```
import pandas as pd

df = pd.read_csv('pd_speech_features.csv')
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 756 entries, 0 to 755
Columns: 755 entries, id to class
dtypes: float64(749), int64(6)
memory usage: 4.4 MB
```

```
df.head()
```

```
   id  gender      PPE      DFA     RPDE  numPulses  numPeriodsPulses  
\
0   0       1  0.85247  0.71826  0.57227        240               239

1   0       1  0.76686  0.69481  0.53966        234               233

2   0       1  0.85083  0.67604  0.58982        232               231

3   1       0  0.41121  0.79672  0.59257        178               177

4   1       0  0.32790  0.79782  0.53028        236               235


   meanPeriodPulses  stdDevPeriodPulses  locPctJitter  ...  \
0          0.008064            0.000087       0.00218  ...
1          0.008258            0.000073       0.00195  ...
2          0.008340            0.000060       0.00176  ...
3          0.010858            0.000183       0.00419  ...
4          0.008162            0.002669       0.00535  ...

   tqwt_kurtosisValue_dec_28  tqwt_kurtosisValue_dec_29  \
0                     1.5620                     2.6445
1                     1.5589                     3.6107
2                     1.5643                     2.3308
3                     3.7805                     3.5664
4                     6.1727                     5.8416

   tqwt_kurtosisValue_dec_30  tqwt_kurtosisValue_dec_31  \
0                     3.8686                     4.2105
1                    23.5155                    14.1962
2                     9.4959                    10.7458
3                     5.2558                    14.0403
4                     6.0805                     5.7621

   tqwt_kurtosisValue_dec_32  tqwt_kurtosisValue_dec_33  \
0                     5.1221                     4.4625
1                    11.0261                     9.5082
2                    11.0177                     4.8066
