practical-6-dsbda

May 4, 2025

[3]:
```
#practical 6
import pandas as pd
from sklearn.metrics import␣
 ↪confusion_matrix,precision_score,recall_score,accuracy_score
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
```

[11]:
```
df = pd.read_csv("Iris.csv")
df.head()
```

[11]:

	Id	SepalLengthCm	SepalWidthCm	PetalLengthCm	PetalWidthCm	Species
0	1	5.1	3.5	1.4	0.2	Iris-setosa
1	2	4.9	3.0	1.4	0.2	Iris-setosa
2	3	4.7	3.2	1.3	0.2	Iris-setosa
3	4	4.6	3.1	1.5	0.2	Iris-setosa
4	5	5.0	3.6	1.4	0.2	Iris-setosa

[12]:
```
df.drop('Id',axis = 1,inplace=True)
```

[6]:
```
x = df.drop('Species',axis=1)
y = df['Species']
```

[7]:
```
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.
 ↪2,random_state=0)
```

[14]:
```
model = GaussianNB()
model.fit(x_train,y_train)
```

[14]:
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GaussianNB()
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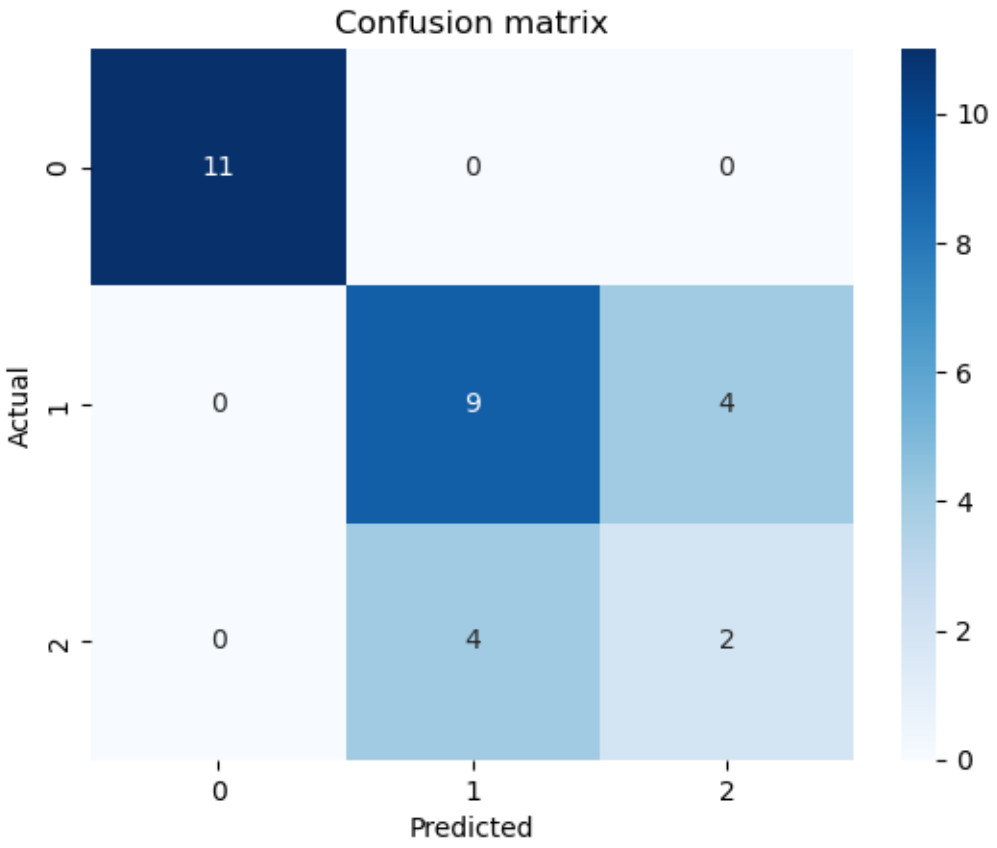
[15]:
```
y_pred = model.predict(x_test)
```

[21]:
```
cm = confusion_matrix(y_test,y_pred)
TP = [1,1]
TN = [0,0]
FP = [0,1]
FN = [1,0]
```

```
print("Confusion matrix :\n ",cm)
print(f"True Positive : {TP}")
print(f"True Negative : {TN}")
print(f"False Positive : {FP}")
print(f"False Negative : {FN}")

accuracy = accuracy_score(y_test,y_pred)
error_rate = 1 - accuracy
precision = precision_score(y_test,y_pred,average='macro')
recall = recall_score(y_test,y_pred,average='macro')

print("\nAccuracy Score  : ",accuracy)
print(f"Error rate  : ",error_rate)
print(f"Precision Score  : ",precision)
print(f"Recall Score  : ",recall)
```

```
Confusion matrix :
  [[11  0  0]
 [ 0  9  4]
 [ 0  4  2]]
True Positive : [1, 1]
True Negative : [0, 0]
False Positive : [0, 1]
False Negative : [1, 0]

Accuracy Score  :  0.7333333333333333
Error rate  :  0.2666666666666667
Precision Score  :  0.6752136752136751
Recall Score  :  0.6752136752136751
```

[25]:
```
import seaborn as sns
import matplotlib.pyplot as plt
sns.heatmap(cm,annot=True,fmt='d',cmap='Blues')
plt.xlabel("Predicted")
plt.ylabel("Actual")
plt.title("Confusion matrix")
plt.show()
```


Confusion matrix
11
0
0
0
9
4
0
4
2
Actual
Predicted
0
1
2
10
8
6
4
2
0

[ ]: