•[1]:

```
#M.vishal
#240701598
#7/10/2025
import numpy as np
import pandas as pd
df=pd.read_csv('Social_Network_Ads.csv')
df
```

[1]:

	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
...	...	...	...	...	...
395	15691863	Female	46	41000	1
396	15706071	Male	51	23000	1
397	15654296	Female	50	20000	1
398	15755018	Male	36	33000	0
399	15594041	Female	49	36000	1

400 rows × 5 columns

•[2]:

```
#M.vishal
#240701598
#7/10/2025
df.head()
```

[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

•[3]:

```
#M.vishal
#240701598
#7/10/2025
features=df.iloc[:,[2,3]].values
label=df.iloc[:,4].values
features
```

[3]:

```
array([[    19,  19000],
       [    35,  20000],
       [    26,  43000],
       [    27,  57000],
       [    19,  76000],
       [    27,  58000],
       [    27,  84000],
       [    32, 150000],
       [    25,  33000],
       [    35,  65000],
       [    26,  80000],
       [    26,  52000],
       [    20,  86000],
       [    32,  18000],
       [    18,  82000],
       [    29,  80000],
       [    47,  25000],
       [    45,  26000],
       [    46,  28000],
       [    48,  29000],
       [    45,  22000],
       [    47,  49000],
       [    48,  41000],
       [    45,  22000],
       [    46,  23000],
       [    47,  20000],
       [    49,  28000],
       [    47,  30000],
```

•[4]:

```
#M.vishal
#240701598
#7/10/2025
label
```

[4]:

```
array([0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 1,
       0, 1, 1, 1, 0, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 0, 0, 1, 1, 0,
       1, 1, 0, 1, 0, 1, 0, 1, 0, 0, 1, 1, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0,
       1, 1, 0, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 0, 1,
       0, 1, 0, 1, 1, 1, 1, 0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 1, 0, 0, 0, 1,
       1, 0, 0, 1, 0, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1,
       0, 1, 0, 0, 1, 0, 1, 0, 0, 1, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0,
       1, 0, 1, 1, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1,
       0, 1, 0, 0, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 0, 1,
       1, 1, 0, 1])
```

•[5]:

```
#M.vishal
#240701598
#7/10/2025
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
```

•[7]:

```
#M.vishal
#240701598
#7/10/2025
for i in range(1, 401):
    x_train, x_test, y_train, y_test = train_test_split(features, label, test_size=0.3, random_state=i)
    model=LogisticRegression()
    model.fit(x_train,y_train)
    train_score=model.score(x_train,y_train)
    test_score=model.score(x_test,y_test)
    if test_score>train_score:
        print("Test {} Train{} Random State {}".format(test_score,train_score,i))
```

```
Test 0.8833333333333333 Train0.8285714285714286 Random State 4
Test 0.8666666666666667 Train0.8464285714285714 Random State 5
Test 0.875 Train0.8464285714285714 Random State 6
Test 0.875 Train0.8392857142857143 Random State 7
Test 0.875 Train0.8464285714285714 Random State 10
Test 0.8583333333333333 Train0.8285714285714286 Random State 13
Test 0.8666666666666667 Train0.8535714285714285 Random State 14
Test 0.8833333333333333 Train0.8464285714285714 Random State 15
Test 0.8833333333333333 Train0.8464285714285714 Random State 16
Test 0.8583333333333333 Train0.8535714285714285 Random State 17
Test 0.8833333333333333 Train0.8285714285714286 Random State 18
```

•[8]:

```
#M.vishal
#240701598
#7/10/2025
x_train, x_test, y_train, y_test = train_test_split(features, label, test_size=0.2,random_state=42)
finalModel = LogisticRegression()
finalModel.fit(x_train, y_train)
```

[8]:

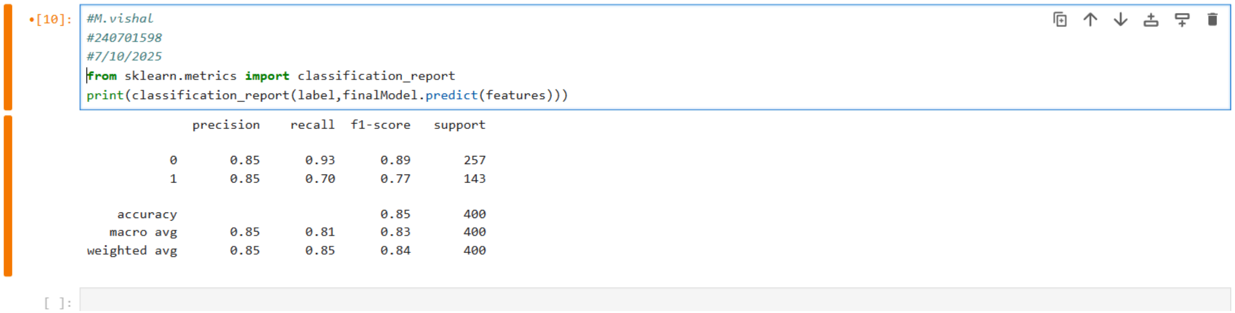
LogisticRegression

▶ Parameters

•[9]:

```
#M.vishal
#240701598
#7/10/2025
print(finalModel.score(x_train,y_train))
print(finalModel.score(x_test,y_test))
```

```
0.8375
0.8875
```



```
•[10]: #M.vishal
       #240701598
       #7/10/2025
       from sklearn.metrics import classification_report
       print(classification_report(label,finalModel.predict(features)))
```

```
              precision    recall  f1-score   support

           0       0.85      0.93      0.89       257
           1       0.85      0.70      0.77       143

    accuracy                           0.85       400
   macro avg       0.85      0.81      0.83       400
weighted avg       0.85      0.85      0.84       400
```

```
[ ]:
```