#### EX.NO: 11a

## **DECISION TREE CLASSIFICATION**

#### AIM:

To classify the Social Network dataset using Decision tree analysis

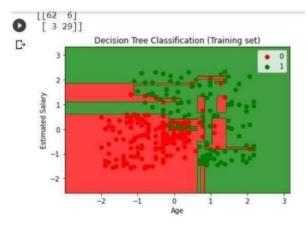
## **Source Code:**

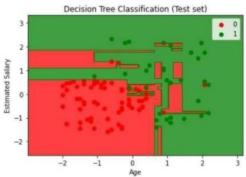
 $X_{set}$ ,  $y_{set} = X_{train}$ ,  $y_{train}$ 

```
from google.colab import drive
drive.mount("/content/gdrive")
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
dataset=pd.read_csv('/content/gdrive/My Drive/Social_Network_Ads.csv')
X = dataset.iloc[:, [2, 3]].values
y = dataset.iloc[:, -1].values
from sklearn.model_selection import train_test_split
X_{train}, X_{test}, y_{train}, y_{test} = train_test_split(X, y, test_size = 0.25, random_state =0)
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X \text{ train} = \text{sc.fit transform}(X \text{ train})
X_{\text{test}} = \text{sc.transform}(X_{\text{test}})
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier(criterion = 'entropy', random state = 0)
classifier.fit(X_train, y_train)
y_pred = classifier.predict(X_test)
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(y_test, y_pred)
print(cm)
from matplotlib.colors import ListedColormap
```

```
 \begin{array}{l} X1,\,X2 = \operatorname{np.meshgrid}(\operatorname{np.arange}(\operatorname{start} = X\_\operatorname{set}[:,0].\operatorname{min}() - \\ 1,\,\operatorname{stop} = X\_\operatorname{set}[:,0].\operatorname{max}() + 1,\,\operatorname{step} = 0.01),\,\operatorname{np.arange}(\operatorname{start} = X\_\operatorname{set}[:,1].\operatorname{min}() - \\ 1,\,\operatorname{stop} = X\_\operatorname{set}[:,1].\operatorname{max}() + 1,\,\operatorname{step} = 0.01)) \\ \operatorname{plt.contourf}(X1,\,X2,\,\operatorname{classifier.predict}(\operatorname{np.array}([X1.\operatorname{ravel}(),X2.\operatorname{ravel}()]).T).\operatorname{reshape}(X1.\operatorname{shape}),\,\operatorname{al} \\ \operatorname{pha} = 0.75,\,\operatorname{cmap} = \operatorname{ListedColormap}((\operatorname{'red','green'}))) \\ \operatorname{plt.xlim}(X1.\operatorname{min}(),\,X1.\operatorname{max}()) \\ \operatorname{plt.ylim}(X2.\operatorname{min}(),\,X2.\operatorname{max}()) \\ \operatorname{for}\,i,\,j\,\operatorname{in}\,\operatorname{enumerate}(\operatorname{np.unique}(y\_\operatorname{set})): \\ \operatorname{plt.scatter}(X\_\operatorname{set}[y\_\operatorname{set} == j,0],\,X\_\operatorname{set}[y\_\operatorname{set} == j,1],c = \operatorname{ListedColormap}((\operatorname{'red','green'}))(i),\,\operatorname{label} \\ = j) \\ \operatorname{plt.title}(\operatorname{'Decision}\,\operatorname{Tree}\,\operatorname{Classification}(\operatorname{Training}\,\operatorname{set})') \\ \operatorname{plt.ylabel}(\operatorname{'Purchase'}) \\ \operatorname{plt.legend}() \\ \operatorname{plt.show}() \end{aligned}
```

# **OUTPUT:**





# **RESULT:**

Thus the python code is implemented successfully and the output is verified.