lab-8-data-mining

April 29, 2024

[ ]:

```
import numpy as np
import pandas as pd

df = pd.read_csv("/content/diabetes.csv")
df.describe()
df.head(10)
```

[ ]:

```
y = df['Outcome']
y
```

[ ]:

```
0      1
1      0
2      1
3      0
4      1
      ..
763    0
764    0
765    0
766    1
767    0
Name: Outcome, Length: 768, dtype: int64
```

[ ]:

```
x = df.drop(columns = ['Outcome'])
# x
def z_score(df):
    # copy the dataframe
    df_std = df.copy()
    # apply the z-score method
    for column in df_std.select_dtypes(include=np.number).columns:
        df_std[column] = (df_std[column] - df_std[column].mean()) /␣
 ↪df_std[column].std()

    return df_std

x = z_score(x)
x
```

[ ]:

```
     Pregnancies   Glucose  BloodPressure  SkinThickness   Insulin       BMI  \
0       0.639530  0.847771       0.149543       0.906679 -0.692439  0.203880
1      -0.844335 -1.122665      -0.160441       0.530556 -0.692439 -0.683976
2       1.233077  1.942458      -0.263769      -1.287373 -0.692439 -1.102537
3      -0.844335 -0.997558      -0.160441       0.154433  0.123221 -0.493721
4      -1.141108  0.503727      -1.503707       0.906679  0.765337  1.408828
..           …         …             …             …         …         …
763     1.826623 -0.622237       0.356200       1.721613  0.869464  0.115094
764    -0.547562  0.034575       0.046215       0.405181 -0.692439  0.609757
765     0.342757  0.003299       0.149543       0.154433  0.279412 -0.734711
766    -0.844335  0.159683      -0.470426      -1.287373 -0.692439 -0.240048
767    -0.844335 -0.872451       0.046215       0.655930 -0.692439 -0.201997

     DiabetesPedigreeFunction       Age
0                    0.468187  1.425067
1                   -0.364823 -0.190548
2                    0.604004 -0.105515
3                   -0.920163 -1.040871
4                    5.481337 -0.020483
..                        …         …
763                 -0.908090  2.530487
764                 -0.398023 -0.530677
765                 -0.684747 -0.275580
766                 -0.370859  1.169970
767                 -0.473476 -0.870806

[768 rows x 8 columns]
```

[ ]:

```
from sklearn.model_selection import train_test_split

X_train, X_test,\
    y_train, y_test = train_test_split(x, y,
                                       test_size=0.4,
                                       random_state=37)
```

[ ]:

```
from sklearn import linear_model

reg = linear_model.LogisticRegression()
```

[ ]:

```
reg.fit(X_train, y_train)
```

[ ]:

```
LogisticRegression()
```

[ ]:

```
y_pred = reg.predict(X_test)
```

[ ]:

```
from sklearn import metrics
```

```
print("Logistic Regression model accuracy(in %):",
      metrics.accuracy_score(y_test, y_pred)*100)
print("Logistic Regression model precision(in %):",
      metrics.precision_score(y_test, y_pred)*100)
print("Logistic Regression model recall(in %):",
      metrics.recall_score(y_test, y_pred)*100)
print("Logistic Regression model f-1 score(in %):",
      metrics.f1_score(y_test, y_pred)*100)
```

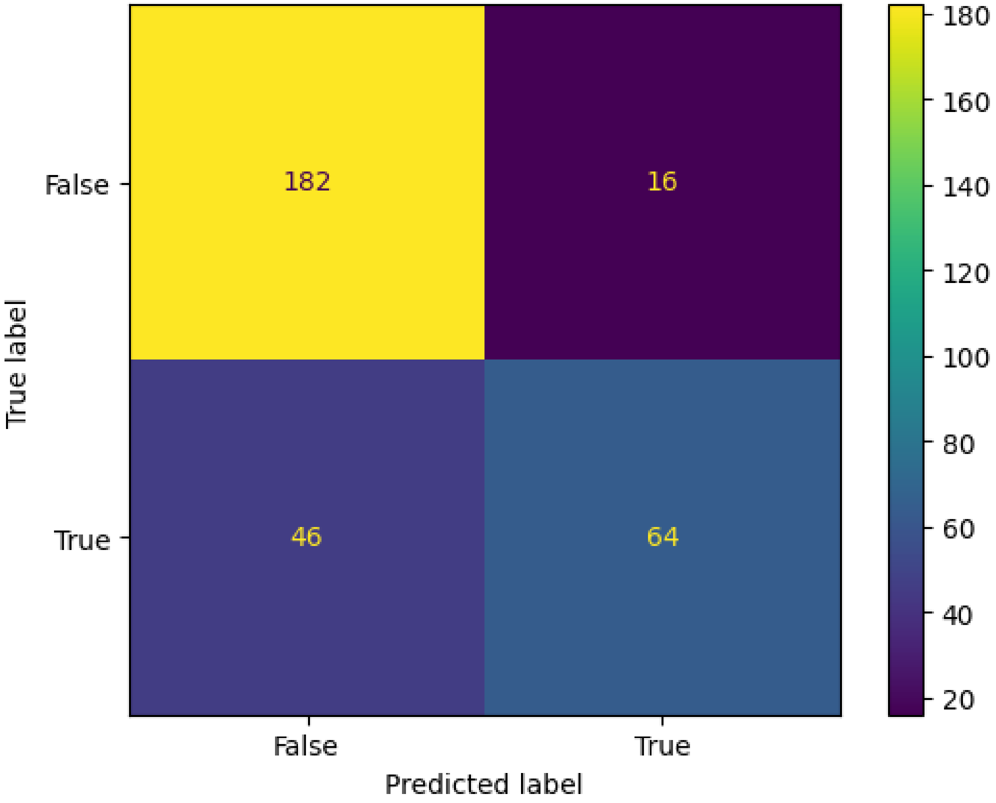
```
Logistic Regression model accuracy(in %): 79.87012987012987
Logistic Regression model precision(in %): 80.0
Logistic Regression model recall(in %): 58.18181818181818
Logistic Regression model f-1 score(in %): 67.36842105263158
```

[ ]:

```
confusion_matrix = metrics.confusion_matrix(y_test, y_pred)

cm_display = metrics.ConfusionMatrixDisplay(confusion_matrix =␣
 ↪confusion_matrix, display_labels = [False, True])

cm_display.plot()
plt.show()
```


False
True
True label
False
True
Predicted label