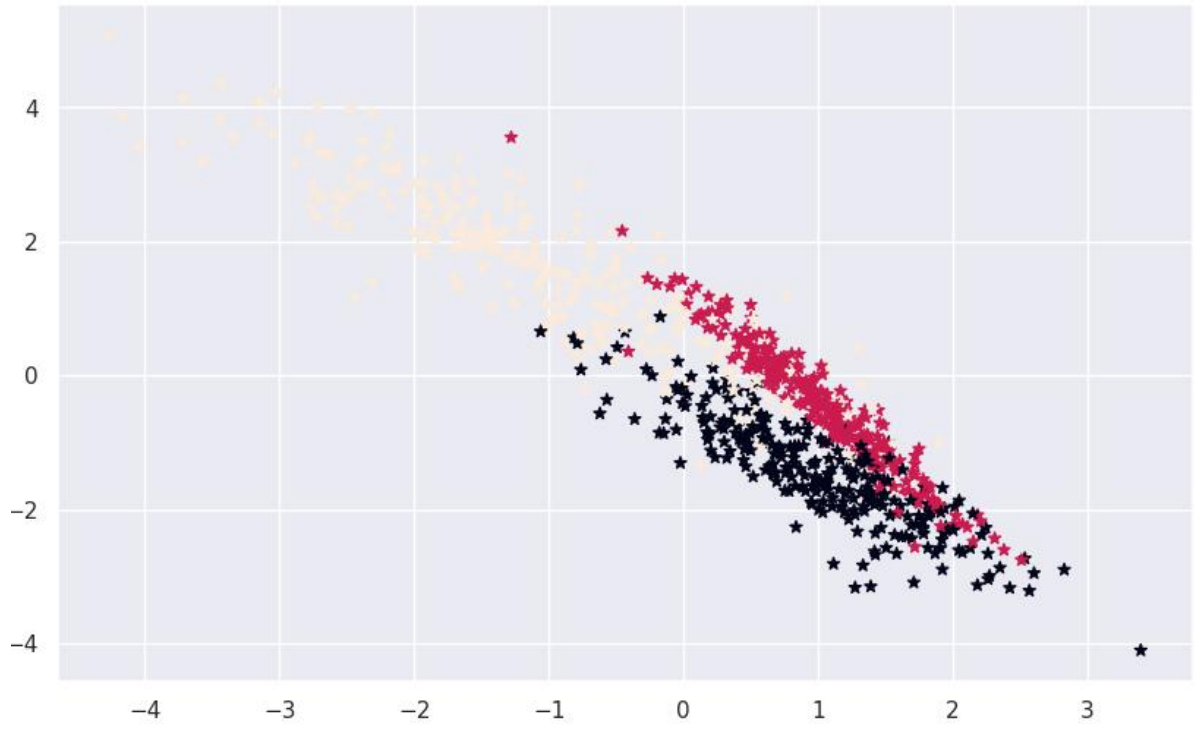
Expt no: 5 Implementation of Naïve Bayes Algorithm

```
from sklearn.datasets import make_classification

X, y = make_classification(
    n_features=6,
    n_classes=3,
    n_samples=800,
    n_informative=2,
    random_state=1,
    n_clusters_per_class=1,
)
import matplotlib.pyplot as plt

plt.scatter(X[:, 0], X[:, 1], c=y, marker="*");
```




```
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.33, random_state=125
)
```

```
from sklearn.naive_bayes import GaussianNB

# Build a Gaussian Classifier
model = GaussianNB()

# Model training
model.fit(X_train, y_train)

# Predict Output
predicted = model.predict([X_test[6]])

print("Actual Value:", y_test[6])
print("Predicted Value:", predicted[0])
```

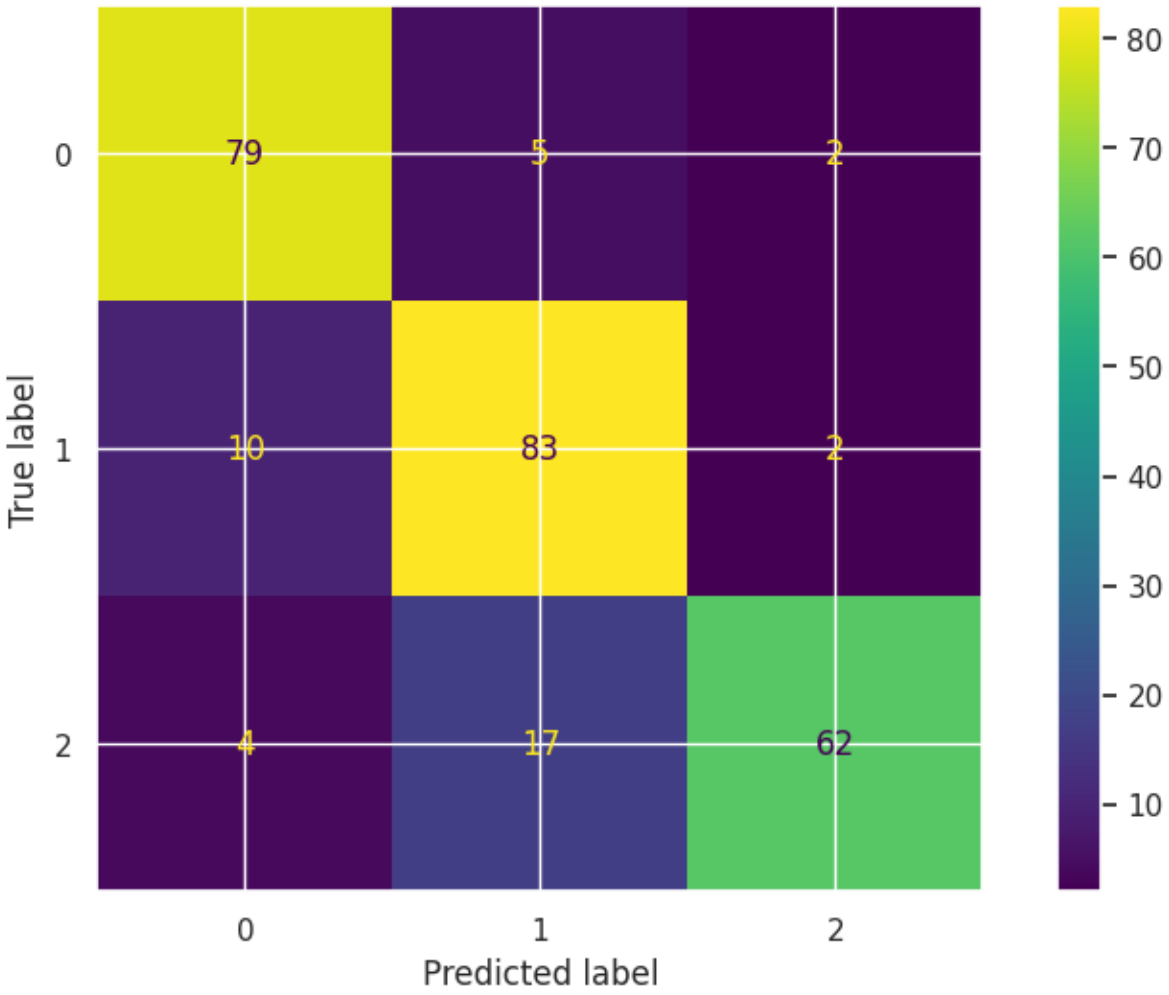
```
Actual Value: 0
Predicted Value: 0
```

```
from sklearn.metrics import (
    accuracy_score,
    confusion_matrix,
    ConfusionMatrixDisplay,
    f1_score,
)

y_pred = model.predict(X_test)
accuray = accuracy_score(y_pred, y_test)
f1 = f1_score(y_pred, y_test, average="weighted")
```

```
Accuracy: 0.8484848484848485
F1 Score: 0.8491119695890328
```

```
labels = [0,1,2]
cm = confusion_matrix(y_test, y_pred, labels=labels)
disp = ConfusionMatrixDisplay(confusion_matrix=cm, display_labels=labels)
disp.plot();
```


79
5
2
10
83
2
4
17
62
0
1
2
True label
0
1
2
Predicted label
80
70
60
50
40
30
20
10