

```
import numpy as np
import pandas as pd
df=pd.read_csv('Social_Network_Ads.csv')
df
```

	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 x 5 columns]
```

```
df.head()
```

	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

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

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

```
features
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label

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```

```

from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression

```

```

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 {} Train{} Random State
{}".format(test_score,train_score,i))

```

```

Test 0.6875 Train0.63125 Random State 3
Test 0.7375 Train0.61875 Random State 4
Test 0.6625 Train0.6375 Random State 5
Test 0.65 Train0.640625 Random State 6

```

Test 0.675 Train0.634375 Random State 7
Test 0.675 Train0.634375 Random State 8
Test 0.65 Train0.640625 Random State 10
Test 0.6625 Train0.6375 Random State 11
Test 0.7125 Train0.625 Random State 13
Test 0.675 Train0.634375 Random State 16
Test 0.7 Train0.628125 Random State 17
Test 0.7 Train0.628125 Random State 21
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Test 0.6625 Train0.6375 Random State 25
Test 0.75 Train0.615625 Random State 26
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Test 0.8875 Train0.834375 Random State 158
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Test 0.7125 Train0.625 Random State 161
Test 0.675 Train0.634375 Random State 162
Test 0.6625 Train0.6375 Random State 163
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Test 0.6625 Train0.6375 Random State 325
Test 0.7125 Train0.625 Random State 327
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Test 0.6875 Train0.63125 Random State 350
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Test 0.725 Train0.621875 Random State 353
Test 0.675 Train0.634375 Random State 354
Test 0.6875 Train0.63125 Random State 355
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Test 0.7375 Train0.61875 Random State 357
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Test 0.6625 Train0.6375 Random State 359
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Test 0.6625 Train0.6375 Random State 368

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Test 0.7 Train0.628125 Random State 397
Test 0.7125 Train0.625 Random State 400

```

```

x_train,x_test,y_train,y_test=train_test_split(features,label,test_size=0.2,random_state=i)
finalModel=LogisticRegression()
finalModel.fit(x_train,y_train)

```

```
LogisticRegression()
```

```

print(finalModel.score(x_train,y_train))
print(finalModel.score(x_test,y_test))

```

```

0.625
0.7125

```

```

from sklearn.metrics import classification_report
print(classification_report(label, finalModel.predict(features),
zero_division=1))

```

	precision	recall	f1-score	support
0	0.64	1.00	0.78	257
1	1.00	0.00	0.00	143
accuracy			0.64	400
macro avg	0.82	0.50	0.39	400
weighted avg	0.77	0.64	0.50	400