**House Price Prediction Using Machine Learning And Neural Networks**

**Alternative title:**

Predict house price based on neural network and machine learning algorithm

**Aim:**

Housing prices keep changing day inand day out and sometimes are hyped rather thanbeing based on valuation. Predicting housingprices with real factors is the main crux of ourresearch project. Here we aim to make ourevaluations based on every basic parameter that isconsidered while determining the price

**Abstract:**

 Real estate is the least transparent industry in ourecosystem. Housing prices keep changing day inand day out and sometimes are hyped rather thanbeing based on valuation. Predicting housingprices with real factors is the main crux of ourresearch project. Here we aim to make ourevaluations based on every basic parameter that isconsidered while determining the price. We usevarious regression techniques in this pathway, andour results are not sole determination of onetechnique rather it is the weighted mean ofvarious techniques to give most accurate results.The results proved that this approach yieldsminimum error and maximum accuracy thanindividual algorithms applied. We also propose touse real-time neighborhood details using Googlemaps to get exact real-world valuations.

**Synopsis:**

Our model analyses a set of parameters selected by the customer so as to find an ideal price according to their requirements and interest. It uses a classical technique called linear regression, forest regression and Boosted regression for prediction and tries to give an analysis of the results obtained. On top of this, Neural networks are further used to increase the accuracy of the algorithm which are then further enhanced with boosted regression. It helps establishes the relationship strength between dependent variable and other changing independent variable known as label attribute and regular attribute respectively.

**Existing System:**

Real estate is the least transparent industry in ourecosystem. Housing prices keep changing day inand day out and sometimes are hyped rather thanbeing based on valuation.

**Problem Definition:**

Our model analyses a set of parametersselected by the customer so as to find an ideal priceaccording to their requirements and interest. It uses aclassical technique called machine learning for prediction andtries to give an analysis of the results obtained. Ontop of this, Neural networks are further used toincrease the accuracy of the algorithm which are thenfurther enhanced with boosted regression.

**Proposed System:**

Our dataset comprises of various essential parametersand data mining has been at the root of our system.We initially cleaned up our entire dataset and alsotruncated the outlier values. Further, we weighedeach parameter based on its importance indetermining the pricing of the system and this led usto increase the value that each parameter withholds inthe system. We shortlisted 3 different machinelearning algorithms and tested our system withdifferent combinations that can guarantee bestpossibly reliability of our results

**Advantage:**

Even after that, we followed a unique approach toincrease the accuracy, our survey led to a conclusionthat the actual real estate value also depends onnearby local amenities such as railway station,supermarket, school, hospital, temple, parks etc. Andnow we propose our unique approach that cancounter this need. We carried this out with manualexamples and this gave us tremendous results interms of accuracy in prediction

**Algorithm:**

**Neural Networks:**

 Furthermore, the results of all the above algorithmsare fed as input to the neural network. We use neuralnetwork applied with boosted regression to increasethe accuracy of the result. Neural network does thejob pretty well by comparing all the predictions andcomputing them to display the most accurate result.

**Modules:**

* Dataset Collection
* Detection

**Dataset Collection:**

Dataset collection from Kaggle.com

**Detection:**

 The customer is displayed with the GUIwhere he can enter the locality, area and differentparameters about the house he is looking to buy. Thesystem then displays the matching properties and itsprice according to the user preferences

**Architecture Diagram:**

Dataset Creation

Data pre-process

Machine learning algorithm

Prediction

Result

**Hardware Requirements:**

* Hard Disk : 500GB and Above
* RAM : 4GB and Above
* Processor : I3 and Above
* Webcam - 1

**Software Requirements:**

* Operating System : Windows 10 (64 bit)
* Software : Python
* Tools : Anaconda

**Conclusion:**

A system that aims to provide an accurate predictionof housing prices has been developed. The systemmakes optimal use of Linear Regression, Forestregression, Boosted regression. The efficiency of thealgorithm has been further increased with use ofNeural networks. The system will satisfy customersby providing accurate output and preventing the risk

of investing in the wrong house. Additional featuresfor the customer’s benefit can also be added to thesystem without disturbing it’s core functionality. Amajor future update could be the addition of largercities to the database, which will allow ourusers to explore more houses, get more accuracy andthus come to a proper decision.

**Future Work:**

The accuracy of the system can be improved. Severalmore cites can be included in the system if the sizeand computational power increases of the system.Furthermore, we can integrate different UI/UXmethodology for better visualization of the results ina more interacting way using Augmented Reality. Also, a learning system can be created which

will gather users feedback and history so that thesystem can display the most suitable results to theuser according to his preferences.