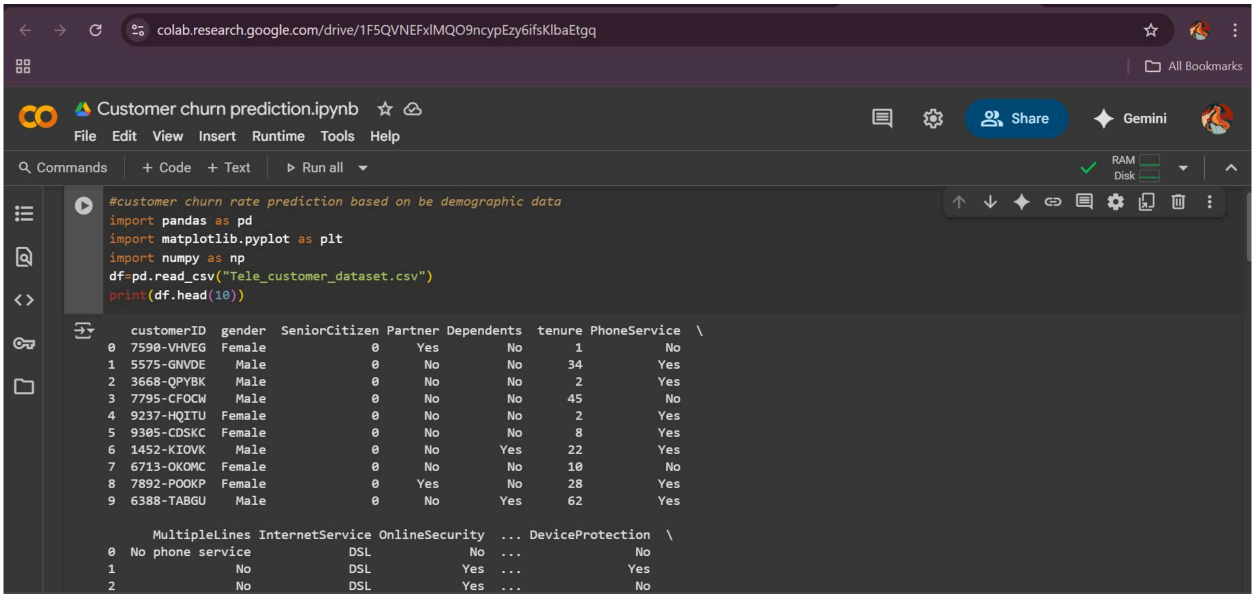
colab.research.google.com/drive/1F5QVNEFxlMQO9ncypEzy6ifsKlbaEtgq
All Bookmarks
Customer churn prediction.ipynb
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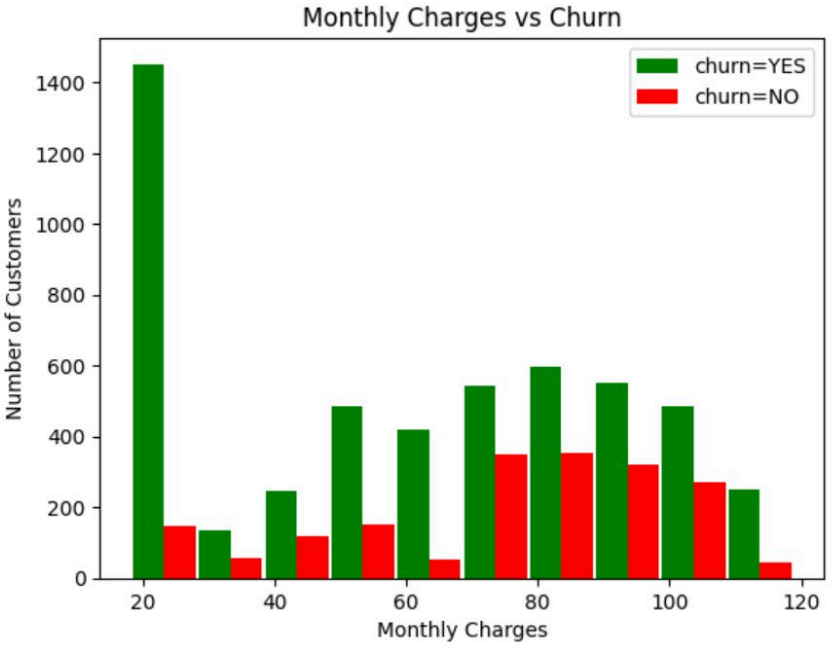
```python
#customer churn rate prediction based on be demographic data
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
df=pd.read_csv("Tele_customer_dataset.csv")
print(df.head(10))
```

```
   customerID  gender  SeniorCitizen Partner Dependents  tenure PhoneService  \
0  7590-VHVEG  Female              0     Yes         No       1           No
1  5575-GNVDE    Male              0      No         No      34          Yes
2  3668-QPYBK    Male              0      No         No       2          Yes
3  7795-CFOCW    Male              0      No         No      45           No
4  9237-HQITU  Female              0      No         No       2          Yes
5  9305-CDSKC  Female              0      No         No       8          Yes
6  1452-KIOVK    Male              0      No        Yes      22          Yes
7  6713-OKOMC  Female              0      No         No      10           No
8  7892-POOKP  Female              0     Yes         No      28          Yes
9  6388-TABGU    Male              0      No        Yes      62          Yes

      MultipleLines InternetService OnlineSecurity  ... DeviceProtection  \
0  No phone service             DSL             No  ...               No
1                No             DSL            Yes  ...              Yes
2                No             DSL            Yes  ...               No
```

MONTHLY CHARGES V/S CHURN RATE BARPLOT

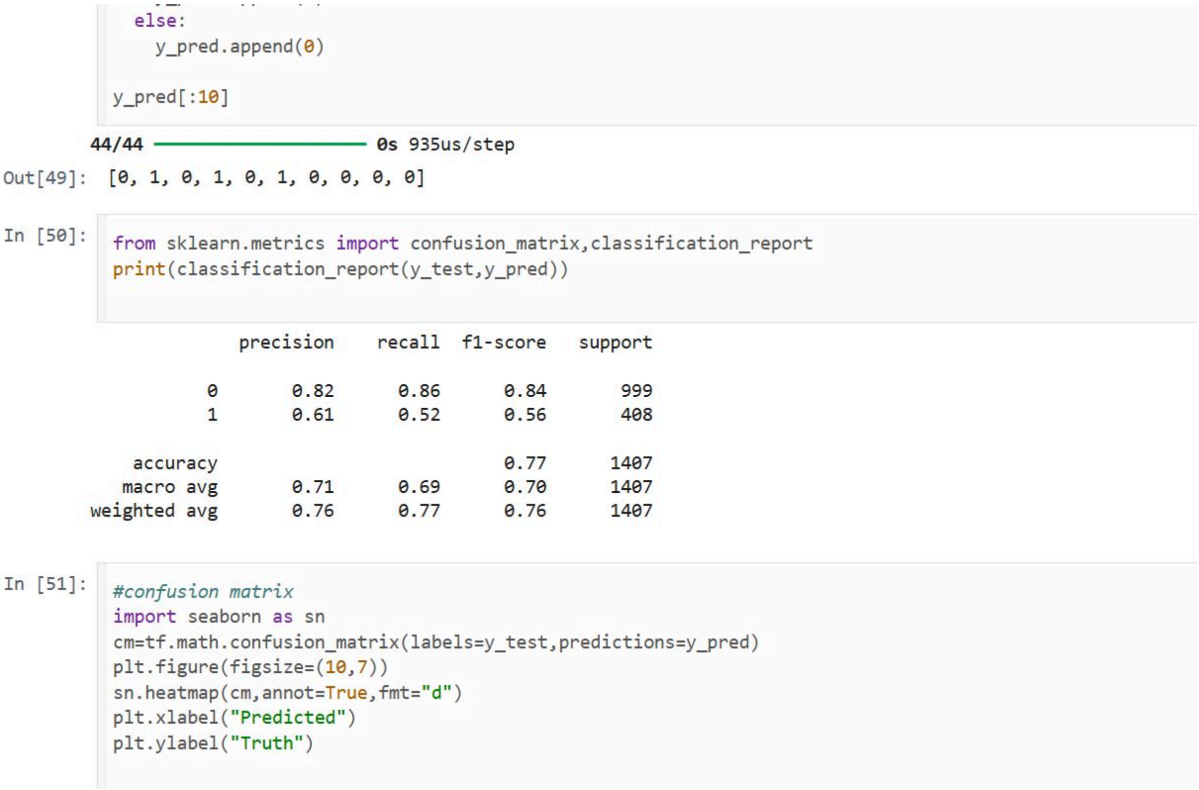
```python
plt.show()
```



```
In [28]:
```

```python
#data cleaning as ml dont understand variables in data set so we gonna change in 0s and 1s
```

CLASSIFICATION REPORT



```
  else:
    y_pred.append(0)

y_pred[:10]
```

```
44/44 ━━━━━━━━━━━━━━━━━━━━ 0s 935us/step
```

```
Out[49]:  [0, 1, 0, 1, 0, 1, 0, 0, 0, 0]
```

```
In [50]:  from sklearn.metrics import confusion_matrix,classification_report
          print(classification_report(y_test,y_pred))
```

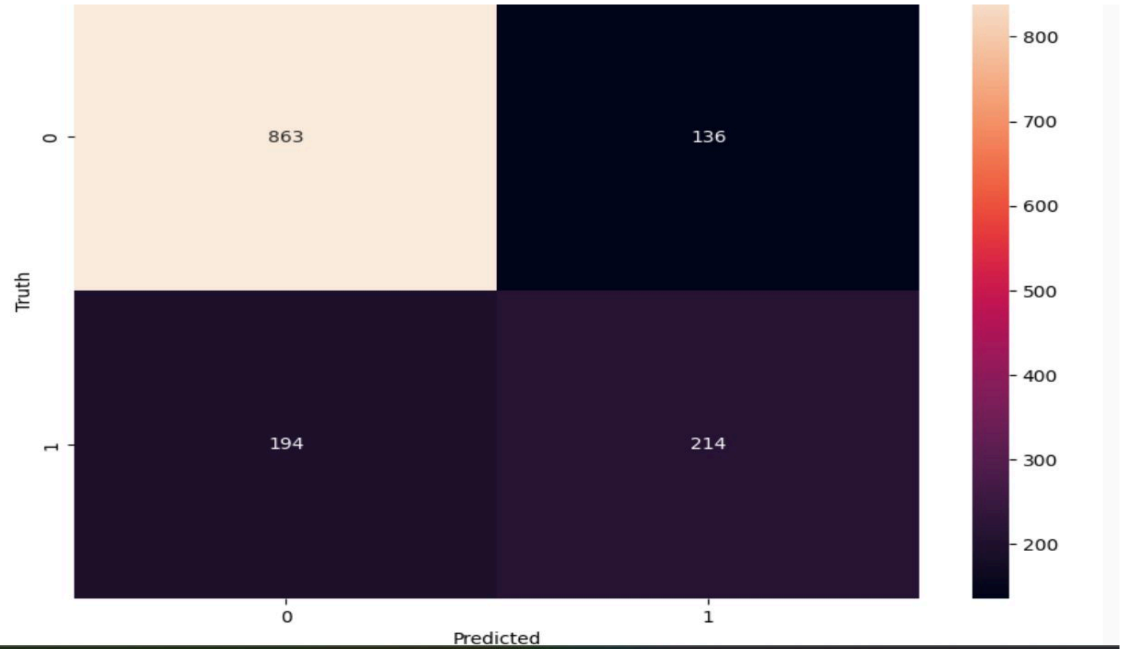
```
              precision    recall  f1-score   support

           0       0.82      0.86      0.84       999
           1       0.61      0.52      0.56       408

    accuracy                           0.77      1407
   macro avg       0.71      0.69      0.70      1407
weighted avg       0.76      0.77      0.76      1407
```

```
In [51]:  #confusion matrix
          import seaborn as sn
          cm=tf.math.confusion_matrix(labels=y_test,predictions=y_pred)
          plt.figure(figsize=(10,7))
          sn.heatmap(cm,annot=True,fmt="d")
          plt.xlabel("Predicted")
          plt.ylabel("Truth")
```

CONFUSION MATRIX


Truth
Predicted