

```
In [1]: import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

```
In [4]: dataset = pd.read_csv('https://raw.githubusercontent.com/mk-gurucharan/Classif:
X = dataset.iloc[:, :4].values
y = dataset['species'].values
dataset.head(5)
```

Out[4]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```
In [5]: 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)
```

```
In [6]: from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
```

```
In [7]: from sklearn.naive_bayes import GaussianNB
classifier = GaussianNB()
classifier.fit(X_train, y_train)
```

Out[7]:

```
▼ GaussianNB
GaussianNB()
```

```
In [8]: y_pred = classifier.predict(X_test)
y_pred
```

```
Out[8]: array(['setosa', 'setosa', 'setosa', 'virginica', 'setosa', 'versicolor',
'virginica', 'versicolor', 'setosa', 'setosa', 'virginica',
'versicolor', 'virginica', 'setosa', 'setosa', 'setosa',
'versicolor', 'virginica', 'setosa', 'versicolor', 'setosa',
'virginica', 'setosa', 'virginica', 'versicolor', 'versicolor',
'setosa', 'versicolor', 'virginica', 'virginica'], dtype='<U10')
```

```
In [13]: from sklearn.metrics import confusion_matrix
cm = confusion_matrix(y_test,y_pred)
from sklearn.metrics import accuracy_score
print("accuracy :",accuracy_score(y_test,y_pred))
cm
```

accuracy : 0.9

```
Out[13]: array([[13,  0,  0],
                [ 0,  6,  1],
                [ 0,  2,  8]], dtype=int64)
```

```
In [14]: df = pd.DataFrame({'Real Values':y_test, 'Predicted Values':y_pred})  
df
```

Out[14]:

	Real Values	Predicted Values
0	setosa	setosa
1	setosa	setosa
2	setosa	setosa
3	virginica	virginica
4	setosa	setosa
5	versicolor	versicolor
6	versicolor	virginica
7	versicolor	versicolor
8	setosa	setosa
9	setosa	setosa
10	virginica	virginica
11	virginica	versicolor
12	virginica	virginica
13	setosa	setosa
14	setosa	setosa
15	setosa	setosa
16	versicolor	versicolor
17	virginica	virginica
18	setosa	setosa
19	versicolor	versicolor
20	setosa	setosa
21	virginica	virginica
22	setosa	setosa
23	virginica	virginica
24	versicolor	versicolor
25	versicolor	versicolor
26	setosa	setosa
27	virginica	versicolor
28	virginica	virginica
29	virginica	virginica

```
In [16]: from sklearn.metrics import confusion_matrix

cm = confusion_matrix(y_test, y_pred)

print('Confusion matrix\n\n', cm)

print('\nTrue Positives(TP) = ', cm[0,0])

print('\nTrue Negatives(TN) = ', cm[1,1])

print('\nFalse Positives(FP) = ', cm[0,1])

print('\nFalse Negatives(FN) = ', cm[1,0])
```

Confusion matrix

```
[[13  0  0]
 [ 0  6  1]
 [ 0  2  8]]
```

True Positives(TP) = 13

True Negatives(TN) = 6

False Positives(FP) = 0

False Negatives(FN) = 0

In []: