```
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()
```

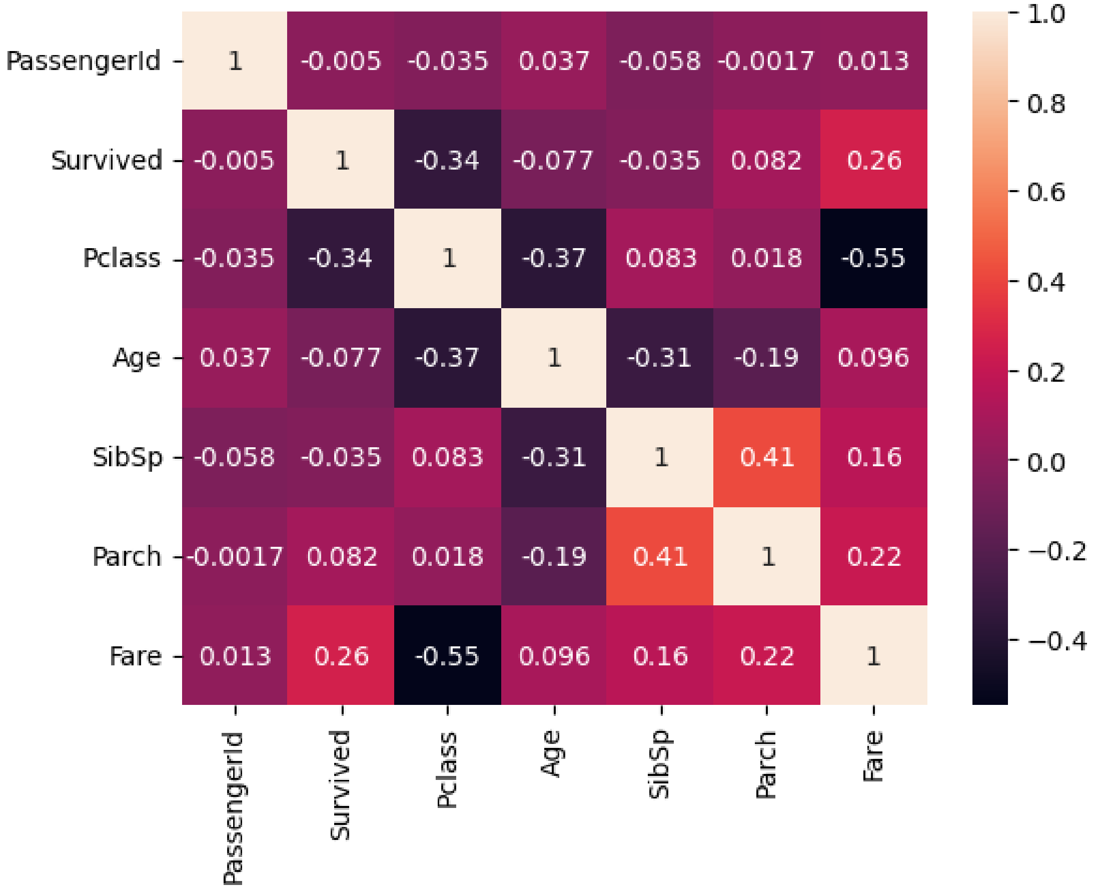
```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000   
mean    446.000000    0.383838    2.308642   29.699118    0.523008   
std     257.353842    0.486592    0.836071   14.526497    1.102743   
min       1.000000    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
```

```
             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)
```

```
<AxesSubplot:>
```



```
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)
```

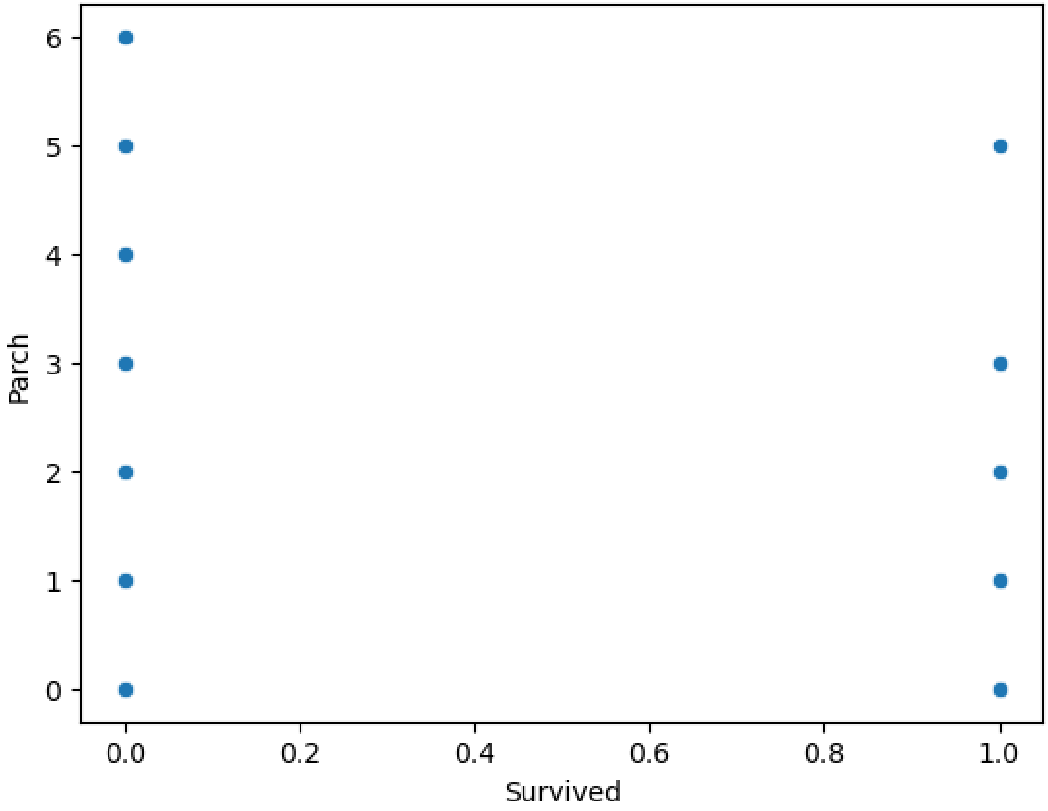
```
data.isnull().sum() #Removed all null values
```

```
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
```

