xpcnjz7hk

September 20, 2023

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

[ ]:
```
data=pd.read_csv('Titanic-Dataset.csv')
data.head()
```

[ ]:
```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                 Name     Sex   Age  SibSp  \
0                             Braund, Mr. Owen Harris    male  22.0      1
1  Cumings, Mrs. John Bradley (Florence Briggs Th…  female  38.0      1
2                              Heikkinen, Miss. Laina  female  26.0      0
3        Futrelle, Mrs. Jacques Heath (Lily May Peel)  female  35.0      1
4                            Allen, Mr. William Henry    male  35.0      0

   Parch            Ticket     Fare Cabin Embarked
0      0         A/5 21171   7.2500   NaN        S
1      0          PC 17599  71.2833   C85        C
2      0  STON/O2. 3101282   7.9250   NaN        S
3      0            113803  53.1000  C123        S
4      0            373450   8.0500   NaN        S
```

[ ]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 891 entries, 0 to 890
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   PassengerId  891 non-null    int64
 1   Survived     891 non-null    int64
 2   Pclass       891 non-null    int64
 3   Name         891 non-null    object
 4   Sex          891 non-null    object
 5   Age          714 non-null    float64
 6   SibSp        891 non-null    int64
 7   Parch        891 non-null    int64
 8   Ticket       891 non-null    object
 9   Fare         891 non-null    float64
 10  Cabin        204 non-null    object
 11  Embarked     889 non-null    object
dtypes: float64(2), int64(5), object(5)
memory usage: 83.7+ KB
```

[ ]:
```
data.describe()
```

[ ]:
```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000
mean    446.000000    0.383838    2.308642   29.699118    0.523008
std     257.353842    0.486592    0.836071   14.526497    1.102743
min       1.000000    0.000000    1.000000    0.420000    0.000000
25%     223.500000    0.000000    2.000000   20.125000    0.000000
50%     446.000000    0.000000    3.000000   28.000000    0.000000
75%     668.500000    1.000000    3.000000   38.000000    1.000000
max     891.000000    1.000000    3.000000   80.000000    8.000000

            Parch        Fare
count  891.000000  891.000000
mean     0.381594   32.204208
std      0.806057   49.693429
min      0.000000    0.000000
25%      0.000000    7.910400
50%      0.000000   14.454200
75%      0.000000   31.000000
max      6.000000  512.329200
```

[ ]:
```
corr=data.corr()
corr
```

```
<ipython-input-6-0d3ae1d0be10>:1: FutureWarning: The default value of
numeric_only in DataFrame.corr is deprecated. In a future version, it will
default to False. Select only valid columns or specify the value of numeric_only
to silence this warning.
  corr=data.corr()
```

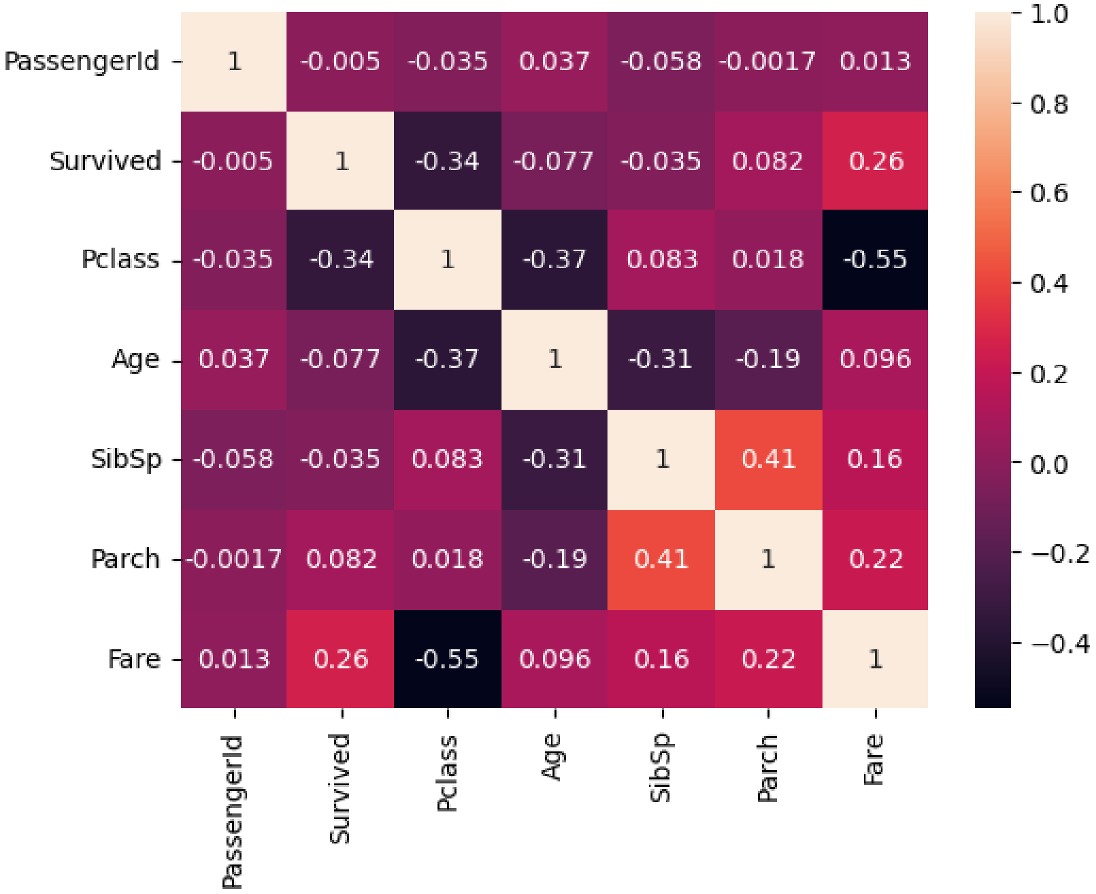
[ ]:
```
             PassengerId  Survived    Pclass       Age     SibSp     Parch  \
PassengerId     1.000000 -0.005007 -0.035144  0.036847 -0.057527 -0.001652
Survived       -0.005007  1.000000 -0.338481 -0.077221 -0.035322  0.081629
Pclass         -0.035144 -0.338481  1.000000 -0.369226  0.083081  0.018443
```

```
Age            0.036847 -0.077221 -0.369226  1.000000 -0.308247 -0.189119
SibSp         -0.057527 -0.035322  0.083081 -0.308247  1.000000  0.414838
Parch         -0.001652  0.081629  0.018443 -0.189119  0.414838  1.000000
Fare           0.012658  0.257307 -0.549500  0.096067  0.159651  0.216225

                 Fare
PassengerId  0.012658
Survived     0.257307
Pclass      -0.549500
Age          0.096067
SibSp        0.159651
Parch        0.216225
Fare         1.000000
```

```
[ ]: sns.heatmap(corr,annot=True)
```

```
[ ]: <Axes: >
```



```
[ ]: data.Cabin.value_counts()
```

```
[ ]: B96 B98        4
     G6             4
     C23 C25 C27    4
     C22 C26        3
     F33            3
                   ..
     E34            1
     C7             1
     C54            1
     E36            1
     C148           1
     Name: Cabin, Length: 147, dtype: int64
```

```
[ ]: data.Embarked.value_counts()
```

```
[ ]: S    644
     C    168
     Q     77
     Name: Embarked, dtype: int64
```

```
[ ]: data.Parch.value_counts()
```

```
[ ]: 0    678
     1    118
     2     80
     5      5
     3      5
     4      4
     6      1
     Name: Parch, dtype: int64
```

```
[ ]: data.isnull().any()
```

```
[ ]: PassengerId    False
     Survived       False
     Pclass         False
     Name           False
     Sex            False
     Age             True
     SibSp          False
     Parch          False
     Ticket         False
     Fare           False
     Cabin           True
     Embarked        True
```

```
dtype: bool
```

```
[ ]: data.isnull().sum()
```

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

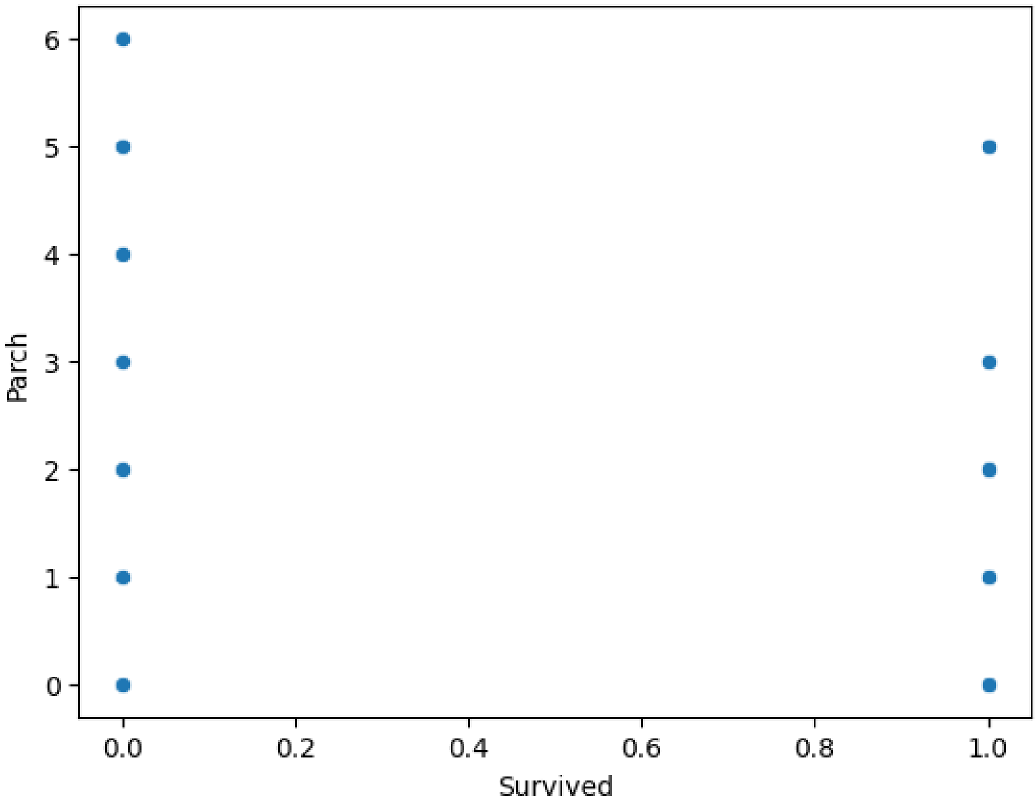
```
[ ]: data["Age"].fillna(data["Age"].mean(),inplace=True)
     data["Cabin"].fillna(data["Cabin"].mode()[0],inplace=True)
     data["Embarked"].fillna(data["Embarked"].mode()[0],inplace=True)
```

```
[ ]: data.isnull().sum()#I removed all null values
```

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

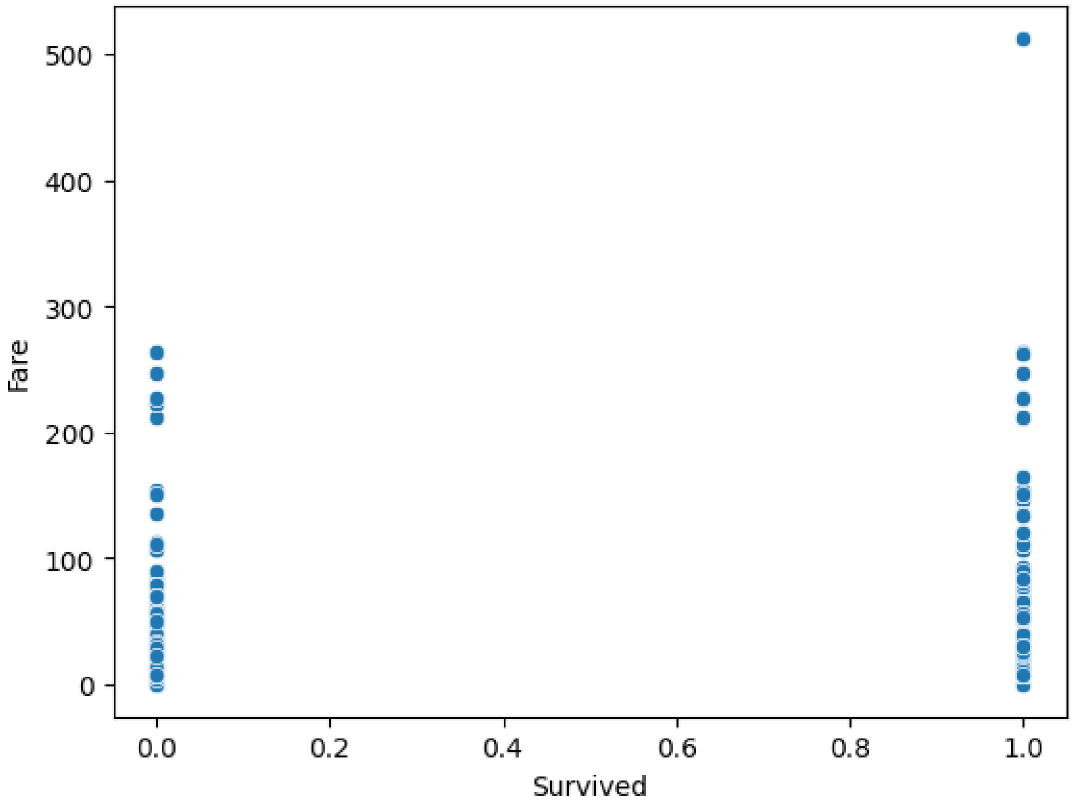
```
[ ]: sns.scatterplot(x=data["Survived"],y=data["Parch"])
```

```
[ ]: <Axes: xlabel='Survived', ylabel='Parch'>
```



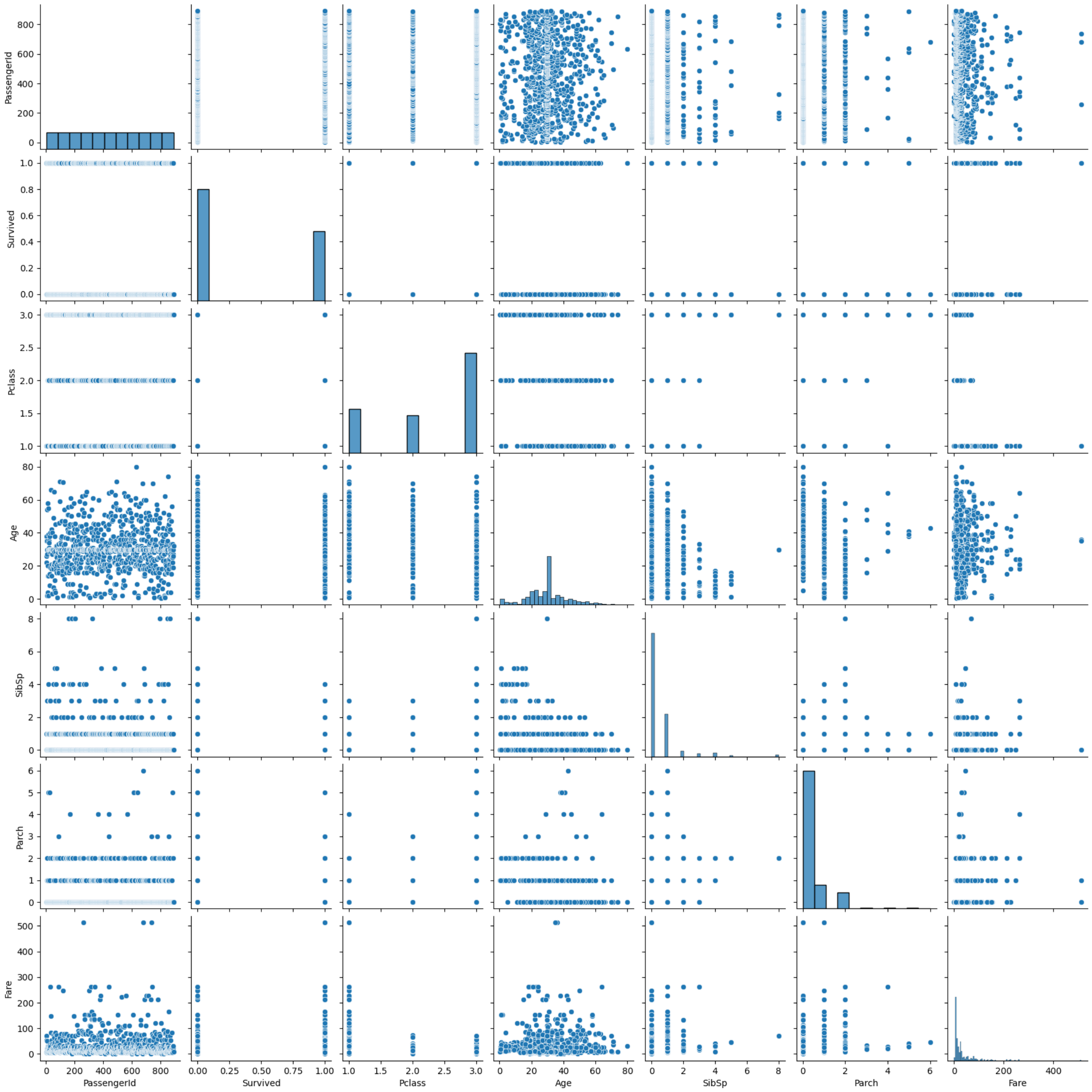
```
[ ]: sns.scatterplot(x=data["Survived"],y=data["Fare"])
```

```
[ ]: <Axes: xlabel='Survived', ylabel='Fare'>
```



[ ]:
```
sns.pairplot(data)
```

[ ]:
```
<seaborn.axisgrid.PairGrid at 0x7969af457940>
```



```
[ ]: from sklearn.preprocessing import LabelEncoder
     le=LabelEncoder()
```

