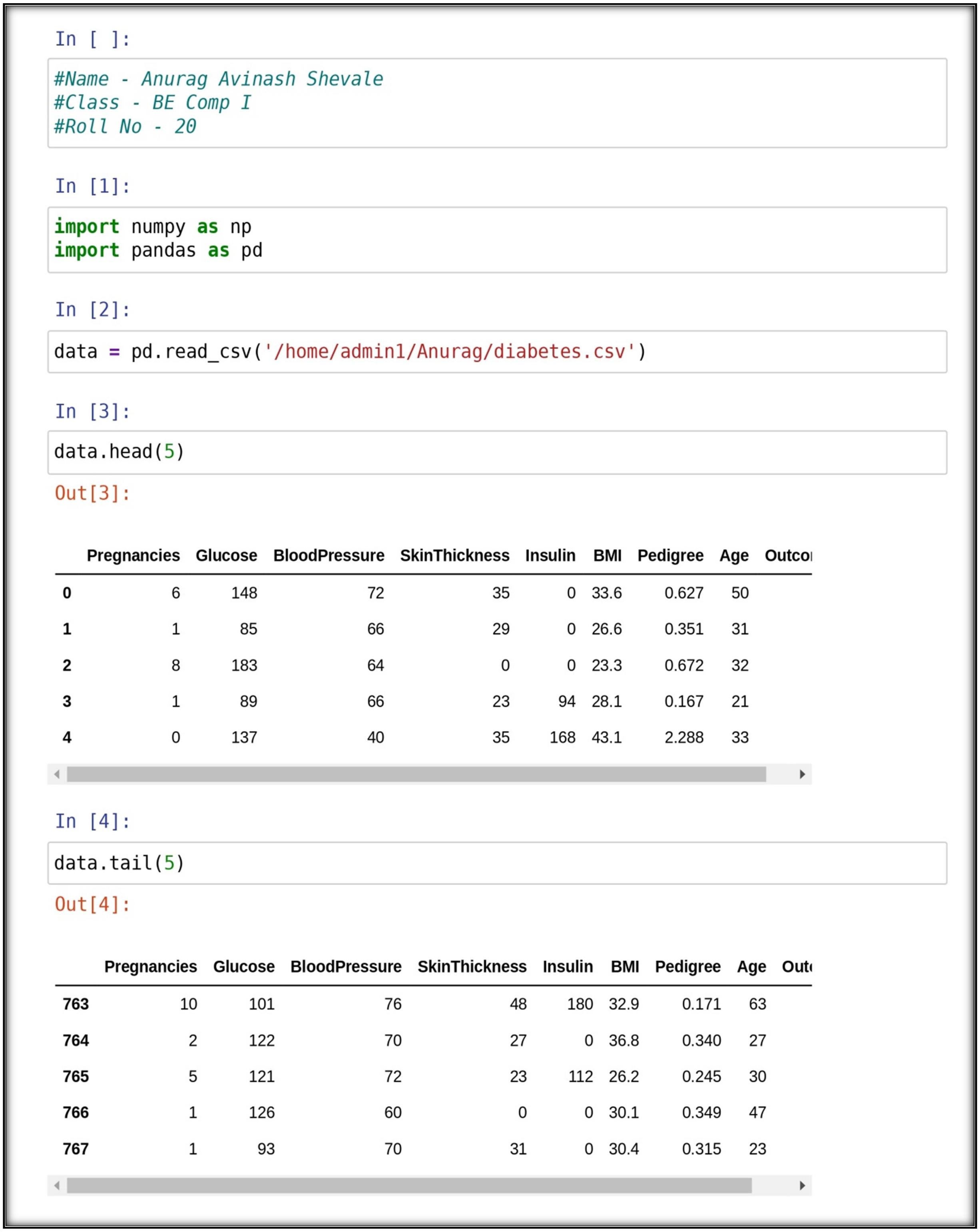
Machine Learning Laboratory – Assignment 5

- NAME :- ANURAG AVINASH SHEVALE
- CLASS :- BE COMP I
- ROLL NO :- 20



In [ ]:

```
#Name - Anurag Avinash Shevale
#Class - BE Comp I
#Roll No - 20
```

In [1]:

```
import numpy as np
import pandas as pd
```

In [2]:

```
data = pd.read_csv('/home/admin1/Anurag/diabetes.csv')
```

In [3]:

```
data.head(5)
```

Out[3]:

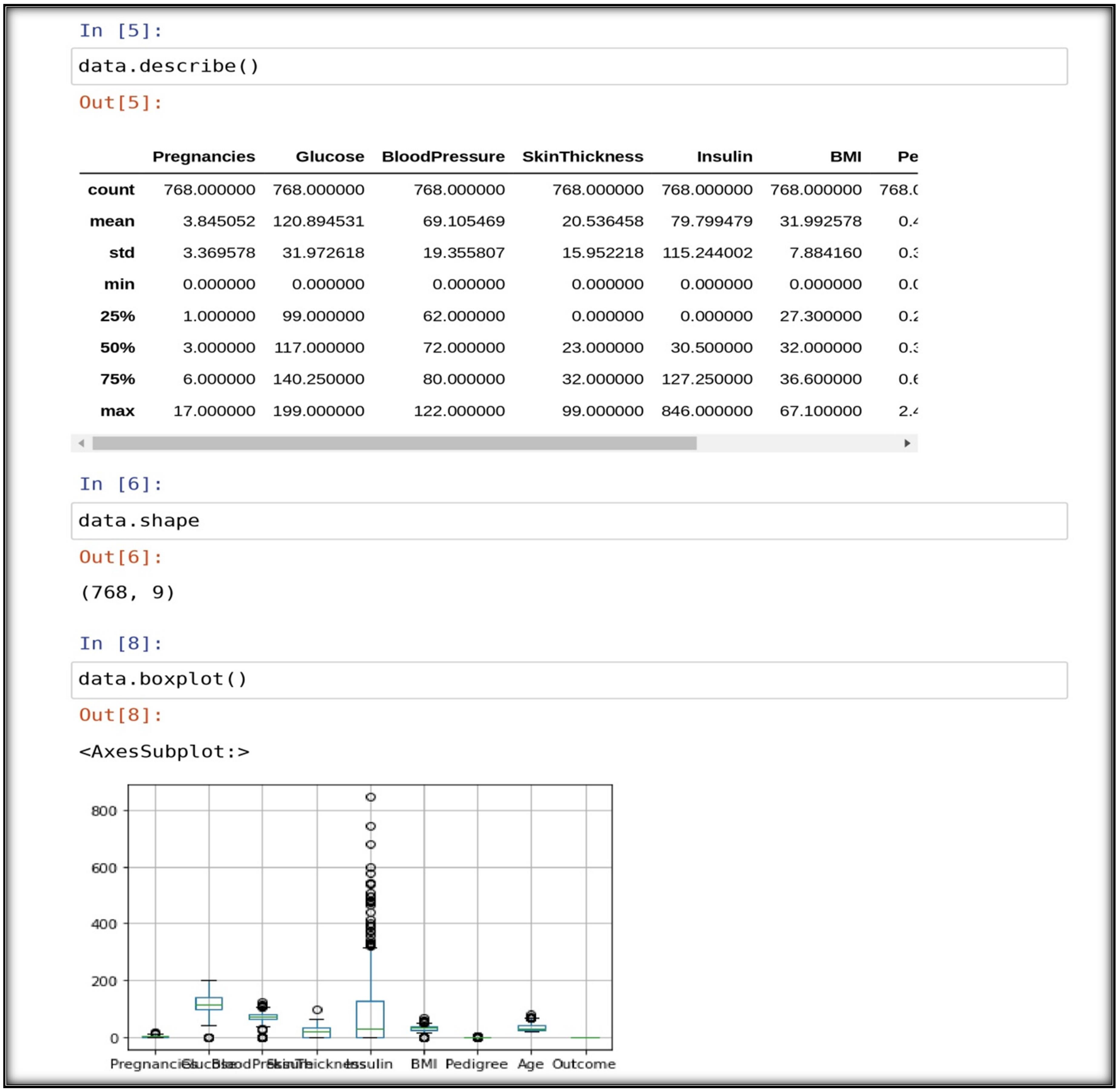
	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	Pedigree	Age	Outco
0	6	148	72	35	0	33.6	0.627	50	
1	1	85	66	29	0	26.6	0.351	31	
2	8	183	64	0	0	23.3	0.672	32	
3	1	89	66	23	94	28.1	0.167	21	
4	0	137	40	35	168	43.1	2.288	33	

In [4]:

```
data.tail(5)
```

Out[4]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	Pedigree	Age	Out
763	10	101	76	48	180	32.9	0.171	63	
764	2	122	70	27	0	36.8	0.340	27	
765	5	121	72	23	112	26.2	0.245	30	
766	1	126	60	0	0	30.1	0.349	47	
767	1	93	70	31	0	30.4	0.315	23	



In [5]:

```
data.describe()
```

Out[5]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	Pe
count	768.000000	768.000000	768.000000	768.000000	768.000000	768.000000	768.(
mean	3.845052	120.894531	69.105469	20.536458	79.799479	31.992578	0.4
std	3.369578	31.972618	19.355807	15.952218	115.244002	7.884160	0.3
min	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
25%	1.000000	99.000000	62.000000	0.000000	0.000000	27.300000	0.2
50%	3.000000	117.000000	72.000000	23.000000	30.500000	32.000000	0.3
75%	6.000000	140.250000	80.000000	32.000000	127.250000	36.600000	0.6
max	17.000000	199.000000	122.000000	99.000000	846.000000	67.100000	2.4

In [6]:

```
data.shape
```

Out[6]:

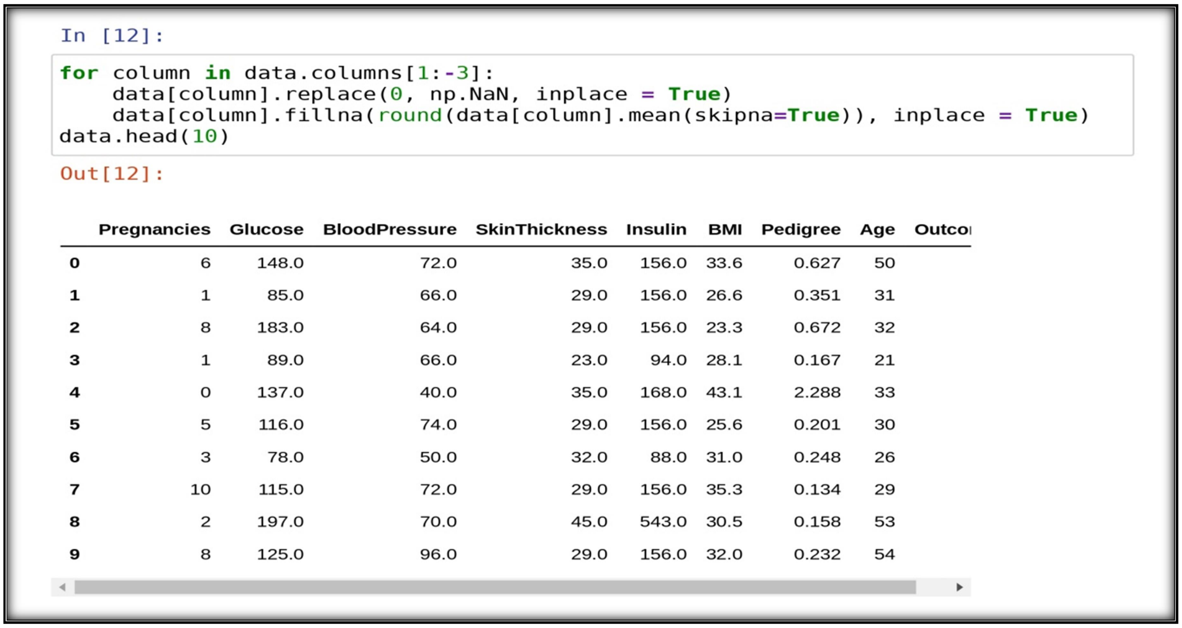
```
(768, 9)
```

In [8]:

```
data.boxplot()
```

Out[8]:

```
<AxesSubplot:>
```

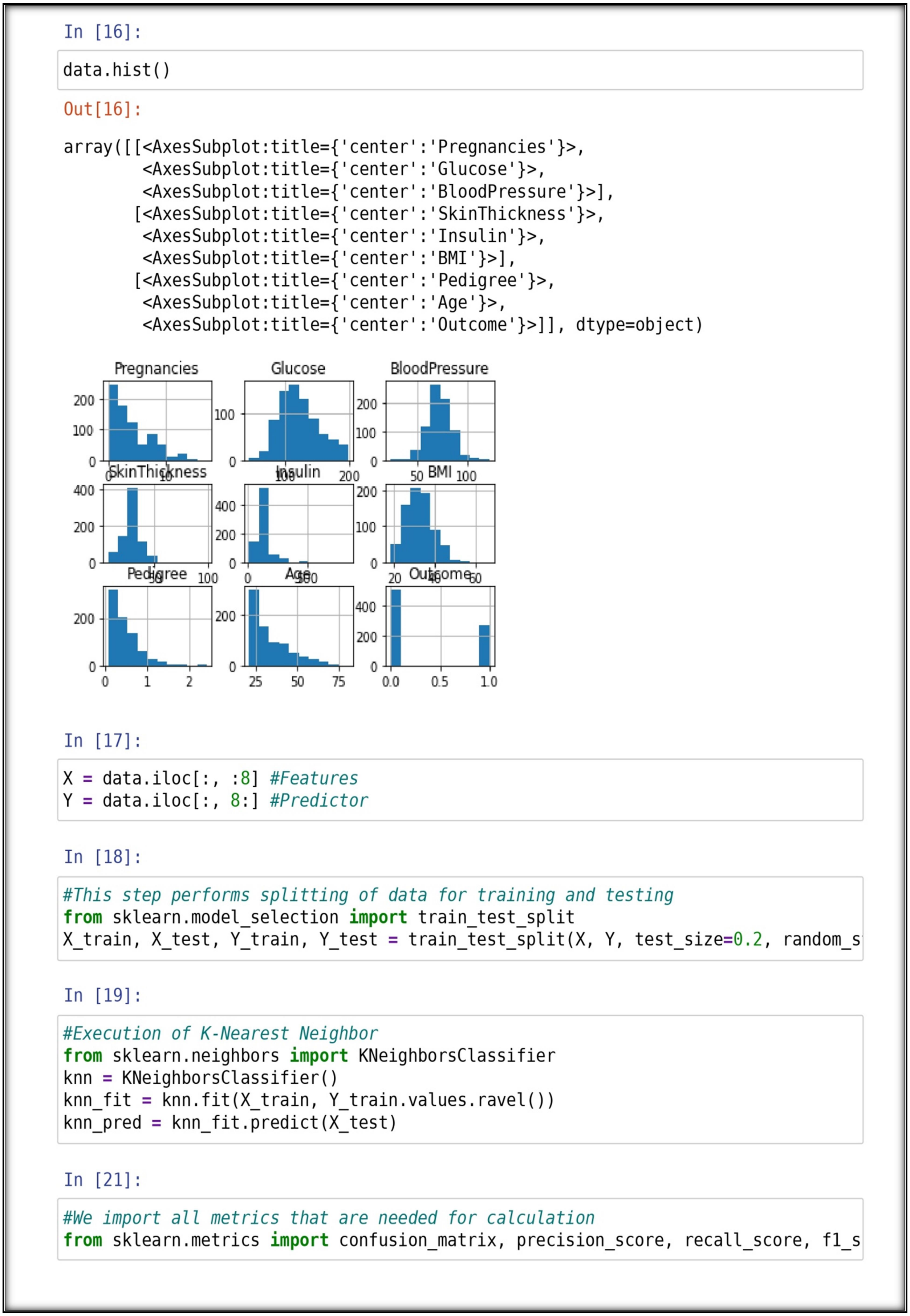


In [12]:

```
for column in data.columns[1:-3]:
    data[column].replace(0, np.NaN, inplace = True)
    data[column].fillna(round(data[column].mean(skipna=True)), inplace = True)
data.head(10)
```

Out[12]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	Pedigree	Age	Outco
0	6	148.0	72.0	35.0	156.0	33.6	0.627	50	
1	1	85.0	66.0	29.0	156.0	26.6	0.351	31	
2	8	183.0	64.0	29.0	156.0	23.3	0.672	32	
3	1	89.0	66.0	23.0	94.0	28.1	0.167	21	
4	0	137.0	40.0	35.0	168.0	43.1	2.288	33	
5	5	116.0	74.0	29.0	156.0	25.6	0.201	30	
6	3	78.0	50.0	32.0	88.0	31.0	0.248	26	
7	10	115.0	72.0	29.0	156.0	35.3	0.134	29	
8	2	197.0	70.0	45.0	543.0	30.5	0.158	53	
9	8	125.0	96.0	29.0	156.0	32.0	0.232	54	



In [16]:

```
data.hist()
```

Out[16]:

```
array([[<AxesSubplot:title={'center':'Pregnancies'}>,
        <AxesSubplot:title={'center':'Glucose'}>,
        <AxesSubplot:title={'center':'BloodPressure'}>],
       [<AxesSubplot:title={'center':'SkinThickness'}>,
        <AxesSubplot:title={'center':'Insulin'}>,
        <AxesSubplot:title={'center':'BMI'}>],
       [<AxesSubplot:title={'center':'Pedigree'}>,
        <AxesSubplot:title={'center':'Age'}>,
        <AxesSubplot:title={'center':'Outcome'}>]], dtype=object)
```

In [17]:

```
X = data.iloc[:, :8] #Features
Y = data.iloc[:, 8:] #Predictor
```

In [18]:

