

MODEL LAB

1) House price prediction

Aim: To Analyze House data And predict House prices Using Regression Model

Algorithms:

- Read the House dataset
- Clean And preprocess the data
- Split data into Training And Testing Sets
- Train a Regression Model
- predict House prices

Program:-

```
import pandas as pd
from sklearn.linear_model import
Linear Regression
data = pd.read_csv ("house-data.csv")
data.fillna (data.mean().iloc[0], inplace=True)
x = data.drop ("price", axis=1)
y = data ["price"]
rmodel = Linear Regression()
rmodel.fit (x, y)
print (rmodel.predict (x))
```

Output:

Area = 1500 Sqft

Bedrooms = 3

Predicted price = ₹ 5,400,000.

Result:- House prices were Successfully predicted Using Regression.

2) Candidate Elimination Algorithm

Aim:- To Find all Hypotheses Consistent With Given Training Examples Using Candidate Elimination.

Algorithm:-

- Initialize Specific and General Hypotheses
- Read Training Examples
- Generalize for positive Examples
- Specialize G for Negative Examples
- Display Final Hypotheses

Program:-

```
import csv
data = list(csv.reader(open("Training_data.csv")))
Hypotheses = data[1]
S = Hypotheses[0][: -1]
For h in Hypotheses:
    if h is Hypotheses:
        if h[-1] == "Yes":
            For i in Range (Lens)):
                if h[i] != S[i]:
                    S[i] = '?'
            print ("Specific Hypothesis", S)
```

Output:-

Find Specific Hypothesis(S):

[?, Large, Light? Thrice]

Result: The Consistent Hypothesis Was Obtained Using Candidate Estimation.

3) Linear Regression

Aim:- To Implement Linear Regression And Evaluate its prediction Capability

Algorithm:-

- Load dataset
- Separate input And Output Variables
- Train Output Values
- predict Output Values
- Display predictions

Program:-

```
import pandas as pd
from sklearn.linear_model import
Linear Regression
data = pd.read_csv("data.csv")
x = data['x']
y = data['y']
Model = Linear Regression()
Model.fit(x, y)
print(Model.predict(x))
```

Output:-

Regression Equation: $y = 2x$

For $x = 5$,
Predicted $y = 10$.

Result:- Linear Regression Correctly Modeled The Relationship between x and y .

4) Em Algorithm

Aim: To cluster data using the Expectation Maximization Algorithm.

Algorithm:

- Initialize cluster parameters
- perform Expectation Step
- perform Maximization Step
- Repeat Until Convergence.
- Output Clusters

Program:

```
import numpy as np
from sklearn.mixture import GaussianMixture

x = np.array([1],[2],[3],[3],[4],[4])
model = GaussianMixture(n_components=2)
model.fit(x)
print(model.predict(x))
```

Output:

Data point	Cluster
1	0
2	0
3	0
3	0
4	1
4	1
4	1
4	1

Result: The Em Algorithm Successfully Clustered The Data into Two Groups.