

House Planning and Price Prediction System using Machine Learning

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ABSTRACT

The housing sector has hike as it is the one of the basic need. Housing the main domain of real estate. In the major metropolitan cities and the cities with many prestigious Educational institutions and IT Parks have reasonable price increase in housing. Home buying plans can derails the family's financial planning and other goals. Now a day's house price changing rapidly according to various parameters. The buyer gets confused in choosing his dream home as difference in price making it challenging. Both the buyer and seller should satisfy so they do not overestimate or underestimate price. So to build the platform where buyer can find home according to its needs and friendly to its financial condition. House price prediction on different parameters is our goal. Doing that we are going to use regression algorithms using machine learning on dataset so it can extract features from dataset. Result of this approach provide maximum efficiency and minimum errors. We also propose to determine the plane for house building.

Keywords: House price prediction, Regression algorithm, Machine learning, Feature extraction.

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I. INTRODUCTION

The real estates is not only the living requirement, it also represents the personal wealth and glory. In addition, the real estate's price fluctuation may impact the households 'investment and consumption situation. It is also an important impact factor for investing company, real estate's developer, banker and policy makers. Hence, it can be concerned as an important economic index. How to establish the real estate's price variation prediction model is an interesting research topic.

Studies on housing market forecasting investigate the house values, growth trend, and its relationships with various factors. The improvement of machine learning techniques and the proliferation of data or big data available have paved the way for real estate studies in recent years. There is a variety of research leveraging statistical learning methods to investigate the housing market

In India, the property is sold as per the wish of seller. Thus, it is a biased procedure to buy a house in India since there is no standard way to list the selling price of the

property. Very less work on real estate valuation is done in India. People in India believe on what is shown on the mass media. But mass media can manipulate the content as per their convenience and profits. So we require a trusted medium which can predict the house prices with noteworthy precision and least mistake. Here we are proposing a model which predicts house prices based on various factors affecting on house price using machine learning. Sklearn is a Simple and efficient tools for data mining and data analysis. [7] After evaluating for various test runs we conclude that instead of an individual algorithm a series of algorithm yields better results. [1].

Problem Statement:

To design and implement a web based application which predicts price of houses by considering many factors effecting on price and suggest basic architectural plan for houses.

II. LITERATURE SURVEY

This paper seeks useful models for house price prediction. It also provides insights into the Cities Housing Market.

Preparation of original data is the first step and then it transformed into a cleaned dataset ready for analysis. Stepwise and PCA techniques are used for data reduction and transformation. Data reduction is done to minimize data by eliminating the useless, noisy data. Transformation transform the data into single format so the operation can be done on it. Different methods are then implemented and evaluated to achieve an optimal solution. The evaluation phase is the combination of Step-wise and Support Vector Machine (SVM) model and it's a competitive approach. Therefore, it could be used for further deployment. This research can also be applied for transactional datasets of the housing market from different locations across country. [2].

A system is developed which can predict the actual price of house using regression algorithm. The system makes use of Linear Regression, Forest regression, and Boosted regression algorithms. For increasing the efficiency of algorithms the neural network is used. The system will satisfy customers by providing accurate output by considering the input given by customer and preventing the risk of investing in the wrong house. Without disturbing the core functionality of the system additional features can be added to the system. Additional features are added accordingly to the need of customer .A major future update could be the addition of larger cities to the database, which will allow our users to explore more houses in order to get maximum profit, get more accuracy, minimize errors and risk thus come to a proper decision. [3].

The Radial Basis Neural Network (RBF) and Back Propagation Neural Network (BPF) neural networks are introduced to model the complicated correlation function between macro-economic parameters variation and house price index variation. 40 seasons leading data sets are used to employed on training the neural network. Then, the less 13 season's data sets are used to evaluate the prediction accuracy between Neural Network (NN) model output and the Cathay or Sinai house price index. The results of data analysis show that the house price variation prediction results is not accurate enough. However, for establishment of investor, developer and government reference house price prediction trend is used. [4].

The large set of data can be analyzed by series analysis. In addition to the parameters mentioned in the research paper, we could use dynamic parameters like inflation rate, GDP which has a huge impact on the real estate prices. This study can be extended in several ways. First, it could be desirable to investigate other problem domains like real estate market prediction, interest rate, economic growth rate and stock price index forecasting to generalize and improve the results. This system will be helpful to many people once it gets deployed. However, practical implementation of this system comes with a various challenges. The dataset used is bound to get outdated after sometime due to various reasons like changes in government policies, geographical changes in that area and therefore needs to be constantly updated which is hard to do. Graphical User Interface of the system uses the English language. Those who are not familiar with this language would find it difficult to interact and use the system effectively and unable to understand the system and

may be not able to used its full functionality. Including the all languages for the Graphical User Interface (GUI) can be hard. [5].

III. PROPOSED SYSTEM

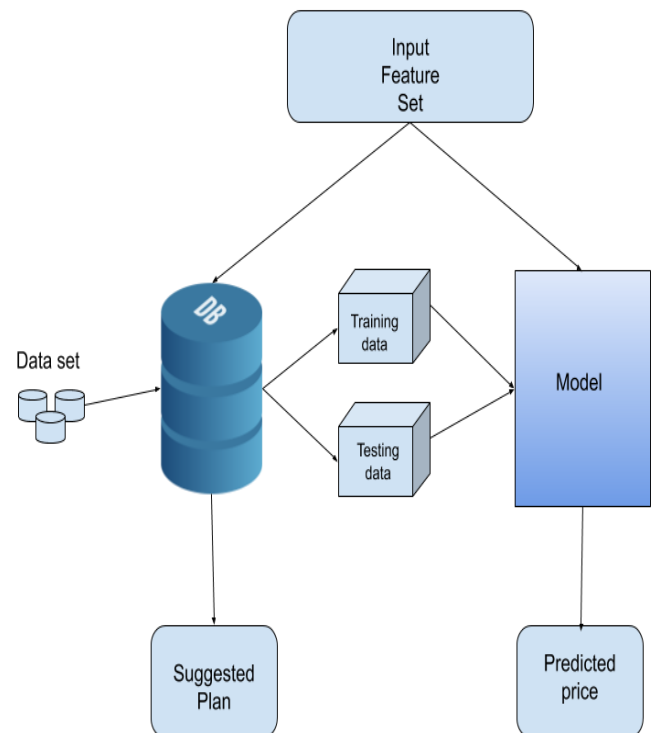


Fig 1. System Architecture

Data from database is used for training purpose. Where the regression algorithm is used to find the relation between the parameters to construct a model. The user input is treated as test data which is unseen by the model. The prediction involved using various features such as latitude, longitude, separate square feet area of each rooms.[8] This data is passed to the model generated by training the data. Model work on the given input and predict the result. The system then displays the matching properties and its price according to the user preferences. [6] The user input of plan is pass to the database to find the most resemble plan and suggest to the user.

System Feature:

- The system will help people to know the close to precise price of real estate.
- User can give their requirements according to which they will get the prices of the desired houses
- User can also get the sample plan of house to get a reference of houses.

IV. CONCLUSION

Machine learning is very useful for finding the relation between the attributes and building the model according to the relation that attributes contain. By using regression algorithm which is part of machine learning the house price prediction can be done. House price prediction helps the customer to buy its dream house among the different price variation, attributes and needs. Algorithm find relation among the training data and the result is applied on test data which will be users input. According to attributes specified the plans gets provided.

REFERENCES

- [1] A. Adair, J. Berry, W. McGreal, Hedonic modelling, housing submarkets and residential valuation, *Journal of Property Research*, 13 (1996) 67-83.
- [2] The Dan Phan “HOUSING PRICE PREDICTION USING MACHINE LEARNING ALGORITHMS: THE CASE OF MELBOURNE CITY, AUSTRALIA”, in *International Conference on Machine Learning and Data Engineering (iCMLDE)*
- [3] Ayush Varma, Abhijit Sarma, Sagar Doshi, Rohini Nair “HOUSE PRICE PREDICTION USING MACHINE LEARNING AND NEURAL NETWORKS” 2017 IEEE International Conference on Applied System Innovation IEEE-ICASI 2017
- [4] Li Li, Kai-Hsuan Chu “PREDICTION OF REAL ESTATE PRICE VARIATION BASED ON ECONOMIC PARAMETERS”, 2017 IEEE International Conference on Applied System Innovation IEEE-ICASI 2017 - Meen, Prior & Lam (Eds)
- [5] Rushab Sawant, Yashwant Jangid, Tushar Tiwari, Saurabh Jain, Ankita Gupta “COMPREHENSIVE ANALYSIS OF HOUSING PRICE PREDICTION IN PUNE USING MULTI-FEATURED RANDOM FOREST APPROACH” 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA)
- [6] T. Kauko, P. Hooimeijer, J. Hakfoort, Capturing housing market segmentation: An alternative approach based on neural network modeling, *Housing Studies*, 17 (2002) 875-894.
- [7] I. S. H. Bahia, “A Data Mining Model by Using ANN for Predicting Real Estate Market: Comparative Study,” *International Journal of Intelligence Science*, vol. 03, no. 04, pp. 162–169, 2013.
- [8] World Population Review (2017). Retrieved from “Pune Population 2018,” (Demographics, Maps, Graphs), 20-Jan-2017.