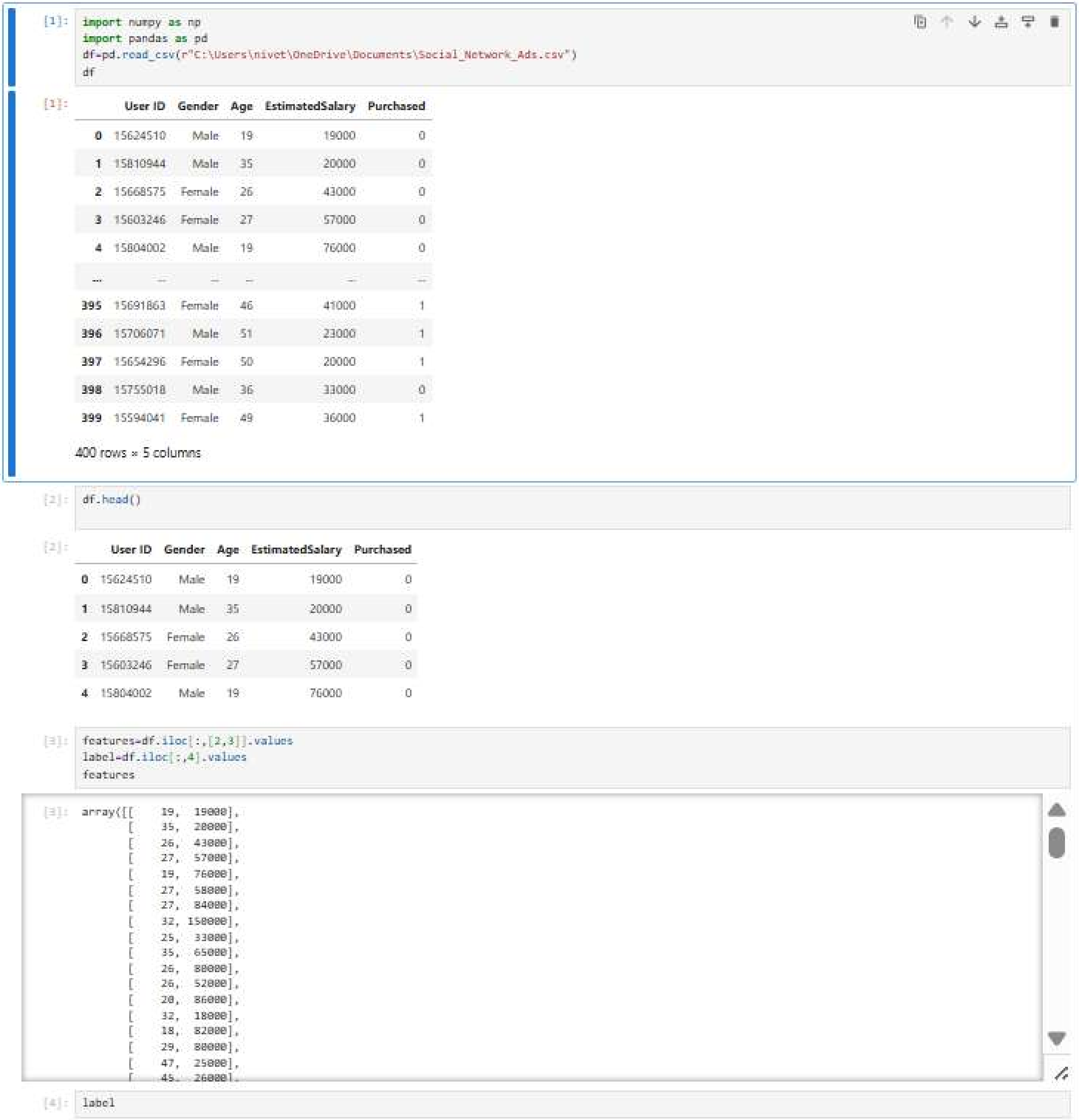


[1]:

```
import numpy as np
import pandas as pd
df=pd.read_csv(r"C:\Users\nivet\OneDrive\Documents\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]:

```
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]:

```
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],
```

[4]:

```
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])
```

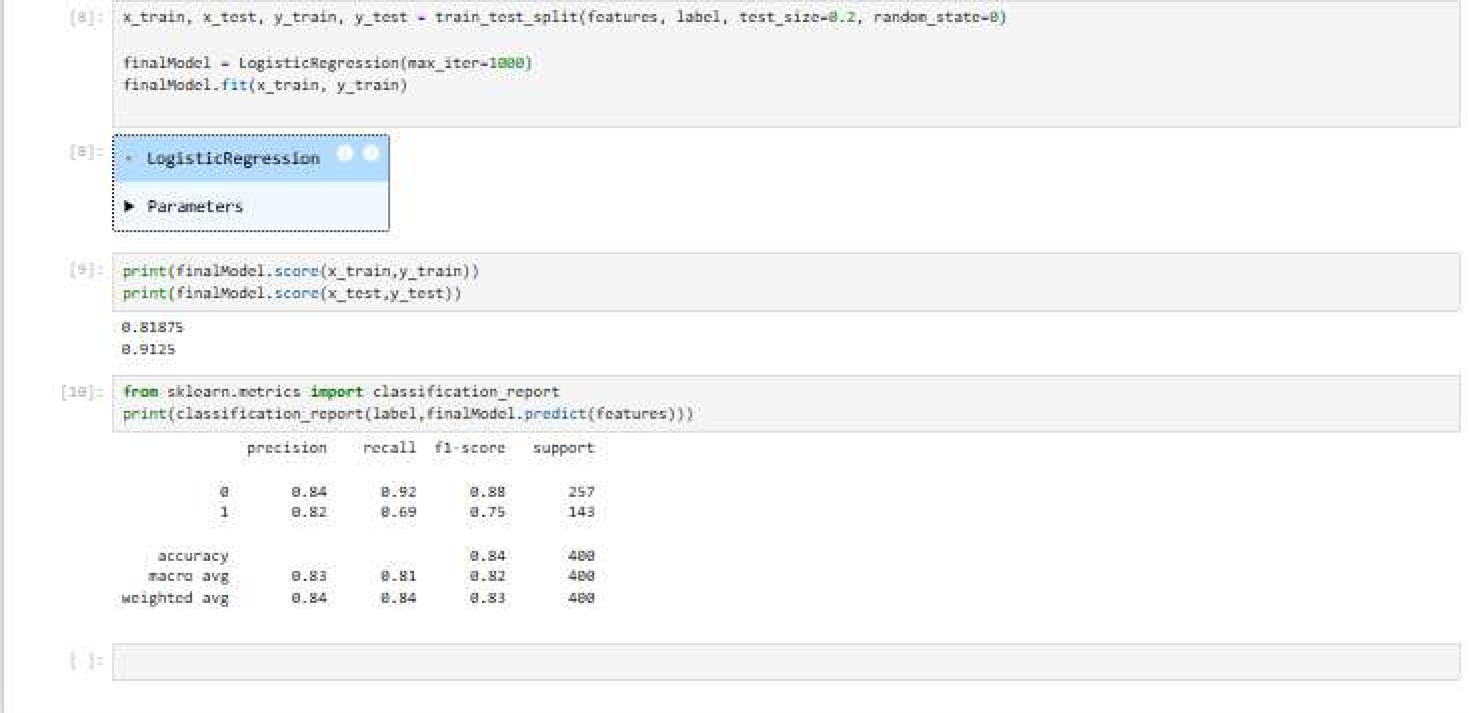
[5]:
```
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
```

[7]:
```
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
Test: 0.850 | Train: 0.834 | Random State: 26
Test: 0.850 | Train: 0.841 | Random State: 27
Test: 0.863 | Train: 0.834 | Random State: 30
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
Test: 0.912 | Train: 0.831 | Random State: 47
Test: 0.875 | Train: 0.831 | Random State: 51
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
Test: 0.887 | Train: 0.834 | Random State: 65
Test: 0.887 | Train: 0.841 | Random State: 68
Test: 0.900 | Train: 0.831 | Random State: 72
Test: 0.887 | Train: 0.838 | Random State: 75
Test: 0.925 | Train: 0.825 | Random State: 76
Test: 0.863 | Train: 0.841 | Random State: 77
Test: 0.863 | Train: 0.859 | Random State: 81
Test: 0.875 | Train: 0.838 | Random State: 82
```



```
[8]: x_train, x_test, y_train, y_test = train_test_split(features, label, test_size=0.2, random_state=0)

     finalModel = LogisticRegression(max_iter=1000)
     finalModel.fit(x_train, y_train)
```

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

```
0.81875
0.9125
```

```
[10]: from sklearn.metrics import classification_report
      print(classification_report(label,finalModel.predict(features)))
```

```
              precision    recall  f1-score   support

           0       0.84      0.92      0.88       257
           1       0.82      0.69      0.75       143

    accuracy                           0.84       400
   macro avg       0.83      0.81      0.82       400
weighted avg       0.84      0.84      0.83       400
```

```
[ ]:
```