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SET-8

Model Practical

1) Aim: To build a linear Regression model to Predict future Sales using past Sales data & advertising expenditure.

Algorithm:

1) Load the data set and Display first five rows
2) Find basic statistics, Check data types & Plot Scatter diagram
3) Check & replace missing values
4) Split data into training & Testing Sets
5) Train linear Regression model & Predict Sales

Python Program:

```
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.model_selection import
train_test_split
data = pd.read_csv("Sales_data.csv")
print(data.head())
print(data.describe())
print(data.info())
plt.scatter(data['Advertising'], data['Sales'])
plt.xlabel("Advertising")
```

```
plt.ylabel ("Sales")
plt.show()
Print (data.isnull().sum())
X = data [['Advertising']]
Y = data ['Sales']
X_train, X_test, Y_train, y_test = train_test_split
(X, Y, test_size = 0.2)
model = LinearRegression()
model.fit (X_train, Y_train)
y_Pred = model.predict (X_test)
    Print (Y_Pred)
```

Output:

* First five rows of dataset displayed
* Scatter plot showing relation between advertising & Sales
* Predicted Sales value printed.

Result: Sales are successfully Predicted using Linear Regression.

(2) Aim: To implement Candidate Elimination Algorithm and find all hypotheses Consistent with the given training data

Algorithm:
* Initialize S with first positive example
* Intialize G1 with the most general hypothesis
* If yes, generaline S, If No, Specialize G1
* Output final S and G1

Python:

```
import Pandas as Pd
data = Pd.read_CSV("data-CSV")
Concepts = data.iloc[:,:-1].values
target = data.iloc[:,-1].values
S = Concept[0].Copy()
G1 = [["?" for i range(len(S))]]
for i in range(len(S)):
    if example(i)!=S(i):
else
    j in range(len(G)):
    if example(j)!=S(j):
Print("Final Specific Hypothesis", S)
Print("Final General Hypothesis", G)
```

Output:

Final Specific Hypothesis ['Small', '?', 'Circle']
Final General Hypothesis [['?', '?', 'Circle']]

Result: The Candidate Eliminate algorithm Successfully find the version Space. using Specifi & general hypothesis

⑤ Aim: To implement logistic Regression using Python & evaluate its performance on a dataset

Algorithm:

1) Import required libraries & load the dataset
2) Split the dataset into training & testing data.
3) Train the logistic regression model
4) Predict the Test data
5) Evaluate performance using accuracy

Python:

```
import Pandas as Pd
from Sklearn.metrics import accuracy_Score,
Confusion_matrix
data = Pd.read_csv("data.csv")
    X = data.iloc[:,:-1]
    y = data.iloc[:,-1]
    model = logist Regression()
    Model.fit(X_train,Y_train)
     Print("Confusion matrix:")
     Print(Confusion_matrix(Y_test,y_pred))
```

Output: Accuracy: 0.92

Confusion Matrix:

[[18,2]
[1,19]]

Result: The logistic regression model is successfully implemented and shows good classification on the test data