Assignment No.04

Title: Linear regression by using Deep Neural network Implement Boston housing price prediction problem by linear regression using Deep Neural Network Use Boston House price prediction dataset.

objective: students should be able to perform linear regression by using Deep Neural network on Boston House Dataset.

Theory:

what is Linear Regression?

Linear regression is a statistical approach that is commonly used to model the relationship between a dependent variable and one or more independent variables.

It assumes a linear relationships between the variables and user mathematical methods to estimate the coefficient that best fit the data.

Deep Neural network are a type of machine Learning algorithm that are model after the structure and function of the human brain.

They consist of multiple layers of interconnected neurons that process data and learns from it to make prediction or classification.

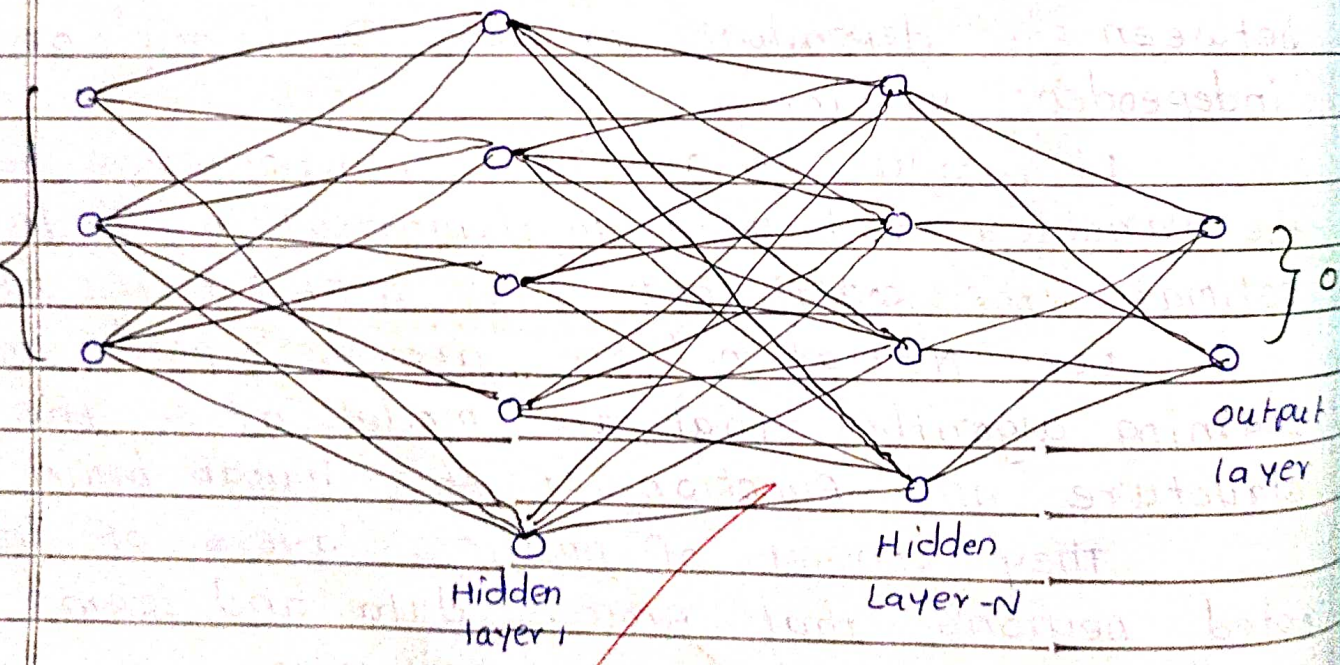
Deep Neural network:

A deep neural network is a type of machine learning algorithm that is made after

the structure and function of human brain.
It consists of multiple layers of interc
nodes of artificial neurons, to process data
and learn from it to make prediction or
classification.

Each layer of the network performs a
specific type of processing on the data
as identifying patterns or corrections betwe
features and passes the results to the
next layers.

The layer closest to the input are kno
the "input layer" while the layer closest to
output are known as "output layer".



Layer 1 & Layer N → Hidden Layer

fig. Deep Neural Network

How Deep Neural nlw work :

Boston house price prediction is a common example used to illustrate how a deep Neural network can work for regression tasks

The goals of this task is to predict the price of a house in Boston based on various features such as the number of rooms, crime rate and accessibility to public transportation

Here's how how a deep neural network can work for Boston house price prediction

① Data preprocessing

first step is to preprocess data

It involves normalizing the input feature to have a mean and standard deviation of 1.

split dataset into testing & training

② model Architecture

Housing a multiple layer

First layer is input layer

several hidden layer can be shallow or deep

output layer to predict price

③ model Training

model is trained using training set

compare actual & predicted data

Done using gradient descent

④ model evaluation
once model is trained, evaluate using training measured performance using mean squared da

⑤ model prediction
Trained model can be used to make predic on new data.

⑥ By using deep neural network for boston House price prediction, we obtain accurate prediction.

Boston House price prediction dataset
The dataset includes 13 input features which are

CRIM : capita crime rate by own
ZN : zone
INDUS : Non-retail business
CHAR : charles oxides come
RM : Rooms per dwelling
AGE : owner-occupied unit
DIR : weight Distance
RAO : Radial Highway
TAX : Tran rate
PITRATIO : ~~Tran~~ ~~rate~~ Pupil-teacher ratio
B : 1000 (BK - 0.63)12
LSTAT : % lower statys

conclusion :
In this way, we can predict the Bosto House price using Deep Neural network.