```
[ ]: data["Sex"]=le.fit_transform(data["Sex"])
```

```
[ ]: data["Embarked"]=le.fit_transform(data["Embarked"])
```

```
[ ]: data.head()
```

```
[ ]:    PassengerId  Survived  Pclass  \
     0            1         0       3
     1            2         1       1
     2            3         1       3
```

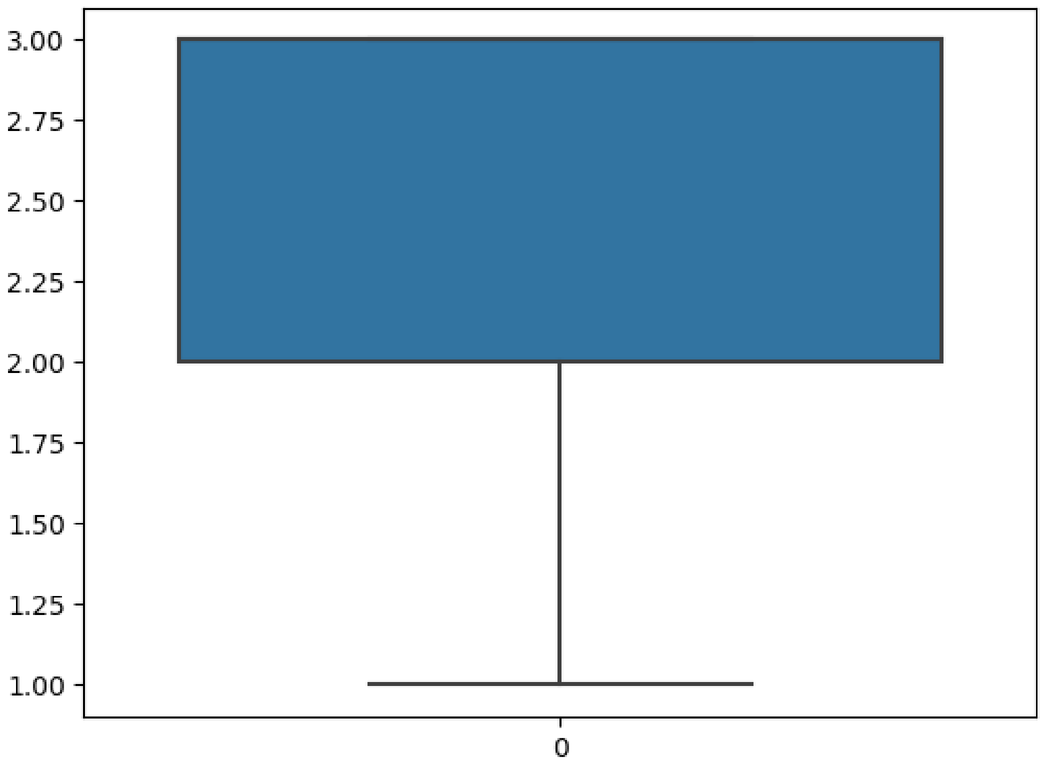
```
3            4         1       1
4            5         0       3

                                                Name  Sex   Age  SibSp  Parch  \
0                            Braund, Mr. Owen Harris    1  22.0      1      0
1  Cumings, Mrs. John Bradley (Florence Briggs Th…    0  38.0      1      0
2                             Heikkinen, Miss. Laina    0  26.0      0      0
3        Futrelle, Mrs. Jacques Heath (Lily May Peel)    0  35.0      1      0
4                           Allen, Mr. William Henry    1  35.0      0      0

             Ticket     Fare    Cabin  Embarked
0         A/5 21171   7.2500  B96 B98         2
1          PC 17599  71.2833      C85         0
2  STON/O2. 3101282   7.9250  B96 B98         2
3            113803  53.1000     C123         2
4            373450   8.0500  B96 B98         2
```

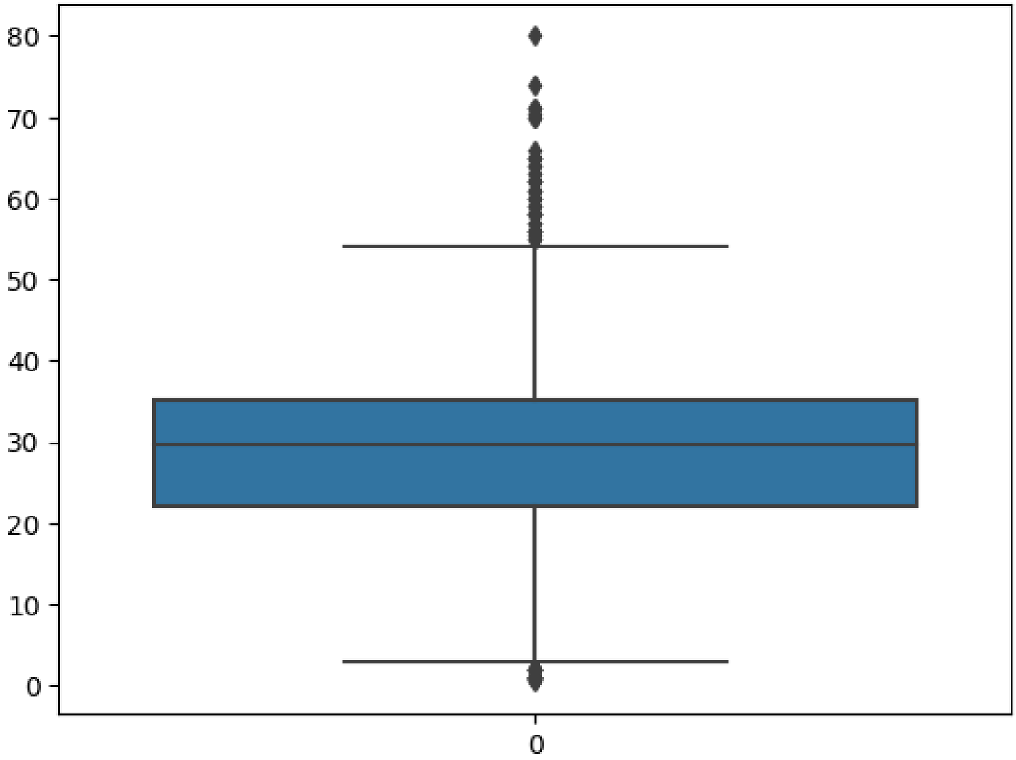
[ ]:
```
sns.boxplot(data['Pclass'])
```

[ ]:
```
<Axes: >
```



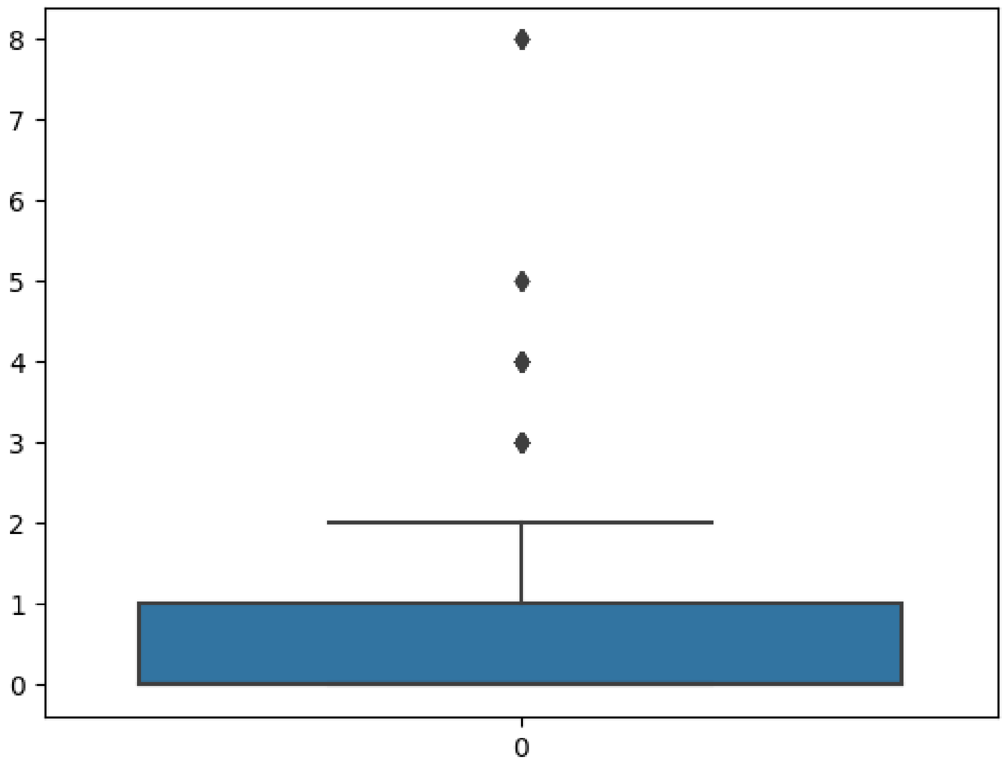
[ ]:
```
sns.boxplot(data['Age'])
```

[ ]: <Axes: >



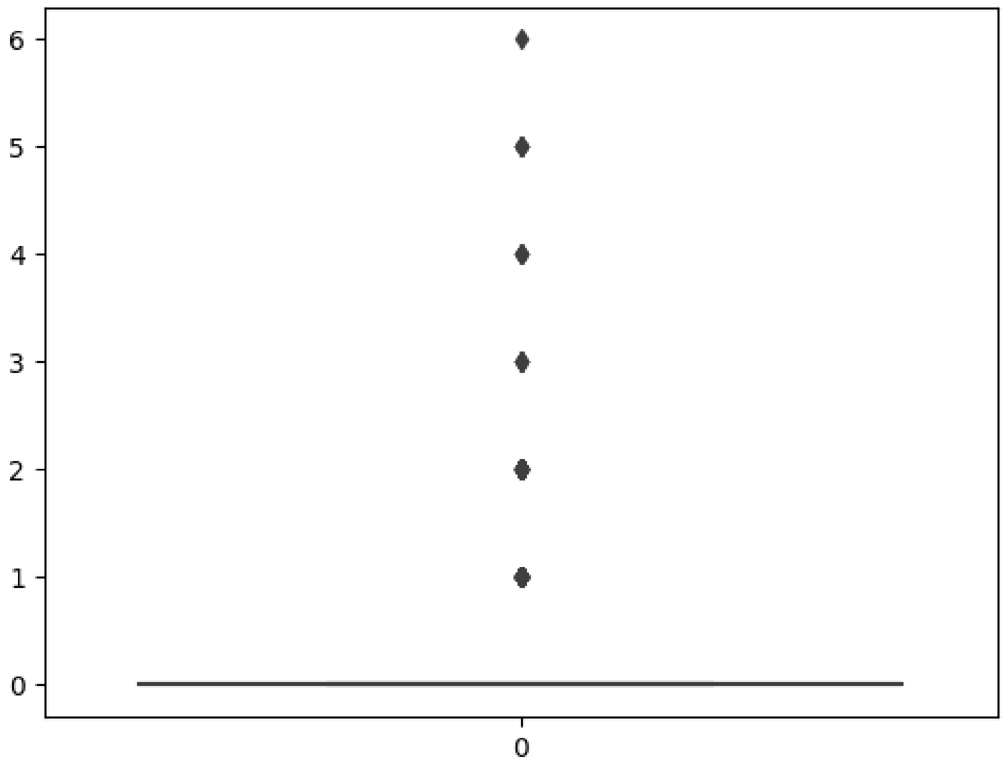
[ ]:
```
sns.boxplot(data['SibSp'])
```

[ ]: <Axes: >



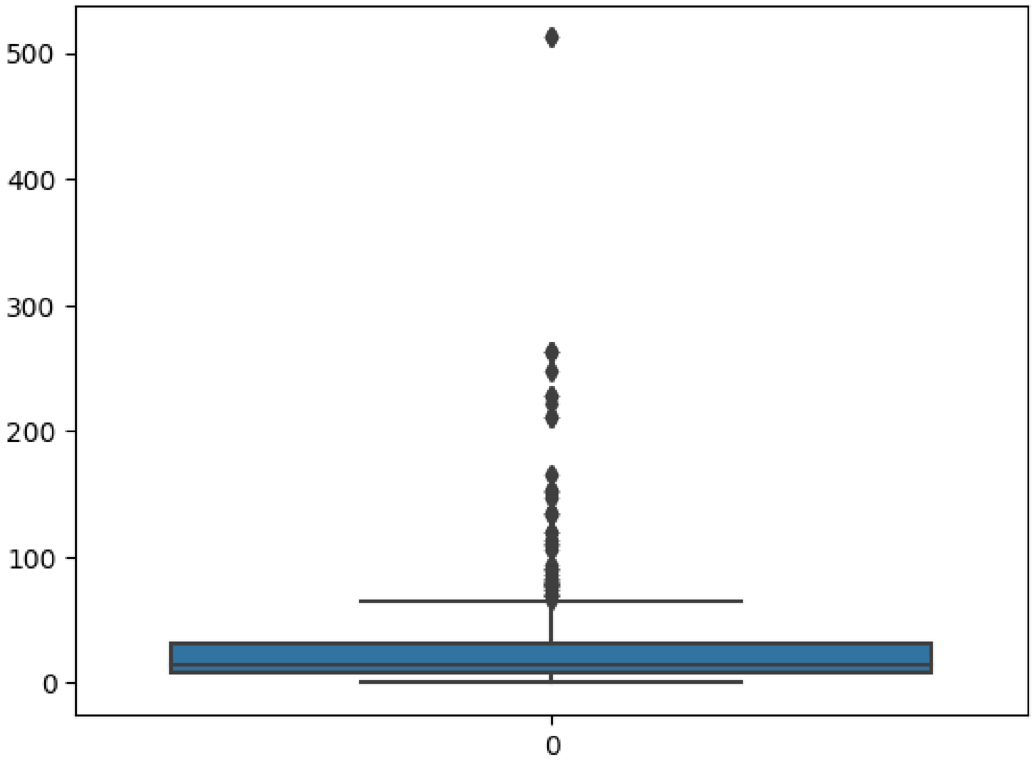
[ ]:
```
sns.boxplot(data['Parch'])
```

[ ]:
```
<Axes: >
```



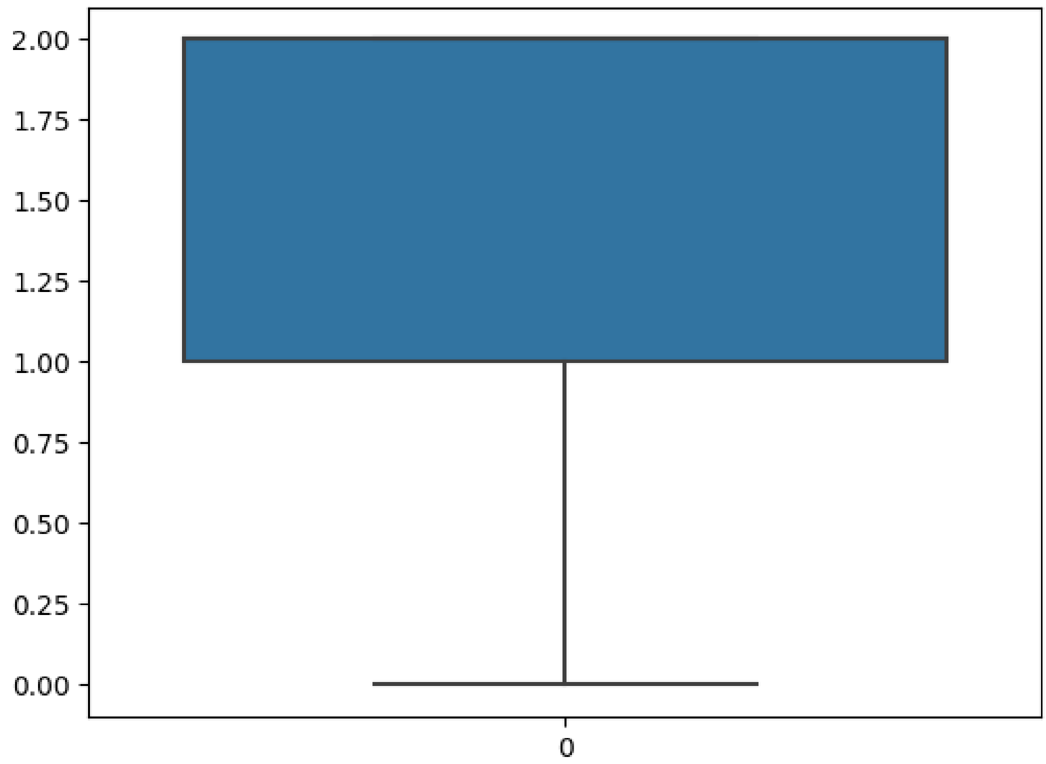
```
[ ]: sns.boxplot(data['Fare'])
```

```
[ ]: <Axes: >
```



```
[ ]: sns.boxplot(data['Embarked'])
```

```
[ ]: <Axes: >
```



```
[ ]: q1=data.Age.quantile(0.25)
     q3=data.Age.quantile(0.75)
     print(q1)
     print(q3)
```

```
22.0
35.0
```

```
[ ]: iqr=q3-q1
     iqr
```

```
[ ]: 13.0
```

```
[ ]: upperlimit = q3+1.5*iqr
     upperlimit
```

```
[ ]: 54.5
```

```
[ ]: lowerlimit=q1-1.5*iqr
     lowerlimit
```

```
[ ]: 2.5
[ ]: data.median()
```

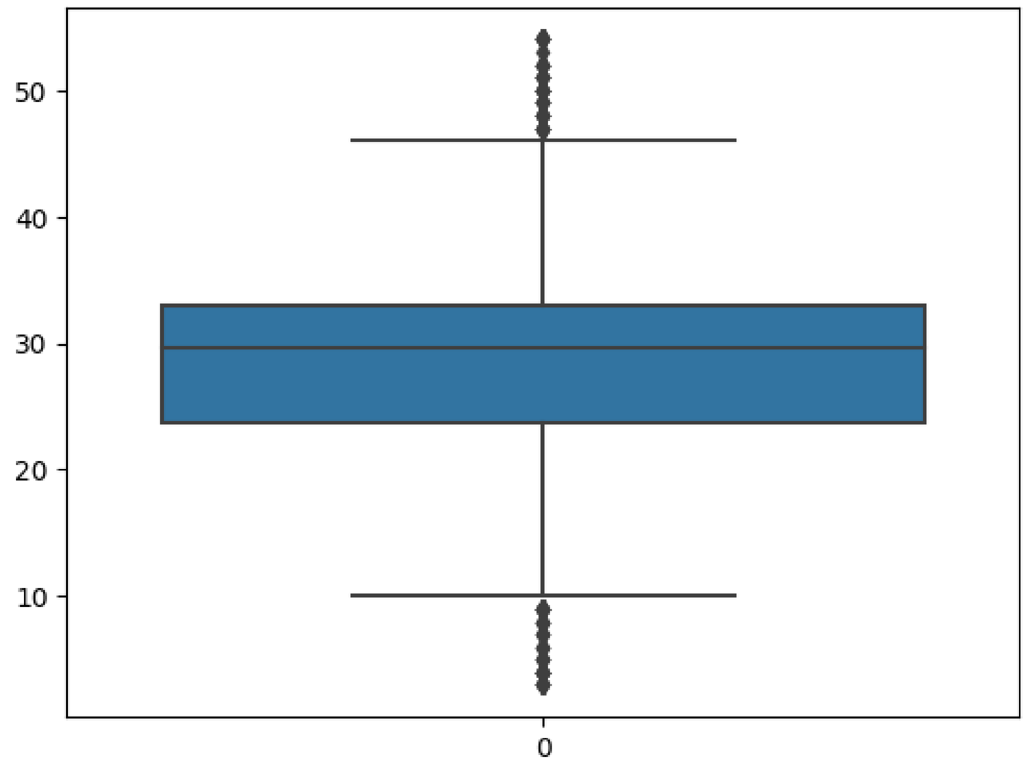
```
<ipython-input-36-135339ac59ce>:1: FutureWarning: The default value of
numeric_only in DataFrame.median is deprecated. In a future version, it will
default to False. In addition, specifying 'numeric_only=None' is deprecated.
Select only valid columns or specify the value of numeric_only to silence this
warning.
  data.median()
```

```
[ ]: PassengerId    446.000000
     Survived         0.000000
     Pclass           3.000000
     Sex              1.000000
     Age             29.699118
     SibSp            0.000000
     Parch            0.000000
     Fare            14.454200
     Embarked         2.000000
     dtype: float64
```

```
[ ]: data['Age']=np.where(data['Age']>upperlimit,29.699118,data['Age'])
     data['Age'] = np.where(data['Age'] < lowerlimit,29.699118, data['Age'])
```

```
[ ]: sns.boxplot(data['Age'])
```

```
[ ]: <Axes: >
```



[ ]:
```
q1=data.SibSp.quantile(0.25)
q3=data.SibSp.quantile(0.75)
print(q1)
print(q3)
```

```
0.0
1.0
```

[ ]:
```
iqr=q3-q1
iqr
```

[ ]:
```
1.0
```

[ ]:
```
upperlimit = q3+1.5*iqr
upperlimit
```

[ ]:
```
2.5
```

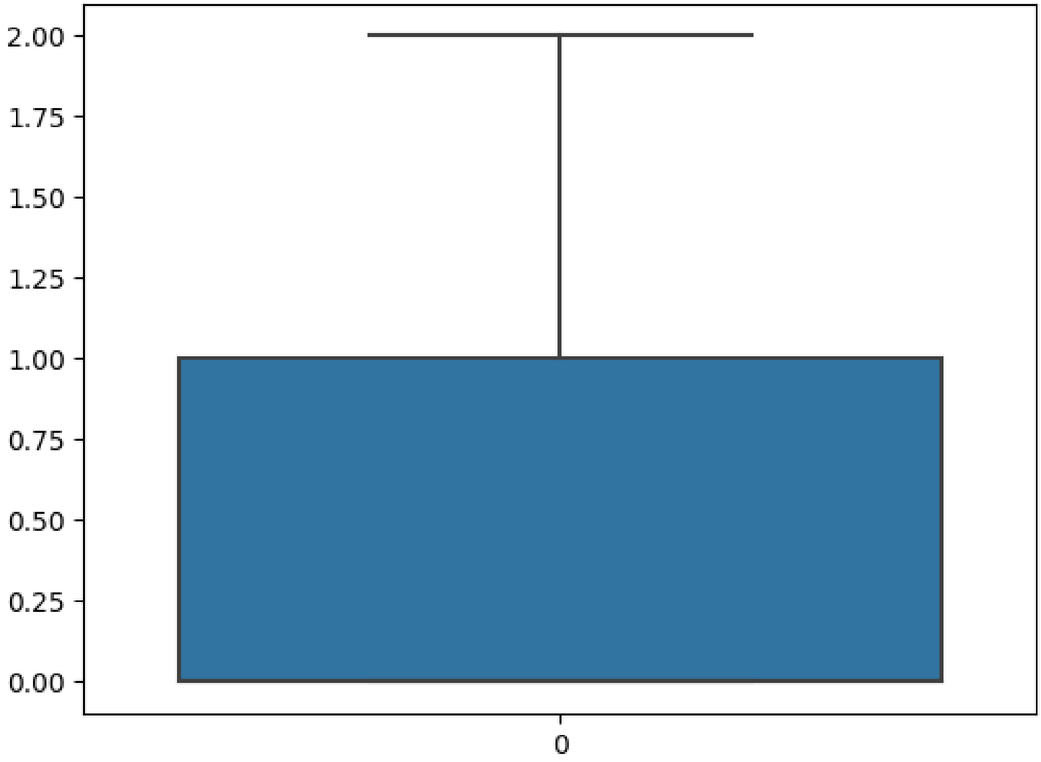
[ ]:
```
lowerlimit=q1-1.5*iqr
lowerlimit
```

[ ]:
```
-1.5
```

```
[ ]: data['SibSp']=np.where(data['SibSp']>upperlimit,0.000000,data['SibSp'])
```

```
[ ]: sns.boxplot(data['SibSp'])
```

```
[ ]: <Axes: >
```



```
[ ]: q1=data.Parch.quantile(0.25)
     q3=data.Parch.quantile(0.75)
     print(q1)
     print(q3)
```

```
0.0
0.0
```

```
[ ]: iqr=q3-q1
     iqr
```

```
[ ]: 0.0
```

```
[ ]: upperlimit = q3+1.5*iqr
     upperlimit
```

```
[ ]: 0.0
```

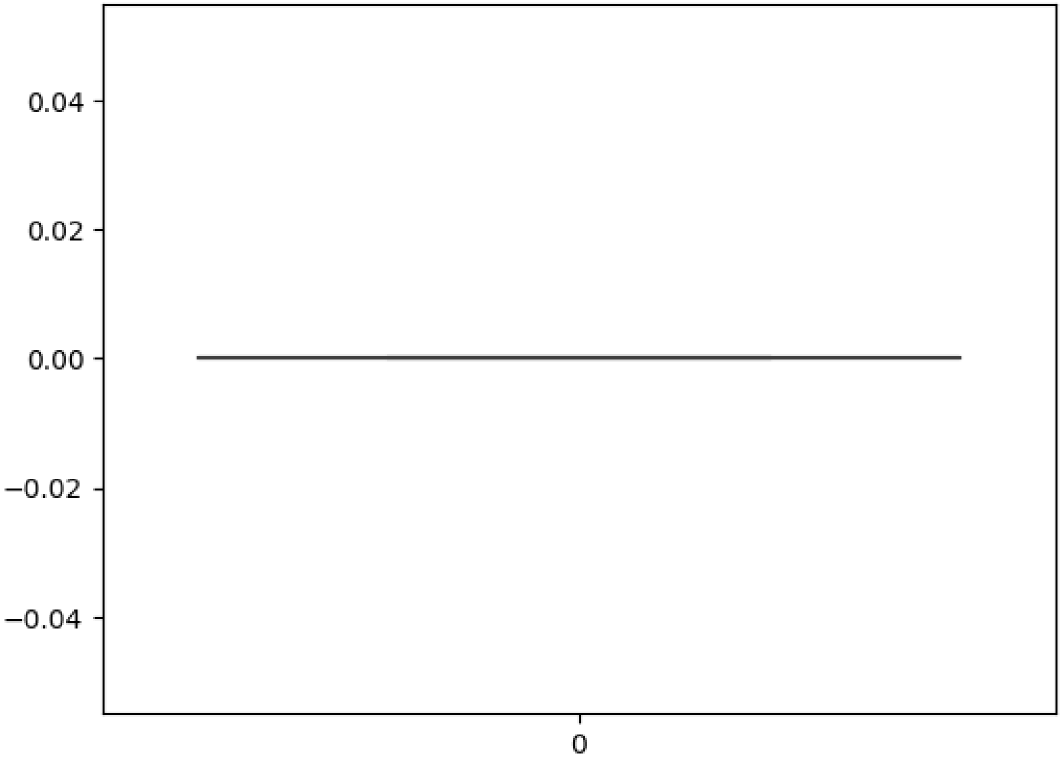
```
[ ]: lowerlimit=q1-1.5*iqr
     lowerlimit
```

```
[ ]: 0.0
```

```
[ ]: data['Parch']=np.where(data['Parch']>upperlimit,0.000000,data['Parch'])
```

```
[ ]: sns.boxplot(data['Parch'])
```

```
[ ]: <Axes: >
```



```
[ ]: q1=data.Fare.quantile(0.25)
     q3=data.Fare.quantile(0.75)
     print(q1)
     print(q3)
```

```
7.9104
31.0
```

[52]:
```
iqr=q3-q1
iqr
```

[52]:
```
23.0896
```

[53]:
```
upperlimit = q3+1.5*iqr
upperlimit
```

[53]:
```
65.6344
```

[54]:
```
lowerlimit=q1-1.5*iqr
lowerlimit
```

[54]:
```
-26.724
```

[55]:
```
data.median()
```

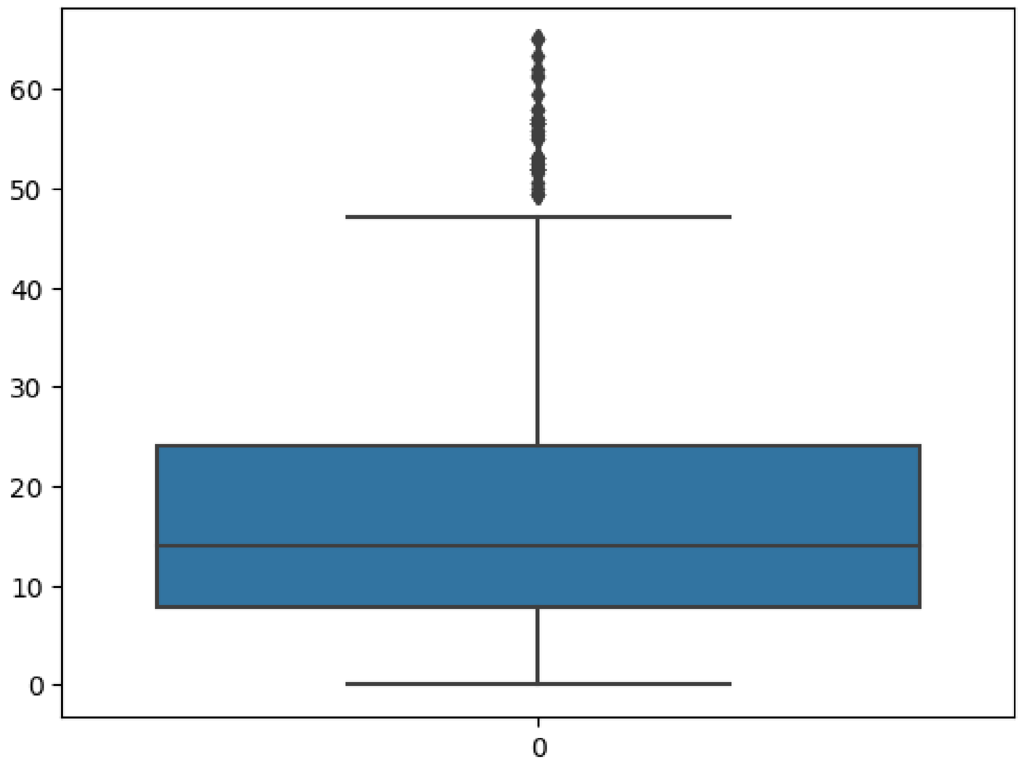
```
<ipython-input-55-135339ac59ce>:1: FutureWarning: The default value of
numeric_only in DataFrame.median is deprecated. In a future version, it will
default to False. In addition, specifying 'numeric_only=None' is deprecated.
Select only valid columns or specify the value of numeric_only to silence this
warning.
  data.median()
```

[55]:
```
PassengerId    446.000000
Survived         0.000000
Pclass           3.000000
Sex              1.000000
Age             29.699118
SibSp            0.000000
Parch            0.000000
Fare            14.454200
Embarked         2.000000
dtype: float64
```

[56]:
```
data['Fare']=np.where(data['Fare']>upperlimit,14.054150,data['Fare'])
```

[57]:
```
sns.boxplot(data.Fare)
```

[57]:
```
<Axes: >
```



```
[58]: y=data["Survived"]
```

```
[59]: X=data.drop(columns=["Name","PassengerId","Survived","Ticket","Cabin"],axis=1)
```

```
[60]: y.head()
```

```
[60]: 0    0
      1    1
      2    1
      3    1
      4    0
      Name: Survived, dtype: int64
```

```
[61]: from sklearn.preprocessing import MinMaxScaler
      ms=MinMaxScaler()
```

```
[62]: X_Scaled=ms.fit_transform(X)
```

```
[63]: X_Scaled=pd.DataFrame(ms.fit_transform(X),columns=X.columns)
```

```
[64]: X_Scaled.head()
```

```
[64]:    Pclass  Sex       Age  SibSp  Parch      Fare  Embarked
      0     1.0  1.0  0.372549    0.5    0.0  0.111538       1.0
      1     0.0  0.0  0.686275    0.5    0.0  0.216218       0.0
      2     1.0  0.0  0.450980    0.0    0.0  0.121923       1.0
      3     0.0  0.0  0.627451    0.5    0.0  0.816923       1.0
      4     1.0  1.0  0.627451    0.0    0.0  0.123846       1.0
```

```
[65]: from sklearn.model_selection import train_test_split
      x_train,x_test,y_train,y_test = train_test_split(X_Scaled,y,test_size =0.
       ↪2,random_state =0)
```

```
[66]: print(x_train.shape,x_test.shape,y_train.shape,y_test.shape)
```

```
(712, 7) (179, 7) (712,) (179,)
```

```
[ ]:
```