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## Used car price prediction

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**Abstract:** This research paper is the combination of dataset collected by the cardekho.com and we have used ML to predict the price of a used car by creating a model using python, flask and HTML the algorithm that we have used is Random Forest Regression. The price of the car is determined by the manufacturer and not everyone can afford it so they look for some low cost alternative such as used car and this helps to build a big and evergreen used car market but due to the price irregularities this market is facing lots of problem so we have used machine learning to develop a new model that will predict the price and help consume to buy the used car at a perfect price.

**Keywords–** Used Car Price, Car Price Prediction, Prediction Model, Machine Learning, Random Forest Regression, Seaborn, Python, Flask, Pandas, Numpy.

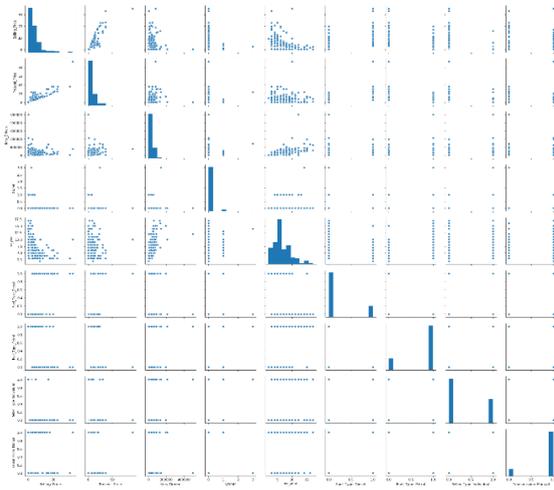
## 1. INTRODUCTION

In these times as we explore through automobile websites in search of buying or selling a used car, the price that we get is not accurate enough. Sometimes the buying price is high or sometimes the selling price is too low. This puts us in a confusing state whether to buy or sell the car at that price. The used car automobile industry works on the aim of making profits from the buyers and sellers. It includes their commission and extra profits they make from the customers. Deciding whether a used car is worth the posted price when you see listings online can be difficult. Several factors, including KM Driven, Fuel Type, No. of Owner, year, 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 to develop models for predicting used car prices. The market is flooded with millions of used cars. Using their data on our own platform, we can generate accurate prices of used cars. In this way both buyers and sellers get a satisfactory price. Our research that we did on the Indian Automobile Industry, we got to know that the whole industry comprises of 65% used cars. In 2019, used car market in India was worth 24.24 billion USD. The value is further expected to register a CAGR of 15% of growth.

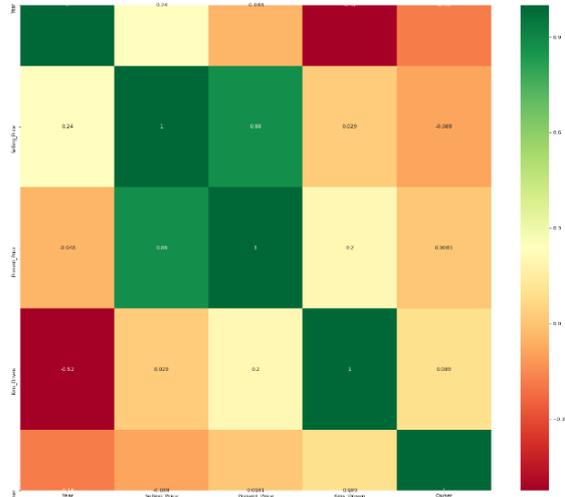
## 2. TECHNOLOGY

### 2.1 Requirements

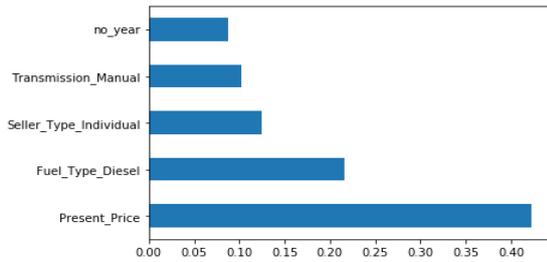
- Python as a programming language.
- Jupyter as an IDE.
- Flask as a python-based web framework.
- Pandas for Data Manipulation and Analysis.
- Numpy for working with arrays.
- Seaborn for Data Visualization
- Sklearn for Machine learning.
- Matplotlib for plotting graphs and charts.
- Random Forest Regressor as an Algorithm.



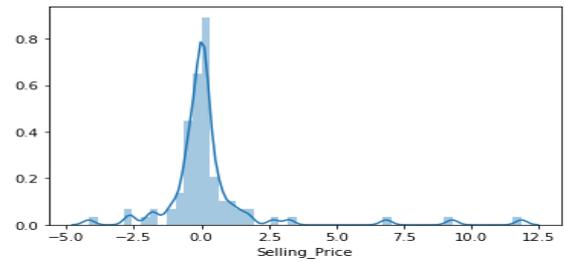
**Fig-1: Pair Plot Final Dataset**



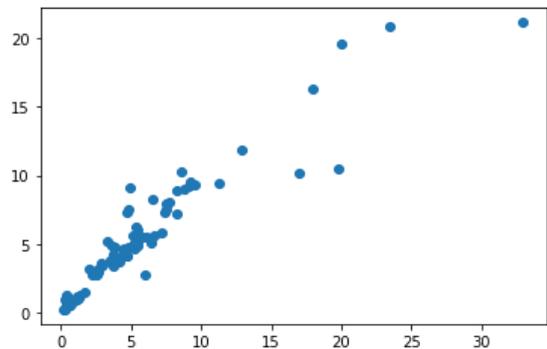
**Fig-2: Heat Map Final Dataset**



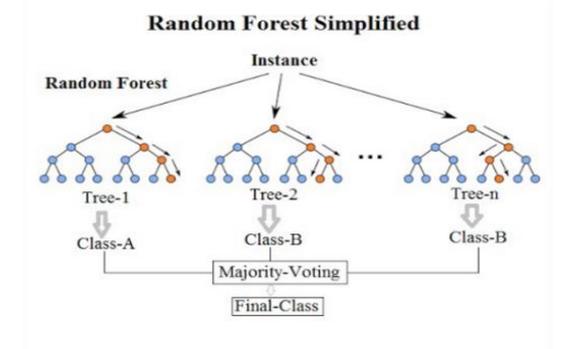
**Fig-3: Feature in Bar Graph**



**Fig-4: Prediction of the Dataset**

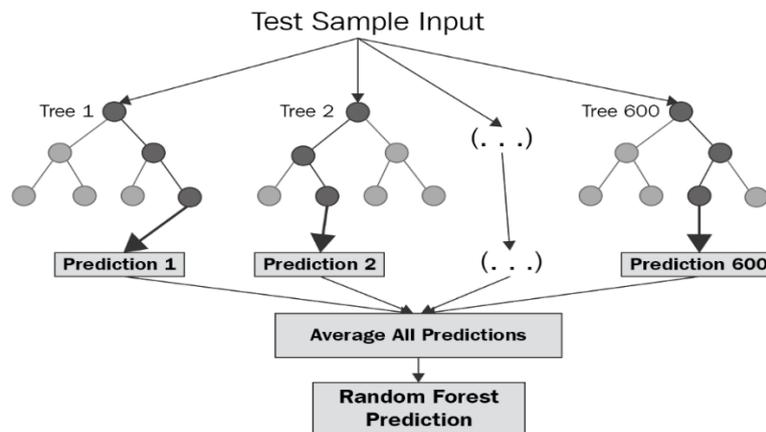


**Fig-5: Evaluation of the Model**



**Fig-6: Random Forest Simplified**

Random Forest Regression is a supervised learning algorithm that uses ensemble learning method for regression. An Instance is divided into various sub parts and at last a majority voting decides the outcome of the process.



**Fig-7: Test Sample Input**

### 3. METHODOLOGY

This project is divided into 5 subsections as follows:

#### 3.1- Data collection

I have used the data of cardekho.com in a csv format.

**3.2- Data cleaning**

To eliminate the unnecessary data points and to detect the out liars.

**3.3- Exploratory Data Analysis**

Create chats. Diagrams and Graphs to understand the data in a proper way.

**3.4- Regression Model and Evaluation**

To find out the pattern in the data set. And to generate a prediction for the given data set.

**3.5- Further improvement**

Create a web-based framework using Flask to predict the price using the prediction models.

**4. COMPARISON ANALYSIS**

**Table 4.1– Comparison of current model with existing model**

There are multiple models in the market that predict the price, but they all are not using every data point to calculate the exact price and this results in the wrong price calculation.	Our model uses the Random Forest Regression as an algorithm to determine the exact price of the used car and it also helps to predict the accurate value by using various data points such as Km driven, Number of Owner, Car Type etc.
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**5. CONCLUSION**

The new car market now getting costly and not everyone can afford it so the used car market will be the future so that everyone can afford it at a very low cost but there is a problem with the market that the perfect price for the used car is determined by the dealer and he can put any price as he likes but this creates a problem in the market.

So, this model will help to predict the exact price of the car.

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