```
# Cargue de Librerías básicas
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Importar tensorflow
import tensorflow as tf
print("TF version   : ", tf.__version__)

# Necesitaremos GPU
print("GPU available: ", tf.config.list_physical_devices('GPU'))

# keras version is 2.11.0
import keras
print("Keras version   : ", keras.__version__)
```

```
TF version   :  2.15.0
GPU available:  []
Keras version   :  2.15.0
```

```
#-----------------------------------------#
#       debido a que estoy usando COLAB     #
#-----------------------------------------#

from google.colab import drive
drive.mount('/content/drive') #/content/drive/MyDrive/pec2/data/xl.pickle
print("GPU available: ", tf.config.list_physical_devices('GPU'))
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call
GPU available:  []
```

```
import pandas as pd

home =  '/content/drive/MyDrive/TFM/'

file_path = home + "2017_2023DSTrabajo.xlsx"

dsXls = pd.read_excel(file_path)
dsXls.head(5)
dsXls.info()

#####################################
```

```
# LIMPIEZA DE DATOS
####################################
#1. validar duplicados
dsXls.nunique()

#2. validar nulos, rellenar valores faltantes con la mediana
#dsXls.isnull().sum()
dsXls['Dist'].fillna(dsXls['Dist'].median(), inplace=True)
dsXls['Attendance'].fillna(dsXls['Attendance'].median(), inplace=True)
dsXls.isnull().sum()


####################################
# ESTADISTICAS
####################################
#dsXls.describe().T
dsXls.iloc[:,1:].describe()

```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4092 entries, 0 to 4091
Data columns (total 21 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   Date        4092 non-null   datetime64[ns]
 1   Round       4092 non-null   object
 2   Day         4092 non-null   object
 3   Venue       4092 non-null   object
 4   Result      4092 non-null   object
 5   GF          4092 non-null   float64
 6   GA          4092 non-null   float64
 7   Opponent    4092 non-null   object
 8   xG          4092 non-null   float64
 9   xGA         4092 non-null   float64
 10  Poss        4092 non-null   float64
 11  Attendance  3212 non-null   float64
 12  Season      4092 non-null   int64
 13  Team        4092 non-null   object
 14  Sh          4092 non-null   float64
 15  SoT         4092 non-null   float64
 16  Dist        4089 non-null   float64
 17  SCA         4092 non-null   float64
 18  KP          4092 non-null   float64
 19  PPA         4092 non-null   float64
 20  CrsPA       4092 non-null   float64
dtypes: datetime64[ns](1), float64(13), int64(1), object(6)
memory usage: 671.5+ KB
```

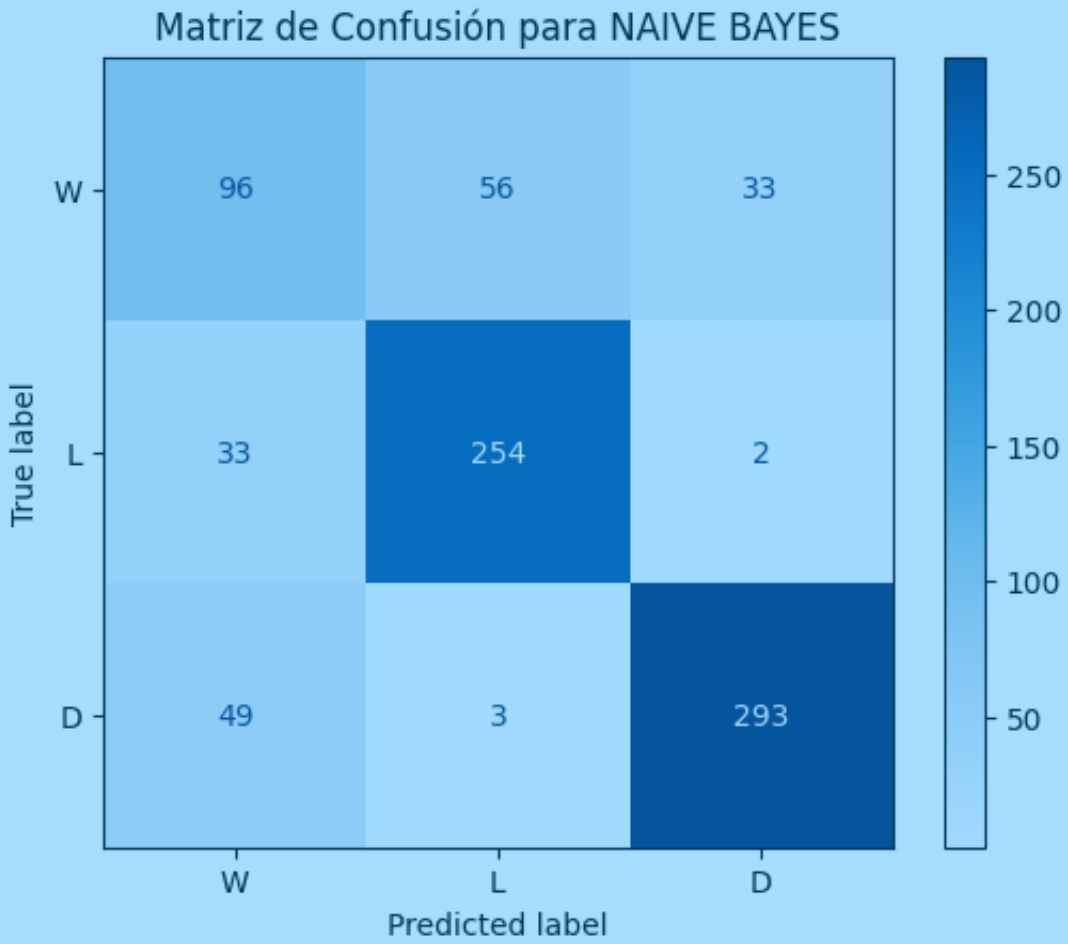
	GF	GA	xG	xGA	Poss	Attendance	
count	4092.000000	4092.000000	4092.000000	4092.000000	4092.000000	4092.000000	4(
mean	1.377810	1.377810	1.346163	1.346163	50.001222	36912.650049	2(
std	1.277631	1.277631	0.796551	0.796551	12.726702	15301.262664	
min	0.000000	0.000000	0.000000	0.000000	18.000000	2000.000000	2(
25%	0.000000	0.000000	0.700000	0.700000	41.000000	29296.000000	2(
50%	1.000000	1.000000	1.200000	1.200000	50.000000	32092.500000	2(
75%	2.000000	2.000000	1.800000	1.800000	59.000000	51237.000000	2(
max	9.000000	9.000000	5.900000	5.900000	82.000000	83222.000000	2(

```
1  import numpy as np
2  import pandas as pd
```

```
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import GaussianNB
from sklearn.metrics import accuracy_score
from sklearn.decomposition import PCA
from sklearn.preprocessing import StandardScaler
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import confusion_matrix, ConfusionMatrixDisplay, classifi
from sklearn.model_selection import cross_val_score


# Supongamos que tienes un DataFrame llamado df con tus datos
# y que ya has excluido las columnas que no deseas incluir.

# Selección de características data = dsXls.drop(['Date', 'Round', 'Day', 'Ven
#1 obtener datos numéricos
dataPCA = dsXls.drop(['Date', 'Round', 'Day', 'Venue', 'Result','Team', 'Oppon

#2 Aplicando PCA
pca = PCA()
X_pca = pca.fit_transform(dataPCA)

#3 obtener variable objetivo Result
y = dsXls['Result']
label_encoder = LabelEncoder()
y_encodedPCA = label_encoder.fit_transform(y)

####X = dsXls.drop(['Date', 'Round', 'Day', 'Venue', 'Result', 'Semester','Tea
#####y = dsXls['Result']  # La columna 'Result' es la variable objetivo

# División de los datos en entrenamiento y prueba
X_train, X_test, y_train, y_test = train_test_split(X_pca, y_encodedPCA, test_

# Crear el modelo Gaussian Naive Bayes
model = GaussianNB()

# Entrenar el modelo
model.fit(X_train, y_train)

# Hacer predicciones
y_pred = model.predict(X_test)

# Calcular la precisión
accuracy = accuracy_score(y_test, y_pred)
print(f"La precisión del modelo Naive Bayes es: {accuracy:.2f}")
```

```
48
49  ####################################
50
51  # Generar y mostrar la matriz de confusión
52  ###y_pred = forest.predict(X_test)
53  cm = confusion_matrix(y_test, y_pred)
54  print(cm)
55
56  disp = ConfusionMatrixDisplay(confusion_matrix=cm, display_labels=['W','L','D'
57  disp.plot(cmap=plt.cm.Blues)
58  plt.title("Matriz de Confusión para NAIVE BAYES")
59  plt.show()
60
61  # Reporte de clasificación
62  print("Classification Report:\n", classification_report(y_test, y_pred))
63
64  # Validación cruzada
65  cross_val_accuracy = cross_val_score(model, X_pca, y_encodedPCA, cv=5, scoring
66  print("Cross-validated Accuracy:", cross_val_accuracy.mean())
```

```
La precisión del modelo Naive Bayes es: 0.79
[[ 96  56  33]
 [ 33 254   2]
 [ 49   3 293]]
```




```
Classification Report:
              precision    recall  f1-score   support

           0       0.54      0.52      0.53       185
           1       0.81      0.88      0.84       289
           2       0.89      0.85      0.87       345

    accuracy                           0.79       819
   macro avg       0.75      0.75      0.75       819
weighted avg       0.78      0.79      0.78       819

Cross-validated Accuracy: 0.791295365867493
```