assn5

May 22, 2023

```
[1]: #Aishwarya kelgandre Roll no.73 batch T3
     import pandas as pd
     import numpy as np
     import matplotlib.pyplot as plt
     s1 =pd.Series(range(1,10,1))
     s1
     import pandas as pd
     import numpy as np
     from matplotlib import pyplot as plt
```

```
[2]: df = pd.read_csv("E:\\TRINITY ACADEMY OF ENGINEERING PUNE\\TE␣
     ↪2022-23\\assignment\\dsbda\\csv\\Social_Network_Ads.csv")
     df.head(10)
```

```
[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
     5  15728773    Male   27            58000          0
     6  15598044  Female   27            84000          0
     7  15694829  Female   32           150000          1
     8  15600575    Male   25            33000          0
     9  15727311  Female   35            65000          0
```

```
[3]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 400 entries, 0 to 399
Data columns (total 5 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   User ID          400 non-null    int64
 1   Gender           400 non-null    object
 2   Age              400 non-null    int64
 3   EstimatedSalary  400 non-null    int64
 4   Purchased        400 non-null    int64
```

```
dtypes: int64(4), object(1)
memory usage: 15.8+ KB
```

[4]: `df.describe()`

[4]:

	User ID	Age	EstimatedSalary	Purchased
count	4.000000e+02	400.000000	400.000000	400.000000
mean	1.569154e+07	37.655000	69742.500000	0.357500
std	7.165832e+04	10.482877	34096.960282	0.479864
min	1.556669e+07	18.000000	15000.000000	0.000000
25%	1.562676e+07	29.750000	43000.000000	0.000000
50%	1.569434e+07	37.000000	70000.000000	0.000000
75%	1.575036e+07	46.000000	88000.000000	1.000000
max	1.581524e+07	60.000000	150000.000000	1.000000

[6]:
```
X = df.iloc[:,[2,3]].values
y = df.iloc[:,4].values
X
```

[6]:
```
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```

[8]: `y`

[8]:
```
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```

```
       0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0,
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       1, 1, 0, 1], dtype=int64)
```

[10]:
```python
from sklearn.model_selection import train_test_split
X_train , X_test , y_train , y_test = train_test_split(X,y,test_size = 0.
↪25,random_state=0)
```

[11]:
```python
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
X_train
```

[11]:
```
array([[ 0.58164944, -0.88670699],
       [-0.60673761,  1.46173768],
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```

```
[12]: from sklearn.linear_model import LogisticRegression
      classifier = LogisticRegression(random_state=0)
      classifier.fit(X_train,y_train)
```

```
[12]: LogisticRegression(random_state=0)
```

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

```
[13]: array([0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 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,
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             0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1], dtype=int64)
```

```
[14]: from sklearn.metrics import confusion_matrix,classification_report
      cm = confusion_matrix(y_test , y_pred)
```

```
[15]: c1_report = classification_report(y_test,y_pred)
      c1_report
```

```
[15]: '              precision    recall  f1-score   support\n\n           0
      0.89      0.96      0.92        68\n           1       0.89      0.75      0.81
      32\n\n    accuracy                           0.89       100\n   macro avg
      0.89      0.85      0.87       100\nweighted avg       0.89      0.89      0.89
      100\n'
```

```
[16]: tp , fn ,fp , tn = confusion_matrix(y_test,y_pred,labels=[0,1]).reshape(-1)
      print('Outcome values : \n' , tp , fn , fp ,tn)
```

```
      Outcome values :
       65 3 8 24
```

```
[22]: print("Accuracy : ",accuracy_cm)
      print("Precision : ",precision_cm)
      print("Recall : ",recall_cm)
      print("F1-Score : ",f1_score)
```

```
      Accuracy :  0.89
      Precision :  0.8904109589041096
      Recall :  0.9558823529411765
      F1-Score :  0.9219858156028368
```