Predicting House Price in Machine Learning

ARTIFICIAL INTELLINGENCE

PROBLEM DEFINITION:

Housing prices are an important reflection of the economy, and housing price ranges are of great interest for both buyers and sellers. In this project, house prices will be predicted given explanatory variables that cover many aspects of residential houses. The goal of this project is to create a regression model that are able to accurately estimate the price of the house given the features.

PROBLEM UNDER CONSIDERATION:

In India, an inadequate amount of work has been done for valuation in real estate . As a result, sellers use this to their advantage and escalate the prices. Thus, there is a biased procedure to purchase residential property in India as there is no standardized list to aid potential buyers in making a viable buying decision. A typical man cannot contemplate the different market patterns and their impact on the property costs in detail. Hence, a

device that understands these patterns and the impact of different parameters on property costs is required. Different machine learning algorithms can be utilized to foresee future estimates. We require to build a model that predicts future housing prices considering precision accuracy and different error metrics.

PROBLEM STATEMENT:

First we predict the values in y using the values in x . Then we compare the actual prices and predicted prices by using scatter plot. Then we find the r square error and mean square error between them . If the errors is less enough then we proceed for testing of the model since the training phase is over.

DECISION TREE:

Decision Tree is a Supervised learning technique that is used for classification and Regression problems, but mostly it is preferred for solving Classification problems. It is a tree-structured classifier, where internal nodes represent the features of a dataset, branches represent the decision rules and each leaf node represents the outcome. There are various algorithms in Machine learning, so choosing the best algorithm for the given dataset and problem is the main point to remember while creating a machine

learning model.

RANDOM FOREST:

Random forests for regression are formed by growing trees, are determined on a random vector. The output values are algorithmic, and we consider that the training set is independently drawn from the distribution of the random vector X and Y . The random forest predictor is formed by taking the moderate over k of the trees. The number of trees in the forest are created randomly and can go to infinity.

Mean Squared Error(MSE) :

(1) Root Mean Squared Error (RMSE)

(2)Mean Absolute Error(MAE)

(3) Mean Absolute Percentage Error(MAPE)

(4) Where, i = Variable n= Number of non-missing data points yi = actual observations time series ŷi = estimated time series.

CONCLUSION:

Satisfaction of customers by expanding the exactness of their decision and diminishing the danger of putting resources into a

home. The sales prices will be calculated with better accuracy and precision. The system will satisfy customers by providing accurate output and preventing the risk of investing in the wrong house. That would make it even easier for the people to select the houses that best suits their budgets.

PROBLEM SOLVING IN AI:

The aim to Artificial intelligence is to develop a system which can solve the various problems on its own. But the challenge is, to understand a problem, a system must predict and convert the problem in its understandable form. That is, when an agent confronts a problem, it should first sense the problem, and this information that the agent gets through the sensing should be converted into machine-understandable form. For this, a particular sequence should be followed by the agent in which a particular format for the representation of agent's knowledge is defined and each time a problem arises, the agent can follow that particular **approach to find a solution to it**.

TYPES OF PROBLEM IN AI:

The types of problems in artificial intelligence are:

1. Ignorable Problems:

In ignorable problems, the solution steps can be ignored.

2. Recoverable Problems:

In recoverable problems, the solution steps which you have already implemented can be undone.

3. Irrecoverable Problems:

In irrecoverable problems, the solution steps which you have already implemented cannot be undone.

STEPS FOR PROBLEM SOLVING IN AI:

I. *Define a problem*:

Whenever a problem arises, the agent must first define a problem to an extent so that a particular state space can be represented through it. Analyzing and defining the problem is a very important step because if the problem is understood something which is different than the actual problem, then the whole problem-solving process by the agent is of no use.

II. *Form the state space*:

Convert the problem statement into state space. A state space is the collection of all the possible valid states that an agent can reside in. But here, all the possible states are chosen which can exist according to the current problem. The rest are ignored while

dealing with this particular problem.

III. *Gather knowledge*:

collect and isolate the knowledge which is required by the agent to solve the current problem. This knowledge gathering is done from both the pre-embedded knowledge in the system and the knowledge it has gathered through the past experiences in solving the same type of problem earlier.

IV. *Planning-(Decide data structure and control strategy)*:

A problem may not always be an isolated problem. It may contain various related problems as well or some related areas where the decision made with respect to the current problem can affect those areas. So, a well-suited data structure and a relevant control strategy must be decided before attempting to solve the problem.

V. *Applying and executing*:

After all the gathering of knowledge and planning the strategies, the knowledge should be applied and the plans should be executed in a systematic way so s to reach the goal state in the most efficient and fruitful manner.

COMPONENTS TO FORMULATE THE ASSOCIATED PROBLEM:

Initial state.

Action.

Transition.

Goal Test.

Path Costing.