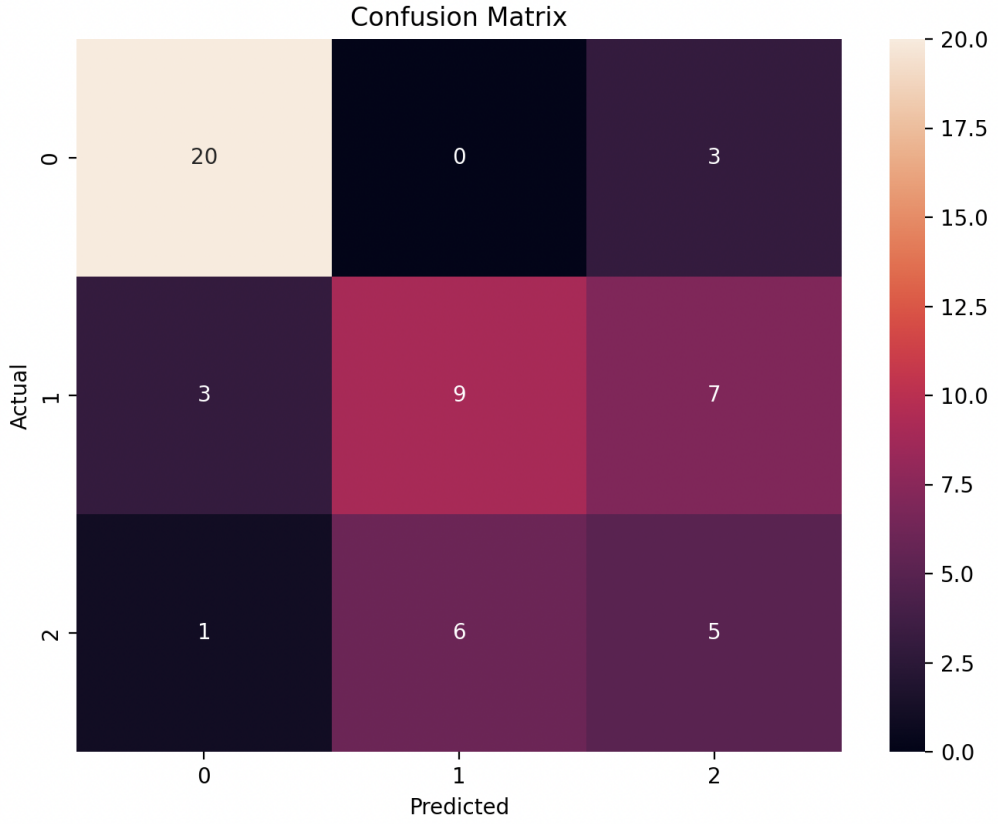
exercise1.py | Keyboard Shortcuts | exercise2.py | Lab1.md | iris.data.csv

WilliamsBenjamin_Lab1 > Exercise1 > exercise1.py > ...

```python
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import confusion_matrix
import seaborn as sns

names =  ["class", "Alcohol","Malic Acid","Ash","Acadlinity","Magnisium","Total Phenols",
          "Flavanoids","NonFlavanoid Phenols", "Proanthocyanins", "Color Intensity",
          "Hue", "OD280/OD315", "Proline" ]
df = pd.read_csv("wine.data.csv", header=None, names = names)

x = np.array(df.iloc[:, 1:14])
y = np.array(df['class'])

x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.3, random_state=3)

knn = KNeighborsClassifier(n_neighbors=5)
knn.fit(x_train, y_train)
y_pred = knn.predict(x_test)

cm = confusion_matrix(y_test, y_pred)

accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy: {accuracy*100:.2f}%")

x_2 = np.array([
    [14.23,1.71,2.43,15.6,127,2.8,3.06,.28,2.29,5.64,1.04,3.92,1065],
    [12.64,1.36,2.02,16.8,100,2.02,1.41,.53,.62,5.75,.98,1.59,450],
    [12.53,5.51,2.64,25,96,1.79,.6,.63,1.1,5,.82,1.69,515],
    [13.49,3.59,2.19,19.5,88,1.62,.48,.58,.88,5.7,.81,1.82,580]
])

predictions = knn.predict(x_2)
print("Predicted Classes:", predictions)

plt.figure(figsize=(8,6))
sns.heatmap(cm, annot=True)
plt.title('Confusion Matrix')
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.show()
```

Figure 1




```
    handle = open(
        handle,
    ...<3 lines>...
        newline="",
    )
FileNotFoundError: [Errno 2] No such file or directory: 'iris.data.csv'
benwilliams@Mac Exercise1 % /Users/benwilliams/Documents/Development/MachineLearning/.venv/bin/python /Users/benwilliams/Documents/Development/MachineLearning/WilliamsBenjamin_Lab1/Exercise1/exercise1.py
Accuracy: 62.96%
Predicted Classes: [1 2 3 2]
```

0 ⚠ 0 Quarto: 1.7.33 Ln 27, Col 40 Spaces: 4 UTF-8 LF {} Python .venv (3.13.7)

MachineLearning

EXPLORER

MACHINELEARNING
- .venv
  - bin
  - include
  - lib
  - share
  - .gitignore
  - pyvenv.cfg
- .vscode
  - settings.json
- WilliamsBenjamin_Lab1
  - Exercise1
    - exercise1.py
    - image.png
    - wine.data.csv
  - Exercise2
    - exercise2.py
    - iris.data.csv
  - wine
    - Index
    - wine.data
    - wine.names
- image-1.png
- image.png
- Lab1.md

OUTLINE

TIMELINE

exercise1.py | image.png | Keyboard Shortcuts | exercise2.py | Lab1.md | iris.data.csv

WilliamsBenjamin_Lab1 > Exercise2 > exercise2.py > ...

```python
import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv("iris.data.csv")
df.columns = ['sepalLength', 'sepalWidth', 'petalLength', 'petalWidth', 'class']

#gives the species a numerical value instead of string classifier
df['class'] = df['class'].map({'Iris-setosa': 1, 'Iris-versicolor': 2, 'Iris-virginica': 3})

color_map = {1: 'purple', 2: 'teal', 3: 'yellow'}
colors = df['class'].map(color_map)

#
fig, (ax1, ax2) = plt.subplots(1, 2)

ax1.scatter(df['sepalLength'], df['sepalWidth'], c = colors)
ax1.set_xlabel('Sepal Length')
ax1.set_ylabel('Sepal Width')

ax2.scatter(df['petalLength'], df['petalWidth'], c = colors)
ax2.set_xlabel('Petal Length')
ax2.set_ylabel('Petal Width')

plt.show()
```

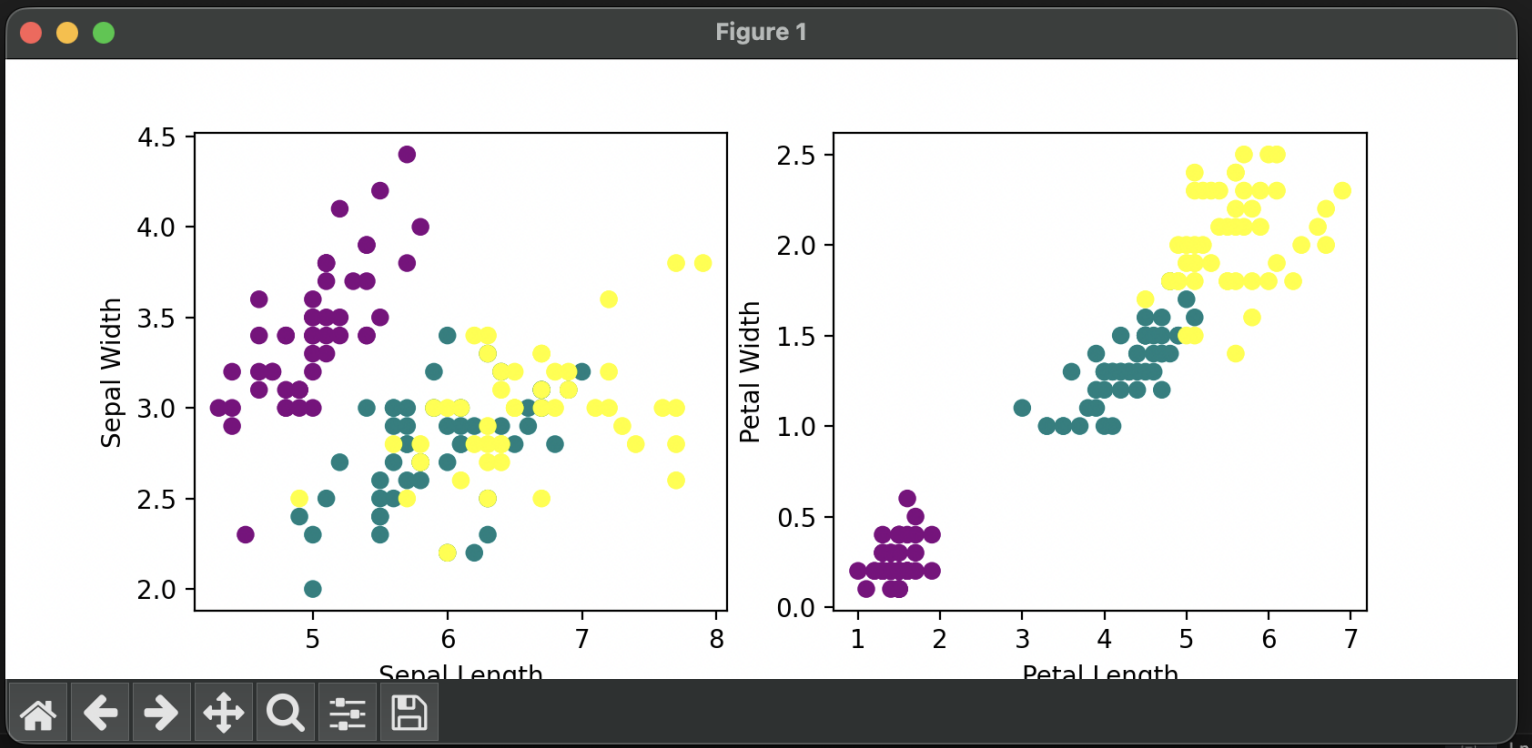



Figure 1