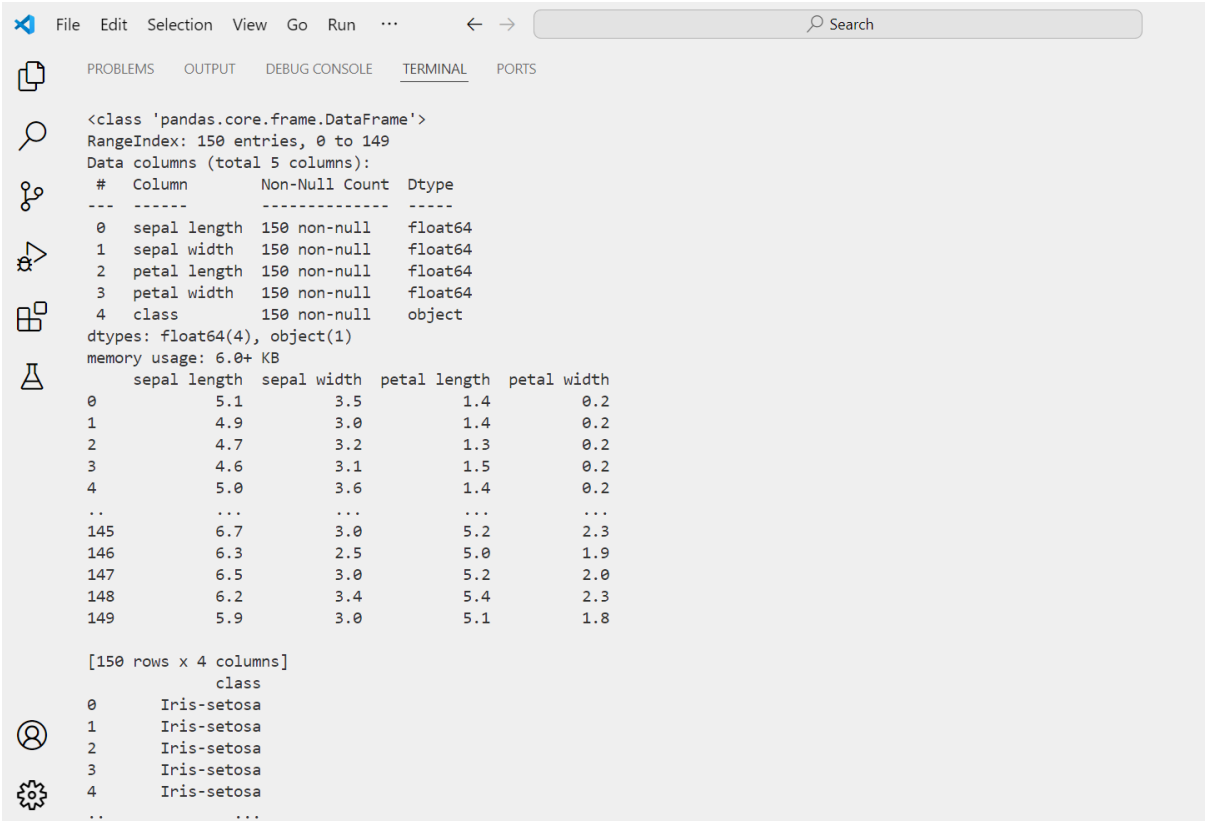
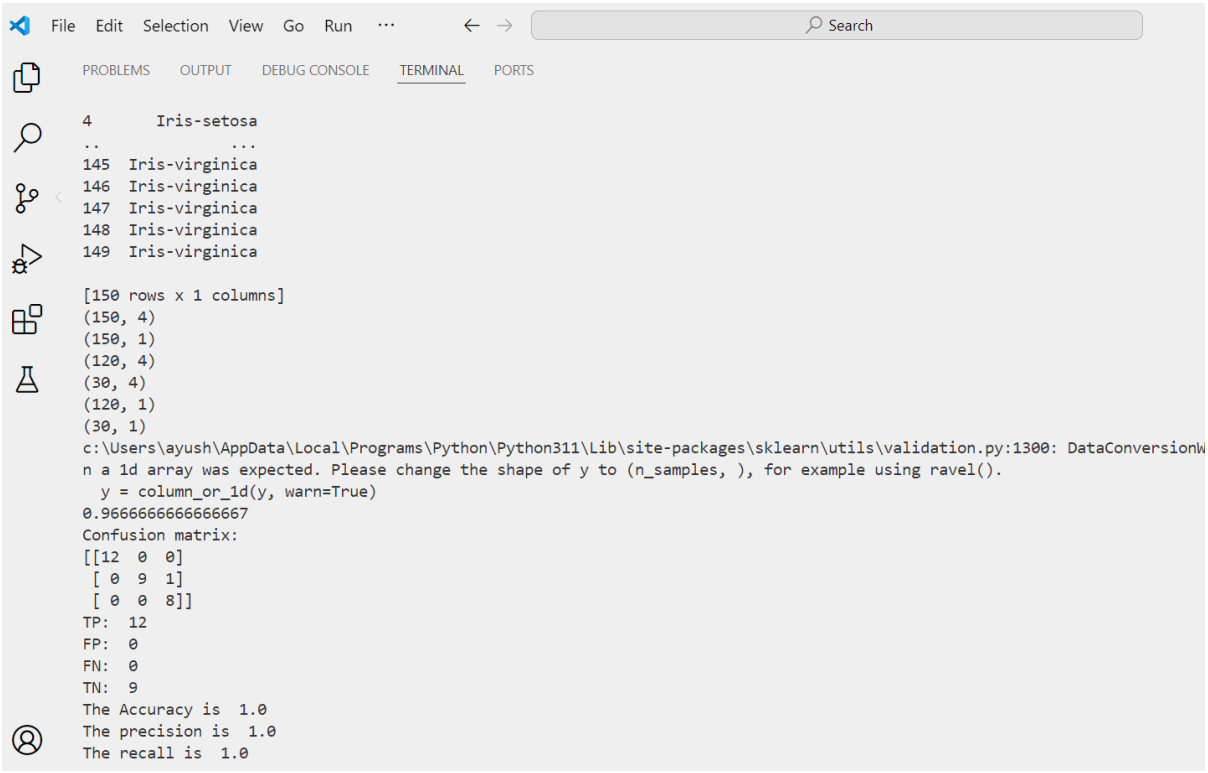
```
import pandas as pd
import matplotlib.pyplot as plt

data = pd.read_csv("https://raw.githubusercontent.com/plotly/datasets/master/iris-data.csv")
data.head()

data.shape

data.head()

data.tail()

data.info()

data.describe()

data.isnull().sum()

X = data.drop(['class'], axis=1)
y = data.drop(['sepal length',  'sepal width',  'petal length',  'petal width'], axis=1)
print(X)
print(y)
print(X.shape)
print(y.shape)

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, shuffle=True)
print(X_train.shape)
print(X_test.shape)
print(y_train.shape)
print(y_test.shape)
```

```
from sklearn.naive_bayes import GaussianNB
model = GaussianNB()
model.fit(X_train, y_train)

y_pred = model.predict(X_test)
model.score(X_test,y_test)

from sklearn.metrics import accuracy_score, confusion_matrix, ConfusionMatrixDisplay
print(accuracy_score(y_test, y_pred))

cm = confusion_matrix(y_test, y_pred)
disp = ConfusionMatrixDisplay(confusion_matrix = cm)
print("Confusion matrix:")
print(cm)

disp.plot()
plt.show()

def get_confusion_matrix_values(y_true, y_pred):
   cm = confusion_matrix(y_true, y_pred)
   return(cm[0][0], cm[0][1], cm[1][0], cm[1][1])

TP, FP, FN, TN = get_confusion_matrix_values(y_test, y_pred)
print("TP: ", TP)
print("FP: ", FP)
print("FN: ", FN)
print("TN: ", TN)

print("The Accuracy is ", (TP+TN)/(TP+TN+FP+FN))
print("The precision is ", TP/(TP+FP))
print("The recall is ", TP/(TP+FN))
```

OUTPUT –




```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 150 entries, 0 to 149
Data columns (total 5 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   sepal length  150 non-null    float64
 1   sepal width   150 non-null    float64
 2   petal length  150 non-null    float64
 3   petal width   150 non-null    float64
 4   class         150 non-null    object
dtypes: float64(4), object(1)
memory usage: 6.0+ KB
     sepal length  sepal width  petal length  petal width
0             5.1          3.5           1.4          0.2
1             4.9          3.0           1.4          0.2
2             4.7          3.2           1.3          0.2
3             4.6          3.1           1.5          0.2
4             5.0          3.6           1.4          0.2
..            ...          ...           ...          ...
145           6.7          3.0           5.2          2.3
146           6.3          2.5           5.0          1.9
147           6.5          3.0           5.2          2.0
148           6.2          3.4           5.4          2.3
149           5.9          3.0           5.1          1.8

[150 rows x 4 columns]
             class
0      Iris-setosa
1      Iris-setosa
2      Iris-setosa
3      Iris-setosa
4      Iris-setosa
..             ...
```




```
4      Iris-setosa
..             ...
145  Iris-virginica
146  Iris-virginica
147  Iris-virginica
148  Iris-virginica
149  Iris-virginica

[150 rows x 1 columns]
(150, 4)
(150, 1)
(120, 4)
(30, 4)
(120, 1)
(30, 1)
c:\Users\ayush\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\utils\validation.py:1300: DataConversionW
n a 1d array was expected. Please change the shape of y to (n_samples, ), for example using ravel().
  y = column_or_1d(y, warn=True)
0.9666666666666667
Confusion matrix:
[[12  0  0]
 [ 0  9  1]
 [ 0  0  8]]
TP:  12
FP:  0
FN:  0
TN:  9
The Accuracy is  1.0
The precision is  1.0
The recall is  1.0
```

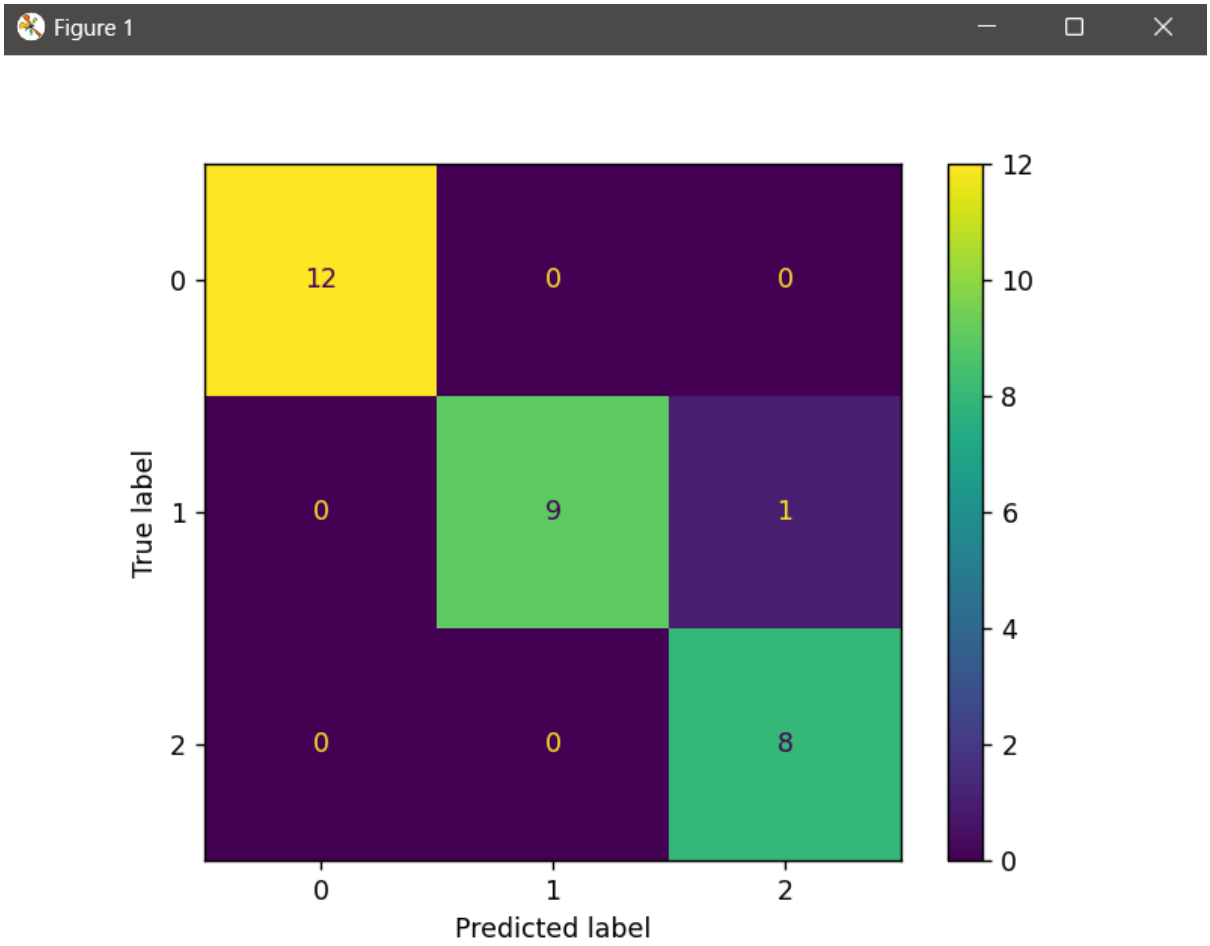


Figure 1
12
0
0
0
9
1
0
0
8
0
1
2
True label
0
1
2
Predicted label
12
10
8
6
4
2
0