[23]:
```
import pandas as pd
titanicdata=pd.read_csv("./tested.csv")
titanicdata
```

[23]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	892	0	3	Kelly, Mr. James	male	34.5	0	0	330911	7.8292	NaN	Q
1	893	1	3	Wilkes, Mrs. James (Ellen Needs)	female	47.0	1	0	363272	7.0000	NaN	S
2	894	0	2	Myles, Mr. Thomas Francis	male	62.0	0	0	240276	9.6875	NaN	Q
3	895	0	3	Wirz, Mr. Albert	male	27.0	0	0	315154	8.6625	NaN	S
4	896	1	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	female	22.0	1	1	3101298	12.2875	NaN	S
...	...	...	...	...	...	...	...	...	...	...	...	...
413	1305	0	3	Spector, Mr. Woolf	male	NaN	0	0	A.5. 3236	8.0500	NaN	S
414	1306	1	1	Oliva y Ocana, Dona. Fermina	female	39.0	0	0	PC 17758	108.9000	C105	C
415	1307	0	3	Saether, Mr. Simon Sivertsen	male	38.5	0	0	SOTON/O.Q. 3101262	7.2500	NaN	S
416	1308	0	3	Ware, Mr. Frederick	male	NaN	0	0	359309	8.0500	NaN	S
417	1309	0	3	Peter, Master. Michael J	male	NaN	1	1	2668	22.3583	NaN	C

418 rows × 12 columns

[24]:
```
titanicdata.isna()
```

[24]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	False	False	False	False	False	False	False	False	False	False	True	False
1	False	False	False	False	False	False	False	False	False	False	True	False
2	False	False	False	False	False	False	False	False	False	False	True	False
3	False	False	False	False	False	False	False	False	False	False	True	False
4	False	False	False	False	False	False	False	False	False	False	True	False
...	...	...	...	...	...	...	...	...	...	...	...	...
413	False	False	False	False	False	True	False	False	False	False	True	False
414	False	False	False	False	False	False	False	False	False	False	False	False
415	False	False	False	False	False	False	False	False	False	False	True	False
416	False	False	False	False	False	True	False	False	False	False	True	False
417	False	False	False	False	False	True	False	False	False	False	True	False

418 rows × 12 columns

[25]:
```
titanicdata.isna().sum()
```

[25]:
```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age             86
SibSp            0
Parch            0
Ticket           0
Fare             1
Cabin          327
Embarked         0
dtype: int64
```

[26]:
```
titanicdata['Age'].isna().sum()
```

[26]:
```
86
```

[27]:
```
titanicdata['Cabin'].isna().sum()
```

[27]:
```
327
```

[28]:
```
titanicdata['Embarked'].isna().sum()
```

[28]:
```
0
```

[29]:
```
titanicdata['Age'].fillna(titanicdata['Age'].mean(), inplace=True)
```

[30]:
```
titanicdata['Age']
```

[30]:
```
0      34.50000
1      47.00000
2      62.00000
3      27.00000
4      22.00000
         ...
413    30.27259
414    39.00000
415    38.50000
416    30.27259
417    30.27259
Name: Age, Length: 418, dtype: float64
```

[31]:
```
titanicdata['Embarked'].fillna(titanicdata['Embarked'].mode()[0], inplace=True)
```

[32]:
```
titanicdata['Embarked']
```

[32]:
```
0      Q
1      S
2      Q
```

```
3      S
4      S
      ..
413    S
414    C
415    S
416    S
417    C
Name: Embarked, Length: 418, dtype: object
```

[33]:
```
titanicdata['Cabin'].isna().count()
```

[33]:
```
418
```

[34]:
```
titanicdata.drop(columns=['Cabin'], inplace=True)
```

[35]:
```
titanicdata
```

[35]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked
0	892	0	3	Kelly, Mr. James	male	34.50000	0	0	330911	7.8292	Q
1	893	1	3	Wilkes, Mrs. James (Ellen Needs)	female	47.00000	1	0	363272	7.0000	S
2	894	0	2	Myles, Mr. Thomas Francis	male	62.00000	0	0	240276	9.6875	Q
3	895	0	3	Wirz, Mr. Albert	male	27.00000	0	0	315154	8.6625	S
4	896	1	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	female	22.00000	1	1	3101298	12.2875	S
...	...	...	...	...	...	...	...	...	...	...	...
413	1305	0	3	Spector, Mr. Woolf	male	30.27259	0	0	A.5. 3236	8.0500	S
414	1306	1	1	Oliva y Ocana, Dona. Fermina	female	39.00000	0	0	PC 17758	108.9000	C
415	1307	0	3	Saether, Mr. Simon Sivertsen	male	38.50000	0	0	SOTON/O.Q. 3101262	7.2500	S
416	1308	0	3	Ware, Mr. Frederick	male	30.27259	0	0	359309	8.0500	S
417	1309	0	3	Peter, Master. Michael J	male	30.27259	1	1	2668	22.3583	C

418 rows × 11 columns

[36]:
```
titanicdata['Sex'] = titanicdata['Sex'].map({'male': 0, 'female': 1})
```

[37]:
```
titanicdata['Sex']
```

[37]:
```
0      0
1      1
2      0
3      0
4      1
      ..
413    0
414    1
415    0
416    0
417    0
Name: Sex, Length: 418, dtype: int64
```

[38]:
```
titanicdata['Embarked'] = titanicdata['Embarked'].map({'C': 0, 'Q': 1, 'S': 2})
```

[39]:
```
titanicdata['Embarked']
```

[39]:
```
0      1
1      2
2      1
3      2
4      2
      ..
413    2
414    0
415    2
416    2
417    0
Name: Embarked, Length: 418, dtype: int64
```

[40]:
```
titanicdata['FamilySize'] =titanicdata['SibSp'] + titanicdata['Parch'] + 1
```

[41]:
```
titanicdata
```

[41]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Embarked	FamilySize
0	892	0	3	Kelly, Mr. James	0	34.50000	0	0	330911	7.8292	1	1
1	893	1	3	Wilkes, Mrs. James (Ellen Needs)	1	47.00000	1	0	363272	7.0000	2	2
2	894	0	2	Myles, Mr. Thomas Francis	0	62.00000	0	0	240276	9.6875	1	1
3	895	0	3	Wirz, Mr. Albert	0	27.00000	0	0	315154	8.6625	2	1
4	896	1	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	1	22.00000	1	1	3101298	12.2875	2	3
...	...	...	...	...	...	...	...	...	...	...	...	...
413	1305	0	3	Spector, Mr. Woolf	0	30.27259	0	0	A.5. 3236	8.0500	2	1
414	1306	1	1	Oliva y Ocana, Dona. Fermina	1	39.00000	0	0	PC 17758	108.9000	0	1
415	1307	0	3	Saether, Mr. Simon Sivertsen	0	38.50000	0	0	SOTON/O.Q. 3101262	7.2500	2	1
416	1308	0	3	Ware, Mr. Frederick	0	30.27259	0	0	359309	8.0500	2	1
417	1309	0	3	Peter, Master. Michael J	0	30.27259	1	1	2668	22.3583	0	3

418 rows × 12 columns

[42]:
```
# Drop unnecessary columns
titanicdata.drop(columns=['Name', 'Ticket', 'PassengerId'], inplace=True)
```

[43]:
```
titanicdata
```

[43]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked	FamilySize
0	0	3	0	34.50000	0	0	7.8292	1	1
1	1	3	1	47.00000	1	0	7.0000	2	2

2	0	2	0	62.00000	0	0	9.6875	1	1
3	0	3	0	27.00000	0	0	8.6625	2	1
4	1	3	1	22.00000	1	1	12.2875	2	3
...	...	...	...	...	...	...	...	...	...
413	0	3	0	30.27259	0	0	8.0500	2	1
414	1	1	1	39.00000	0	0	108.9000	0	1
415	0	3	0	38.50000	0	0	7.2500	2	1
416	0	3	0	30.27259	0	0	8.0500	2	1
417	0	3	0	30.27259	1	1	22.3583	0	3

418 rows × 9 columns

[49]:
```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score, confusion_matrix, classification_report
from sklearn.impute import SimpleImputer
# Define features and target variable
X = titanicdata[['Pclass', 'Sex', 'Age', 'SibSp', 'Parch', 'Embarked', 'FamilySize']]
y = titanicdata['Pclass']

# Split the data
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Standardize the features
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)

# Initialize the model
model = LogisticRegression()

# Train the model
model.fit(X_train, y_train)

# Make predictions
y_pred = model.predict(X_test)

# Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
conf_matrix = confusion_matrix(y_test, y_pred)
class_report = classification_report(y_test, y_pred)

print(f'Accuracy: {accuracy}')
print('Confusion Matrix:')
print(conf_matrix)
print('Classification Report:')
print(class_report)
```

```
Accuracy: 1.0
Confusion Matrix:
[[21  0  0]
 [ 0 21  0]
 [ 0  0 42]]
Classification Report:
              precision    recall  f1-score   support

           1       1.00      1.00      1.00        21
           2       1.00      1.00      1.00        21
           3       1.00      1.00      1.00        42

    accuracy                           1.00        84
   macro avg       1.00      1.00      1.00        84
weighted avg       1.00      1.00      1.00        84
```

*[48]:

[48]:
```
Survived      0
Pclass        0
Sex           0
Age           0
SibSp         0
Parch         0
Fare          1
Embarked      0
FamilySize    0
dtype: int64
```

[ ]:

[ ]:

[ ]:

[ ]: