```
In [1]:  # Author : Amir Shokri
         # github link : https://github.com/amirshnll/Wine
         # dataset link : http://archive.ics.uci.edu/ml/datasets/Wine
         # email : amirsh.nll@gmail.com
```

```
In [23]: import numpy as np
         import matplotlib.pyplot as plt
         import seaborn as sns
         import pandas as pd
```

```
In [24]: col_names = ['class', 'Alcohol', 'Malic acid', 'Ash', 'Alcalinity of ash', 'Ma
         gnesium', 'Total phenols', 'Flavanoids', ' Nonflavanoid phenols','Proanthocyan
         ins','Color intensity','Hue','OD280/OD315 of diluted wines','Proline']
         wine =pd.read_csv("wine.csv",header=None, names=col_names)
```

```
In [25]: wine.head()
```

Out[25]:

	class	Alcohol	Malic acid	Ash	Alcalinity of ash	Magnesium	Total phenols	Flavanoids	Nonflavanoid phenols	Proan
0	1	14.23	1.71	2.43	15.6	127	2.80	3.06	0.28	
1	1	13.20	1.78	2.14	11.2	100	2.65	2.76	0.26	
2	1	13.16	2.36	2.67	18.6	101	2.80	3.24	0.30	
3	1	14.37	1.95	2.50	16.8	113	3.85	3.49	0.24	
4	1	13.24	2.59	2.87	21.0	118	2.80	2.69	0.39	

```
In [26]: inputs =wine.drop('class',axis='columns')
         target = wine['class']
```

```
In [6]:  inputs
```

Out[6]:

	Alcohol	Malic acid	Ash	Alcalinity of ash	Magnesium	Total phenols	Flavanoids	Nonflavanoid phenols	Proanthocy
0	14.23	1.71	2.43	15.6	127	2.80	3.06	0.28	
1	13.20	1.78	2.14	11.2	100	2.65	2.76	0.26	
2	13.16	2.36	2.67	18.6	101	2.80	3.24	0.30	
3	14.37	1.95	2.50	16.8	113	3.85	3.49	0.24	
4	13.24	2.59	2.87	21.0	118	2.80	2.69	0.39	
...	...	...	...	...	...	...	...	...	
173	13.71	5.65	2.45	20.5	95	1.68	0.61	0.52	
174	13.40	3.91	2.48	23.0	102	1.80	0.75	0.43	
175	13.27	4.28	2.26	20.0	120	1.59	0.69	0.43	
176	13.17	2.59	2.37	20.0	120	1.65	0.68	0.53	
177	14.13	4.10	2.74	24.5	96	2.05	0.76	0.56	

178 rows × 13 columns

```
In [27]:  # ایجاد دو دسته داده های آموزشی و تست برای ارزیابی عملکرد
          from sklearn.model_selection import train_test_split

          X_train, X_test, y_train, y_test = train_test_split(inputs, target, test_size=
          0.3,random_state=109)
```

```
In [28]:  # توابع رگوسیون
          from sklearn.linear_model import LogisticRegression

          logreg = LogisticRegression()

          logreg.fit(X_train,y_train)

          y_pred=logreg.predict(X_test)
```

```
In [29]:  # ایجاد ماتریس در هم ریختگی
          from sklearn import metrics
          cnf_matrix = metrics.confusion_matrix(y_test, y_pred)
          cnf_matrix
```

Out[29]:
```
array([[21,  0,  0],
       [ 2, 16,  1],
       [ 0,  0, 14]], dtype=int64)
```

#ساخت ماتریس درهم ریختگی برای ارزیابی عملکرد یک طبقه بندی و نشان دادن تعداد درست
و نادرست
```python
class_names=[0,1] # name  of classes
fig, ax = plt.subplots()
tick_marks = np.arange(len(class_names))
plt.xticks(tick_marks, class_names)
plt.yticks(tick_marks, class_names)
# پ مپ هیت ساخت
sns.heatmap(pd.DataFrame(cnf_matrix), annot=True, cmap="YlGnBu" ,fmt='g')
ax.xaxis.set_label_position("top")
plt.tight_layout()
plt.title('Confusion matrix', y=1.1)
plt.ylabel('Actual label')
plt.xlabel('Predicted label')
```

Out[14]: Text(0.5, 257.44, 'Predicted label')

Confusion matrix
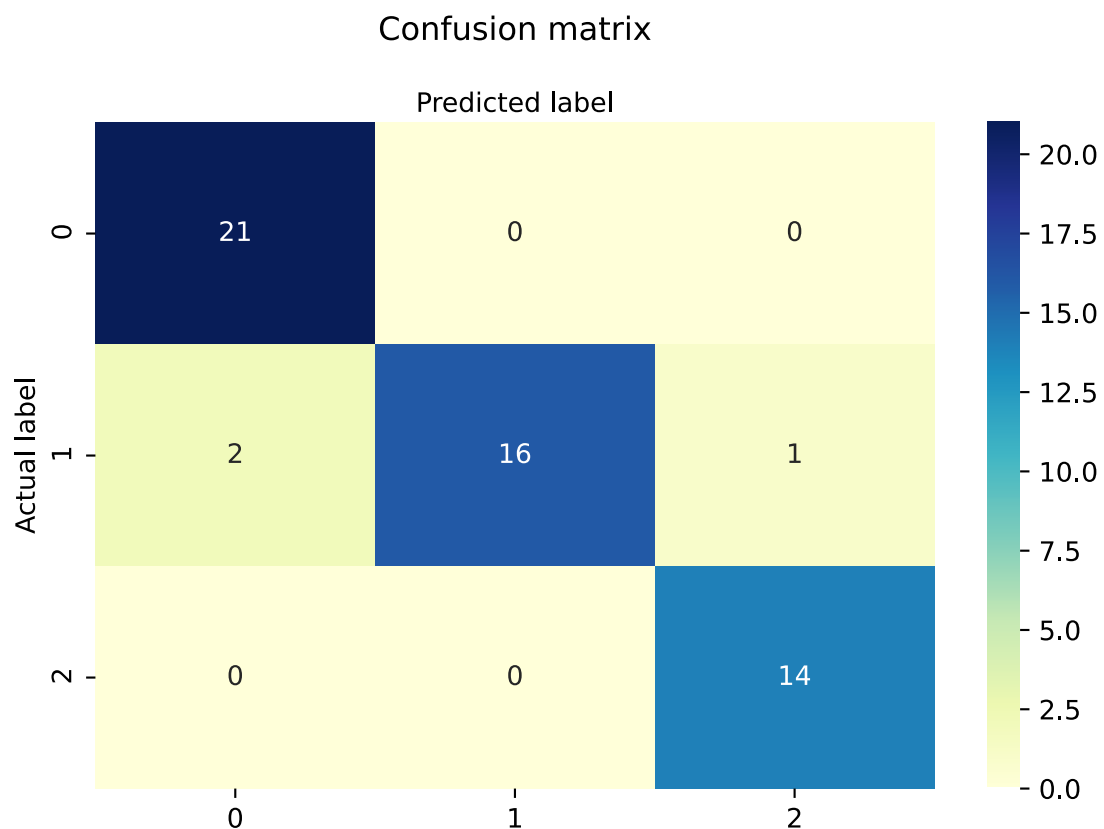
In [30]:
```python
print("Accuracy:",metrics.accuracy_score(y_test, y_pred))
```

Accuracy: 0.944444444444444

In [ ]: