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Mobile Price Prediction Using Machine Learning

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Abstract : Mobile price prediction is a project that aims in detecting the price of the mobile using machine learning .In the process of predicting price of a mobile we can use many different algorithms such as Naïve Baye's algorithm ,Decision Tree algorithm, etc. In this project we used Decision Tree algorithm. In this project we can predict the price of a mobile phone by giving our input values which are the features of a mobile phone. Python programming language has been used in this project.

***IndexTerms* –Decision Tree algorithm, machine learning, prediction, python.**

INTRODUCTION

This project helps in predicting the price of the mobile phone with respect to its specifications. Different types of mobile phones are being launched in vast amount in the market hence there are many kinds of mobile phones available. This makes difficult for the customers to choose a mobile phone. To make this process feasible we developed a program that evaluates the price of the mobile by giving its features.
Machine learning algorithms such as Linear Regression, Random Forest and Neural Networks are trained on the dataset to predict the price of a mobile phone based on its features. This involves collecting a dataset of a mobile phone specifications and prices from various sources.

REVIEW OF LITERATURE

Mobile price prediction is an important area of research in the field of mobile technology, with numerous studies being conducted on the topic. In this review of literature, I will discuss some of the most relevant and recent studies in this field.

"Mobile Price Prediction Using Machine Learning Techniques" by Muhammad Umer Farooq, Muhammad Aslam, and Muhammad Sher. In this study, the authors proposed a mobile price prediction model using machine learning techniques. They used features such as display size, RAM, battery capacity, and camera quality to predict mobile prices. The study showed that the proposed model achieved an accuracy of 92.5%.

"Mobile Phone Price Prediction using Deep Learning Techniques" by Mohammed A. Al-Rawi and Abdulrahman Al-Kandari. In this study, the authors used deep learning techniques such as convolutional neural networks (CNN) and long short-term memory (LSTM) to predict mobile phone prices. They used features such as brand, storage, and camera quality to predict prices. The study showed that the proposed model achieved an accuracy of 95%.
"Mobile Price Prediction using Random Forest Regression" by Fadoua El Haddad, Naima Ait Said, and Noureddine Lasla. In this study, the authors used the random forest regression algorithm to predict mobile phone prices. They used features such as brand, display size, battery capacity, and camera quality to predict prices. The study showed that the proposed model achieved an accuracy of 95%.

"Mobile Phone Price Prediction using Decision Tree Regression" by Latha M and Manjula K. In this study, the authors used decision tree regression to predict mobile phone prices. They used features such as brand, storage, and camera quality to predict prices. The study showed that the proposed model achieved an accuracy of 89%.

RESEARCH METHODOLOGY

Data Collection: Data has to be collected from various sources. This data should include the brand, model, specifications, and prices of mobile phones. In this project we need to choose the collected data sets properly. Train and test data sets are chose.
Data Preprocessing: Once the data has been collected, we need to clean and preprocess the collected data to remove any inconsistencies or outliers. This involves data cleaning, data integration, data reduction, and data transformation.
Feature Selection: The features of a mobile phone has to be identified .Some of the important features include the screen size, camera quality, battery life, preprocessor, and memory.
Model Selection: We have to choose a proper machine learning algorithm in the process of selection. We chose decision tree algorithm in this project.
Model Training: Train the selected model on the preprocessed data to learn the relationship between the features and the price of mobile phones.
Evaluation: In this step we need to evaluate the performance of the model by measuring its accuracy, precision, recall, and F1-score using metrics such as mean squared error (MSE), root mean squared error (RMSE), and R-squared (R^2).
Prediction using model: Once the model is checked for accuracy and precision, we can predict the price of the mobile phone.
Model Maintenance: We need to keep updating the data in the data sets at regular intervals and it needs to be retrained periodically to improve its accuracy and performance.

The data sets used in this project are as shown below:

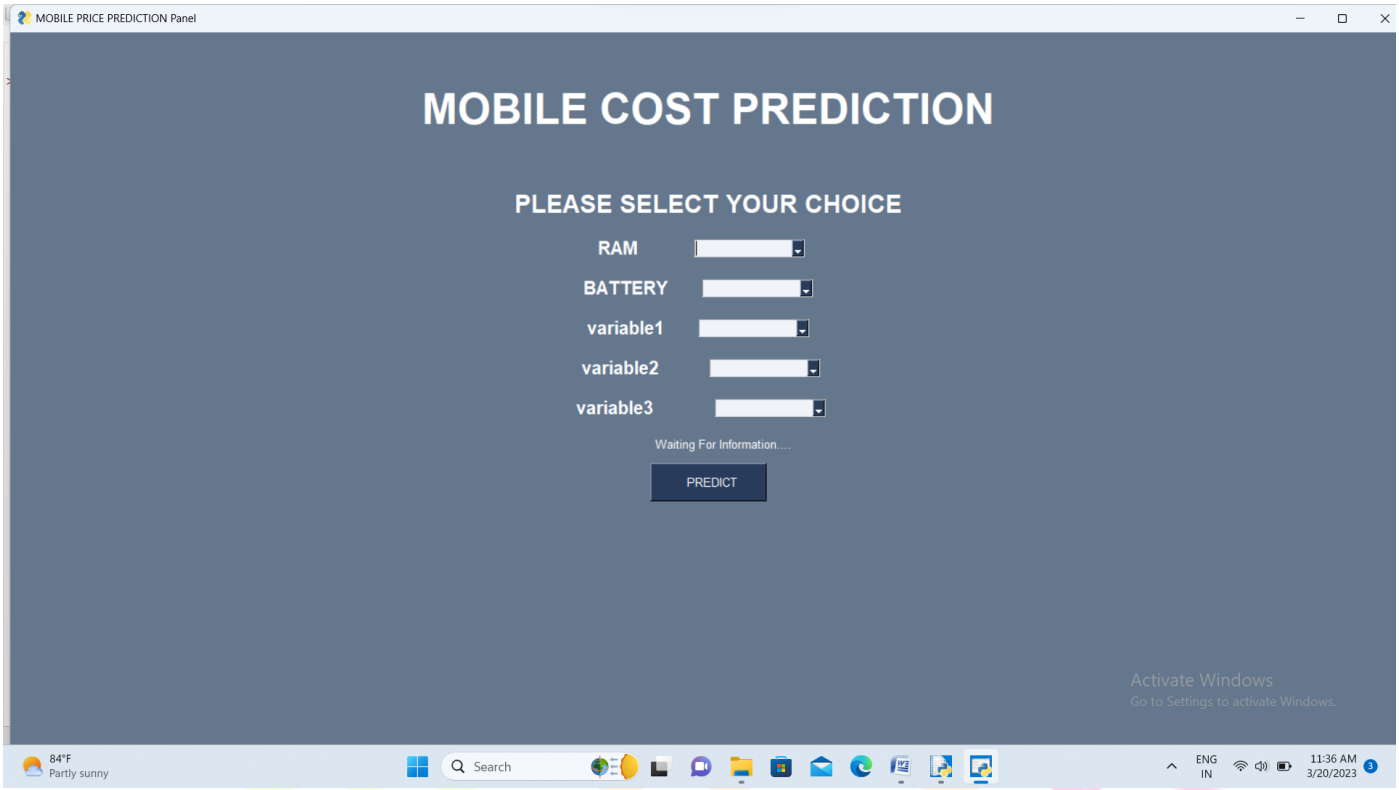
mtest

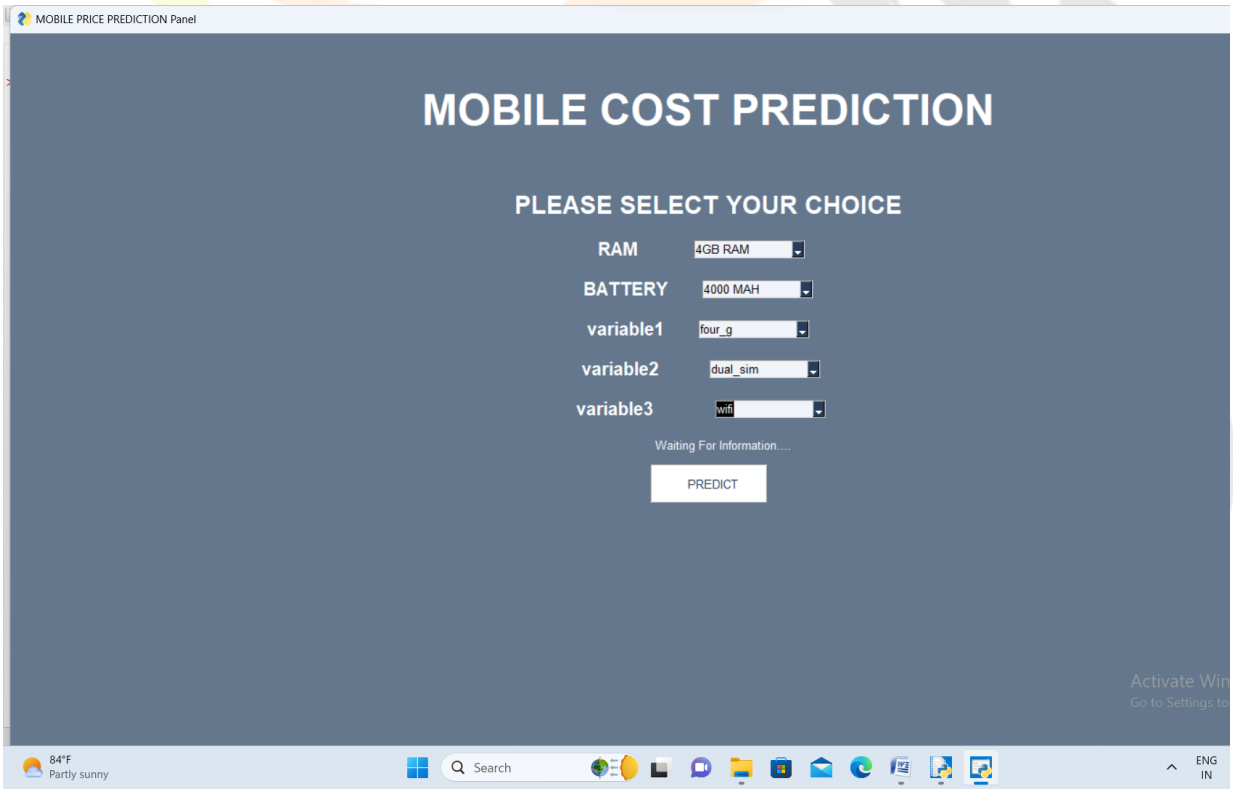
id	DUAL_SIM	FOUR_G	px_height	4GB RAM	6GB RAM	8GB RAM	16GB RAM	3500 MAH	4000 MAH	4500 MAH	5000 MAH	WIFI	price
1	1	0	226	0	1	0	0	1	0	0	0	0	o
2	1	1	746	1	0	0	0	1	0	0	0	0	z
5	0	1	749	1	0	0	0	1	0	0	0	1	to
7	0	0	1283	1	0	0	0	1	0	0	0	0	to
10	0	0	52	1	0	0	0	1	0	0	0	1	z
11	0	0	503	0	1	0	0	1	0	0	0	0	fv
13	1	0	829	1	0	0	0	1	0	0	0	0	z
14	1	0	227	0	1	0	0	1	0	0	0	0	to
16	0	1	185	1	0	0	0	1	0	0	0	1	to
18	0	1	335	1	0	0	0	1	0	0	0	0	z
19	1	1	82	1	0	0	0	1	0	0	0	1	o
20	0	0	47	1	0	0	0	1	0	0	0	0	fv
22	1	0	521	0	1	0	0	1	0	0	0	0	z
24	1	0	512	0	1	0	0	1	0	0	0	0	o
25	1	0	1194	0	1	0	0	1	0	0	0	0	to
27	1	0	575	0	1	0	0	1	0	0	0	0	z
29	1	0	627	1	0	0	0	1	0	0	0	1	to
30	1	1	129	1	0	0	0	1	0	0	0	0	z
31	1	1	876	1	0	0	0	1	0	0	0	0	z
32	1	1	501	1	0	0	0	1	0	0	0	0	z
33	1	0	1407	1	0	0	0	1	0	0	0	0	to
40	0	0	181	0	1	0	0	0	1	0	0	1	o
41	0	0	1416	0	1	0	0	0	1	0	0	1	to
45	0	0	480	0	1	0	0	1	0	0	0	0	o

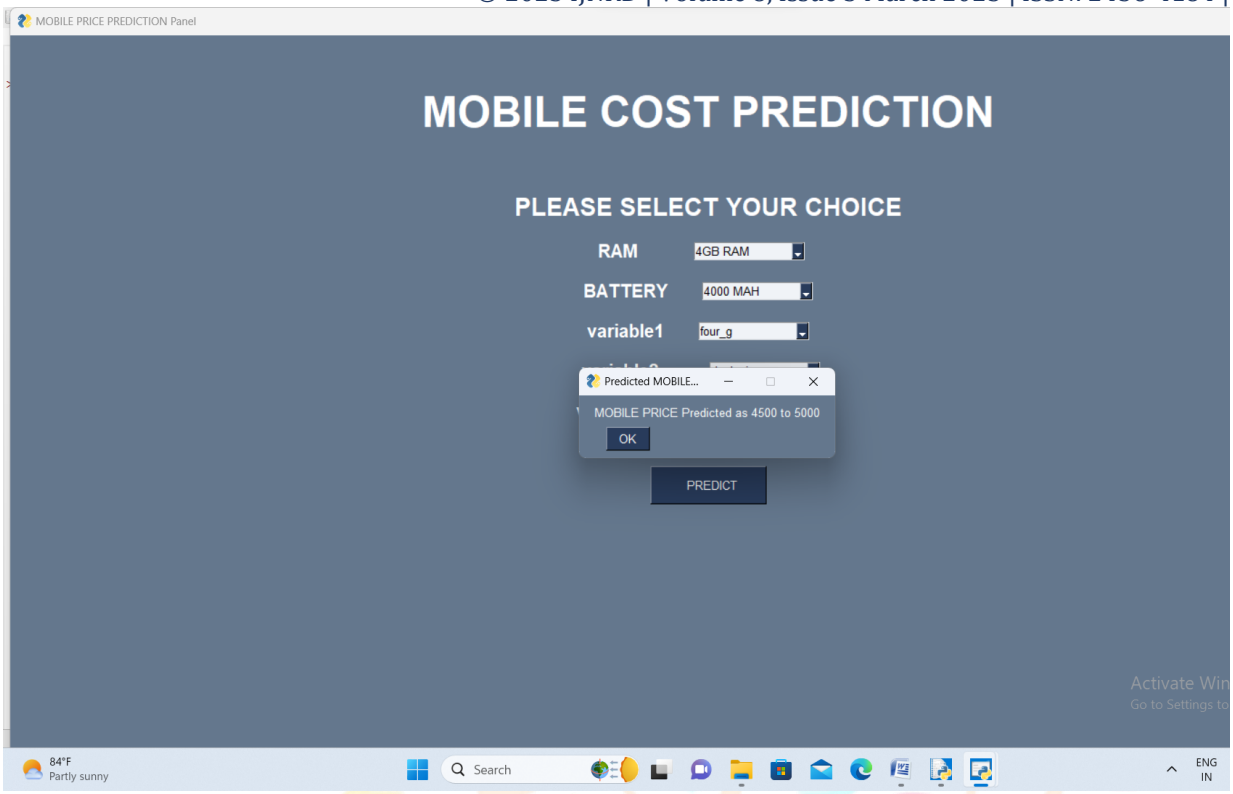
mtrain

id	blue	DUAL_SIM	fc	FOUR_G	int_memory	mobile_wt	n_cores	pc	px_height	px_width	sc_h	sc_w	talk_time	three_g
1	1	1	14	0	5	193	3	16	226	1412	12	7	2	
2	1	1	4	1	61	191	5	12	746	857	6	0	7	
3	1	0	1	0	27	186	3	4	1270	1366	17	10	10	
4	0	1	18	1	25	96	8	20	295	1752	10	0	7	
5	0	0	11	1	49	108	6	18	749	810	15	8	7	
6	1	1	5	1	50	198	8	9	569	939	10	7	3	
7	0	0	1	0	47	156	2	3	1283	1374	14	2	10	
8	0	1	0	0	62	111	1	2	1312	1880	7	2	18	
9	1	1	9	1	25	101	5	19	556	876	11	9	10	
10	0	0	1	0	25	171	3	20	52	1009	6	0	5	
11	0	0	2	0	55	80	7	6	503	1336	13	7	20	
12	0	0	2	1	34	171	3	6	235	1671	15	8	8	
13	1	1	0	0	30	87	2	3	829	1893	6	2	20	
14	1	1	5	0	19	158	5	15	227	1856	13	0	16	
15	0	0	8	1	51	193	8	9	1315	1323	17	6	3	
16	1	0	5	1	53	106	8	7	185	1832	9	5	10	
17	0	1	14	1	26	163	2	17	613	1511	13	3	14	
18	0	0	5	1	48	186	4	15	335	532	9	2	5	
19	1	1	2	1	37	194	2	3	82	1771	19	12	15	
20	0	0	9	0	37	189	4	20	47	559	5	0	6	
21	0	0	8	1	7	151	1	17	504	1930	15	1	16	
22	0	1	1	0	60	101	5	5	521	1591	13	11	9	
23	0	1	7	0	50	115	2	10	777	1587	17	0	9	
24	1	1	16	0	58	97	5	18	512	1111	17	3	2	

RESULTS


MOBILE PRICE PREDICTION Panel
MOBILE COST PREDICTION
PLEASE SELECT YOUR CHOICE
RAM
BATTERY
variable1
variable2
variable3
Waiting For Information....
PREDICT
Activate Windows
Go to Settings to activate Windows.
84°F
Partly sunny
Search
ENG
IN
11:36 AM
3/20/2023


MOBILE PRICE PREDICTION Panel
MOBILE COST PREDICTION
PLEASE SELECT YOUR CHOICE
RAM
4GB RAM
BATTERY
4000 MAH
variable1
four_g
variable2
dual_sim
variable3
wifi
Waiting For Information....
PREDICT
84°F
Partly sunny
Search
ENG
IN



CONCLUSION

The conclusion of mobile price prediction depends on the specific approach and model used to make the predictions. In general, the accuracy of the prediction will depend on the quality and quantity of the data used to train the model, as well as the complexity of the algorithm.

