HOUSING PRICE PREDICTION USING MACHINE LEARNING ALGORITHM

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Abstract - People are careful when they are trying to buy a new house with their budgets and market strategies. The objective of the paper is to predict house prices for non-house holders based on their financial provisions and their aspirations. By analyzing the foregoing merchandise, fare ranges and also forewarns developments, speculated prices will be estimated. The paper involves predictions using different Regression techniques like Linear Regression and Decision Tree Regression with performing some matrices like accuracy and R2 score values on useful data. House price prediction on a data set has been done by using all the mentioned techniques to find out the best among them. The motive of this paper is to help the seller to estimate the selling cost of a house perfectly and to help people to predict the exact time slap to accumulate a house.

Key Word: House Price Prediction, Machine Learning Algorithms, Linear Regression, Decision Tree Regression.

1.INTRODUCTION

The fluctuation of real estate is violent and there are many complicated financial indicators. However, the advancement in technology, provides an opportunity to gain steady fortune for house price and also can help experts to find out the most informative indicators to make better prediction. The main motivation of the project of HOUSE PRICE PREDICTION was to make the best possible prediction of house prices by using appropriate algorithms and finding out which among them is best suitable for predicting the price with low error rate. This is an interesting problem because most of the people will eventually buy/sell a home. This problem allows us, as house price analysts, to learn more about the housing market and helps with making more informed decisions. The prediction of the house prices is of paramount importance to help in maximizing the profit of real estate option purchase while keeping the risk low.

2. LITERATURE SURVEY

Literature survey is the most important step in software development process. Before developing the tool, it is necessary to determine the time factor, economy n company strength. Once these things r satisfied, ten next steps are to determine which operating system and language can be used for developing the tool. Once the programmers start building the tool the programmers need lot of external support. This support can be obtained from senior programmers, from book or from websites. Before building the system, the above considerations are taken into account for developing the proposed system.

In [1], People are careful when they are trying to buy a new house with their budgets and market strategies. The objective of the paper is to forecast the coherent house prices for non-house holders based on their financial provisions and their aspirations. By analyzing the foregoing merchandise, fare ranges and also forewarns developments, speculated prices will be estimated. The paper involves predictions using different Regression techniques like Multiple linear, Ridge, LASSO, Elastic Net, Gradient boosting and Ada Boost Regression. House price prediction on a data set has been done by using all the, above mentioned techniques to find out the best among them. The motive of this paper is to help the seller to estimate the selling cost of a house perfectly and to help people to predict the exact time slap to accumulate a house. Some of the related factors that impact the cost were also taken into considerations such as physical conditions, concept and location etc.

In [2], House prices increase every year, so there is a need for a system to predict house prices in the future. House price prediction can help the developer determine the selling price of a house and can help the customer to arrange the right time to purchase a house. There are three factors that influence the price of a house which include physical conditions, concept and location. This research aims to predict house prices based on NJOP houses in Malang city with regression analysis and

particle swarm optimization (PSO). PSO is used for selection of affect variables and regression analysis is used to determine the optimal coefficient in prediction. The result from this research proved combination regression and PSO is suitable and get the minimum prediction error.

In [3]. Housing market is of great important for the economy activities. Housing construction and renovation boost the economy through an increase in the aggregate expenditures, employment and volume of house sales. They also simulate the demand for relevant industries such as household durables. The oscillation of house prices affects the value of asset portfolio for most households forwhom a house is the largest single asset. An accurate prediction on the house price is important to prospective homeowners, developers, investors, appraisers, tax assessors and other real estate market participants, such as, mortgage lenders and insurers. Traditional house price prediction is based on cost and sale price comparison lacking of an accepted standard and a certification process. Therefore, the availability of a house price prediction model helps fill up an important information gap and improve the efficiency of the real estate market.

According to, the results show that the houses with more bedrooms and bathrooms are priced higher. A relatively new house is more expensive than an old house and a house with a garden is priced higher than one without a garden. Recent studies further

In [4], Precisely assessing programming exertion is likely the greatest test confronting for programming engineers. Assessments done at the proposition

arrange has high level of incorrectness, where prerequisites for the degree are not characterized to the most reduced subtle elements, but rather as the venture advances and necessities are explained, exactness and certainty on appraise increments. It is vital to pick the correct programming exertion estimation systems for the forecast of programming exertion. Artificial Neural Network (ANN) and Support Vector Machine (SVM) have been utilized on guarantee dataset for forecast of programming exertion in this article.

We justify the necessity of housing price analysis with a conclusion that housing sector plays a significant role in acting as a leading indicator of the real sector of the economy and assets prices help forecast both inflation and output. Many previous studies find empirical evidence supporting the significant interrelations between house price and various economic variables, such as income, interest rates, construction costs and labor market variables.

III. METHODOLOGY
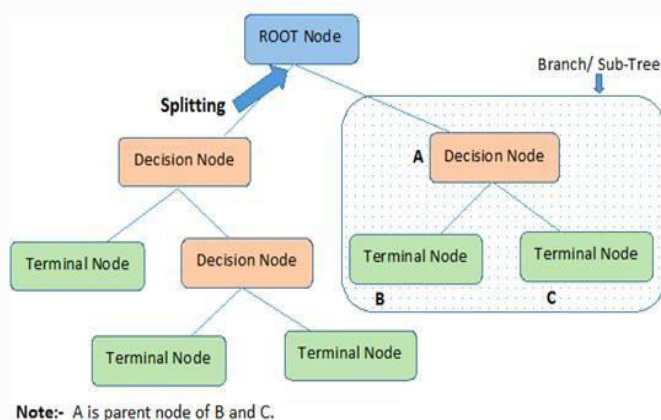
Fig 1. Decision Tree regression

Fig. 1 shows the decision tree regression technique

Root Node: It represents the entire population or sample and this further gets divided into two or more homogeneous sets.

Splitting: It is a process of dividing a node into two or more sub-nodes.

Decision Node: When a sub-node splits into further sub-nodes, then it is called the decision node.

Leaf / Terminal Node: Nodes do not split is called Leaf or Terminal node.

Pruning: When we remove sub-nodes of a decision node, this process is called pruning. You can say the opposite process of splitting.

Branch / Sub-Tree: A subsection of the entire tree is called branch or sub-tree.

IV. RESULTS AND DISCUSSION

In this section, we compare the results of five classification algorithms namely K-Nearest Neighbors, Logistic Regression, Convolutional Neural Network, Random Forest Classifier and Support Vector Machine.
Fig.2 shows the login page for prediction

Fig 2. House price prediction page
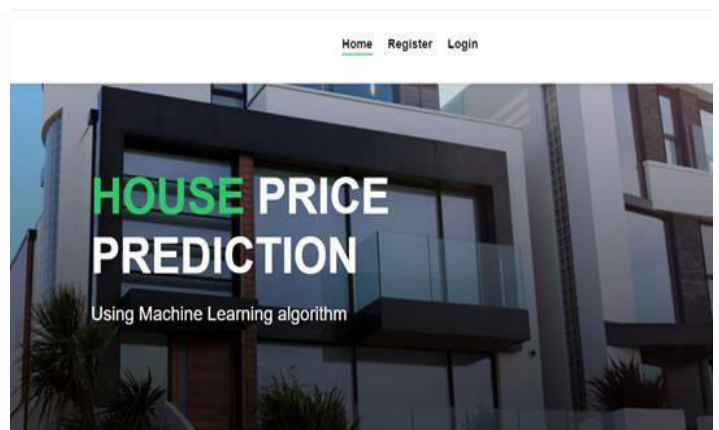

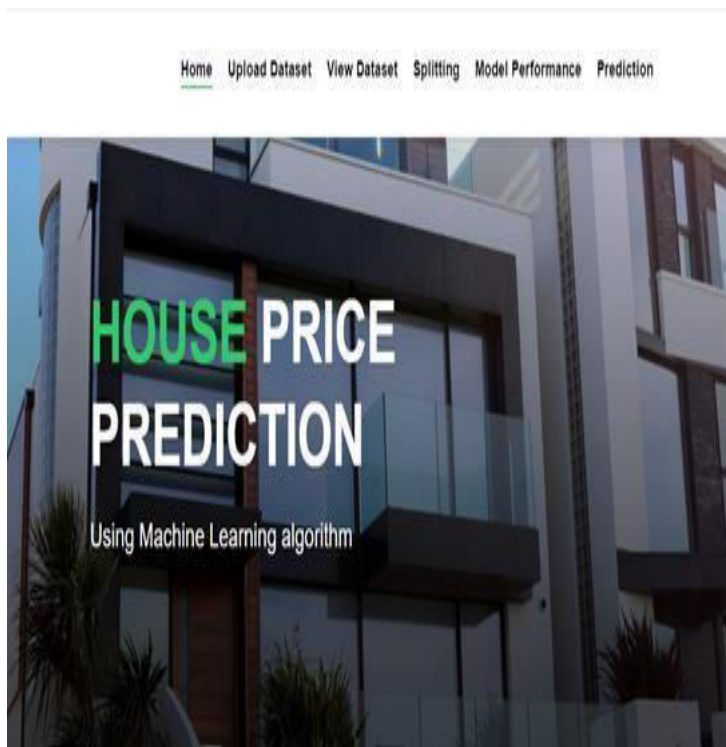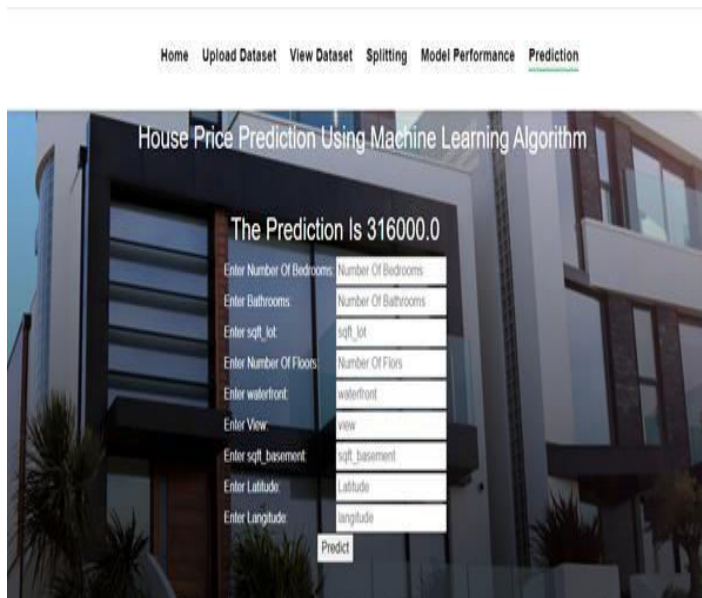Note:- A is parent node of B and C.
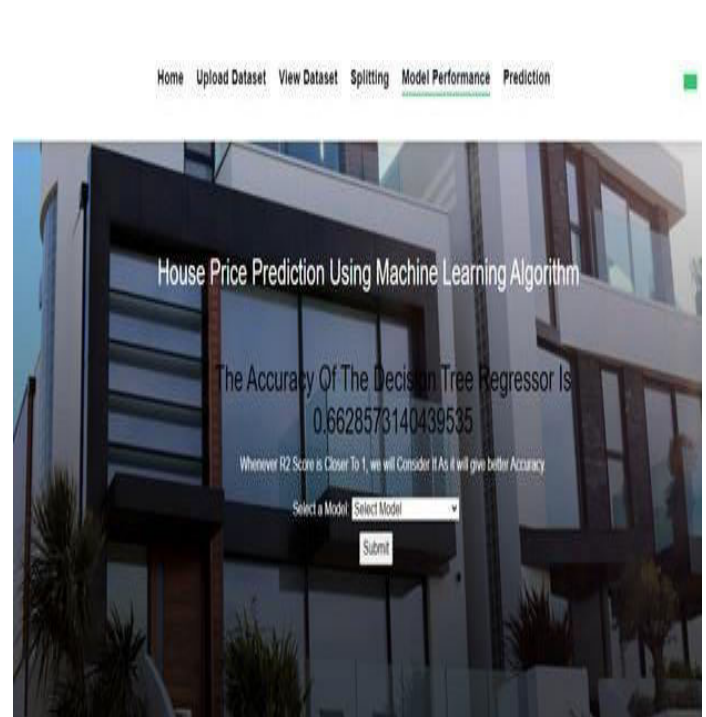
Fig.3 shows the different modules

Fig 3. Different modules for prediction

Fig.4 shows the usage of machine learning prediction

Fig 4. Machine learning prediction

Fig.5 shows the model performance and accuracy

of the decision tree

Fig 5. Model performance of decision tree

V. CONCLUSION

This article mainly concentrates on the comparison between different machine learning algorithms (Linear regression and Decision Tree Regressor) about House price prediction Analysis. From the above experiment results, Decision Tree Regressor algorithm has high accuracy value when compared to all the other algorithms regarding house price predictions. Here the [MSE] Mean Square Error and $R2$ score are used in order to calculate the accuracy value of the algorithm on the King County Dataset which was collected from public dataset. The paper can be extended by applying the above said algorithms to predict House resale value.

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