

Exercise-9

November 2, 2025

```
[1]: import pandas as pd  
df=pd.read_csv('Social_Network_Ads.csv')
```

```
[3]: import numpy as np  
import pandas as pd
```

```
[4]: features=df.iloc[:,[2,3]].values  
label=df.iloc[:,4].values  
features
```

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```
[5]: from sklearn.model_selection import train_test_split  
from sklearn.linear_model import LogisticRegression
```

```
[6]: for i in range(1, 401):
    x_train, x_test, y_train, y_test = train_test_split(features, label, □
    ↪test_size=0.2, 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 {:.3f} Train {:.3f} Random State {}".format(test_score, □
        ↪train_score, i))
```

Test 0.900 Train 0.841 Random State 4
 Test 0.863 Train 0.850 Random State 5
 Test 0.863 Train 0.859 Random State 6
 Test 0.887 Train 0.838 Random State 7
 Test 0.863 Train 0.838 Random State 9
 Test 0.900 Train 0.841 Random State 10
 Test 0.863 Train 0.856 Random State 14
 Test 0.850 Train 0.844 Random State 15
 Test 0.863 Train 0.856 Random State 16
 Test 0.875 Train 0.834 Random State 18
 Test 0.850 Train 0.844 Random State 19
 Test 0.875 Train 0.844 Random State 20
 Test 0.863 Train 0.834 Random State 21
 Test 0.875 Train 0.841 Random State 22
 Test 0.875 Train 0.841 Random State 24
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 Test 0.863 Train 0.856 Random State 31
 Test 0.875 Train 0.853 Random State 32
 Test 0.863 Train 0.844 Random State 33
 Test 0.875 Train 0.831 Random State 35
 Test 0.863 Train 0.853 Random State 36
 Test 0.887 Train 0.841 Random State 38
 Test 0.875 Train 0.838 Random State 39
 Test 0.887 Train 0.838 Random State 42
 Test 0.875 Train 0.847 Random State 46
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 Test 0.900 Train 0.844 Random State 54
 Test 0.850 Train 0.844 Random State 57
 Test 0.875 Train 0.844 Random State 58
 Test 0.925 Train 0.838 Random State 61
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```
[7]: 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)
```

```
[7]: LogisticRegression()
```

```
[8]: print(finalModel.score(x_train,y_train))
print(finalModel.score(x_test,y_test))
```

```
0.8375
0.8875
```

```
[9]: 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

```
[ ]:
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