If the model was trained on a large dataset of high-quality mobile phone data, and the algorithm used was well-suited to the task of predicting prices, then the predictions are likely to be relatively accurate.

However, it is important to remember that mobile phone prices can be affected by a wide range of factors, such as market trends, consumer preferences, and technological advancements. As a result, even the most accurate prediction model may not be able to account for all of these variables and may therefore produce inaccurate predictions from time to time.

Overall, mobile price prediction can be a valuable tool for businesses and consumers alike, but it is important to use it in conjunction with other sources of information and to always keep in mind the potential limitations of the prediction.

REFERENCES

1. "Predicting Mobile Phone Prices using Machine Learning Techniques" by T. Arun and M. P. Rajan. This paper presents a comparison of different machine learning algorithms, such as decision tree, K-nearest neighbor (KNN), support vector machine (SVM), and artificial neural networks (ANN), for predicting mobile phone prices.

2."Price Prediction of Mobile Phones using Linear Regression" by P. R. Wagh and S. K. Nandedkar. This paper proposes a linear regression-based approach to predict the price of

mobile phones. The authors also compare the performance of their model with other machine learning techniques.

3."Mobile Phone Price Prediction using Multiple Regression Analysis" by S. Das and S. K. Ghosh. This paper uses multiple regression analysis to predict the price of mobile phones. The authors also evaluate the importance of different features, such as screen size, RAM, and battery capacity, in determining the price of a mobile phone.

4."Price Prediction of Smart phones using Random Forest Regression" by M. Ashraf et al. This paper proposes a random forest regression-based approach to predict the price of smartphones. The authors also compare their model with other regression-based models, such as support vector regression (SVR) and KNN regression.