

In []:

```
1 # CLASS:- MCA1 CA LAB-VII(A) LAB on Machine Learning
2 # Write a program to implement Decision Tress Using Python
```

In [1]:

```
1 import pandas as pd
2 import numpy as np
```

In [3]:

```
1 dataset = pd.read_csv("User_Data.csv")
```

In [4]:

```
1 x = dataset.iloc[:, [2, 3]].values
2 y = dataset.iloc[:, 4].values
```

In [5]:

```
1 from sklearn.model_selection import train_test_split
2 X_train, X_test, y_train, y_test = train_test_split(x, y, test_size = 0.20,
3 random_state = 0)
```

In [6]:

```
1 from sklearn.preprocessing import StandardScaler
2 sc_x = StandardScaler()
3 xtrain = sc_x.fit_transform(X_train)
4 xtest = sc_x.transform(X_test)
```

In [7]:

```
1 #Fitting Decision Tree classifier to the training set
2 from sklearn.tree import DecisionTreeClassifier
3 classifier= DecisionTreeClassifier(criterion='entropy', random_state=0)
4 classifier.fit(xtrain, y_train)
```

Out[7]:

```
DecisionTreeClassifier(criterion='entropy', random_state=0)
```

In [8]:

```
1 y_pred = classifier.predict(xtest)
```

In [9]:

```
1 y_pred
```

Out[9]:

```
array([0, 0, 0, 1], dtype=int64)
```

In [10]:

```
1 #Creating the Confusion matrix
2 from sklearn.metrics import confusion_matrix
3 cm= confusion_matrix(y_test, y_pred)
4 cm
5
```

Out[10]:

```
array([[3, 0],
       [0, 1]], dtype=int64)
```

In [11]:

```
1 # PRINT PRECISION, SENSITIVITY, F1-SCORE
2 from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score
```

In [12]:

```
1 # Calculate accuracy
2 accuracy = accuracy_score(y_test, y_pred)
3 print("Accuracy:", accuracy)
```

Accuracy: 1.0

In [13]:

```
1 # Calculate precision
2 precision = precision_score(y_test, y_pred)
3 print("Precision:", precision)
```

Precision: 1.0

In [14]:

```
1 # Calculate recall (sensitivity)
2 recall = recall_score(y_test, y_pred)
3 print("Recall (Sensitivity):", recall)
```

Recall (Sensitivity): 1.0

In [15]:

```
1 # Calculate F1-score
2 f1 = f1_score(y_test, y_pred)
3 print("F1-Score:", f1)
```

F1-Score: 1.0