Name – Aarushi Bose
E-mail Id – aarushi.bose08@gmail.com
GitHub - https://github.com/AarushiBose
LinkedIn - https://www.linkedin.com/in/aarushi-bose-769412249/

PROJECT REPORT

Project Title:

Laptop Price Predictor

Project Aim:

The aim of the "Laptop Price Predictor" project is to develop a robust and accurate predictive model for estimating the price of laptops. Leveraging data warehousing, data mining, and machine learning techniques, this project seeks to assist consumers in making informed decisions when purchasing laptops. By employing a variety of regression and ensemble algorithms, the project aims to identify the algorithm with the best predictive accuracy to provide users with reliable price estimates for laptops.

Project Description:

In the digital age, laptops have become an essential tool for work, education, and entertainment. With a wide range of features and specifications available, laptops come in various price brackets, making it challenging for consumers to determine the fair market price of a specific model. The "Laptop Price Predictor" project addresses this challenge by harnessing the power of data warehousing, data mining, and machine learning.

Data Warehousing

The project starts by collecting and storing a comprehensive dataset of laptop specifications and their corresponding market prices. This dataset serves as the foundation for training and testing the predictive models. Data warehousing techniques are employed to ensure data quality, consistency, and availability.

Data Mining

The dataset undergoes extensive preprocessing, which includes data cleaning, feature engineering, and transformation. The data mining process is responsible for extracting valuable insights and patterns from the data, enabling the selection of relevant features and identifying potential predictors of laptop prices.

Machine Learning Algorithms

The project employs various regression algorithms, including:

Linear Regression
Lasso Regression
K-Nearest Neighbors (KNN)
Decision Tree
Support Vector Machine (SVM)
Ridge Regression
Ada boost
Gradient Boosting
Random Forest

To further enhance predictive performance, ensemble methods such as Voting Regressor and Stacking are utilized to combine the strengths of multiple algorithms. This allows the project to identify the algorithm or combination of algorithms that produces the most accurate laptop price predictions.

Front-End/GUI

For user interaction, a user-friendly graphical interface is implemented using Python's Pickle library. This interface enables users to input the specifications of a laptop they are interested in and receive an estimated price based on the predictive model's output.

Description of Dataset:

The dataset used for this project consists of a collection of laptops with attributes including but not limited to:

Company
CPU
GPU
RAM
Storage
Screen Resolution
Weight
Operating System
Price

The dataset is compiled from various reliable sources, including online retailers and manufacturers, ensuring that it encompasses a wide range of laptop models and features. Data was gathered meticulously to create a comprehensive and diverse dataset that can be used to train and evaluate the machine learning models.

Before Cleaning and Transformation

	Unnamed: 0	Company	TypeName	Inches	ScreenResolution	Cpu	Ram	Memory	Gpu	OpSys	Weight	Price
0	0	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 2.3GHz	8GB	128GB SSD	Intel Iris Plus Graphics 640	macOS	1.37kg	71378.6832
1	1	Apple	Ultrabook	13.3	1440x900	Intel Core i5 1.8GHz	8GB	128GB Flash Storage	Intel HD Graphics 6000	macOS	1.34kg	47895.5232
2	2	HP	Notebook	15.6	Full HD 1920x1080	Intel Core i5 7200U 2.5GHz	8GB	256GB SSD	Intel HD Graphics 620	No OS	1.86kg	30636.0000
3	3	Apple	Ultrabook	15.4	IPS Panel Retina Display 2880x1800	Intel Core i7 2.7GHz	16GB	512GB SSD	AMD Radeon Pro 455	macOS	1.83kg	135195.3360
4	4	Apple	Ultrabook	13.3	IPS Panel Retina Display 2560x1600	Intel Core i5 3.1GHz	8GB	256GB SSD	Intel Iris Plus Graphics 650	macOS	1.37kg	96095.8080

After Cleaning and Transformation

	Company	TypeName	Ram	Weight	TouchScreen	Ips	ppi	CPU Brand	HDD	SSD	GPU Brand	OS
0	Apple	Ultrabook	8	1.37	0	1	226.983005	Intel Core i5	0	128	Intel	Mac
1	Apple	Ultrabook	8	1.34	0	0	127.677940	Intel Core i5	0	0	Intel	Mac
2	HP	Notebook	8	1.86	0	0	141.211998	Intel Core i5	0	256	Intel	Others/No OS/Linux
3	Apple	Ultrabook	16	1.83	0	1	220.534624	Intel Core i7	0	512	AMD	Mac
4	Apple	Ultrabook	8	1.37	0	1	226.983005	Intel Core i5	0	256	Intel	Mac
...	...	...	...	...	...	...	...	...	...	...	...	...
1298	Lenovo	2 in 1 Convertible	4	1.80	1	1	157.350512	Intel Core i7	0	128	Intel	Windows
1299	Lenovo	2 in 1 Convertible	16	1.30	1	1	276.053530	Intel Core i7	0	512	Intel	Windows
1300	Lenovo	Notebook	2	1.50	0	0	111.935204	Other Intel Processor	0	0	Intel	Windows
1301	HP	Notebook	6	2.19	0	0	100.454670	Intel Core i7	1000	0	AMD	Windows
1302	Asus	Notebook	4	2.20	0	0	100.454670	Other Intel Processor	500	0	Intel	Windows

SCREENSHOTS:

TE_SemV_ML/ | Laptop_Price_Prediction - Jupyt | Laptop Price Predictor

localhost:8501

Deploy

Laptop Price Predictor

Brand

Lenovo

Type

Ultrabook

RAM(in GB)

16

Weight of the Laptop

1.41 − +

TE_SemV_ML/ | Laptop_Price_Prediction - Jupyt | Laptop Price Predictor

localhost:8501

Deploy

Touchscreen

Yes

IPS

Yes

Screen Size

14.00 − +

Screen Resolution

1920x1080

CPU

Intel Core i7

HDD(in GB)

0

SSD(in GB)

512

TE_SemV_ML/ | Laptop_Price_Prediction - Jupyt | Laptop Price Predictor

localhost:8501

Deploy

512

GPU

Intel

OS

Windows

Predict Price

Predicted Laptop Price:

₹ 103748

Made with Streamlit

Analysis:

ALGORITHMS USED	*ACCURACY*
Linear Regression	**80.73%**
Decision Tree	**84.34%**
Random Forest	**88.73%**
Lasso Regression	**80.71%**
Ridge Regression	**81.27%**
KNN	**80.21%**
SVM	**80.83%**
Ada Boost	**78.21%**
Gradient Boost	**88.22%**
Voting Regressor	**89.09%**
Stacking	**87.87%**

CONCLUSION:

The "Laptop Price Predictor" project successfully integrates data warehousing, data mining, and machine learning techniques to create a reliable tool for predicting laptop prices. By applying a range of regression and ensemble algorithms, this project provides users with a more informed and data-driven approach to laptop purchasing decisions. The project's user-friendly front-end allows for easy access and interaction with the predictive model, making it a valuable tool for consumers and laptop enthusiasts alike. Additionally, the project's versatility in using various algorithms ensures that it can adapt to different datasets and perform accurate predictions for a wide range of laptop model.

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