<option value="gl">Gl </option>
<option value="doblo">Doblo </option>
<option value="musa">Musa </option>
<option value="amarok">Amarok </option>
<option value="156">156 </option>
<option value="move">Move </option>
<option value="9000">9000 </option>
<option value="v60">V60 </option>
<option value="145">145 </option>
<option value="aveo">Aveo </option>
<option value="200">200 </option>
<option value="300c">300c </option>
<option value="b_max">B Max </option>
<option value="delta">Delta </option>
<option value="terios">Terios </option>
<option value="rangerover">RangeRover </option>
<option value="90">90 </option>
<option value="materia">Materia </option>
<option value="kalina">Kalina </option>
<option value="elefantino">Elefantino </option>
<option value="i3">I3 </option>
<option value="kappa">Kappa </option>
<option value="serie_3">Serie 3 </option>
<option value="48429">48429 </option>
<option value="serie_1">Serie 1 </option>
<option value="discovery_sport">Discovery Sport </option>

</select>
<br>
<br>
</td>
</tr>

<tr>
<td><label for="brand">Brand :</label></td>
<td>
<select name="brand" id="brand">
<option value="" disabled selected hidden>Choose Brand Name...</option>
<option value="volkswagen">Volkswagen </option>
<option value="audi">Audi </option>
```

```
<option value="jeep">Jeep </option>
<option value="skoda">Skoda </option>
<option value="bmw">Bmw </option>
<option value="peugeot">Peugeot </option>
<option value="ford">Ford </option>
<option value="mazda">Mazda </option>
<option value="nissan">Nissan </option>
<option value="renault">Renault </option>
<option value="mercedes_benz">Mercedes Benz </option>
<option value="opel">Opel </option>
<option value="seat">Seat </option>
<option value="citroen">Citroen </option>
<option value="honda">Honda </option>
<option value="fiat">Fiat </option>
<option value="mini">Mini </option>
<option value="smart">Smart </option>
<option value="hyundai">Hyundai </option>
<option value="sonstige_autos">Sonstige Autos </option>
<option value="alfa_romeo">Alfa Romeo </option>
<option value="subaru">Subaru </option>
<option value="volvo">Volvo </option>
<option value="mitsubishi">Mitsubishi </option>
<option value="kia">Kia </option>
<option value="suzuki">Suzuki </option>
<option value="lancia">Lancia </option>
<option value="porsche">Porsche </option>
<option value="toyota">Toyota </option>
<option value="chevrolet">Chevrolet </option>
<option value="dacia">Dacia </option>
<option value="daihatsu">Daihatsu </option>
<option value="trabant">Trabant </option>
<option value="saab">Saab </option>
<option value="chrysler">Chrysler </option>
<option value="jaguar">Jaguar </option>
<option value="daewoo">Daewoo </option>
<option value="rover">Rover </option>
<option value="land_rover">Land Rover </option>
<option value="lada">Lada </option>
</select>
<br>
<br>
```

```
</td>
</tr>

<tr>
<td><label for="fuelType">Fuel Type :</label></td>
<td>
<select name="fuelType" id="brand">
<option value="" disabled selected hidden>Choose Fuel Type...</option>
<option value="petrol"> Petrol </option>
<option value="diesel"> Diesel </option>
<option value="lpg">LPG </option>
<option value="cng">CNG </option>
<option value="hybrid">Hybrid </option>
<option value="electric">Electric </option>
<option value="others">Others </option>
</select>
<br>
<br>
</td>
</tr>

<tr>
<td><label for="vehicletype">Vehicle type:</label></td>
<td>
<select name="vehicletype" id="vehicle" >
<option value="" disabled selected hidden>Choose Vehicle Type...</option>
<option value="coupe">Coupe </option>
<option value="suv">SUV </option>
<option value="kleinwagen">Kleinwagen </option>
<option value="limousine">Limousine </option>
<option value="cabrio">Cabrio </option>
<option value="bus">Bus </option>
<option value="kombi">Kombi </option>
<option value="andere">Andere </option>
<option value="volkswagen">Volkswagen </option>
</select>
<br>
<br>
</td>
</tr>
</tbody>
```

```
  </table>
  <br>
  <input name="Submit" type="Submit" value="Submit" id="button"/>
  </form>
 </section>

 <script>
  function myFunction() {
   var x = document.getElementById("myTopnav");
   if (x.className === "topnav") {
    x.className += " responsive";
   } else {
    x.className = "topnav";
   }
  }
  </script>
</body
```

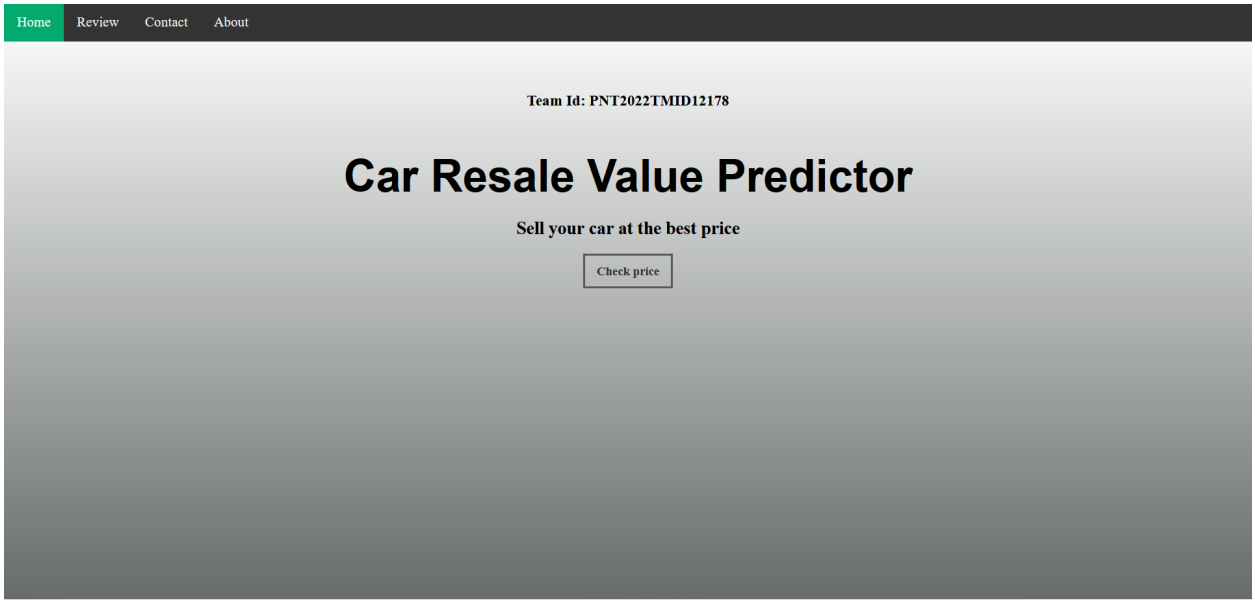
Predict Page:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <link rel="stylesheet" href="../static/css/predict.css">
  <title>Car Resale Predicted Value</title>
</head>
<body>
 <div class="topnav" id="myTopnav">
  <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build HTML Page\templates\car.html" class="active">Home</a>
  <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build HTML Page\templates\review.html">Review</a>
  <a href="C:\Users\Thaniyeal P\OneDrive\Desktop\IBM-CAR RESALE VALUE PREDICTION\IBM-Car Resale Value Prediction\Final Deliverables\Application Building\Build HTML Page\templates\contact.html">Contact</a>
  <a href="https://aboutpage11.nicepage.io/?version=4fe492b6-c34a-4273-a015-
```

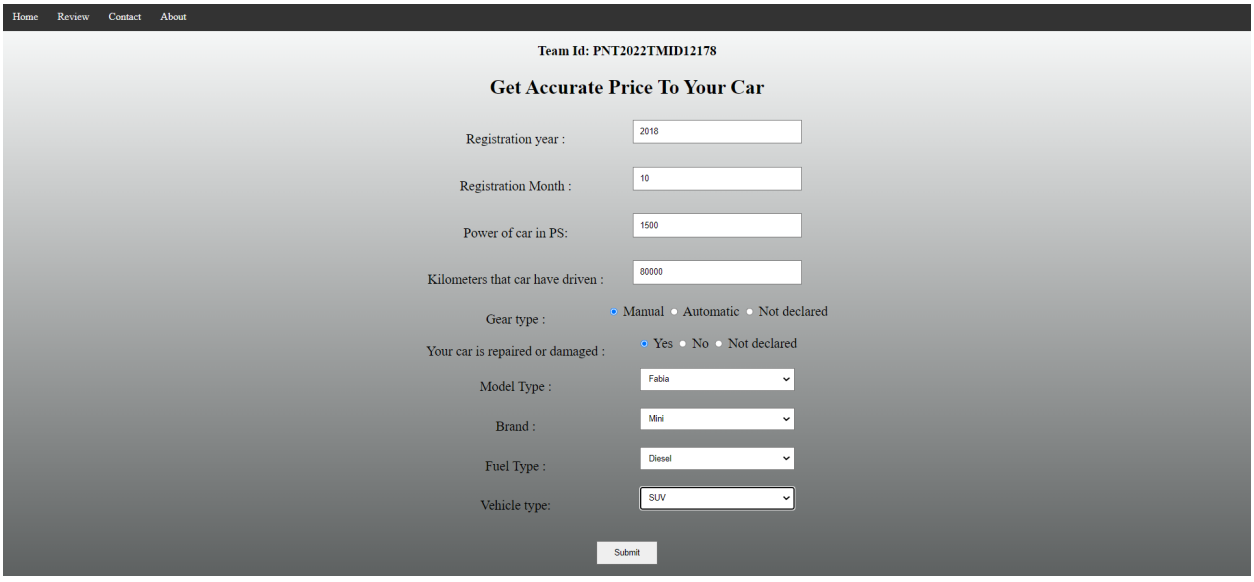
```
96e7e73644b8&uid=dc98e9fe-5c0a-469b-bfb3-412034d3ee39">About</a>
   <a href="javascript:void(0);" class="icon" onclick="myFunction()">
    <i class="fa fa-bars"></i>
   </a>
  </div>
  <section class="header">

      <div class="text-box">
        <h1>The Predicted Car Resale Value is </h1>
     <h1>1,30,000</h1>
      </div>
   </section>


   <script>
    function myFunction() {
      var x = document.getElementById("myTopnav");
      if (x.className === "topnav") {
        x.className += " responsive";
      } else {
        x.className = "topnav";
      }
    }
    </script>

</body>
</html>
```

