In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

In [2]:
```
df=pd.read_csv('Social_Network_Ads.csv')
df.head()
```

Out[2]:

	User ID	Gender	Age	EstimatedSalary	Purchased
0	15624510	Male	19	19000	0
1	15810944	Male	35	20000	0
2	15668575	Female	26	43000	0
3	15603246	Female	27	57000	0
4	15804002	Male	19	76000	0

In [3]:
```
df=df.drop(columns=['User ID'])
df
```

Out[3]:

	Gender	Age	EstimatedSalary	Purchased
0	Male	19	19000	0
1	Male	35	20000	0
2	Female	26	43000	0
3	Female	27	57000	0
4	Male	19	76000	0
...	...	...	...	...
395	Female	46	41000	1
396	Male	51	23000	1
397	Female	50	20000	1
398	Male	36	33000	0
399	Female	49	36000	1

400 rows × 4 columns

In [4]:
```
df=pd.get_dummies(df,drop_first=True)
df
```

Out[4]:

	Age	EstimatedSalary	Purchased	Gender_Male
0	19	19000	0	1
1	35	20000	0	1
2	26	43000	0	0
3	27	57000	0	0
4	19	76000	0	1
...	...	...	...	...
395	46	41000	1	0
396	51	23000	1	1
397	50	20000	1	0
398	36	33000	0	1
399	49	36000	1	0

400 rows × 4 columns

In [5]:
```
independent=df[["Age","EstimatedSalary","Gender_Male"]]
dependent=df[["Purchased"]]
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(independent,dependent,test_size=1/3,random_state=0)
```

In [8]:
```
from sklearn.ensemble import RandomForestClassifier
classifier=RandomForestClassifier(n_estimators=10,criterion='entropy',random_state=0)
classifier.fit(X_train,Y_train)
```

```
C:\ProgramData\anaconda3\Lib\site-packages\sklearn\base.py:1151: DataConversionWarning: A column-vector y was passed when a 1d array was expected. Please chan
ge the shape of y to (n_samples,), for example using ravel().
  return fit_method(estimator, *args, **kwargs)
```

Out[8]:
```
RandomForestClassifier(criterion='entropy', n_estimators=10, random_state=0)
```

In [13]:
```
Y_pred=classifier.predict(X_test)
```

In [17]:
```
from sklearn.metrics import confusion_matrix,classification_report
cm=confusion_matrix(Y_test,Y_pred)
print(cm)
```

```
[[78  7]
 [ 6 43]]
```

In [18]:
```
clf_report=classification_report(Y_test,Y_pred)
print("Classification_Report",clf_report)
```

```
Classification_Report               precision    recall  f1-score   support

           0       0.93      0.92      0.92        85
           1       0.86      0.88      0.87        49

    accuracy                           0.90       134
   macro avg       0.89      0.90      0.90       134
weighted avg       0.90      0.90      0.90       134
```

In [19]:
```
import joblib
joblib.dump(classifier,'random_forest_model.pkl')
print("Model saved as random_forest_model.pkl")
```

```
Model saved as random_forest_model.pkl
```

In [20]:
```
loaded_model=joblib.load('random_forest_model.pkl')
print("Model loaded successfully.")
```

```
Model loaded successfully.
```

In [21]:
```
y_pred_loaded=loaded_model.predict(X_test)
print("Predictions from loaded model:\n",y_pred_loaded)
```

```
Predictions from loaded model:
 [0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 1 0 0 1 0 0 1 0 1 0 1 0 0 0 0 0 0 1 0 0 0 0
 0 0 1 0 0 0 0 1 0 0 1 0 1 1 0 0 1 1 1 0 0 1 0 0 1 0 1 0 1 0 0 0 0 1 0 0 1
 0 0 0 0 1 1 1 1 0 0 1 0 1 1 0 0 0 1 0 0 0 0 0 1 1 1 1 1 0 1 1 1 0 0 0 0 0
 0 0 1 1 0 0 0 0 1 0 1 1 1 0 0 1 1 1 1 0 1 0 1]
```

In [23]:
```
Age=int(input("enter the age input value:"))
EstimatedSalary=int(input("enter the estimatedsalary input value:"))
Gender_Male=int(input("enter the gender_male input value:"))
future_prediction=classifier.predict([[Age,EstimatedSalary,Gender_Male]])
print("future_prediction={Purchased=0,Non Purchased=1}",format(future_prediction))
```

```
enter the age input value:10
enter the estimatedsalary input value:10
enter the gender_male input value:1
future_prediction={Purchased=0,Non Purchased=1} [0]
C:\ProgramData\anaconda3\Lib\site-packages\sklearn\base.py:464: UserWarning: X does not have valid feature names, but RandomForestClassifier was fitted with f
eature names
  warnings.warn(
```

In [ ]: