In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
sns.set()
```

Q1

Load the data from ‘ex1data1.txt’. The first column is the population of a city and the second column is the profit of a food truck in that city. A negative value for profit indicates a loss

In [48]:
```
df = pd.read_table('./datasets/ex1data1.txt', sep=",", names=['Population', 'Pr
df.head()
```

Out[48]:

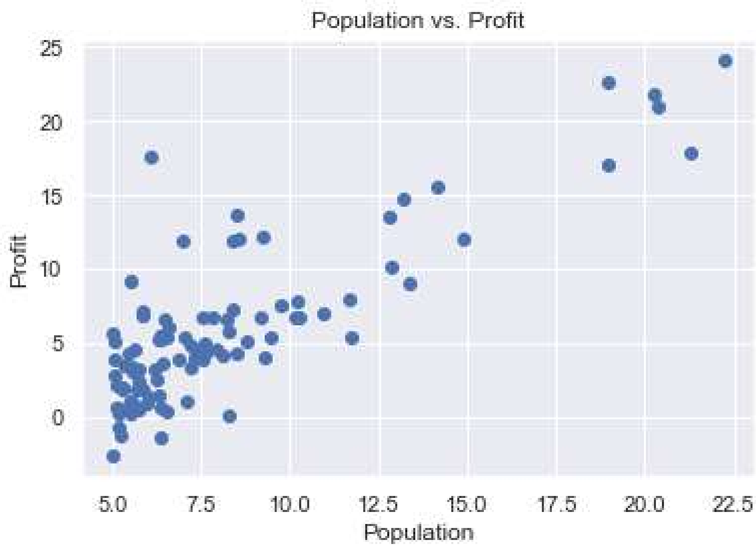
	Population	Profit
0	6.1101	17.5920
1	5.5277	9.1302
2	8.5186	13.6620
3	7.0032	11.8540
4	5.8598	6.8233

a. Visualize the data using the appropriate plot.

In [16]:
```
plt.scatter(df.Population, df.Profit)

plt.xlabel('Population')
plt.ylabel('Profit')
plt.title('Population vs. Profit')

plt.show()
```



b. Print the description of the data.

In [20]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 97 entries, 0 to 96
Data columns (total 2 columns):
 #   Column      Non-Null Count  Dtype  
---  ------      --------------  -----  
 0   Population  97 non-null     float64
 1   Profit      97 non-null     float64
dtypes: float64(2)
memory usage: 1.6 KB
```

c. Check if attributes have a linear relationship, and apply the Linear Regression model. (Train/Test split = 80/20)

In [21]:
```
X = df.drop(['Profit'], axis=1)
y = df.Profit
```

In [31]:
```
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)
```

In [32]:
```
from sklearn.linear_model import LinearRegression
reg = LinearRegression()
```

In [33]:
```
reg.fit(X_train, y_train)
```

Out[33]:
```
LinearRegression()
```

In [34]:
```
y_pred = reg.predict(X_test)
```

In [35]:
```
reg.score(X_test, y_test)
```

Out[35]:
```
0.7208154017953732
```

In [37]:
```
reg.coef_
```

Out[37]:
```
array([1.22220802])
```

In [38]:
```
reg.intercept_
```

Out[38]:
```
-4.314934514518108
```

In [40]:
```
print(f'y = {reg.coef_[0]}x + ({reg.intercept_})')
```

```
y = 1.2222080197692473x + (-4.314934514518108)
```

Q2

Load the data from ‘ex1data2.txt’ contains a training set of housing prices in Portland, Oregon. The first column is the size of the house (in square feet), the second column is the number of bedrooms, and the third column is the price of the house.

In [49]:
```
df = pd.read_table('./datasets/ex2data1.txt', sep=",", names=['size', 'bedrooms
df.head()
```

Out[49]:

	size	bedrooms	price
0	34.623660	78.024693	0
1	30.286711	43.894998	0
2	35.847409	72.902198	0
3	60.182599	86.308552	1
4	79.032736	75.344376	1

a. Print the description of the data.

In [51]:
```
df.describe()
```

Out[51]:

	size	bedrooms	price
count	100.000000	100.000000	100.000000
mean	65.644274	66.221998	0.600000
std	19.458222	18.582783	0.492366
min	30.058822	30.603263	0.000000
25%	50.919511	48.179205	0.000000
50%	67.032988	67.682381	1.000000
75%	80.212529	79.360605	1.000000
max	99.827858	98.869436	1.000000

b. Apply the Linear Regression model. (Train/Test split = 80/20)

In [52]:
```
X = df.drop(['price'], axis=1)
y = df.price
```

In [54]:
```
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, randon
```

In [55]:
```
from sklearn.linear_model import LinearRegression
reg = LinearRegression()
```

In [56]:
```
reg.fit(X_train, y_train)
```

Out[56]:
```
LinearRegression()
```

c. Find and print the regression parameters.

In [58]:
```
print(f'y = {reg.coef_[0]} * x1 + {reg.coef_[1]} * x2 + ({reg.intercept_})')
```

```
y = 0.015981513268614855 * x1 + 0.013024853034574952 * x2 + (-1.3283092360466
782)
```

d. Find the goodness of the model using R2

In [59]:
```
y_pred = reg.predict(X_test)
```

In [61]:
```
from sklearn.metrics import r2_score
r2_score(y_test, y_pred)
```

Out[61]:
```
0.49507543910358076
```

e. Compute MSE for the instances in the test set.

In [65]:
```
from sklearn.metrics import mean_squared_error
mse = mean_squared_error(y_pred, y_test)
print(mse)
```

```
0.12118189461514065
```

Q3

Load the data from 'canada_per_capita_income.csv'. Use this to build a regression model and predict the per capita income for Canadian citizens in the year 2020. Predict Canada's per capita income in the year 2020. (Expected Output - 41288.69409442)

In [71]:
```
df = pd.read_csv('./datasets/canada_per_capita_income.csv', names=['year', 'inc
df.head()
```

Out[71]:

	year	income
0	1970	3399.299037
1	1971	3768.297935
2	1972	4251.175484
3	1973	4804.463248
4	1974	5576.514583

In [72]:
```
X = df.drop(['income'], axis=1)
y = df.income
```

In [73]:
```
from sklearn.linear_model import LinearRegression
reg = LinearRegression().fit(X, y)
```

In [77]:
```
reg.predict([[2020]])
```

```
C:\Users\Maitray\AppData\Local\Programs\Python\Python310\lib\site-packages\sk
learn\base.py:450: UserWarning: X does not have valid feature names, but Line
arRegression was fitted with feature names
  warnings.warn(
```

Out[77]:
```
array([41288.69409442])
```

Q4

Suppose that you are the administrator of a university department and you want to determine each applicant's chance of admission based on their results on two exams. You have historical data ("ex2data1.txt") from previous applicants that you can use as a training set for logistic regression. For each training example, you have the applicant's scores on two exams and the

In [3]:
```
df = pd.read_table('./datasets/ex2data1.txt', names=['a', 'b', 'passed'], sep='
df.head()
```

Out[3]:

	a	b	passed
0	34.623660	78.024693	0
1	30.286711	43.894998	0
2	35.847409	72.902198	0
3	60.182599	86.308552	1
4	79.032736	75.344376	1

In [4]:
```
X = df.drop(['passed'], axis=1)
y = df.passed
```

In [5]:
```
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, randon
```

In [84]:
```
from sklearn.linear_model import LogisticRegression
log = LogisticRegression()
```

In [85]:
```
log.fit(X_train, y_train)
```

Out[85]:
```
LogisticRegression()
```

In [86]:
```
log.score(X_test, y_test)
```

Out[86]:
```
0.8
```

In [87]:
```
y_pred = log.predict(X_test)
```

In [88]:
```
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[88]:
```
array([[7, 1],
       [3, 9]], dtype=int64)
```

Q5

Load the data from 'HR_comma_sep.csv'. Use this to build a logistic regression model and compute the accuracy of model.

```
In [36]: df = pd.read_csv('./datasets/HR_comma_sep.csv')
         df.head()
```

Out[36]:

	satisfaction_level	last_evaluation	number_project	average_montly_hours	time_spend_company
0	0.38	0.53	2	157	3
1	0.80	0.86	5	262	6
2	0.11	0.88	7	272	4
3	0.72	0.87	5	223	5
4	0.37	0.52	2	159	3

```
In [38]: depts, salaries = pd.get_dummies(df.Department), pd.get_dummies(df.salary)

         df.drop(['Department', 'salary'], inplace=True, axis=1)

         df = pd.concat((df, depts, salaries), axis=1)
         df.head()
```

Out[38]:

	satisfaction_level	last_evaluation	number_project	average_montly_hours	time_spend_company
0	0.38	0.53	2	157	3
1	0.80	0.86	5	262	6
2	0.11	0.88	7	272	4
3	0.72	0.87	5	223	5
4	0.37	0.52	2	159	3

5 rows × 21 columns

```
In [62]: X = df.drop(['left'], axis=1)
         y = df.left
```

```
In [63]: 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)
```

```
In [67]: from sklearn.linear_model import LogisticRegression
         log = LogisticRegression(max_iter=3000)
```

```
In [68]: log.fit(X_train, y_train)

Out[68]: LogisticRegression(max_iter=3000)
```

```
In [69]: log.score(X_test, y_test)

Out[69]: 0.793
```

Q6

Load the data from ‘Naive-Bayes-Classification-Data.csv’. Use this to build a Naïve Bayes classifier and compute the accuracy of model.

https://heartbeat.comet.ml/naive-bayes-classifier-in-python-using-scikit-learn13c4deb83bcf (https://heartbeat.comet.ml/naive-bayes-classifier-in-python-using-scikit-learn13c4deb83bcf)

In [70]:
```
df = pd.read_csv("./heart.csv")
df.head()
```

Out[70]:

	glucose	bloodpressure	diabetes
0	40	85	0
1	40	92	0
2	45	63	1
3	45	80	0
4	40	73	1

In [71]:
```
X = df.drop('diabetes', axis=1)
y = df.diabetes
```

In [72]:
```
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)
```

In [73]:
```
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB().fit(X_train, y_train)
```

In [75]:
```
gnb.score(X_test, y_test)
```

Out[75]:
```
0.9396984924623115
```

Q7

Load Iris data-set. Use this to build a Naïve Bayes classifier and find the accuracy of the model.

In [74]:
```
from sklearn.datasets import load_iris
iris_data = load_iris()
```

In [75]:
```
iris_data.keys()
```

Out[75]:
```
dict_keys(['data', 'target', 'frame', 'target_names', 'DESCR', 'feature_name
s', 'filename', 'data_module'])
```

In [76]:
```python
iris = pd.DataFrame(iris_data.data, columns=iris_data.feature_names)
iris['species'] = iris_data.target

iris.head()
```

Out[76]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	species
0	5.1	3.5	1.4	0.2	0
1	4.9	3.0	1.4	0.2	0
2	4.7	3.2	1.3	0.2	0
3	4.6	3.1	1.5	0.2	0
4	5.0	3.6	1.4	0.2	0

In [128]:
```python
X = iris.drop('species', axis=1)
y = iris.species
```

In [133]:
```python
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, randon
```

In [134]:
```python
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB()
```

In [135]:
```python
gnb.fit(X_train, y_train)
```

Out[135]:
```
GaussianNB()
```

In [136]:
```python
gnb.score(X_test, y_test)
```

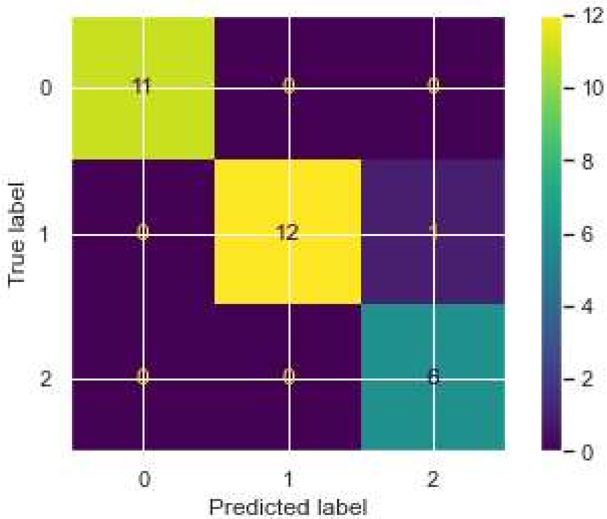
Out[136]:
```
0.9666666666666667
```

In [137]:
```python
y_pred = gnb.predict(X_test)
```

In [138]:
```python
from sklearn.metrics import confusion_matrix, ConfusionMatrixDisplay
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[138]:
```
array([[11,  0,  0],
       [ 0, 12,  1],
       [ 0,  0,  6]], dtype=int64)
```

In [139]:
```
ConfusionMatrixDisplay(cm).plot()
plt.show()
```



Q9

Load Iris data-set. Use this to build a SVM classifier and find the accuracy of the model.

In [140]:
```
from sklearn.svm import SVC
svc = SVC()
```

In [141]:
```
svc.fit(X_train, y_train)
```

Out[141]:
```
SVC()
```

In [142]:
```
svc.score(X_test, y_test)
```

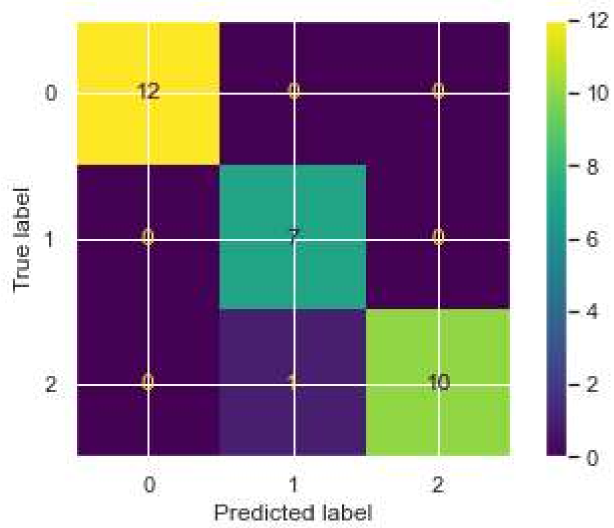
Out[142]:
```
0.9666666666666667
```

In [143]:
```
y_pred = svc.predict(X_test)
```

In [144]:
```
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[144]:
```
array([[11,  0,  0],
       [ 0, 12,  1],
       [ 0,  0,  6]], dtype=int64)
```

In [110]:
```
ConfusionMatrixDisplay(cm).plot()
plt.show()
```



Q8

Load Breast Cancer Wisconsin (Diagnostic) data-set. Use this to build a SVM classifier and find the accuracy of this model

In [111]:
```
from sklearn.datasets import load_breast_cancer
cancer_data = load_breast_cancer()
```

In [113]:
```
df = pd.DataFrame(cancer_data.data, columns = cancer_data.feature_names)
df.head()
```

Out[113]:

	mean radius	mean texture	mean perimeter	mean area	mean smoothness	mean compactness	mean concavity	mean concave points	mean symmetry
0	17.99	10.38	122.80	1001.0	0.11840	0.27760	0.3001	0.14710	0.2419
1	20.57	17.77	132.90	1326.0	0.08474	0.07864	0.0869	0.07017	0.1812
2	19.69	21.25	130.00	1203.0	0.10960	0.15990	0.1974	0.12790	0.2069
3	11.42	20.38	77.58	386.1	0.14250	0.28390	0.2414	0.10520	0.2597
4	20.29	14.34	135.10	1297.0	0.10030	0.13280	0.1980	0.10430	0.1809

5 rows × 30 columns

In [115]:
```
df['type'] = cancer_data.target
```

In [117]:
```
X = df.drop('type', axis=1)
y = df.type
```

In [119]:
```python
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)
```

In [120]:
```python
from sklearn.svm import SVC
svc = SVC()
```

In [121]:
```python
svc.fit(X_train, y_train)
```

Out[121]:
```
SVC()
```

In [122]:
```python
svc.score(X_test, y_test)
```

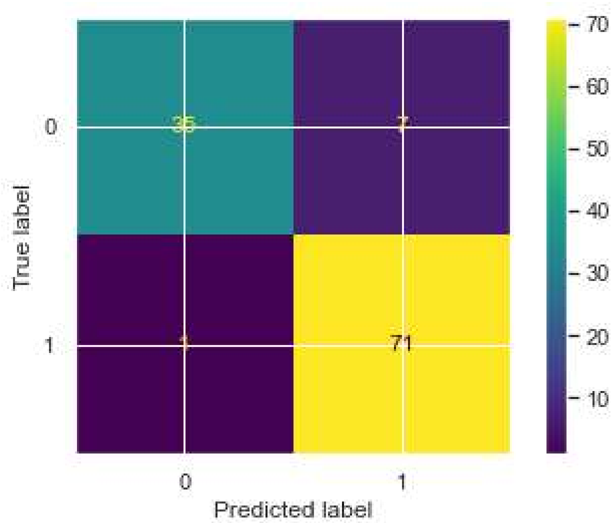
Out[122]:
```
0.9298245614035088
```

In [123]:
```python
y_pred = svc.predict(X_test)
```

In [125]:
```python
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[125]:
```
array([[35,  7],
       [ 1, 71]], dtype=int64)
```

In [126]:
```python
ConfusionMatrixDisplay(cm).plot()
plt.show()
```



Q10

Load the data from Iris data-set. Use this to build a Decision Tree model and compute the accuracy of the model.

In [145]:
```
X = iris.drop('species', axis=1)
y = iris.species
```

In [146]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)
```

In [153]:
```
from sklearn.tree import DecisionTreeClassifier, plot_tree
dtc = DecisionTreeClassifier()
```

In [154]:
```
dtc.fit(X_train, y_train)
```

Out[154]:
```
DecisionTreeClassifier()
```

In [155]:
```
dtc.score(X_test, y_test)
```

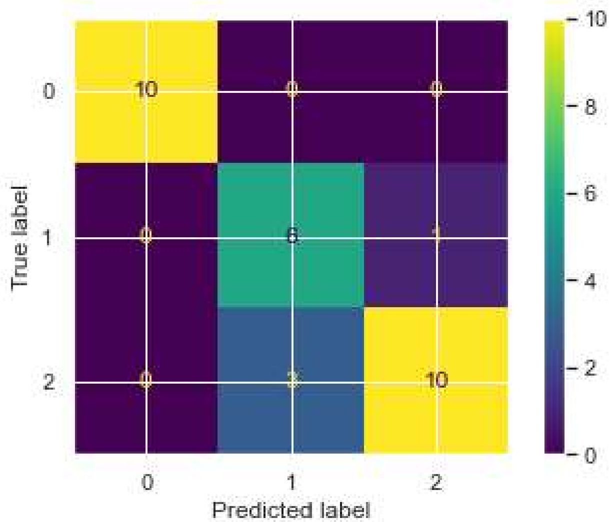
Out[155]:
```
0.8666666666666667
```

In [156]:
```
y_pred = dtc.predict(X_test)
```

In [157]:
```
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[157]:
```
array([[10,  0,  0],
       [ 0,  6,  1],
       [ 0,  3, 10]], dtype=int64)
```

In [162]:
```
ConfusionMatrixDisplay(cm).plot()
plt.show()
```



In [ ]:
```
fig = plt.figure(figsize=(20, 10))
plot_tree(dtc, filled=True)
plt.show()
```

Q11

Load the data from Titanic data-set. Use this to build a Decision Tree model and compute the accuracy.

In [55]:
```
df = pd.read_csv('./datasets/titanic.csv')
df.head()
```

Out[55]:

	PassengerId	Name	Pclass	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embar
0	1	Braund, Mr. Owen Harris	3	male	22.0	1	0	A/5 21171	7.2500	NaN	
1	2	Cumings, Mrs. John Bradley (Florence Briggs Th...	1	female	38.0	1	0	PC 17599	71.2833	C85	
2	3	Heikkinen, Miss. Laina	3	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	
3	4	Futrelle, Mrs. Jacques Heath (Lily May Peel)	1	female	35.0	1	0	113803	53.1000	C123	
4	5	Allen, Mr. William Henry	3	male	35.0	0	0	373450	8.0500	NaN	

In [56]:
```
df.isna().sum()
```

Out[56]:
```
PassengerId      0
Name             0
Pclass           0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
Survived         0
dtype: int64
```

In [57]:
```
df.Age.fillna(df.Age.mean(), inplace=True)
df.dropna(subset=['Embarked'], axis=0, inplace=True)
df.drop('Cabin', inplace=True, axis=1)

df.isna().sum()
```

Out[57]:
```
PassengerId    0
Name           0
Pclass         0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
Survived       0
dtype: int64
```

In [58]:
```
sex, embarked = pd.get_dummies(df.Sex), pd.get_dummies(df.Embarked)

df.drop(['Sex', 'Embarked'], inplace=True, axis=1)
df = pd.concat((df, sex, embarked), axis=1)

df.head()
```

Out[58]:

	PassengerId	Name	Pclass	Age	SibSp	Parch	Ticket	Fare	Survived	female	ma
0	1	Braund, Mr. Owen Harris	3	22.0	1	0	A/5 21171	7.2500	0	0	
1	2	Cumings, Mrs. John Bradley (Florence Briggs Th...	1	38.0	1	0	PC 17599	71.2833	1	1	
2	3	Heikkinen, Miss. Laina	3	26.0	0	0	STON/O2. 3101282	7.9250	1	1	
3	4	Futrelle, Mrs. Jacques Heath (Lily May Peel)	1	35.0	1	0	113803	53.1000	1	1	
4	5	Allen, Mr. William Henry	3	35.0	0	0	373450	8.0500	0	0	

In [59]:
```
X = df.drop(['PassengerId', 'Name', 'Ticket', 'Survived'], axis=1)
y = df.Survived
```

In [65]:
```
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)
```

In [66]:
```
from sklearn.tree import DecisionTreeClassifier, plot_tree
dtc = DecisionTreeClassifier().fit(X_train, y_train)
```

In [67]:
```
dtc.score(X_test, y_test)
```

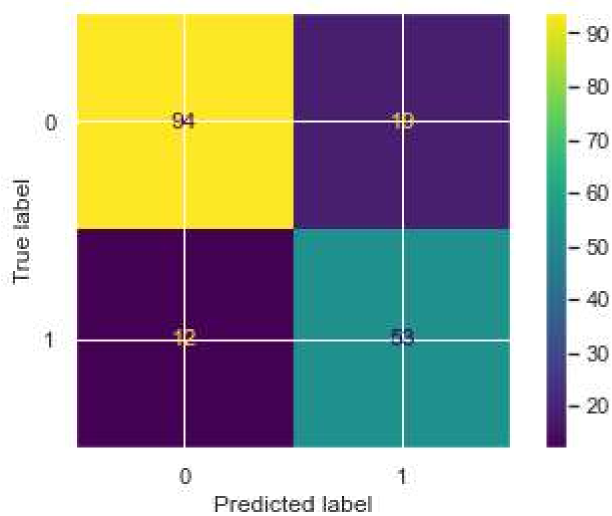
Out[67]:
```
0.8258426966292135
```

In [68]:
```
y_pred = dtc.predict(X_test)
```

In [69]:
```
from sklearn.metrics import confusion_matrix, ConfusionMatrixDisplay
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[69]:
```
array([[94, 19],
       [12, 53]], dtype=int64)
```

In [70]:
```
ConfusionMatrixDisplay(cm).plot()
plt.show()
```



In [5]:
```python
##Q12

import pandas as pd
from sklearn.datasets import fetch_openml
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score

# Load the Titanic dataset
titanic = fetch_openml(name='titanic', version=1)
data = pd.DataFrame(titanic.data, columns=titanic.feature_names)
target = pd.Series(titanic.target)

# Convert non-numeric data to numeric values
data['sex'] = pd.factorize(data['sex'])[0]
data['embarked'] = pd.factorize(data['embarked'])[0]

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(data, target, test_size=0.2

# Build a kNN classifier with k=5
knn = KNeighborsClassifier(n_neighbors=5)
knn.fit(X_train, y_train)

# Compute the accuracy of the model on the testing set
y_pred = knn.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print('Accuracy:', accuracy)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_11752\3495374044.py in <module>
     20 # Build a kNN classifier with k=5
     21 knn = KNeighborsClassifier(n_neighbors=5)
---> 22 knn.fit(X_train, y_train)
     23 
     24 # Compute the accuracy of the model on the testing set

~\anaconda3\lib\site-packages\sklearn\neighbors\_classification.py in fit(sel
f, X, y)
    196         self.weights = _check_weights(self.weights)
    197 
--> 198         return self._fit(X, y)
    199 
    200     def predict(self, X):

~\anaconda3\lib\site-packages\sklearn\neighbors\_base.py in _fit(self, X, y)
    398         if self._get_tags()["requires_y"]:
    399             if not isinstance(X, (KDTree, BallTree, NeighborsBase)):
--> 400                 X, y = self._validate_data(X, y, accept_sparse="csr",
multi_output=True)
    401 
    402             if is_classifier(self):

~\anaconda3\lib\site-packages\sklearn\base.py in _validate_data(self, X, y, r
eset, validate_separately, **check_params)
    579                 y = check_array(y, **check_y_params)
    580             else:
--> 581                 X, y = check_X_y(X, y, **check_params)
    582             out = X, y
    583 

~\anaconda3\lib\site-packages\sklearn\utils\validation.py in check_X_y(X, y,
accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite, ens
ure_2d, allow_nd, multi_output, ensure_min_samples, ensure_min_features, y_nu
meric, estimator)
    962         raise ValueError("y cannot be None")
    963 
--> 964     X = check_array(
    965         X,
    966         accept_sparse=accept_sparse,

~\anaconda3\lib\site-packages\sklearn\utils\validation.py in check_array(arra
y, accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite,
ensure_2d, allow_nd, ensure_min_samples, ensure_min_features, estimator)
    744                     array = array.astype(dtype, casting="unsafe", cop
y=False)
    745                 else:
--> 746                     array = np.asarray(array, order=order, dtype=dtyp
e)
    747             except ComplexWarning as complex_warning:
    748                 raise ValueError(

~\anaconda3\lib\site-packages\pandas\core\generic.py in __array__(self, dtyp
e)
   2062 
```

```
   2063     def __array__(self, dtype: npt.DTypeLike | None = None) -> np.nda
rray:
-> 2064         return np.asarray(self._values, dtype=dtype)
   2065 
   2066     def __array_wrap__(

ValueError: could not convert string to float: 'Peltomaki, Mr. Nikolai Johann
es'
```

Q13

Load Iris data-set. Use this to build kNN classifier and compute the accuracy of model.

In [78]:
```
X = iris.drop('species', axis=1)
y = iris.species
```

In [79]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2)
```

In [90]:
```
from sklearn.neighbors import KNeighborsClassifier
knn = KNeighborsClassifier().fit(X_train, y_train)
```

In [91]:
```
knn.score(X_test, y_test)
```

Out[91]:
```
1.0
```

In [92]:
```
y_pred = knn.predict(X_test)
cm = confusion_matrix(y_test, y_pred)
cm
```

Out[92]:
```
array([[10,  0,  0],
       [ 0, 10,  0],
       [ 0,  0, 10]], dtype=int64)
```

Q14

Load Iris data-set. Perform k-means Clustering over it.

In [2]:

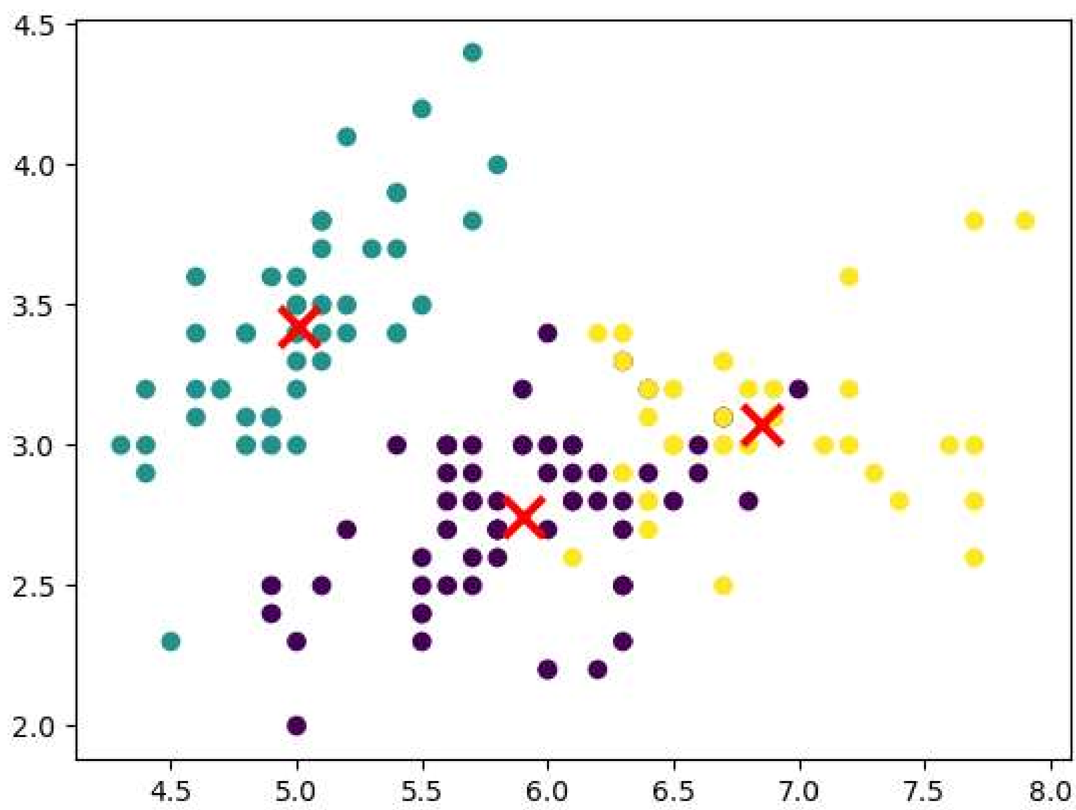
```python
import pandas as pd
import numpy as np
from sklearn.datasets import load_iris
from sklearn.cluster import KMeans
import matplotlib.pyplot as plt

# Load the Iris dataset
iris = load_iris()
data = pd.DataFrame(iris.data, columns=iris.feature_names)

# Perform k-means clustering with 3 clusters
kmeans = KMeans(n_clusters=3, random_state=0).fit(data)

# Get the cluster labels and centroids
labels = kmeans.labels_
centroids = kmeans.cluster_centers_

# Visualize the results
plt.scatter(data.iloc[:, 0], data.iloc[:, 1], c=labels)
plt.scatter(centroids[:, 0], centroids[:, 1], marker='x', s=200, linewidths=3,
plt.show()
```



In [6]:

In [ ]:

In [ ]:

In [9]:

```
import pandas as pd
from sklearn.datasets import fetch_openml
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score

# Load the Titanic dataset
titanic = fetch_openml(name='titanic', version=1)
data = pd.DataFrame(titanic.data, columns=titanic.feature_names)
target = pd.Series(titanic.target)

# Convert non-numeric data to numeric values
data['sex'] = pd.factorize(data['sex'])[0]
data['embarked'] = pd.factorize(data['embarked'])[0]

# Drop irrelevant columns
data = data.drop(['name', 'ticket', 'cabin', 'boat', 'body', 'home.dest'], axis

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(data, target, test_size=0.2

# Build a kNN classifier with k=5
knn = KNeighborsClassifier(n_neighbors=5)
knn.fit(X_train, y_train)

# Compute the accuracy of the model on the testing set
y_pred = knn.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print('Accuracy:', accuracy)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_11752\2965278580.py in <module>
     22 # Build a kNN classifier with k=5
     23 knn = KNeighborsClassifier(n_neighbors=5)
---> 24 knn.fit(X_train, y_train)
     25 
     26 # Compute the accuracy of the model on the testing set

~\anaconda3\lib\site-packages\sklearn\neighbors\_classification.py in fit(sel
f, X, y)
    196         self.weights = _check_weights(self.weights)
    197 
--> 198         return self._fit(X, y)
    199 
    200     def predict(self, X):

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multi_output=True)
    401 
    402             if is_classifier(self):

~\anaconda3\lib\site-packages\sklearn\base.py in _validate_data(self, X, y, r
eset, validate_separately, **check_params)
    579                 y = check_array(y, **check_y_params)
    580             else:
--> 581                 X, y = check_X_y(X, y, **check_params)
    582             out = X, y
    583 

~\anaconda3\lib\site-packages\sklearn\utils\validation.py in check_X_y(X, y,
accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite, ens
ure_2d, allow_nd, multi_output, ensure_min_samples, ensure_min_features, y_nu
meric, estimator)
    962         raise ValueError("y cannot be None")
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--> 964     X = check_array(
    965         X,
    966         accept_sparse=accept_sparse,

~\anaconda3\lib\site-packages\sklearn\utils\validation.py in check_array(arra
y, accept_sparse, accept_large_sparse, dtype, order, copy, force_all_finite,
ensure_2d, allow_nd, ensure_min_samples, ensure_min_features, estimator)
    798 
    799         if force_all_finite:
--> 800             _assert_all_finite(array, allow_nan=force_all_finite ==
"allow-nan")
    801 
    802     if ensure_min_samples > 0:

~\anaconda3\lib\site-packages\sklearn\utils\validation.py in _assert_all_fini
te(X, allow_nan, msg_dtype)
    112         ):
    113             type_err = "infinity" if allow_nan else "NaN, infinity"
```

```
--> 114             raise ValueError(
    115                 msg_err.format(
    116                     type_err, msg_dtype if msg_dtype is not None else
X.dtype

ValueError: Input contains NaN, infinity or a value too large for dtype('floa
t64').
```

In [ ]: