MAJOR-1 PROJECT

SYNOPSIS

For

House Price Prediction using Machine Learning

Submitted By

Specialization	SAP ID	Name
B.Tech (C.S.E. – B.A.O.)	500077712	Shreya Sharma
B.Tech (C.S.E. – B.A.O.)	500075219	Shivani Saran
B.Tech (C.S.E. – C.S.F.)	500076504	Tanisha Pathak

Department of Informatics

School Of Computer Science

UNIVERSITY OF PETROLEUM & ENERGY STUDIES,

DEHRADUN- 248007. Uttarakhand

Dr. Bikram Pratim Bhuyan
Project Guide

Dr. T. P. Singh
Cluster Head

School of Computer Science
University of Petroleum & Energy Studies, Dehradun

Synopsis Report

Project Title: House Price Prediction using Machine Learning

Abstract

House Price Prediction (HPI) is commonly used to estimate the changes in housing price. As, house prices is dependent on many factors, like location, size, population, etc., it requires other information apart from HPI to predict individual house prices.

1. Introduction

The problem falls under the category of Supervised Learning algorithms. The dataset we'll be using, comprises of some input features and one target feature. The input features include features that may or may not impact the price.

2. Literature Review

Related Studies

[1]The paper studies the SVM algorithm in machine learning for house price prediction. It takes data from the user and process it and classify it using pre-available data and uses various classification algorithm and classifies data and predict the accurate price of the property.

[2]This paper proposed the FSTM to explore the spatiotemporal characteristics of the residential house price in Shunde as an example of the middle-small cities in China.

[3]The author constructs a fundamental algorithm based on the multiple linear regression method to predict housing prices and combines it with the Spearman correlation coefficient to determine the influential factors affecting housing prices.

[4]The study shows a comparison between the regression algorithms and artificial neural network when predicting house prices in Ames, Iowa, United States and Malmö, Sweden.

[5]This study is an exploratory attempt to use three machine learning algorithms in estimating housing prices, and then compare their results.

[6]This article concentrates on the comparison between different machine learning algorithms (Multiple Linear Regression, Ridge Regression, LASSO Regression, Elastic Net Regression, Ada Boosting Regression, gradient boosting) about House price prediction Analysis.

[7]The study proposed a house prices prediction algorithm in Ames, lowa by deliberating on data processing, feature engineering and combination forecasting.

[8]This paper seeks useful models for house price prediction. It also provides insights into the Melbourne Housing Market. The evaluation phase indicates that the combination of Step-wise and SVM model is a competitive approach.

[9]This paper proposes a hybrid Lasso and Gradient boosting regression model to predict individual house price. The proposed approach has recently been deployed as the key kernel for Kaggle Challenge “House Prices: Advanced Regression Techniques”.

[10]In this paper, SVM, LSSVM, and PLS algorithms are used in the field of construction to predict the housing value.

3. Problem Statement

We are given dataset of house prices with some features like no. of rooms, location, area, etc. Our task is to create a model which will predict the price for any new house by looking at its features.

4. Objectives

Predict the price of any new house based on its feature, which will include following sub objectives:

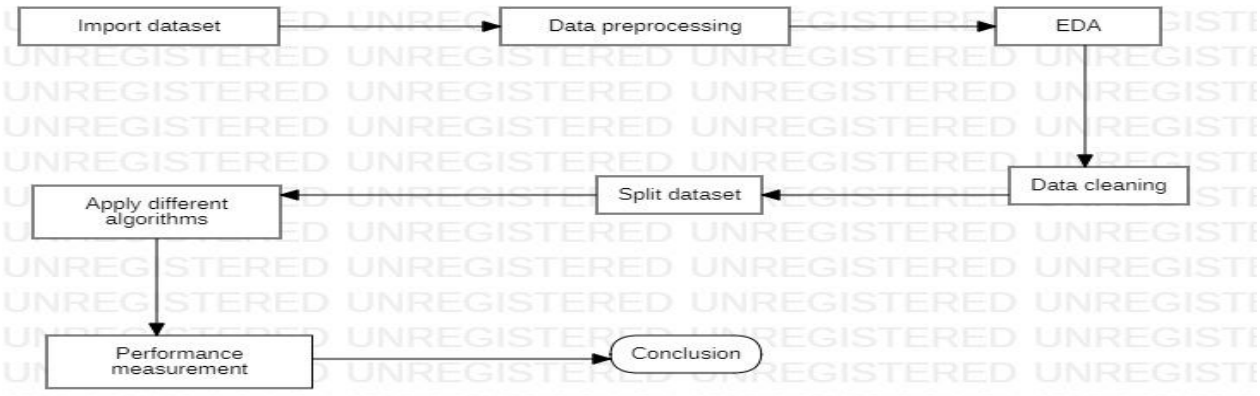
- Finding the type of model to build
- Selecting a performance measure
- Checking assumptions

5. Methodology

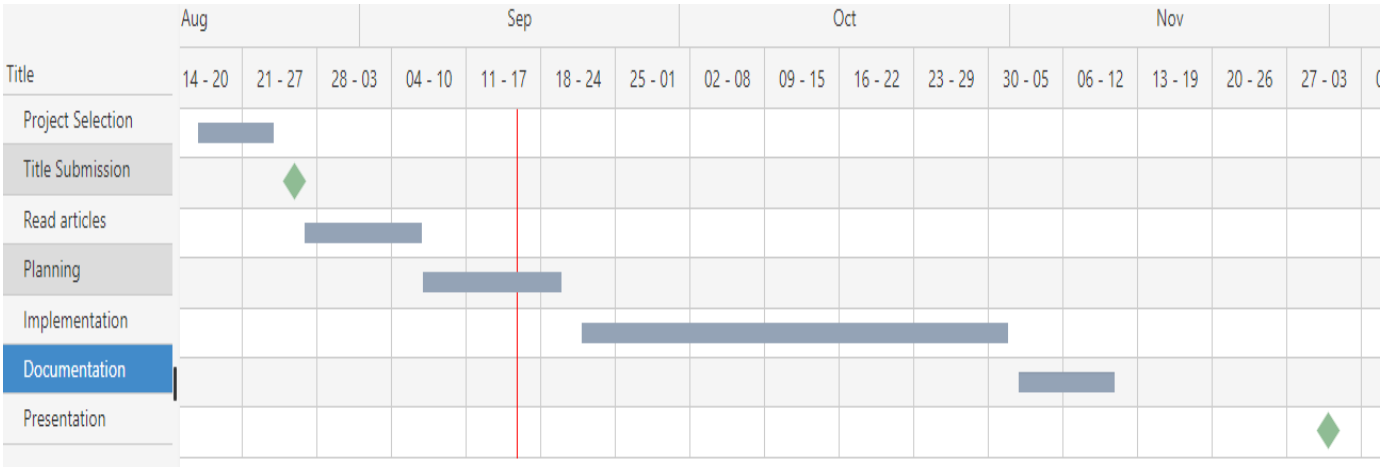
We will use a test driven approach to build a model using Python from and then we will use trained model to predict house sale prices and extend it further.
Steps:

- Import dataset and necessary libraries
- Data pre-processing
- Exploratory data analysis
- Data cleaning
- Split dataset into training and test set
- Model and accuracy
- Compare and find the most suitable algorithm

Flowchart:



6. PERT Chart



References

1. Mr. Piyush Chordia, Mr. Pratik Konde, Ms. Supriya Jadhav, Hrutik Pandhare, Prof. Shikha Pachouly. Prediction of House Price Using Machine Learning 2022. https://doi.org/10.22214/ijraset.2022.40466
2. Lu Wang,Guangxing Wang,Huan YuORCID Icon &Fei Wang. Prediction and analysis of residential house price using a flexible spatiotemporal model 2022 https://www.tandfonline.com/doi/full/10.1080/15140326.2022.2045466
3. Qingqi Zhang. Housing Price Prediction Based on Multiple Linear Regression 2021 https://doi.org/10.1155/2021/7678931
4. Ahmad Abdulal Nawar Aghi. House Price Prediction 2020 https://www.diva-portal.org/smash/get/diva2:1456610/FULLTEXT01.pdf
5. Winky K.O. Ho,Bo-Sin Tang &Siu Wai Wong. Predicting property prices with machine learning algorithms 2020 https://www.tandfonline.com/doi/full/10.1080/09599916.2020.1832558
6. CH. Raga Madhuri; G. Anuradha; M. Vani Pujitha. House Price Prediction Using Regression Techniques: A Comparative Study 2019 DOI: 10.1109/ICSSS.2019.8882834
7. Fan C, Cui Z, Zhong X. House Prices Prediction with Machine Learning Algorithms. Proceedings of the 2018 10th International Conference on Machine Learning and Computing ICMLC 2018. doi:10.1145/3195106.3195133.
8. Phan TD. Housing Price Prediction Using Machine Learning Algorithms: The Case of Melbourne City, Australia. 2018 International Conference on Machine Learning and Data Engineering (ICMLDE) 2018. doi:10.1109/icmlde.2018.00017.
9. Lu S, Li Z, Qin Z, Yang X, Goh RSM. A hybrid regression technique for house prices prediction. 2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM) 2017. doi:10.1109/ieem.2017.8289904.
10. Mu J, Wu F, Zhang A Housing Value Forecasting Based on Machine Learning Methods Abstract and Applied Analysis, 2014 (2014), pp. 1-7 doi:10.1155/2014/648047.