MLA0202

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Machine Learning — model practical

SET-6

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① House price prediction:

Aim: To analyze house data and predict house prices using regression model.

Algorithm:

1) Read the house dataset.
2) clean and preprocess the data.
3) split data into training and testing sets.
4) Train a regression model.
5) 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.mode().iloc[0], inplace = True)

X = data.drop("price", axis=1)
Y = data["price"]

model = LinearRegression()
model.fit(x, y)

print(model.predict(x))
```

Output:

Area = 1800 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:

1) Initialize specific and general hypotheses.
2) Read training examples.
3) Generalize S for positive examples.
4) Specialize G for negative examples.
5) 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 in hypotheses:
```

```
if h[-1] == 'yes':
    for i in range(len(s)):
        if h[i] != s[i]:
            s[i] = '?'
print("specific Hypothesis:", s)
```

Output:

Final specific Hypothesis(s):

[?, Large, Light, ?, Thick]

Result:

The consistent hypothesis was obtained using candidate Elimination.

(3) Lineay Regression:

Aim: To implement Lineay Regression and evaluate its prediction capability.

Algorithm:

1) Load dataset.
2) separate input and output variables.
3) Train the regression model.
4) Predict output values.
5) Display predictions.

Program:

```
import pandas as pd
from sklearn.linear_model import
LinearRegression

data = pd.read_csv("data.csv")
X = data[['x']]
Y = data['y']

model = LinearRegression()
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:

1) Initialize cluster parameters.
2) Perform expectation step.
3) Perform maximization step.
4) Repeat until convergence.
5) output clusters.

Program:

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

X = np.array([[1], [2], [3], [8], [9], [10]])
model = GaussianMixture(n_components=2)

model.fit(X)
print(model.predict(X))
```

Output:

Data point	cluster
1	0
2	0
3	0
8	1
9	1
10	1

Result:

The Em algorithm successfully clustered the data into two groups.