ClasificadorFlorIris_Con_NaiveBayes

October 16, 2019

1 Clasificador Naive Bayes - Red de Bayes Simple

1.1 Clasificar las Flores Iris del Dataset sklearn

[1]:

```
# Importar los módulos necesarios
import matplotlib.pyplot as plt
import seaborn as sns
import scipy.stats as stats
from sklearn import datasets
from sklearn.naive_bayes import GaussianNB
from sklearn.metrics import confusion_matrix
from sklearn.model_selection import train_test_split
```

[2]:

```
# Carga el dataset de la flor iris
iris = datasets.load_iris()
X = iris.data
y = iris.target
names = iris['target_names']
feature_names = iris['feature_names']
```

[3]:

```
print("Conjunto de datos del dataset: ")
print(X)
print("Clases de las flores Iris: ")
print(y)
```

```
Conjunto de datos del dataset:
[[5.1 3.5 1.4 0.2]
 [4.9 3.  1.4 0.2]
 [4.7 3.2 1.3 0.2]
 [4.6 3.1 1.5 0.2]
 [5.  3.6 1.4 0.2]
 [5.4 3.9 1.7 0.4]
 [4.6 3.4 1.4 0.3]
 [5.  3.4 1.5 0.2]
 [4.4 2.9 1.4 0.2]
 [4.9 3.1 1.5 0.1]
 [5.4 3.7 1.5 0.2]
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[4.8 3.4 1.6 0.2]
[4.8 3.  1.4 0.1]
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[5.  3.  1.6 0.2]
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[5.2 3.5 1.5 0.2]
[5.2 3.4 1.4 0.2]
[4.7 3.2 1.6 0.2]
[4.8 3.1 1.6 0.2]
[5.4 3.4 1.5 0.4]
[5.2 4.1 1.5 0.1]
[5.5 4.2 1.4 0.2]
[4.9 3.1 1.5 0.2]
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[4.5 2.3 1.3 0.3]
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[5.  3.5 1.6 0.6]
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[5.3 3.7 1.5 0.2]
[5.  3.3 1.4 0.2]
[7.  3.2 4.7 1.4]
[6.4 3.2 4.5 1.5]
[6.9 3.1 4.9 1.5]
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[6.5 2.8 4.6 1.5]
[5.7 2.8 4.5 1.3]
[6.3 3.3 4.7 1.6]
[4.9 2.4 3.3 1. ]
[6.6 2.9 4.6 1.3]
```

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[5.2 2.7 3.9 1.4]
[5.  2.  3.5 1. ]
[5.9 3.  4.2 1.5]
[6.  2.2 4.  1. ]
[6.1 2.9 4.7 1.4]
[5.6 2.9 3.6 1.3]
[6.7 3.1 4.4 1.4]
[5.6 3.  4.5 1.5]
[5.8 2.7 4.1 1. ]
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[6.3 3.3 6.  2.5]
[5.8 2.7 5.1 1.9]
[7.1 3.  5.9 2.1]
[6.3 2.9 5.6 1.8]
[6.5 3.  5.8 2.2]
[7.6 3.  6.6 2.1]
[4.9 2.5 4.5 1.7]
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```
 [7.3 2.9 6.3 1.8]
 [6.7 2.5 5.8 1.8]
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 [7.2 3.  5.8 1.6]
 [7.4 2.8 6.1 1.9]
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 [7.7 3.  6.1 2.3]
 [6.3 3.4 5.6 2.4]
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 [6.  3.  4.8 1.8]
 [6.9 3.1 5.4 2.1]
 [6.7 3.1 5.6 2.4]
 [6.9 3.1 5.1 2.3]
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 [6.8 3.2 5.9 2.3]
 [6.7 3.3 5.7 2.5]
 [6.7 3.  5.2 2.3]
 [6.3 2.5 5.  1.9]
 [6.5 3.  5.2 2. ]
 [6.2 3.4 5.4 2.3]
 [5.9 3.  5.1 1.8]]
Clases de las flores Iris:
[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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 2 2]
```
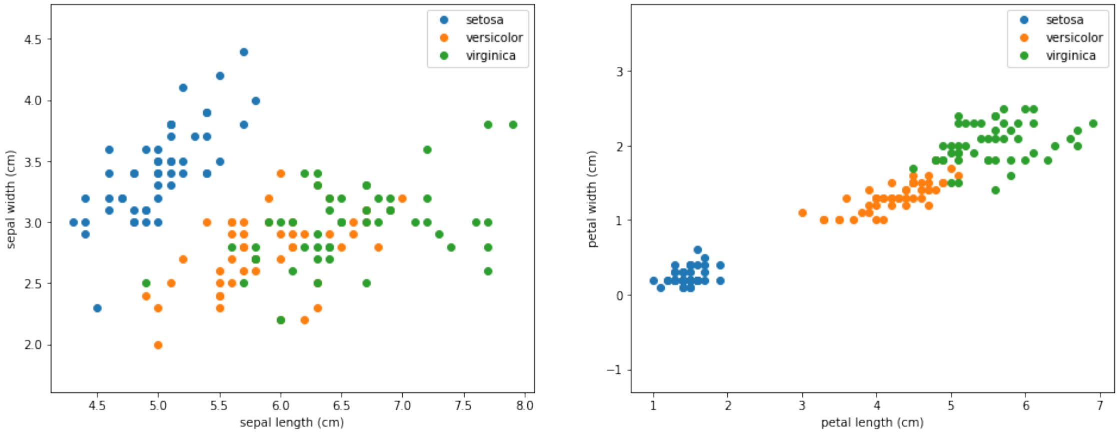

```
[4]: # Visualizar el conjunto de datos
     plt.figure(figsize=(16, 6))
     plt.subplot(1, 2, 1)
     for target, target_name in enumerate(names):
         X_plot = X[y == target]
         plt.plot(X_plot[:, 0], X_plot[:, 1], linestyle='none', marker='o',␣
      ↪label=target_name)
     plt.xlabel(feature_names[0])
     plt.ylabel(feature_names[1])
     plt.axis('equal')
     plt.legend();

     plt.subplot(1, 2, 2)
     for target, target_name in enumerate(names):
         X_plot = X[y == target]
         plt.plot(X_plot[:, 2], X_plot[:, 3], linestyle='none', marker='o',␣
      ↪label=target_name)
     plt.xlabel(feature_names[2])
     plt.ylabel(feature_names[3])
     plt.axis('equal')
     plt.legend();
```



```
[5]: # Dividir los datos en entrenamiento y evaluación
     X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.7,␣
      ↪random_state=0)
```

```
[6]: # inicializar el clasificador Naive Bayes
     bayes_ingenuo = GaussianNB()
```

[7]:

```
# predicción
y_pred = bayes_ingenuo.fit(X_train, y_train).predict(X_test)
```

[8]:

```
# Matriz de confusión
cnf_matrix = confusion_matrix(y_test, y_pred)
```

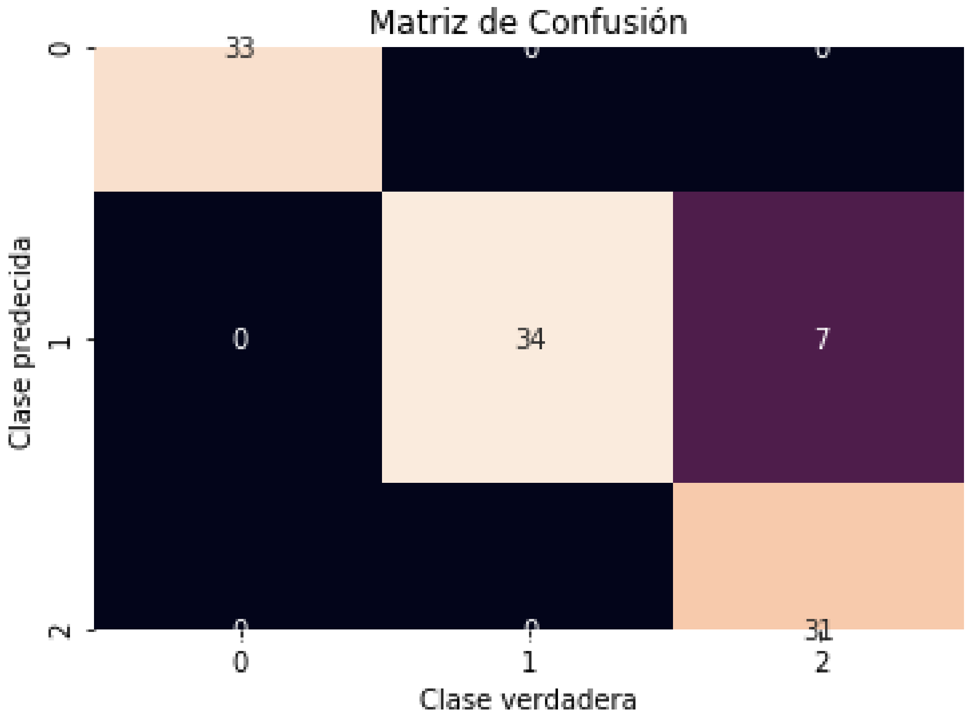
[9]:

```
print("Cantidad de errores de clasificación sobre un total de {0} casos: {1}"
      .format(y_test.shape[0],(y_test != y_pred).sum()))
print("Efectividad del algoritmo: {0: .2f}"
      .format(1 - (y_test != y_pred).sum()/y_test.shape[0]))
```

```
Cantidad de errores de clasificación sobre un total de 105 casos: 7
Efectividad del algoritmo:  0.93
```

[10]:

```
# Graficando la matriz de confusión
sns.heatmap(cnf_matrix.T, square=True, annot=True, fmt='d', cbar=False)
plt.xlabel('Clase verdadera')
plt.ylabel('Clase predecida')
plt.title('Matriz de Confusión')
plt.show()
```



[ ]:

```
```