ABSTRACT

Machine Learning is a study of computer algorithm to improve automatically through experience and by use of data. It has been as a part of artificial Intelligence .Machine learning algorithms build a model based on sample data, known as “Training data”, in order to make predictions or decisions without being explicitly programmed to do so .Machine learning algorithm are used in wide variety of applications, such as medicine, email filtering and computer vision where it is difficult or unfeasible to develop a conventional algorithms to perform needed task.A subset of machine learning is closely related to computational statistics , which is focus on making predictions.

The Housing Price Prediction Using Concept of Machine Learning Has Become one of the most interesting application of Machine Learning Concept. To predict The Price of the House using Linear Regression Algorithm of Machine Learning . Regression is A Machine Learning tool That helps to make prediction by learning from the existing statistical data and this is done by finding relationship between Target Parameter and the set of Other Parameters. According to this definition , a House’s price depends on parameters such as Number of Bedrooms, Living Area , Location etc . If we apply Artificial Learning to these Parameters we can Calculate House Valuations In a given Geographical area.

Jupyter python programming software is used to design the code for Predicting the Housing Prices. It is an open source Software and it provides services for interactive computing across dozen of programming Languages .The software provides various functions and tools and In-Build Python Library so that operations can be performed accurately with maximum efficiency. with loops, functions variables, operators to perform various operations and obtain data. These software are very precise thus used in various research and analytical and educational related works.

TABLE OF CONTENTS

LIST OF FIGURES

ABBREVIATIONS

ABBREVIATION	EXPANSION
ML	-Machine Learning
SDK	-Software Development Kit
KNN	-K Nearest Neighbour
SVM	-Support Vector Machine
CAS	-Carotid Artery Stenting
HRFLM	-Hybrid Random Forest with Linear Model
IHDPS	-Intelligent Heart Disease Prediction System
MLP	-Multi Layer Perception
CNN	-Convolutional Neural Networks
CPU	-Central Processing Unit
RAM	-Random Access Memory
RF	-Random Forest
LM	-Linear Method

CHAPTER 1:

INTRODUCTION

Housing Price Prediction is commonly used to estimate the change in the Housing Price. Since Housing Price is Strongly Correlated to other Factors such as location , area , population ,it requires other information apart from HPI to predict Individual Prediction Prices. However to Predict the Housing Price our Machine Learning model requires data About more Number of Features so that prices can be Predicted more accurately , To do this we use the Machine Learning Algorithm called as Linear Regression . And using the Algorithm we will see effect of different features eg location , area, Furnishing which acts as Independent variables on The price of our house which is a Dependent Variable .

Linear Regression is one of the most Easiest algorithm of Machine learning . It is basically a statistical model that attempts to show the relationship between two variables with a linear equation. Linear Regression is a Supervised Learning Algorithm where the Predicted Output is Continous and has a constant slope . It's used to predict value within a continuous range (eg sales,price) rather than trying to classify them into catogeries (eg Black,Blue) .

Simple regression

Simple linear regression uses traditional slope-intercept form, where mm and bb are the variables our algorithm will try to "learn" to produce the most accurate predictions. xx represents our input data and yy represents our prediction.

$$y=mx+b$$

Let's say we are given a datasett with the following columns (features): how much a company spends on Radio advertising each year and its annual Sales in terms of units sold. We are trying to develop an equation that will let us to predict units sold based on how much a company spends on radio advertising. The rows (observations) represent companies.

TABLE 1.1 : Company Table for Regression with two variables

Company	Radio ($)	Sales
Amazon	37.8	22.1
Google	39.3	10.4
Facebook	45.9	18.3
Apple	41.3	18.5

Our prediction function outputs an estimate of sales given a company's radio advertising spend and our current values for *Weight* and *Bias*.

$$\text{Sales} = \text{Weight} \cdot \text{Radio} + \text{Bias}$$

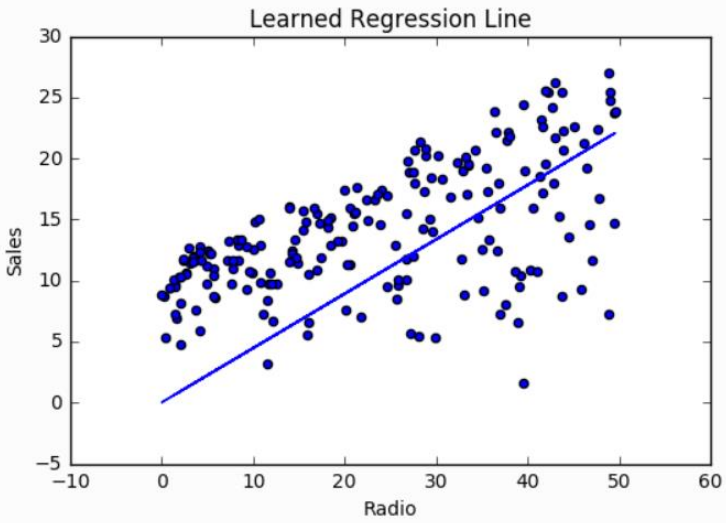
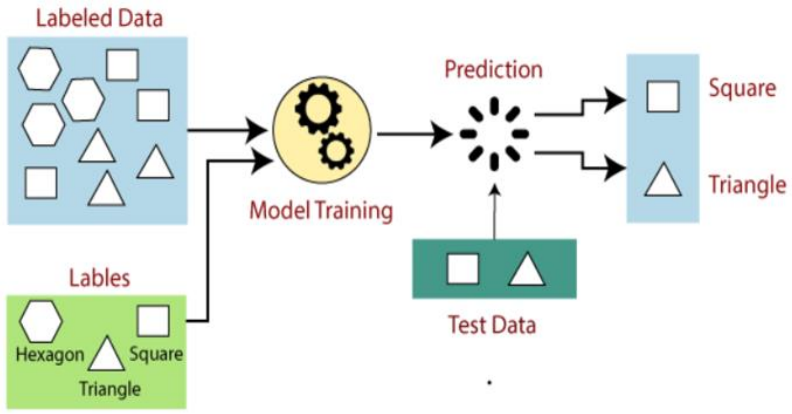


FIGURE 1.1: Linear Regression with Two Variables

HOW SUPERVISED LEARNING WORKS ?

In the supervised learning,models are trained using labelled dataset , where the model learns about each type of data. Once the Learning process is completed , the model is tested on the basis of test data (a subset of the training data) , and then it predicts the output.

***FIGURE* 1.3:Supervised Learning Architecture**



The working of supervised learning can be easily understood by the above example diagram.Suppose we have a dataset of different types of shapes which includes squares,rectangle ,triangle and polygon . Now the first step is that we need to train the model for each shape.

- If the given shape has four side , and all the sides are equal , then it will be labelled as a square .
- If the given shape has three sides, then it will be labelled as a triangle.

- If the given shape has all six equal sides then it will labelled as an hexagon.Now after training , we test our model using the test set , and the task of the model is to identify the shape.The Machine is already trained on all types of shapes, and when it finds a new shape , it classifies the shape on the bases of a number of sides, and predicts the output.

1.1 TYPES OF ALGORITHM USED