```

```
3                      4.2235                     4.6857
4                      7.7817                    11.6891

   tqwt_kurtosisValue_dec_34  tqwt_kurtosisValue_dec_35  \
0                     2.6202                     3.0004
1                     6.5245                     6.3431
2                     2.9199                     3.1495
3                     4.8460                     6.2650
4                     8.2103                     5.0559

   tqwt_kurtosisValue_dec_36  class
0                    18.9405      1
1                    45.1780      1
2                     4.7666      1
3                     4.0603      1
4                     6.1164      1

[5 rows x 755 columns]
```

```
null_values=df.isnull().sum()
```

```
null_values
```

```
id                           0
gender                       0
PPE                          0
DFA                          0
RPDE                         0
                            ..
tqwt_kurtosisValue_dec_33    0
tqwt_kurtosisValue_dec_34    0
tqwt_kurtosisValue_dec_35    0
tqwt_kurtosisValue_dec_36    0
class                        0
Length: 755, dtype: int64
```

```
y = df.loc[:,'class']
X = df.drop(['class', 'id'], axis=1)
```

```
from sklearn.preprocessing import StandardScaler
X = StandardScaler().fit_transform(X)
```

```
X
```

```
array([[ 0.96874225,  0.62764391,  0.2561442 , ..., -0.775137  ,
        -0.81472704, -0.36659507],
       [ 0.96874225,  0.12161952, -0.08043329, ..., -0.52664699,
        -0.58297219,  0.40039616],
       [ 0.96874225,  0.61795018, -0.34983882, ..., -0.75606253,
        -0.8043897 , -0.7809355 ],
       ...,
       [-1.03226633,  0.81336154,  0.3292009 , ..., -0.71674252,
        -0.79017671, -0.77287314],
       [-1.03226633,  0.54105055,  0.69591966, ..., -0.77132466,
        -0.82631929, -0.81173208],
       [-1.03226633,  0.3945807 ,  0.92284035, ..., -0.68658105,
        -0.84098293, -0.82811405]])
