In [7]:

```
import pandas as pd
from sklearn.neural_network import MLPClassifier
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import accuracy_score, confusion_matrix


data = pd.read_csv('WINE_DATASET.csv')

x = data.iloc[:, 1:]
y = data.iloc[:, 0]

x_train, x_test, y_train, y_test = train_test_split(x, y, test_size = 0.2, random_state

scaler = StandardScaler()
x_train = scaler.fit_transform(x_train)
x_test = scaler.transform(x_test)

mlp = MLPClassifier(
    hidden_layer_sizes=(10, 5),
    activation='relu',
    max_iter=500,
    random_state=42
)

mlp.fit(x_train, y_train)

y_pred = mlp.predict(x_test)

accuracy = accuracy_score(y_test, y_pred)
confusionmatrix = confusion_matrix(y_test, y_pred)

print(f'Accuracy: {accuracy:.4f}')
print('Confusion Matrix:')
print(confusionmatrix)

sampleinput = [[13.5, 2.5, 2.0, 20.0, 90, 2.5, 1.5, 0.3, 1.2, 5.5, 0.7, 2.5, 12.0]]
unseenscaleddata = scaler.transform(sampleinput)
predictions = mlp.predict(unseenscaleddata)
print(f'Prediction: {predictions[0]}')
```

```
Accuracy: 1.0000
Confusion Matrix:
[[14  0  0]
 [ 0 14  0]
 [ 0  0  8]]
Prediction: 2
C:\Anaconda\Lib\site-packages\sklearn\neural_network\_multilayer_perceptron.py:691: Conv
ergenceWarning: Stochastic Optimizer: Maximum iterations (500) reached and the optimizat
ion hasn't converged yet.
  warnings.warn(
C:\Anaconda\Lib\site-packages\sklearn\base.py:493: UserWarning: X does not have valid fe
ature names, but StandardScaler was fitted with feature names
  warnings.warn(
```

In [ ]: