```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
%matplotlib inline
```

```
file_path ='/content/Classified_Data.txt'
df = pd.read_table(file_path, sep=',', index_col = 0)
```

```
df.head()
```

	WTT	PTI	EQW	SBI	LQE	QWG	FDJ	PJF	HQE	NXJ
0	0.913917	1.162073	0.567946	0.755464	0.780862	0.352608	0.759697	0.643798	0.879422	1.231409
1	0.635632	1.003722	0.535342	0.825645	0.924109	0.648450	0.675334	1.013546	0.621552	1.492702
2	0.721360	1.201493	0.921990	0.855595	1.526629	0.720781	1.626351	1.154483	0.957877	1.285597
3	1.234204	1.386726	0.653046	0.825624	1.142504	0.875128	1.409708	1.380003	1.522692	1.153093

Next steps: View recommended plots

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1000 entries, 0 to 999
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   WTT           1000 non-null   float64
 1   PTI           1000 non-null   float64
 2   EQW           1000 non-null   float64
 3   SBI           1000 non-null   float64
 4   LQE           1000 non-null   float64
 5   QWG           1000 non-null   float64
 6   FDJ           1000 non-null   float64
 7   PJF           1000 non-null   float64
 8   HQE           1000 non-null   float64
 9   NXJ           1000 non-null   float64
 10  TARGET CLASS  1000 non-null   int64  
dtypes: float64(10), int64(1)
memory usage: 93.8 KB
```

```
summary = df.describe(percentiles=[0.25, 0.5, 0.75, 0.90])
print(summary)
```

```
                WTT          PTI          EQW          SBI          LQE  \
count  1000.000000  1000.000000  1000.000000  1000.000000  1000.000000   
mean      0.949682     1.114303     0.834127     0.682099     1.032336   
std       0.289635     0.257085     0.291554     0.229645     0.243413   
min       0.174412     0.441398     0.170924     0.045027     0.315307   
25%       0.742358     0.942071     0.615451     0.515010     0.870855   
50%       0.940475     1.118486     0.813264     0.676835     1.035824   
75%       1.163295     1.307904     1.028340     0.834317     1.198270   
90%       1.336612     1.441901     1.223127     0.983470     1.341138   
max       1.721779     1.833757     1.722725     1.634884     1.650050   

                QWG          FDJ          PJF          HQE          NXJ  \
count  1000.000000  1000.000000  1000.000000  1000.000000  1000.000000   
mean      0.943534     0.963422     1.071960     1.158251     1.362725   
std       0.256121     0.255118     0.288982     0.293738     0.204225   
min       0.262389     0.295228     0.299476     0.365157     0.639693   
25%       0.761064     0.784407     0.866306     0.934340     1.222623   
50%       0.941502     0.945333     1.065500     1.165556     1.375368   
75%       1.123060     1.134852     1.283156     1.383173     1.504832   
90%       1.277552     1.306497     1.452713     1.535520     1.618096   
max       1.666902     1.713342     1.785420     1.885690     1.893950   

       TARGET CLASS  
count    1000.00000  
mean        0.50000  
std         0.50025  
min         0.00000  
```

```
25%         0.00000
50%         0.50000
75%         1.00000
90%         1.00000
max         1.00000
```

```
df.info(verbose=True)
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1000 entries, 0 to 999
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
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 3   SBI           1000 non-null   float64
 4   LQE           1000 non-null   float64
 5   QWG           1000 non-null   float64
 6   FDJ           1000 non-null   float64
 7   PJF           1000 non-null   float64
 8   HQE           1000 non-null   float64
 9   NXJ           1000 non-null   float64
 10  TARGET CLASS  1000 non-null   int64  
dtypes: float64(10), int64(1)
memory usage: 93.8 KB
```
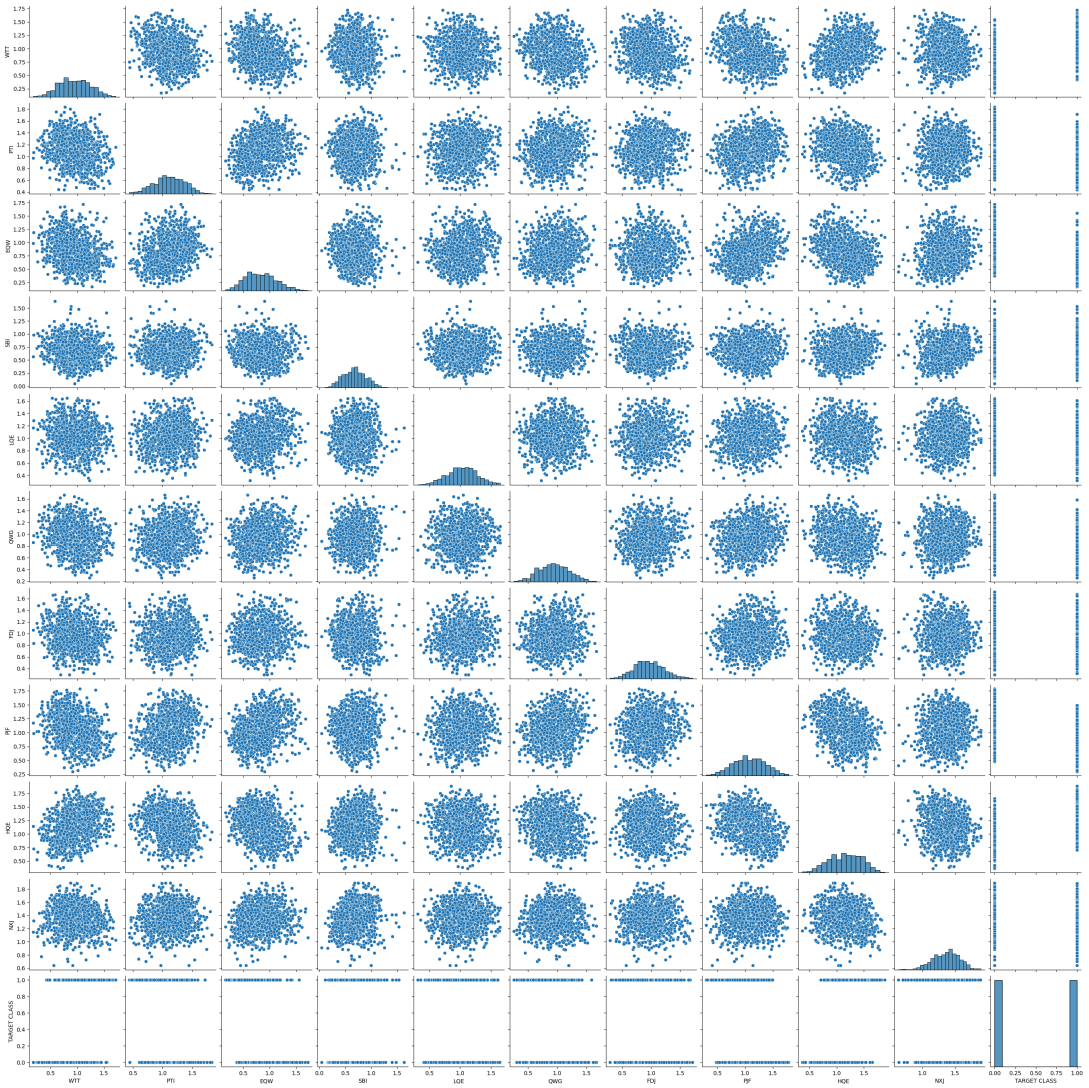

```
sns.pairplot(df)
plt.show()
```




```
l = list(df.columns)
l[0:len(l)-2]
for i in range(len(l)-1):
  sns.boxplot(x='TARGET CLASS', y=l[i], data=df, palette='RdBu_r')
  plt.figure()
```

```
<ipython-input-8-4b7f2990ed58>:4: FutureWarning: 

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign th

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```
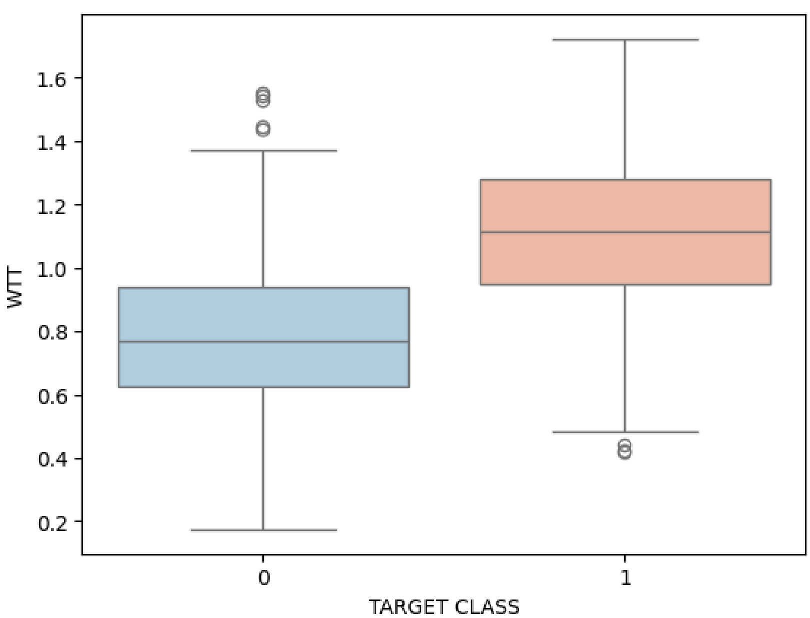
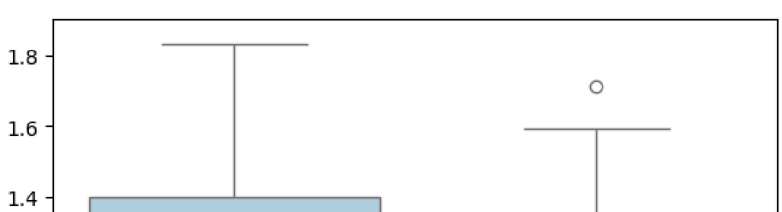
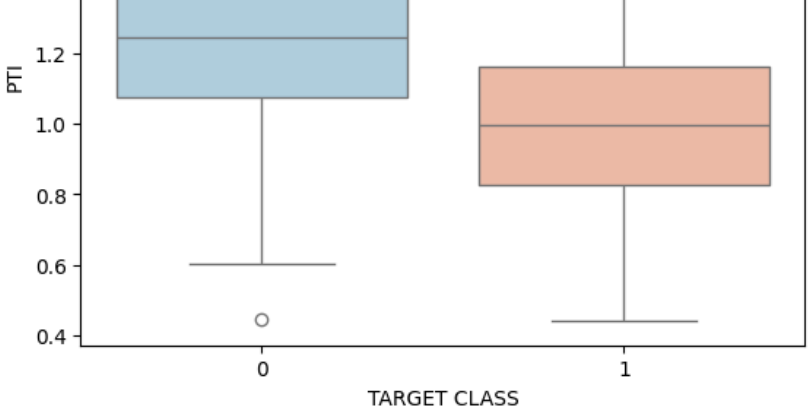
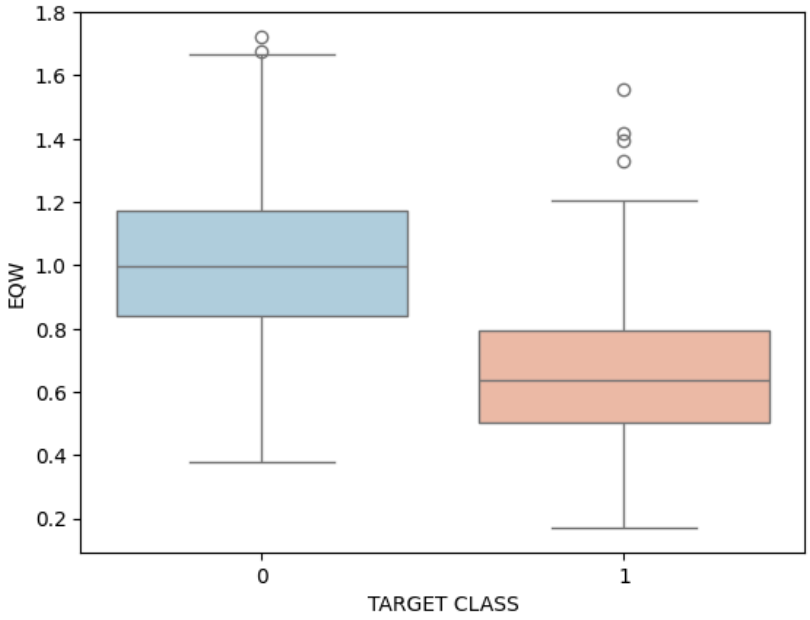
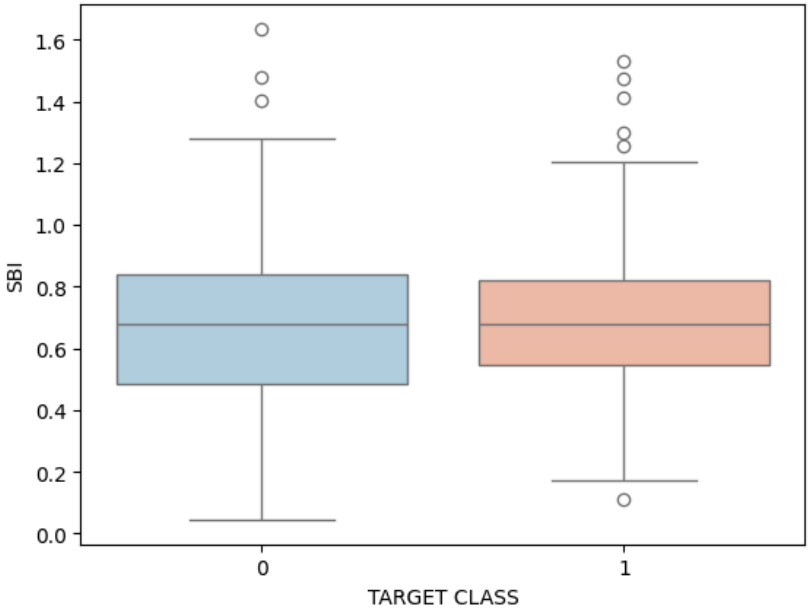
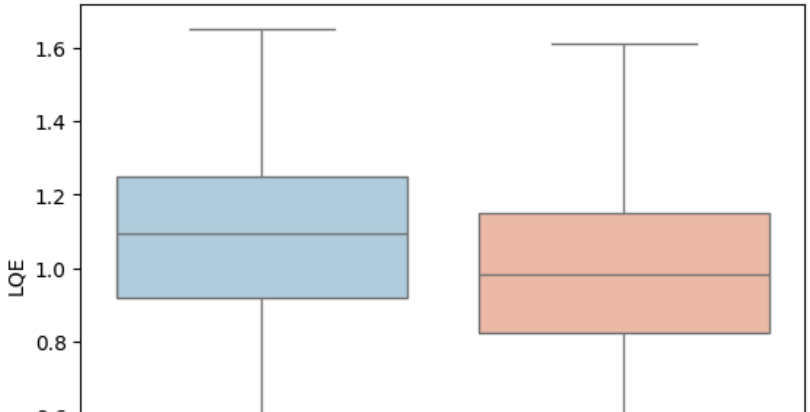





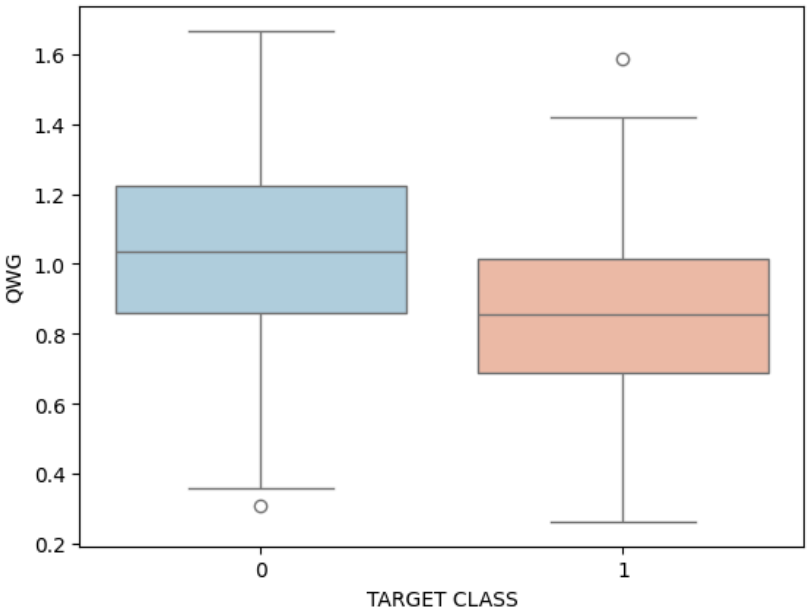

PTI
1.2
1.0
0.8
0.6
0.4
0
1
TARGET CLASS

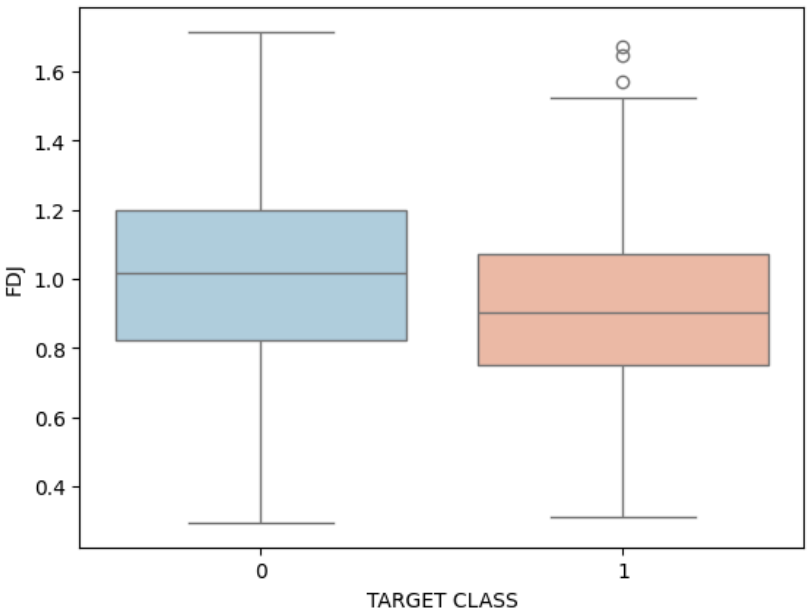

EQW
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
1
TARGET CLASS

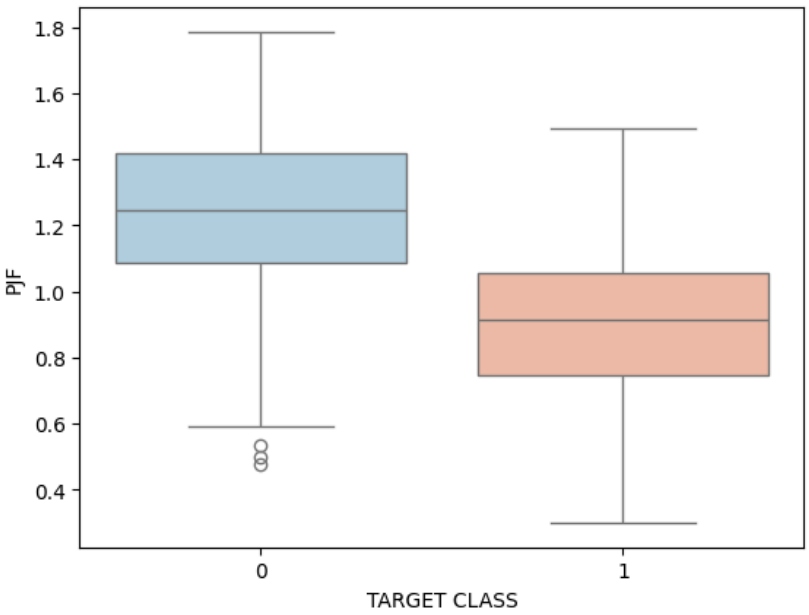

SBI
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
1
TARGET CLASS

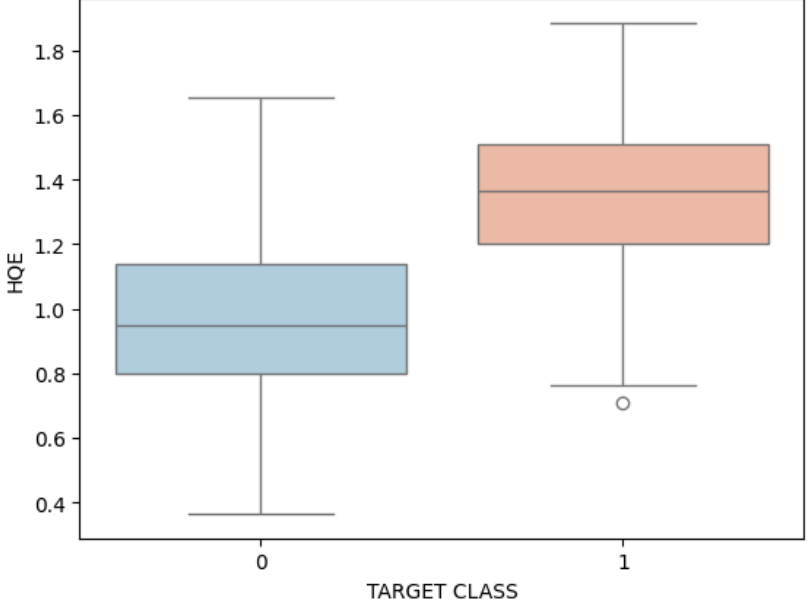

LQE
1.6
1.4
1.2
1.0
0.8

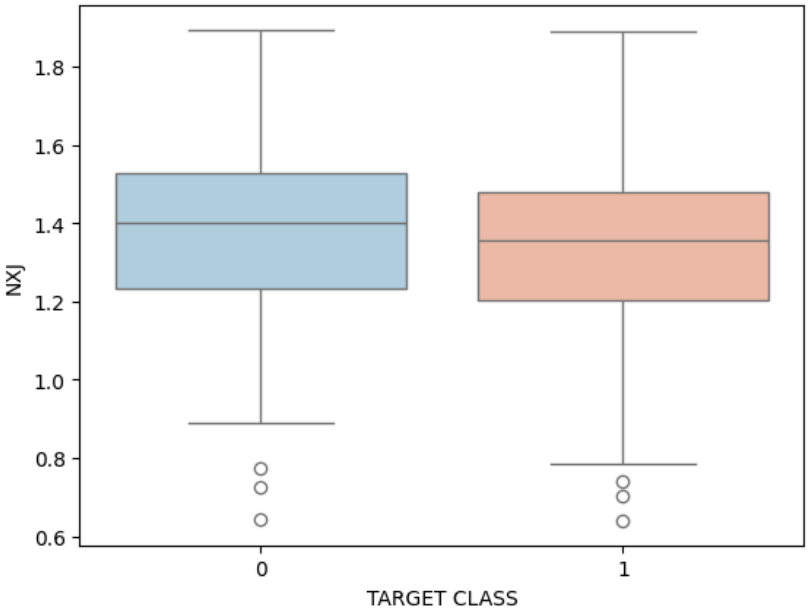

0.6
0.4
0
1
TARGET CLASS


QWG
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0
1
TARGET CLASS


FDJ
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0
1
TARGET CLASS


PJF
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0
1
TARGET CLASS






```
<Figure size 640x480 with 0 Axes>
```

```
from sklearn.preprocessing import StandardScaler
Scaler = StandardScaler()
```

```
Scaler.fit(df.drop('TARGET CLASS',axis=1))
scaled_features = Scaler.transform(df.drop('TARGET CLASS',axis=1))
```

```
df_feat = pd.DataFrame(scaled_features, columns = df.columns[:-1])
df_feat.head()
```

	WTT	PTI	EQW	SBI	LQE	QWG	FDJ	PJF	HQE	
0	-0.123542	0.185907	-0.913431	0.319629	-1.033637	-2.308375	-0.798951	-1.482368	-0.949719	-0.6
1	-1.084836	-0.430348	-1.025313	0.625388	-0.444847	-1.152706	-1.129797	-0.202240	-1.828051	0.6
2	-0.788702	0.339318	0.301511	0.755873	2.031693	-0.870156	2.599818	0.285707	-0.682494	-0.3
3	0.982841	1.060193	-0.621399	0.625299	0.452820	-0.267220	1.750208	1.066491	1.241325	-1.0
4	1.139275	-0.640392	-0.709819	-0.057175	0.822886	-0.936773	0.596782	-1.472352	1.040772	0.2

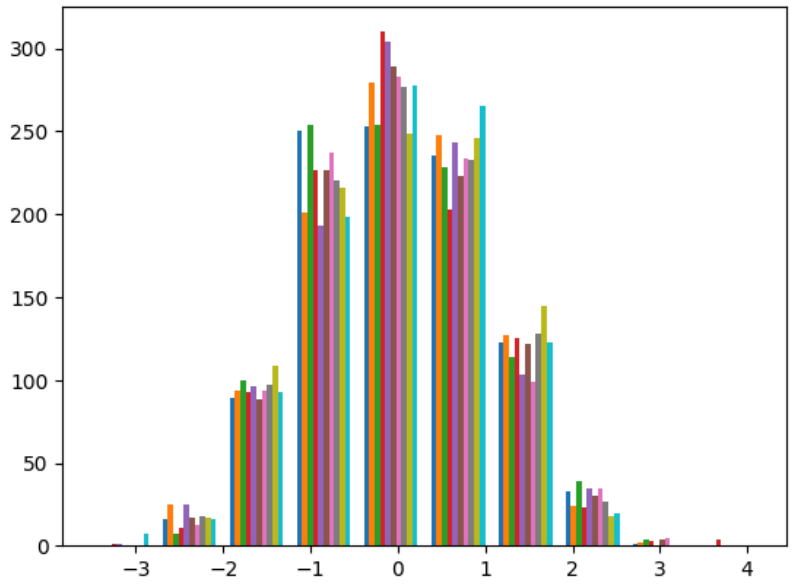
Next steps: View recommended plots

```
plt.hist(df_feat)
plt.show
```

matplotlib.pyplot.show
def show(*args, **kwargs)

/usr/local/lib/python3.10/dist-packages/matplotlib/pyplot.py
Display all open figures.

Parameters
----
block : bool, optional




```
from sklearn.model_selection import train_test_split
X = df_feat
y = df['TARGET CLASS']
X_train, X_test, y_train, y_test = train_test_split(scaled_features, df['TARGET CLASS'], test_size = 0.30, random_state = 101)
```

```
from sklearn.neighbors import KNeighborsClassifier
knn = KNeighborsClassifier(n_neighbors = 1)
knn.fit(X_train, y_train)
```

```
KNeighborsClassifier
KNeighborsClassifier(n_neighbors=1)
```

```
pred = knn.predict(X_test)
```

```
from sklearn.metrics import classification_report, confusion_matrix
conf_mat = confusion_matrix(y_test,pred)
print(conf_mat)
```

```
[[151   8]
 [ 15 126]]
```

```
print(classification_report(y_test,pred))
```

```
              precision    recall  f1-score   support

           0       0.91      0.95      0.93       159
           1       0.94      0.89      0.92       141

    accuracy                           0.92       300
   macro avg       0.92      0.92      0.92       300
weighted avg       0.92      0.92      0.92       300
```

+ Code + Text

```
print("Missclassification error rate: ", round(np.mean(pred!=y_test), 3))
```

```
Missclassification error rate:  0.077
```

```
error_rate = []
for i in range(1,60):
  knn = KNeighborsClassifier(n_neighbors = i)
```

```
knn.fit(X_train, y_train)
pred_i = knn.predict(X_test)
error_rate.append(np.mean(pred_i != y_test))
```