```

```
y
```

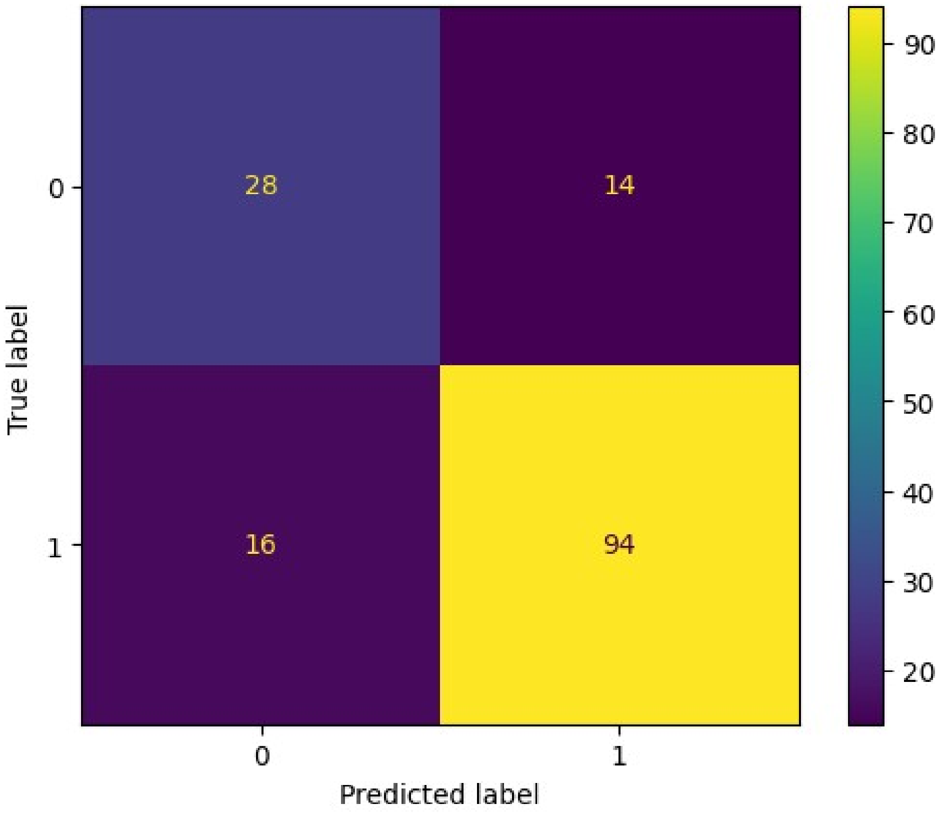
```
0      1
1      1
2      1
3      1
4      1
      ..
751    0
752    0
753    0
754    0
755    0
Name: class, Length: 756, dtype: int64
```

```
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, random_state=80)
```

```
from sklearn.svm import SVC
classifier_1 = SVC(kernel='linear')
classifier_2 = SVC(kernel='rbf')
classifier_3 = SVC(kernel='poly')
```

```
from sklearn.metrics import accuracy_score, confusion_matrix,
ConfusionMatrixDisplay
import matplotlib.pyplot as plt
```

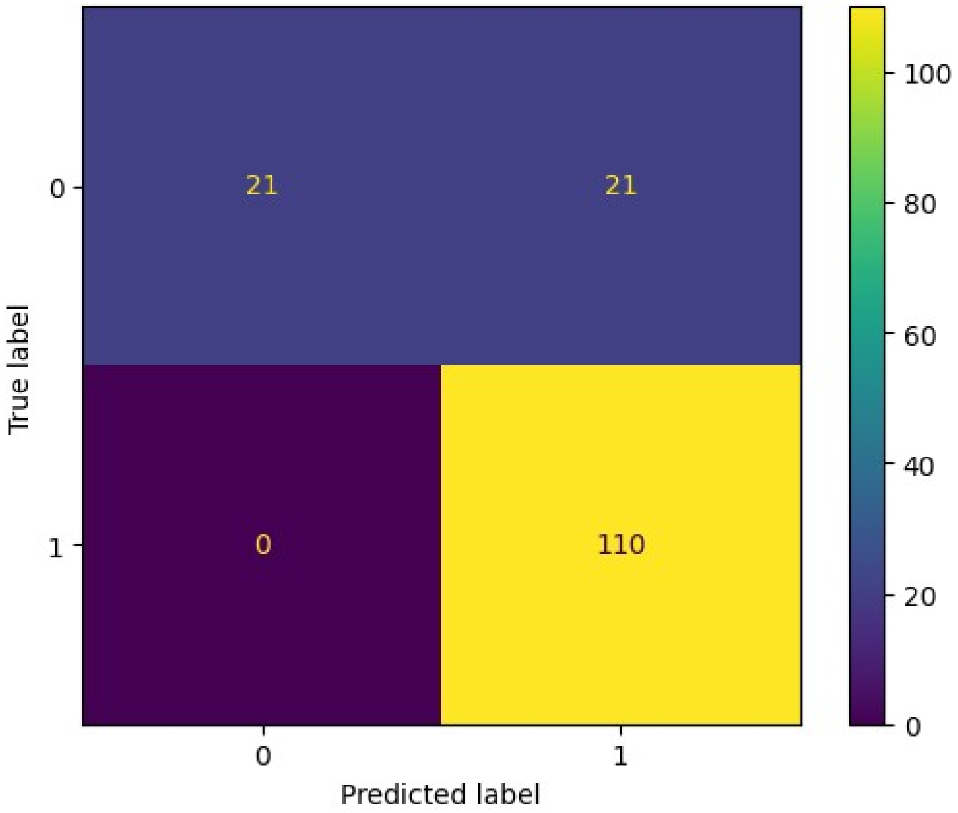
```
classifier_1.fit(X_train, y_train)
y_pred_1 = classifier_1.predict(X_test)
confusion_matrix_1 = confusion_matrix(y_test, y_pred_1)
cm_display_1 = ConfusionMatrixDisplay(confusion_matrix =
confusion_matrix_1, display_labels = [0, 1])
cm_display_1.plot()
plt.show()
```



```
accuracy_1 = accuracy_score(y_test,y_pred_1)
print(f"Acuracy dla liniowego kernela{accuracy_1}")
```

```
Acuracy dla liniowego kernela0.8026315789473685
```

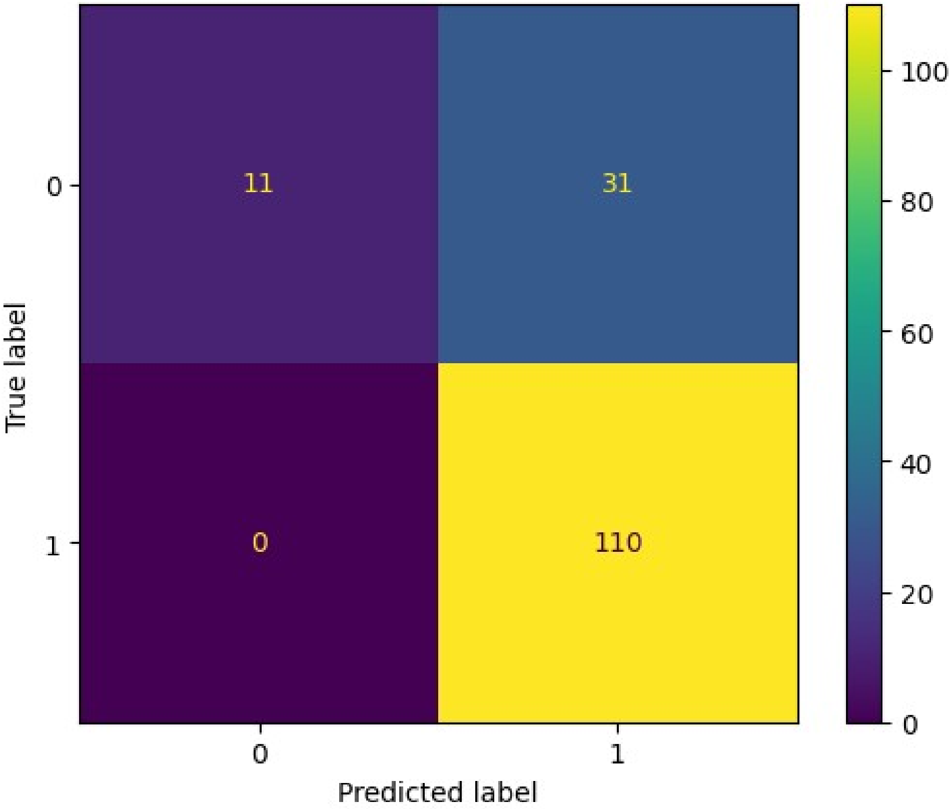
```
classifier_2.fit(X_train, y_train)
y_pred_2 = classifier_2.predict(X_test)
confusion_matrix_2 = confusion_matrix(y_test, y_pred_2)
cm_display_2 = ConfusionMatrixDisplay(confusion_matrix =
confusion_matrix_2, display_labels = [0, 1])
cm_display_2.plot()
plt.show()
```



```
accuracy_2 = accuracy_score(y_test,y_pred_2)
print(f"Acuracy kernela rbf {accuracy_2}")
```

```
Acuracy kernela rbf 0.8618421052631579
```

```
classifier_3.fit(X_train, y_train)
y_pred_3 = classifier_3.predict(X_test)
confusion_matrix_3 = confusion_matrix(y_test, y_pred_3)
cm_display_3 = ConfusionMatrixDisplay(confusion_matrix =
confusion_matrix_3, display_labels = [0, 1])
cm_display_3.plot()
plt.show()
```



```
accuracy_3 = accuracy_score(y_test,y_pred_3)
print(f"Acuracy kernela wielowymianowego {accuracy_3}")

Acuracy kernela wielowymianowego 0.7960526315789473
```