A

MINI-PROJECT REPORT

ON

"Laptop Price Predictor"

Submitted in partial fulfillment of the requirement for the award of

Bachelor of Technology

In

Computer Science and Engineering

Punyashlok Ahilyadevi Holkar Solapur University

By

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Under Guidance Of

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WALCHAND INSTITUE OF TECHNOLOGY
SOLAPUR - 413006

(2021-2022)

CERTIFICATE

This is to certify that the Mini-Project entitled

"Laptop Price Predictor"

Is

Submitted By

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Abstract

As this era is turning to technology age and the base for technology is Computer System, the demand for the laptops are increasing exponentially. The expansion of the market and the increased volume of laptop products on e-commerce websites making difficulty for customer to understand the Actual Price for laptop. This project gives customer a brief basic idea about the price for laptop, it automatically justifies the price according to customer specification for the laptop. Various machine learning algorithms like Linear regression, Ridge Regression, Lasso Regression, KNN algorithm, Decision Tree, Random Forest, SVM, Extra trees, Adaboost, Gradient Boost, Xgboost, Voting Regressor, Stacking are used to identify the price for specified featured laptop.

Introduction

This project is based on Data Science and Machine Learning. The main objective is to clear out the doubt regarding actual laptop prices and market prices to get brief idea so that buyer can easily make decision.

In other words,

1) Giving buyer, understanding about laptop prices.
2) Reducing the time consumption to learn the prices for the same configuration of laptop in different market places.
3) Single Place to Understand multiple device prices with many different features and configurations.
4) Save More Money by learning Price of laptop.
5) Avoid the Fraud Pricing in Market.
6) Easy Comparison in Digital Market.

Background

Many people facing problem in choosing and buying a laptop online or offline. It might be confusion about how much money customer should have to spend on the particular specified laptop. Different brands have their different price range for same specifications. If any user wants to buy a laptop, then our website will provide them a tentative price of laptop according to their configuration requirements.

We have studied different research papers for this project and we have made some analysis and conclusions from those research papers. Some of those papers were related to classifying the laptop domains like Budget, Mid-range, Flagship. In this project instead of just dividing the laptops in different classes, we decided to make more efficient way for customers to understand the market prices of laptop so that they can take their decision faster and easier.

- **https://www.kaggle.com/datasets/muhammetvarl/laptop-price**
- **https://www.kaggle.com/datasets/ionaskel/laptop-prices**
- **https://www.slideshare.net/MDRIAZHASAN/laptop-price-prediction-system/**
- **http://www.iaeng.org/publication/IMECS2021/IMECS2021_pp104-110.pdf**

Technologies Used

Front-End:

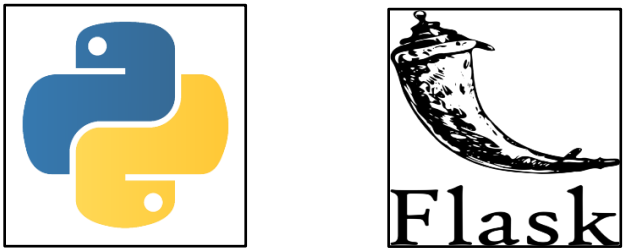
HTML, CSS, JavaScript & Tailwind:-

HTML, CSS and JavaScript are used for creating the User Interface. Styling is done with the help of CSS.
Tailwind template is used for user interface.

Back-End:

Flask:

Flask is based on Python. We used the flask for connection of dataset with front end or User Interface. Flask, flask cors, pickle, pandas, numpy are used.



Python:

Python is used in backend for working on raw data. The software we used for python is Jupyter Notebook. We have imported different libraries like numpy, pandas, matplotlib, and more for working on the raw dataset.

Pickle:

It is used to load model in backend.

Pandas:

It is used to load Data-Set (CSV) file.
With the help of Data Frame function, (df()) we Converted CSV file into pandas dataframe readable format to manipulate the data.

Numpy:

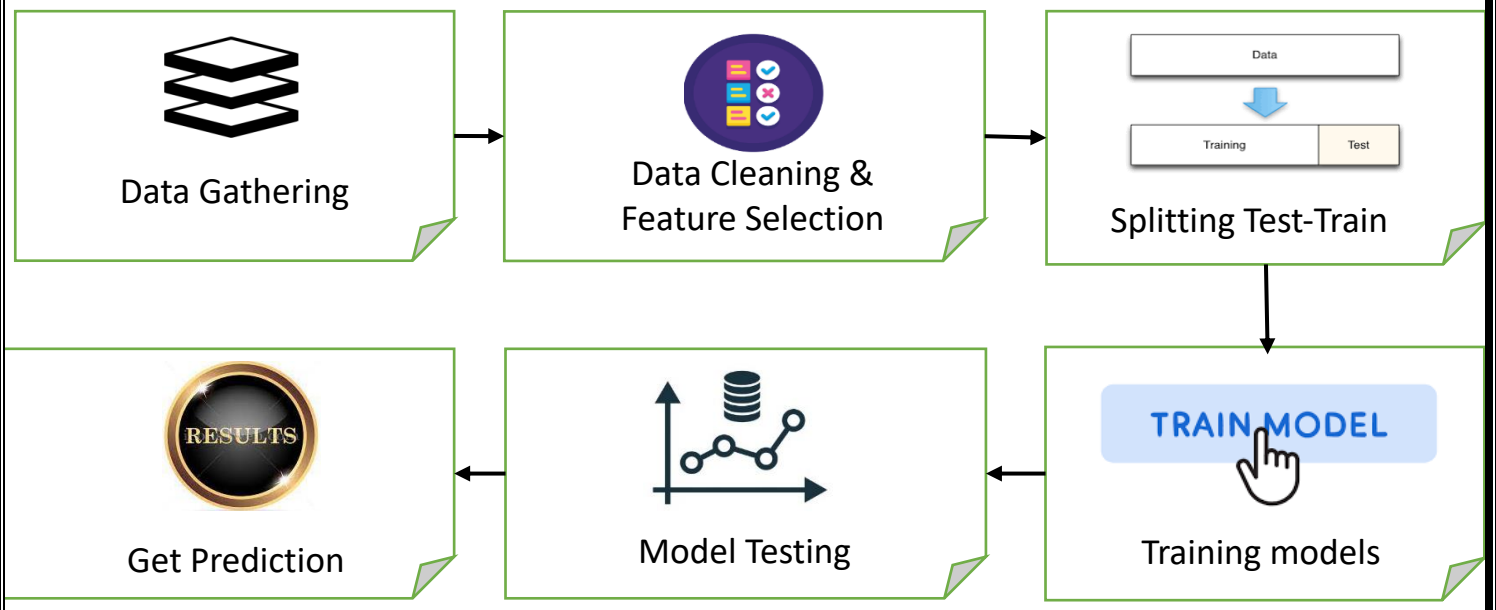
Numpy is used to take unique values from Data Set. Here we have used sorted function to sort unique values.

Machine Learning:

We have used Supervised Machine Learning to Implement this Project.
We have used **Gradient Boost** which performed best in terms of accuracy.

Description and Working of Project

Architecture: -



The dataset has around 1,300 laptop products with detailed specification.
Some columns are as below:

- Company
- TypeName
- Inches
- ScreenResolution
- CPU
- RAM
- Memory
- GPU
- OpSys
- Weight
- Price

Working

1) Data Preparation and Feature Engineering: -

To achieve the object of predicting the price of Laptop, we check for duplicate rows in dataset and remove those duplicates. Also, we find for missing values in dataset and accordingly we fill it. We create the RAM column as integer datatype by dropping GB from that RAM column and typecast it to Integer.
We then find the different types of relation graphs for analysis of data like price – company variation, etc , for further procedure.
We added new columns like Touch Screen, IPS display, PPI, CPU brands, HDD, SSD, GPU brand and OS for better analysis of dataset.

2) Data Splitting: -

In this phase, the data is split into two sets namely the training set and testing set. 95% of the data is used for training or fitting the model while the rest 5% of the data is spared for testing and evaluating the performance of prediction.

3) Algorithms: -

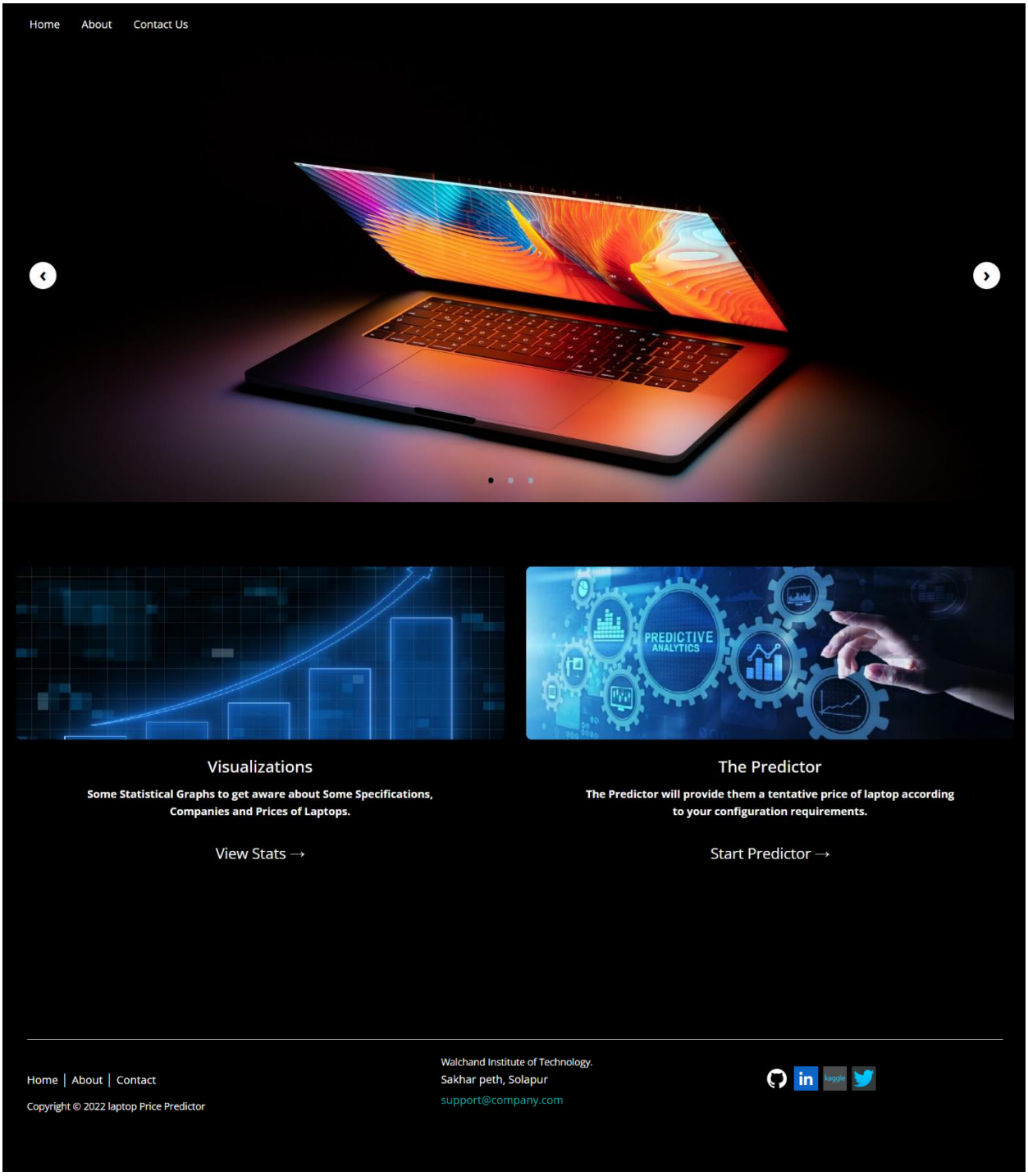
We fit our model with the help of different Machine Learning Algorithms like Linear regression, Ridge Regression, Lasso Regression, KNN algorithm, Decision Tree, Random Forest, SVM, Extra trees, Adaboost, Gradient Boost, Xgboost, Voting Regressor, Stacking.

Algorithms	**Accuracy**
Gradient Boost	87.93 %
XgBoost	77.65 %
Voting Regressor	80.16 %
Stacking	81.28 %
Extra Trees	79.23 %
Random Forest	75.78 %
Decision Tree	81.64 %
Lasso Regression	70.72 %
Linear Regression	70.72 %
Ridge Regression	67.06 %

4) Evaluation and Performance Analysis: -

We evaluated the model on the test dataset in terms of accuracy, precision, Mean Absolute Error. We found that Gradient Boost algorithm was performing the best among all the algorithms with the accuracy of 88%.
We selected this algorithm as final algorithm for our implementation and final model build.

Screenshots & Results




Home
Laptop Price Predictor
AVERAGE LAPTOP PRICE IN INDIA
55000 ₹
TOTAL LAPTOP USERS IN INDIA
7 Crore
BEST SELLING CATEGORY
Gaming
Average price
Price
160000
140000
120000
100000
80000
60000
40000
20000
0
Apple
HP
Acer
Asus
Dell
Lenovo
MSI
Microsoft
Toshiba
Huawei
Xiaomi
Razer
Samsung
Google
LG
Company
Laptop Categories
Price
120000
100000
80000
60000
40000
20000
0
Ultrabook
Notebook
Netbook
Gaming
Touchscreen
Workstation
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Ram Price
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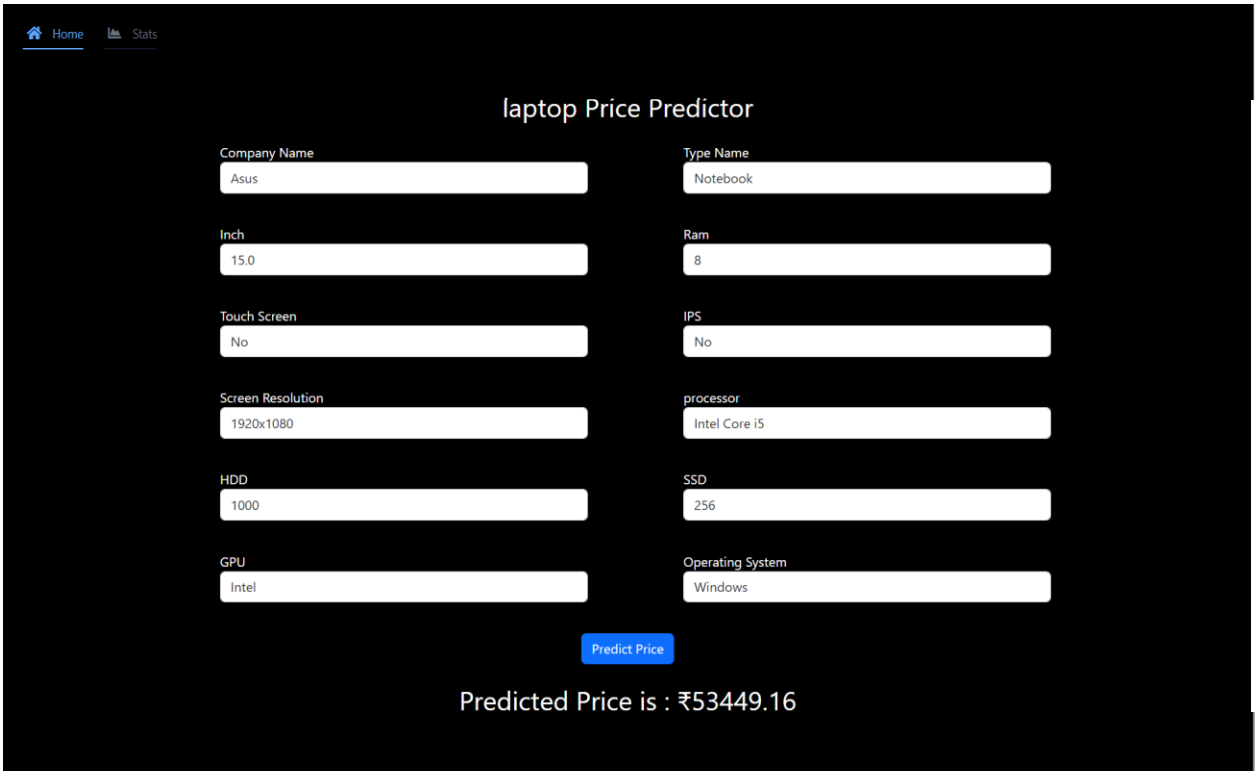
Price
150000
100000
50000
0
4
6
8
12
16
24
32
Ram
Intel Core i5
Intel Core i7
AMD Processor
Intel Core i3
Other Processors
About us
WIT Solapur, Students
Social
Github
Linkedin
Kaggle


Home
Stats
laptop Price Predictor
Company Name
Asus
Type Name
Notebook
Inch
15.0
Ram
8
Touch Screen
No
IPS
No
Screen Resolution
1920x1080
processor
Intel Core i5
HDD
1000
SSD
256
GPU
Intel
Operating System
Windows
Predict Price
Predicted Price is : ₹53449.16

Advantages and Disadvantages or Applications

Advantages:

1. Reduce Time Consumption to learn the prices of Laptops
2. Giving buyer understanding about Laptop Prices
3. Easy User Interface to Navigate
4. Better Predictions by comparing in Digital Market.

Disadvantages:

1. Need to be Updated as new laptop comes in market.
2. Only Suggest Price For specific configuration of Laptop.

Future scope

The significance of this work is the better understanding of laptops prices as per user’s specifications. From the user's point of view, it helps customers to find the required laptop product easily, efficiently, and according to their financial budget.

In future, we can add feature like suggesting a most affordable and trustable website for buying laptop online as per our predicted price.

Conclusion/Summary

- We have concluded our Goals for this project as mentioned above.
- This project is now able to propose a laptop price for specified features.
- Predicting price help user to save time for searching laptop prices on different platform like offline stores or online websites.
- We have provided different graphs to understand which company or specification costs how much.
- Understanding price, user can avoid frauds.

References

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