User Interface:

Home Page:



Value Calculator:



Predicted Price:

About Page:

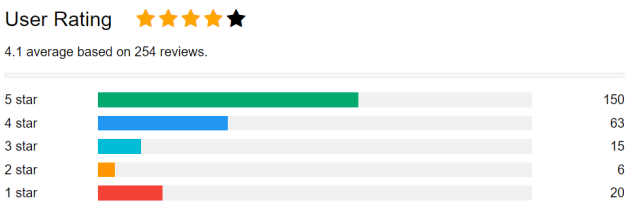
About

Team Leader:
Thaniyeal
Team Members:
Thavanish
Natheem
Rajkumar

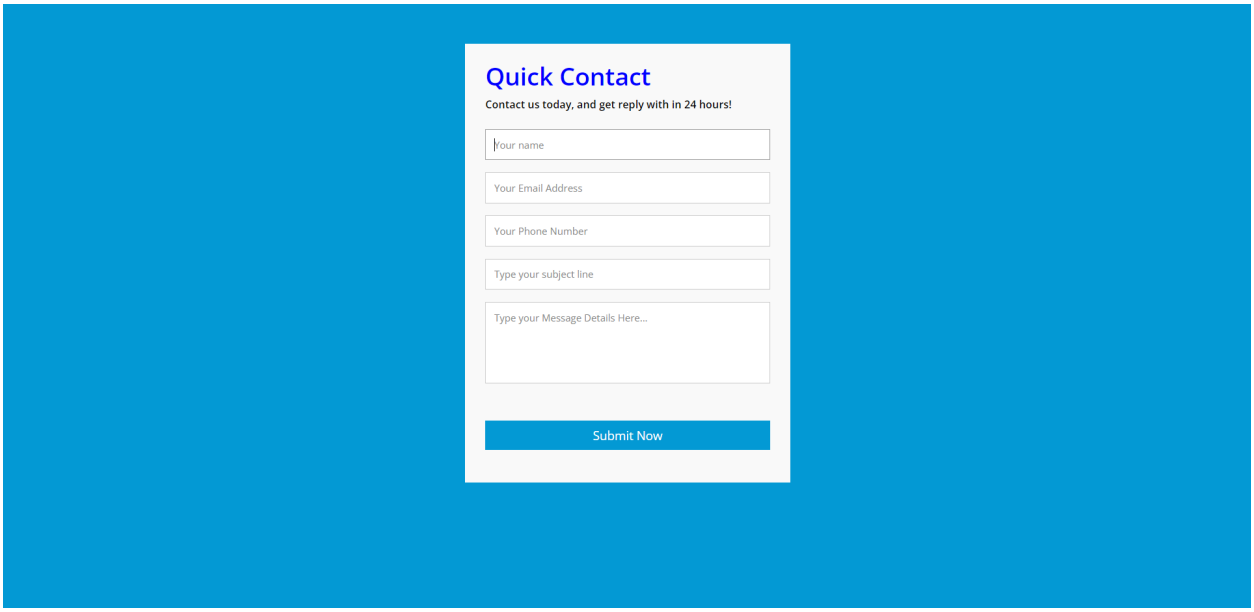
Who are us?
We are the students from K.S.R College of engineering,Tiruchengode.

+91 8852923930

Review Page:



Contact Page:



Demo video link: https://drive.google.com/file/d/1SORkey4d-ZPUADWC2Y4_Xuqbklrgi8NG/view?usp=drivesdk

REFERENCES

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4. Jaideep A Miley(2017) "Prediction of used cars prices by usingSAS EM".
5. Sameerchand Pudaruth(2014) "Car resale value prediction using machine learning".6.Praful Rane, Deep Pandya, Dhawal Kotak(2021)"Used Car Price Prediction".