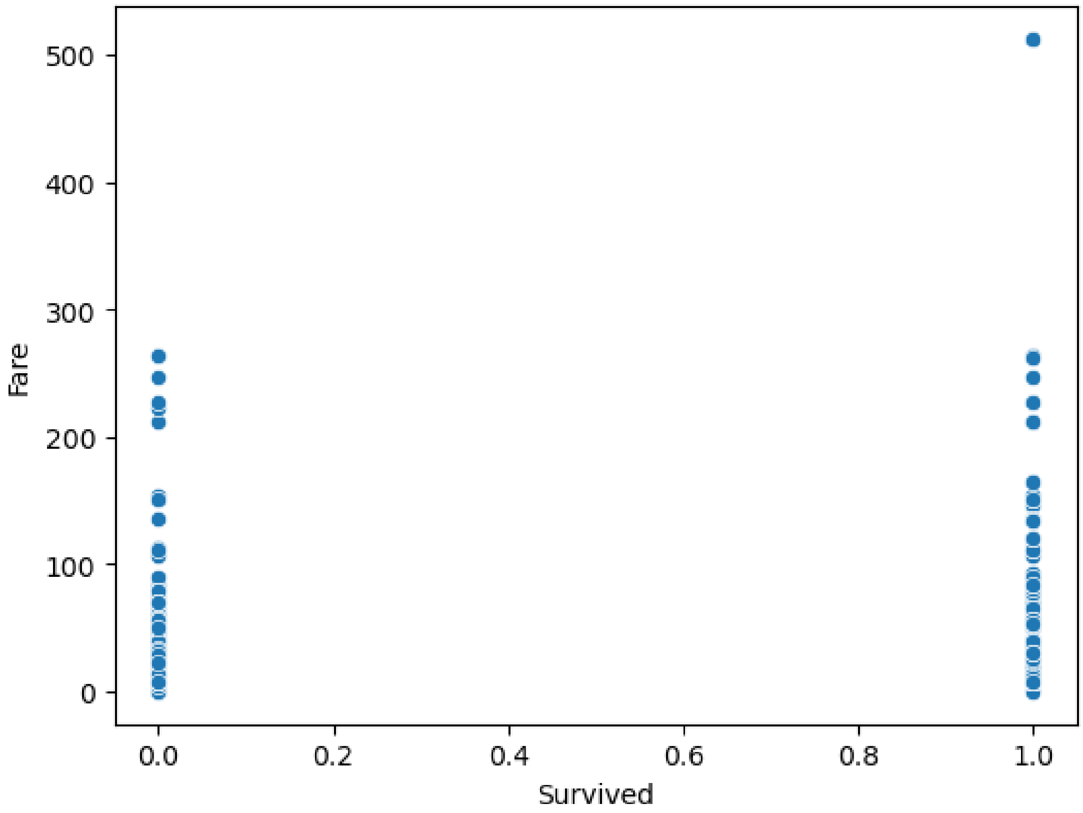
```
sns.scatterplot(x=data["Survived"],y=data["Parch"])
```

```
<AxesSubplot:xlabel='Survived', ylabel='Parch'>
```



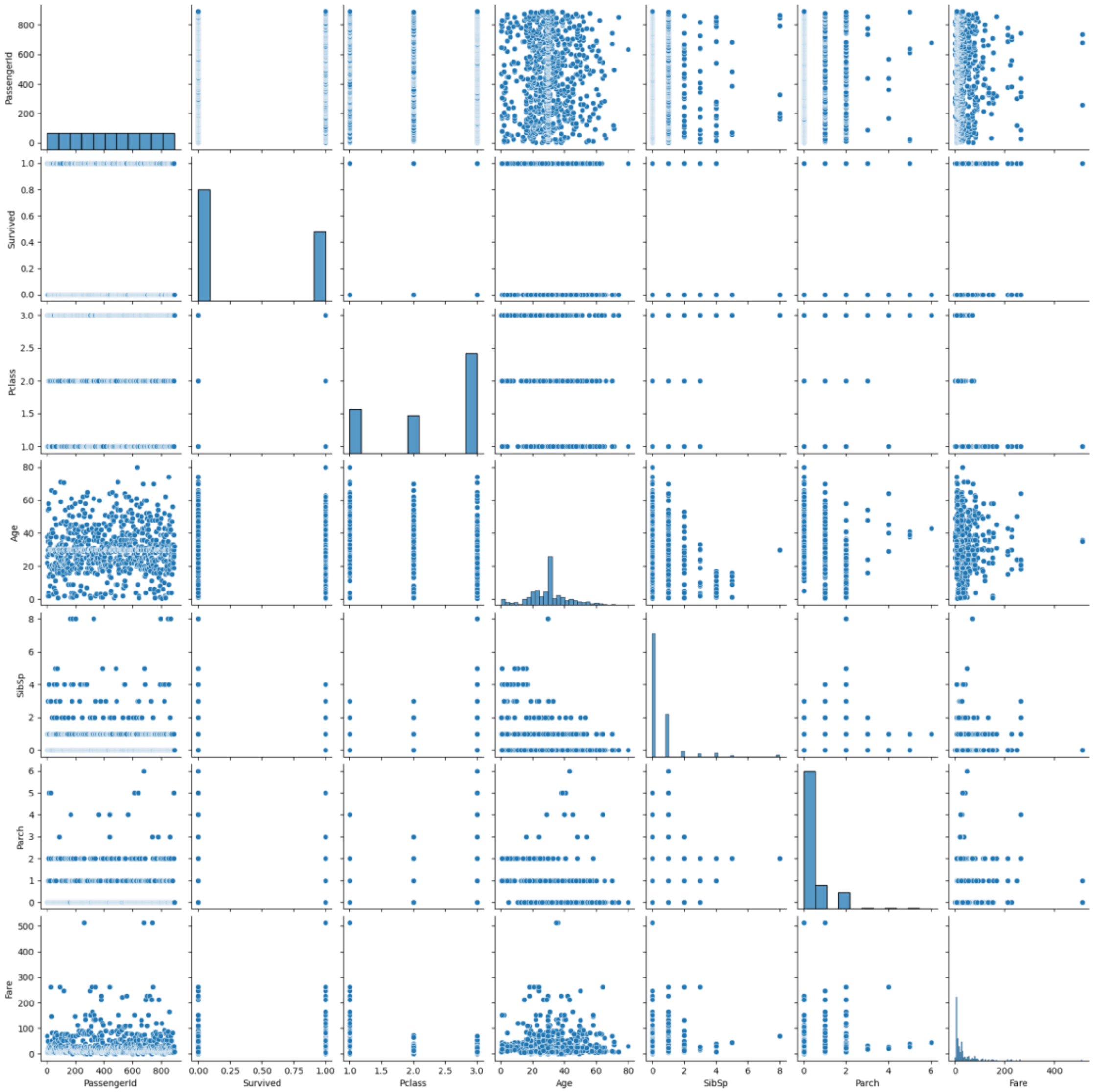
```
sns.scatterplot(x=data["Survived"],y=data["Fare"])
```

```
<AxesSubplot:xlabel='Survived', ylabel='Fare'>
```



```
sns.pairplot(data)
```

```
<seaborn.axisgrid.PairGrid at 0x2064cd352e0>
```



```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()

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

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

data.head()
```

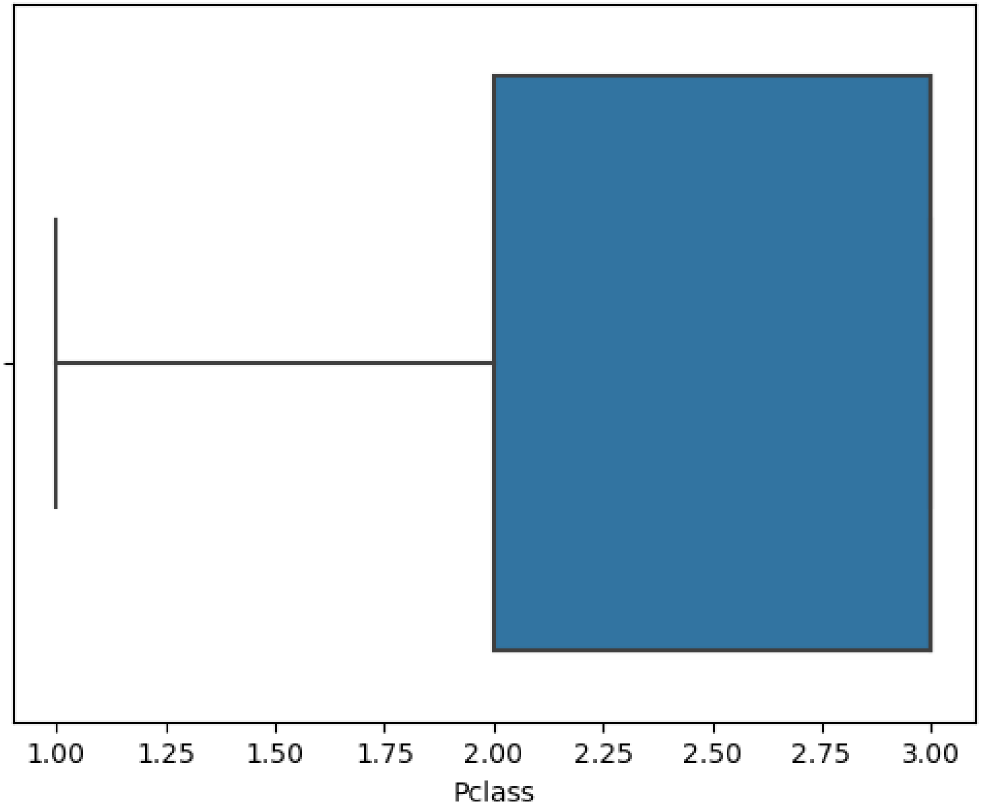
```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                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'])
```

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

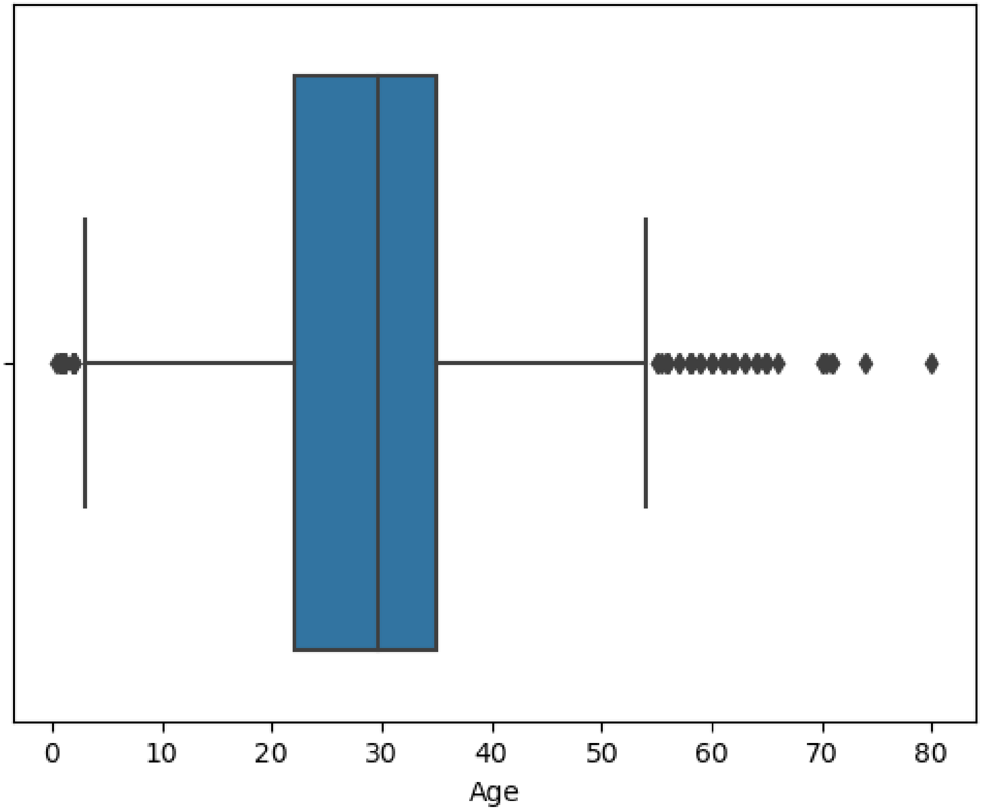
```
<AxesSubplot:xlabel='Pclass'>
```



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

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

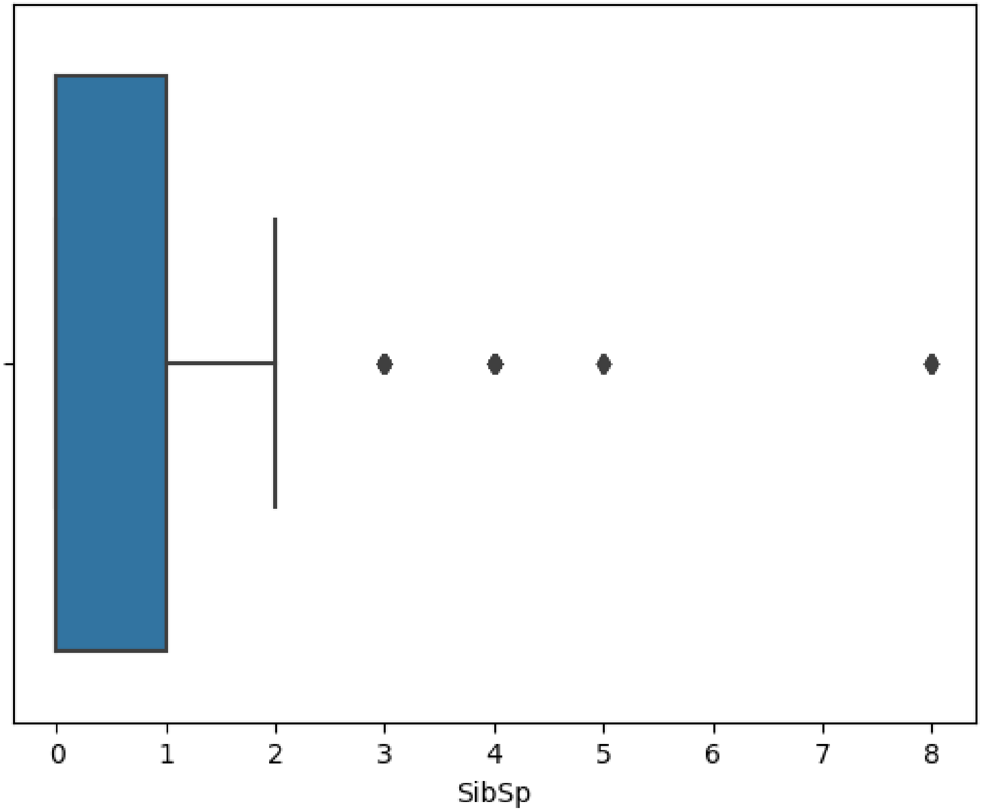
```
<AxesSubplot:xlabel='Age'>
```



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

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

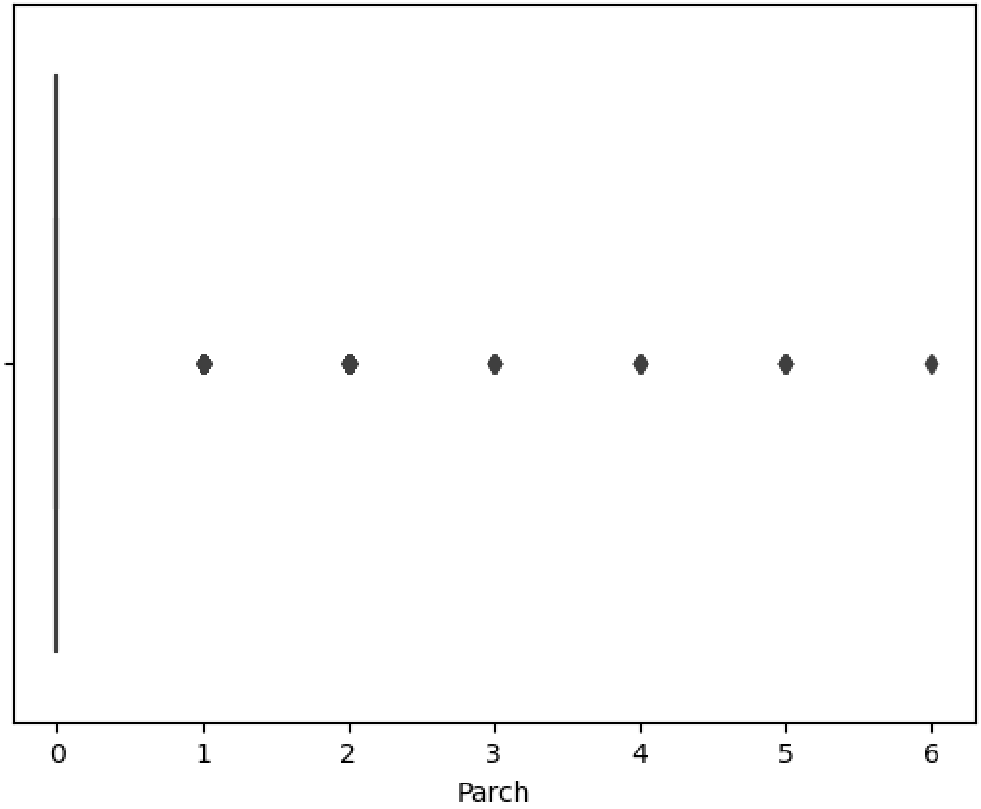
```
<AxesSubplot:xlabel='SibSp'>
```



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

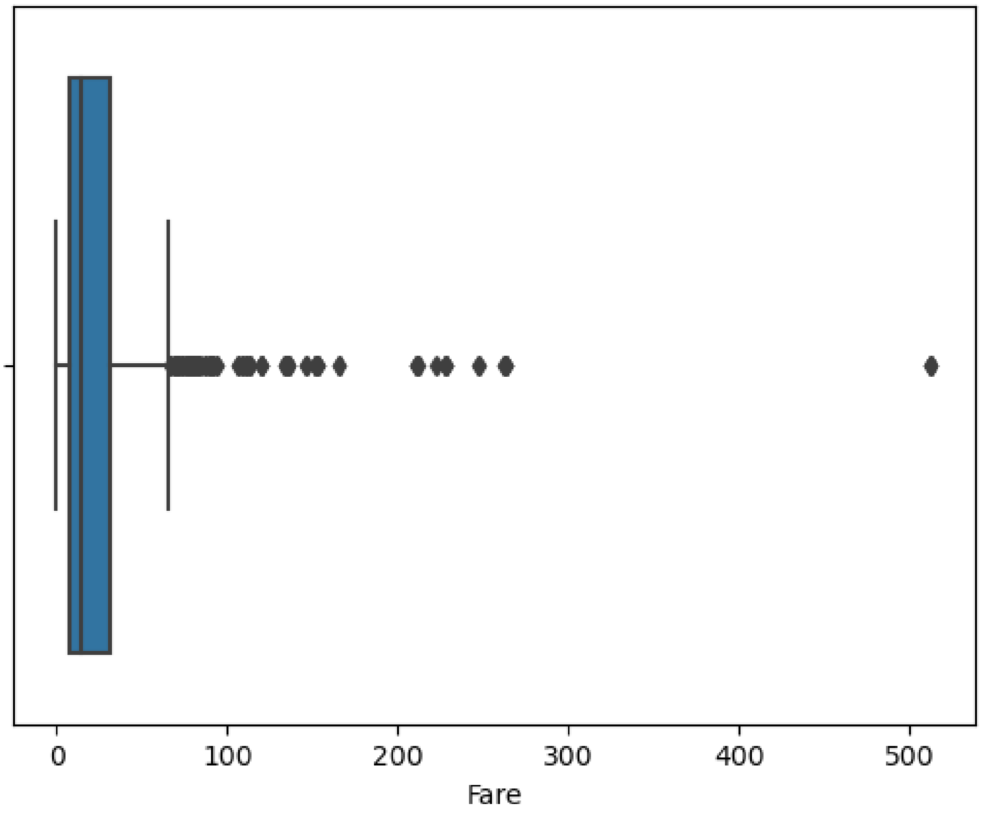
```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

```
<AxesSubplot:xlabel='Parch'>
```



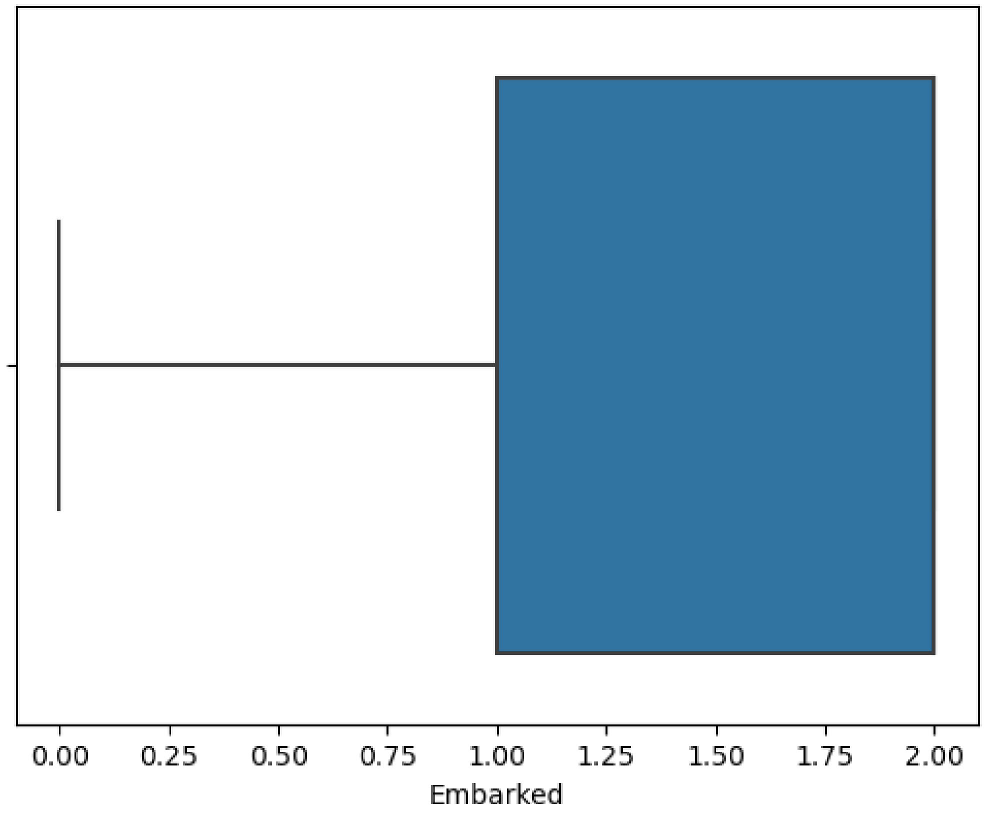
```
sns.boxplot(data['Fare'])
```

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(

<AxesSubplot:xlabel='Fare'>
```



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

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(

<AxesSubplot:xlabel='Embarked'>
```



```
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()
```

```
C:\Users\siva\AppData\Local\Temp\ipykernel_11488\4184645713.py:1:
FutureWarning: Dropping of nuisance columns in DataFrame reductions (with
'numeric_only=None') is deprecated; in a future version this will raise
TypeError.  Select only valid columns before calling the reduction.
  data.median()
```

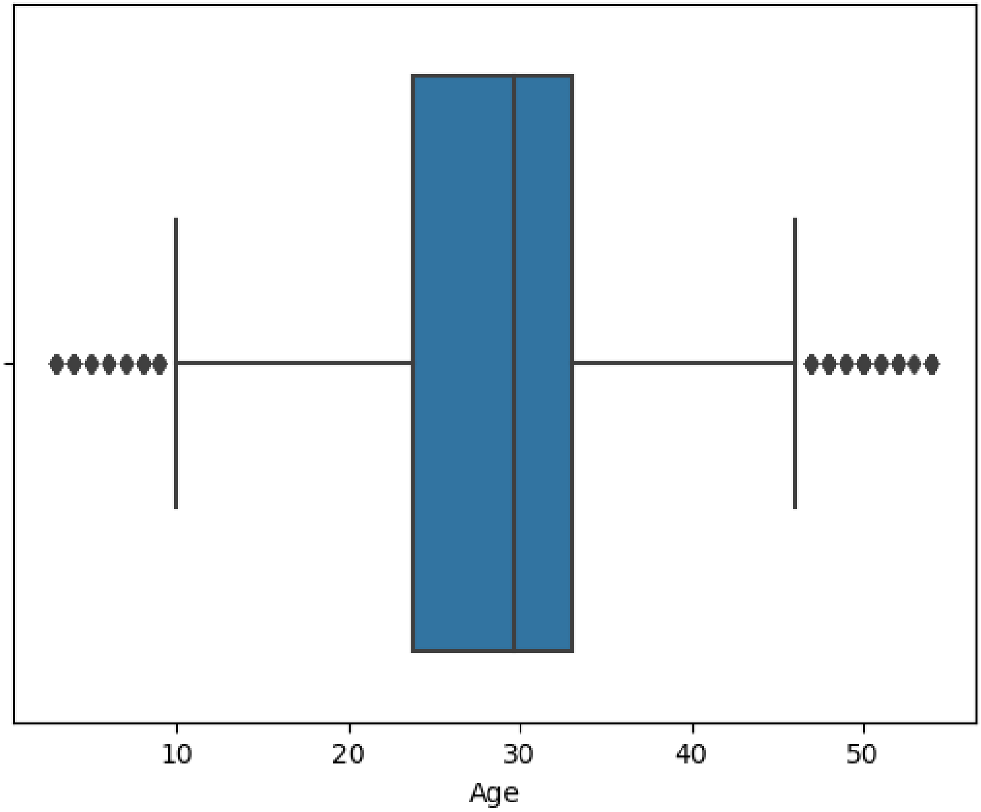
```
PassengerId    446.000000
Survived         0.000000
Pclass           3.000000
Sex              1.000000
Age             29.699118
SibSp            0.000000
Parch            0.000000
Fare            14.454200
Embarked         2.000000
dtype: float64
```

```
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'])
```

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

```
<AxesSubplot:xlabel='Age'>
```



```
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
```

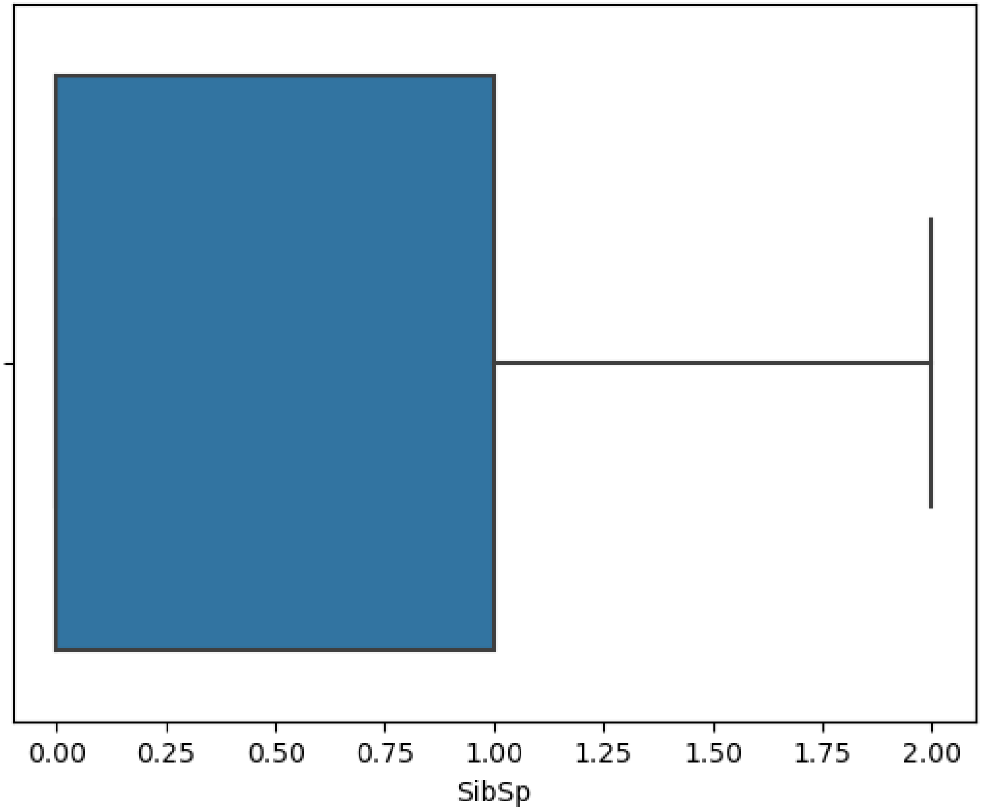
```
-1.5
```

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

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

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

```
<AxesSubplot:xlabel='SibSp'>
```



```
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
```

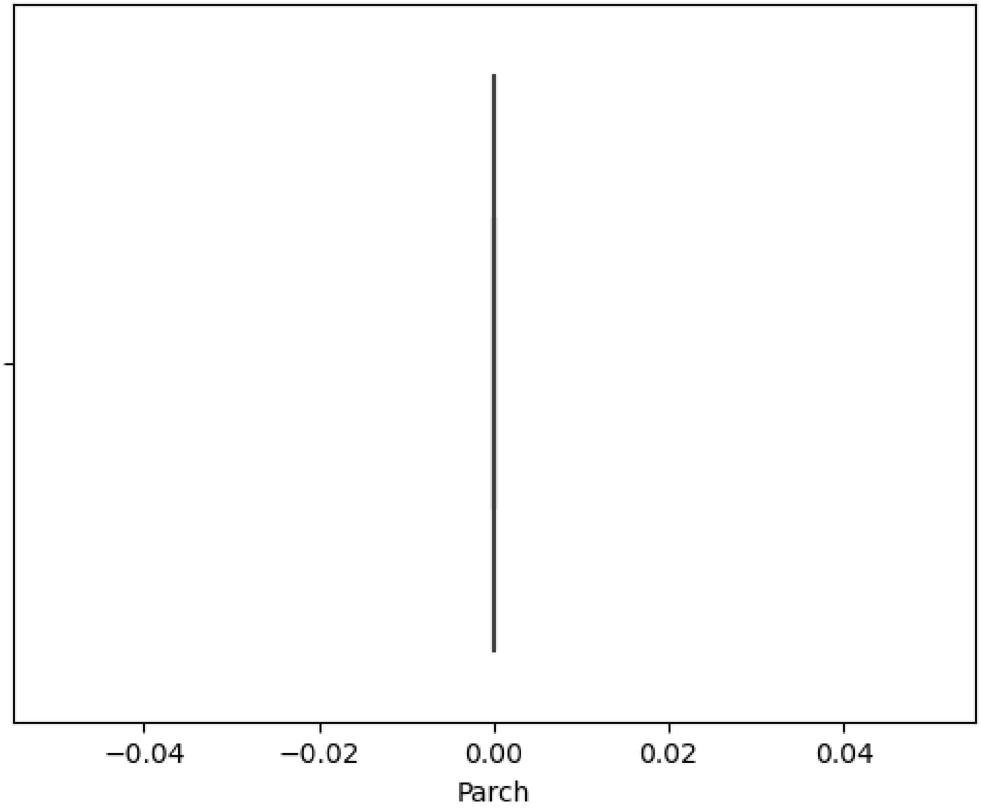
```
0.0
```

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

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

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

```
<AxesSubplot:xlabel='Parch'>
```



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

```
7.8958
30.0
```

```
iqr=q3-q1
iqr
```

```
22.1042
```

```
upperlimit = q3+1.5*iqr
upperlimit
```

```
63.1563
```

```
lowerlimit=q1-1.5*iqr
lowerlimit
```

```
-25.2605
```

```
data.median()
```

```
C:\Users\siva\AppData\Local\Temp\ipykernel_11488\4184645713.py:1:
FutureWarning: Dropping of nuisance columns in DataFrame reductions (with
'numeric_only=None') is deprecated; in a future version this will raise
TypeError.  Select only valid columns before calling the reduction.
  data.median()
```

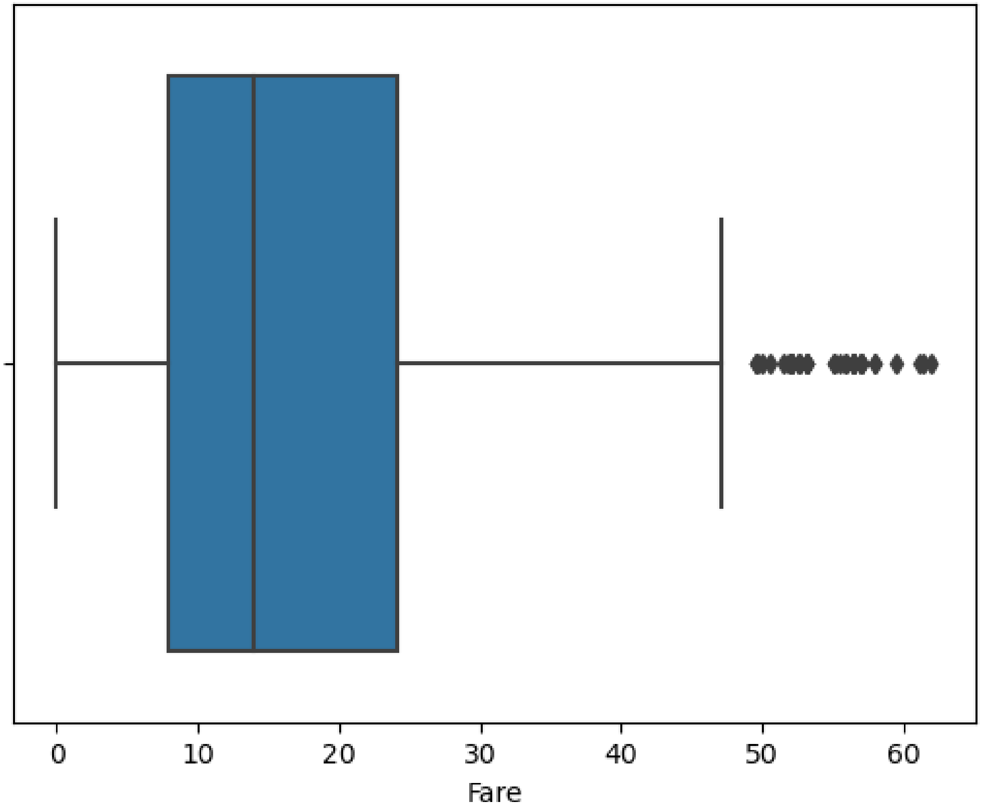
```
PassengerId    447.500000
Survived         0.000000
Pclass           3.000000
Sex              1.000000
Age             29.699118
SibSp            0.000000
Parch            0.000000
Fare            14.054150
Embarked         2.000000
dtype: float64
```

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

```
sns.boxplot(data.Fare)
```

```
C:\Users\siva\anaconda3\lib\site-packages\seaborn\_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(
```

```
<AxesSubplot:xlabel='Fare'>
```



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

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

```
y.head()
```

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

```
from sklearn.preprocessing import MinMaxScaler
ms=MinMaxScaler()
```

```
X_Scaled=ms.fit_transform(X)
```

```
X_Scaled=pd.DataFrame(ms.fit_transform(X),columns=X.columns)
```

```
X_Scaled.head()
```

```
   Pclass  Sex       Age  SibSp  Parch      Fare  Embarked
0     1.0  1.0  0.372549    0.5    0.0  0.116975       1.0
1     0.0  0.0  0.686275    0.5    0.0  0.226756       0.0
2     1.0  0.0  0.450980    0.0    0.0  0.127865       1.0
```

```
3     0.0  0.0  0.627451    0.5    0.0  0.856739       1.0
4     1.0  1.0  0.627451    0.0    0.0  0.129882       1.0
```

```
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)
```

```
print(x_train.shape,x_test.shape,y_train.shape,y_test.shape)
```

```
(699, 7) (175, 7) (699,) (175,)
```