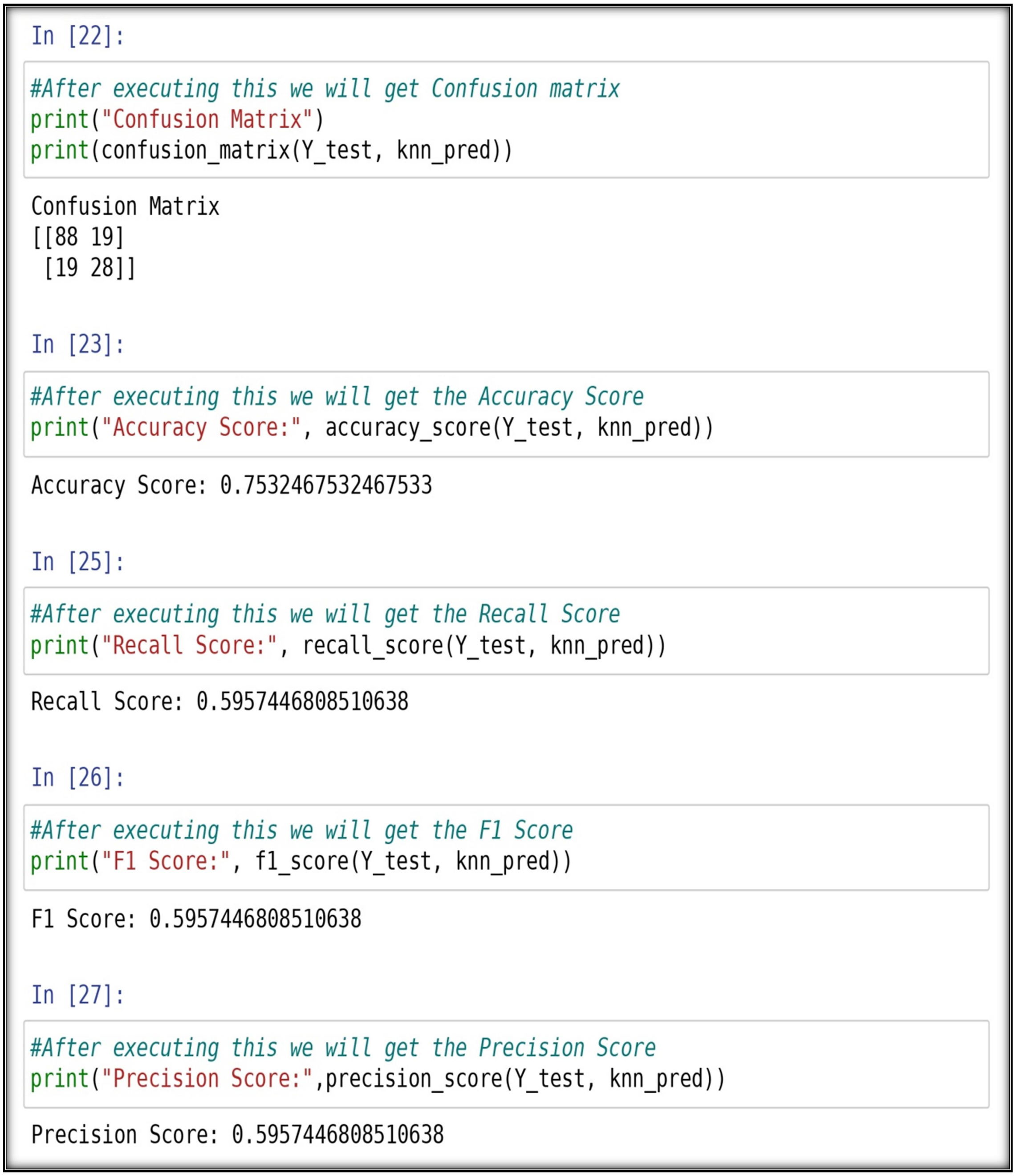
```
#This step performs splitting of data for training and testing
from sklearn.model_selection import train_test_split
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2, random_s
```

In [19]:

```
#Execution of K-Nearest Neighbor
from sklearn.neighbors import KNeighborsClassifier
knn = KNeighborsClassifier()
knn_fit = knn.fit(X_train, Y_train.values.ravel())
knn_pred = knn_fit.predict(X_test)
```

In [21]:

```
#We import all metrics that are needed for calculation
from sklearn.metrics import confusion_matrix, precision_score, recall_score, f1_s
```



In [22]:

```
#After executing this we will get Confusion matrix
print("Confusion Matrix")
print(confusion_matrix(Y_test, knn_pred))
```

```
Confusion Matrix
[[88 19]
 [19 28]]
```

In [23]:

```
#After executing this we will get the Accuracy Score
print("Accuracy Score:", accuracy_score(Y_test, knn_pred))
```

```
Accuracy Score: 0.7532467532467533
```

In [25]:

```
#After executing this we will get the Recall Score
print("Recall Score:", recall_score(Y_test, knn_pred))
```

```
Recall Score: 0.5957446808510638
```

In [26]:

```
#After executing this we will get the F1 Score
print("F1 Score:", f1_score(Y_test, knn_pred))
```

```
F1 Score: 0.5957446808510638
```

In [27]:

```
#After executing this we will get the Precision Score
print("Precision Score:",precision_score(Y_test, knn_pred))
```

```
Precision Score: 0.5957446808510638
```