ASSIGNMENT 3

Beesetty sathwik

In [1]:
```
import numpy as np
```

In [2]:
```
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
```

In [3]:
```
df = pd.read_csv("Titanic-Dataset.csv")
df
```

Out[3]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	F
0	1	0	3	B aund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2
1	2	1	1	Cu nings, Mrs. John B radley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0
...	...	...	...	...	...	...	...	...	...	
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4
889	890	1	1	Behr, Mr. Karl	male	26.0	0	0	111369	30.0

				Howell						
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7

891 rows × 12 columns

In [4]:
```
df.head()
```

Out[4]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
0	1	0	3	B aund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.250
1	2	1	1	Cu nings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.283
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.925
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.100
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.050

In [5]:
```
df.isnull().any()
```

Out[5]:
```
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
```

In [6]:
```
df.isnull().sum()
```

Out[6]:
```
PassengerId      0
```

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

In [7]:
```
df.describe()
```

Out[7]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fa
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.00000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.20420
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.69342
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.00000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.91040
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.45420
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.00000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.32920

In [8]:
```
df.shape
```

Out[8]:
```
(891, 12)
```

In [9]:
```
df["Age"].fillna(df["Age"].mean(),inplace = True)
```

In [10]:
```
df["Cabin"].fillna(df["Cabin"].mode()[0],inplace = True)
df["Embarked"].fillna(df["Embarked"].mode()[0],inplace = True)
```

In [11]:
```
df.isnull().any()
```

Out[11]:
```
PassengerId    False
Survived       False
Pclass         False
Name           False
Sex            False
Age            False
SibSp          False
Parch          False
Ticket         False
Fare           False
Cabin          False
```

```
Embarked        False
dtype: bool
```

In [12]:
```
df.isnull().sum()
```

Out[12]:
```
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
```

In [13]:
```
corr = df.corr()
corr
```

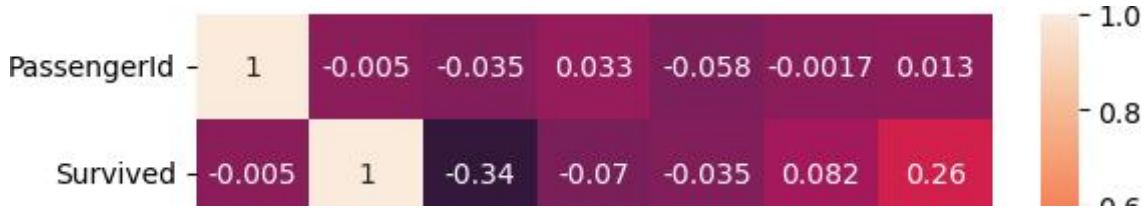
```
/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/2
438084875.py:1: FutureWarning: The default value of numeric_only i
n DataFrame.corr is deprecated. In a future version, it will defau
lt to False. Select only valid columns or specify the value of num
eric_only to silence this warning.
  corr = df.corr()
```

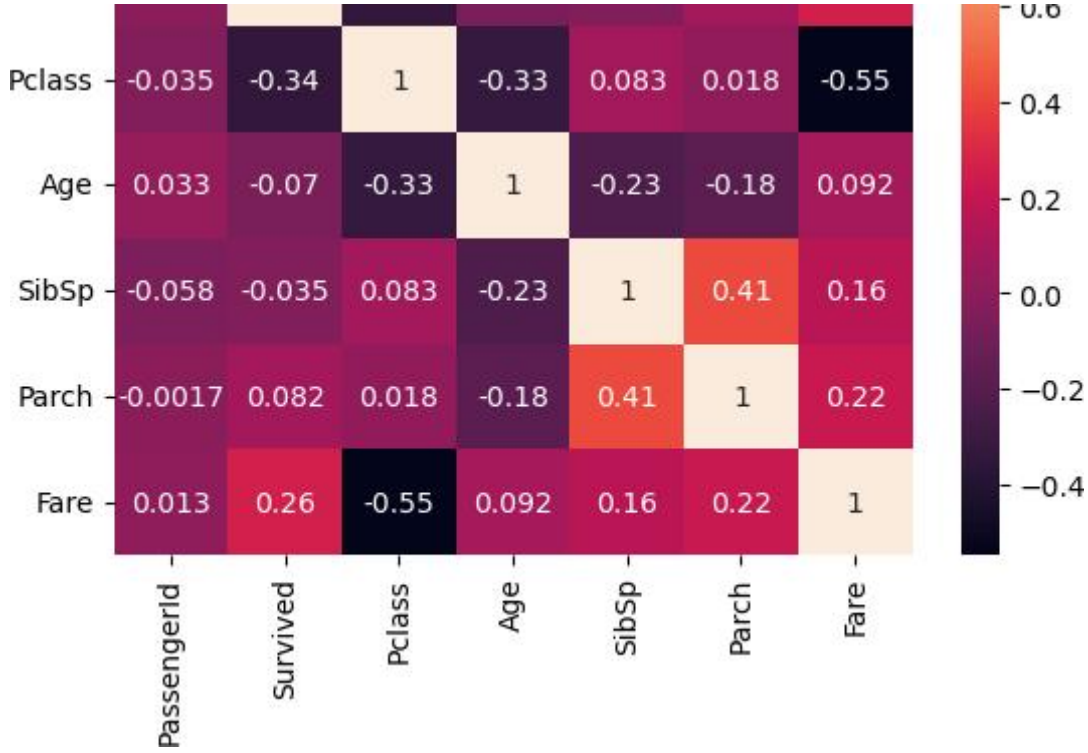
Out[13]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
PassengerId	1.000000	-0.005007	-0.035144	0.033207	-0.057527	-0.001652	0.012658
Survived	-0.005007	1.000000	-0.338481	-0.069809	-0.035322	0.081629	0.257307
Pclass	-0.035144	-0.338481	1.000000	-0.331339	0.083081	0.018443	-0.549500
Age	0.033207	-0.069809	-0.331339	1.000000	-0.232625	-0.179191	0.091566
SibSp	-0.057527	-0.035322	0.083081	-0.232625	1.000000	0.414838	0.159651
Parch	-0.001652	0.081629	0.018443	-0.179191	0.414838	1.000000	0.216225
Fare	0.012658	0.257307	-0.549500	0.091566	0.159651	0.216225	1.000000

In [14]:
```
sns.heatmap(corr,annot = True)
```

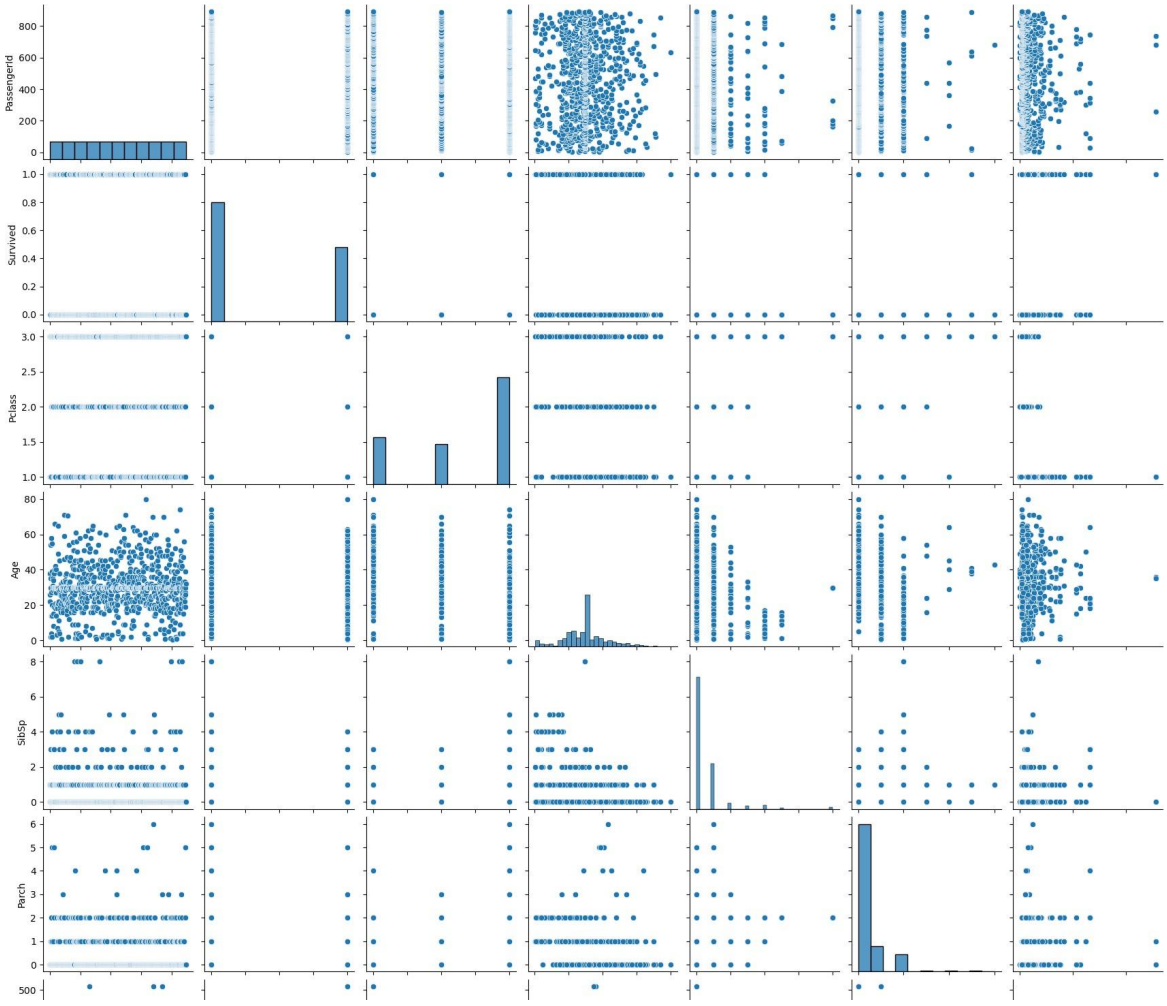
Out[14]:
```
<Axes: >
```

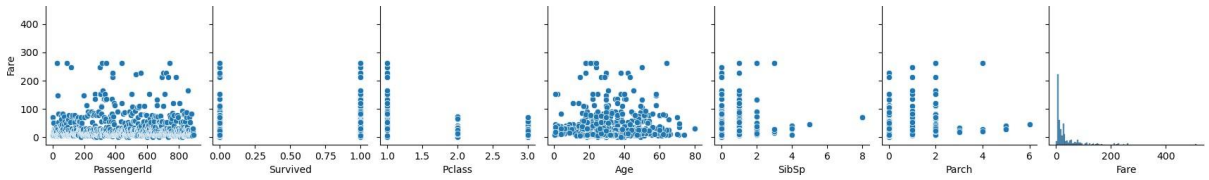




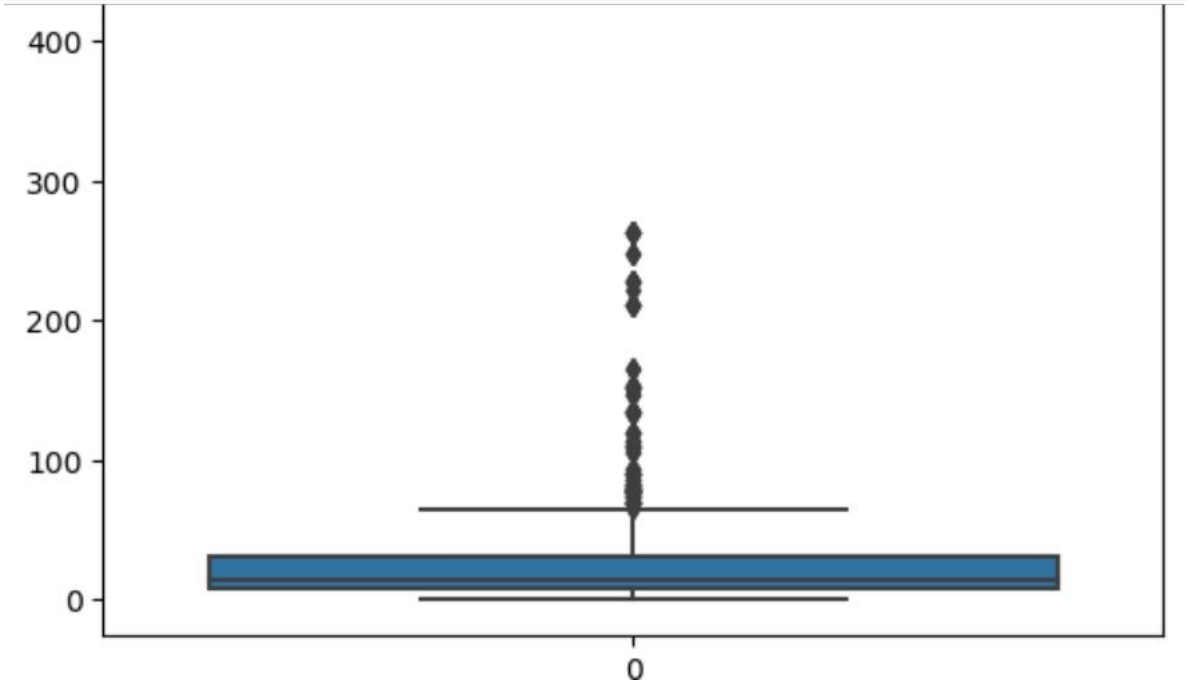
In [15]:
```
sns.pairplot(df)
```

Out[15]: <seaborn.axisgrid.PairGrid at 0x160b066d0>





In [16]:
```
sns.boxplot(df.Fare)
```



In [17]:
```
q1 = df.Fare.quantile(0.25)
q3 = df.Fare.quantile(0.75)
print(q1)
print(q3)
```

```
7.9104
31.0
```

In [18]:
```
q3-q1
```

Out[18]: 23.0896

In [19]:
```
upperlimit = q3+1.5*(q3-q1)
upperlimit
```

Out[19]: 65.6344

In [20]:
```
lowerlimit = q1-1.5*(q3-q1)
lowerlimit
```

Out[20]: -26.724

In [21]:
```
df.median()
```

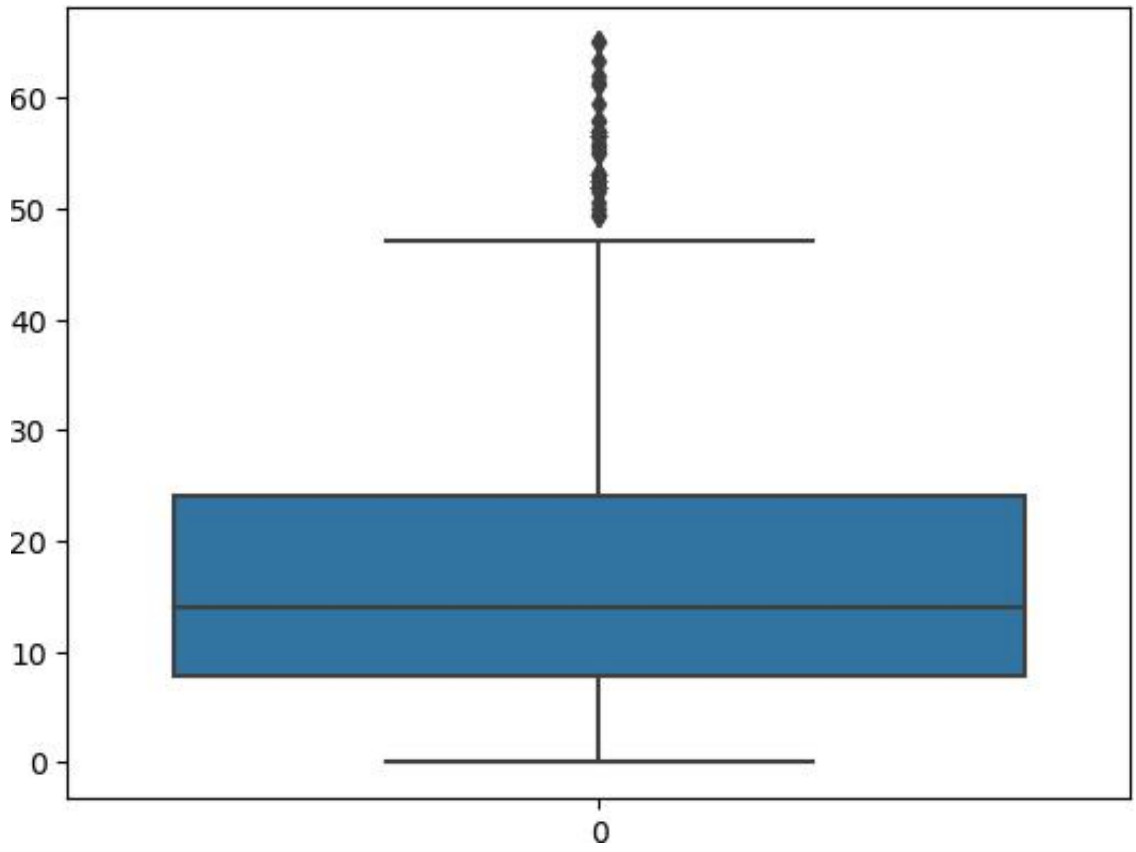
```
/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/5
30051474.py:1: FutureWarning: The default value of numeric_only in
DataFrame.median is deprecated. In a future version, it will defau
lt to False. In addition, specifying 'numeric_only=None' is deprec
ated. Select only valid columns or specify the value of numeric_on
ly to silence this warning.
  df.median()
```

Out[21]:
```
PassengerId     446.000000
Survived          0.000000
Pclass            3.000000
Age              29.699118
SibSp             0.000000
Parch             0.000000
Fare             14.454200
dtype: float64
```

In [22]:
```
df["Fare"]=np.where(df["Fare"]>upperlimit,14,df['Fare'])
```

In [23]:
```
sns.boxplot(df.Fare)
```

Out[23]: <Axes: >



In [24]:
```
q1 = df.Fare.quantile(0.25)
q3 = df.Fare.quantile(0.75)
print(q1)
print(q3)
```

```
7.9104
24.15
```

In [25]:
```
q3-q1
upperlimit = q3+1.5*(q3-q1)
upperlimit
lowerlimit = q1-1.5*(q3-q1)
lowerlimit
df.median()
```

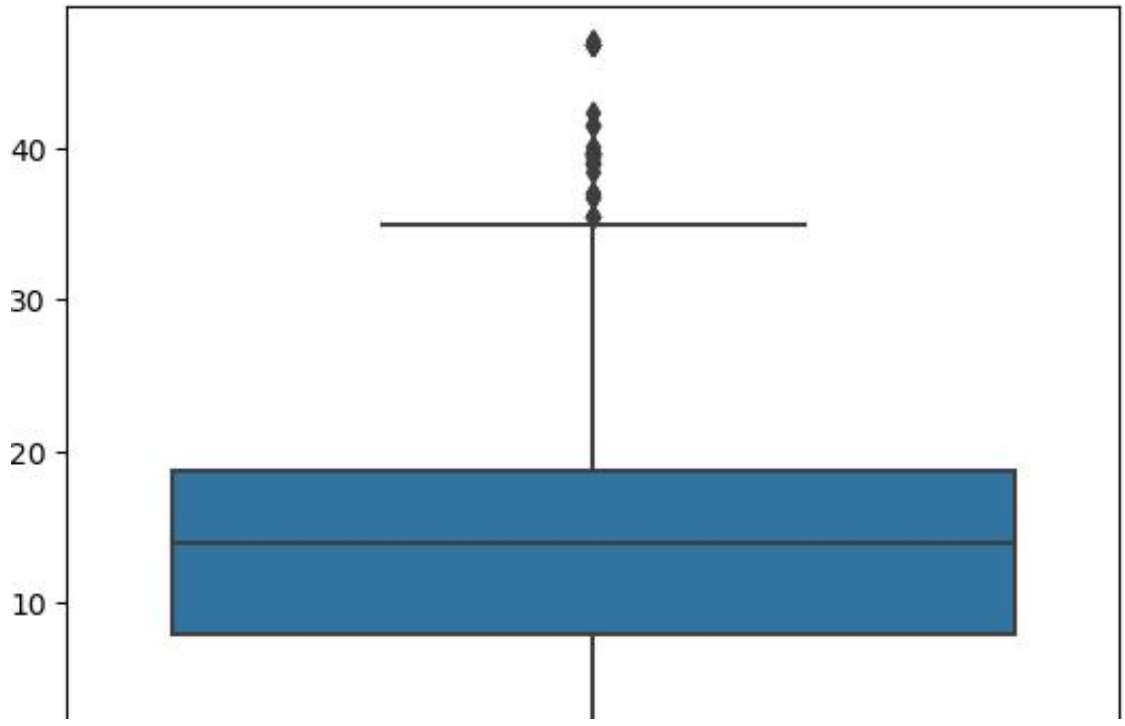
```
/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/1
306267861.py:6: FutureWarning: The default value of numeric_only i
n DataFrame.median is deprecated. In a future version, it will def
ault to False. In addition, specifying 'numeric_only=None' is depr
ecated. Select only valid columns or specify the value of numeric_
only to silence this warning.
  df.median()
```

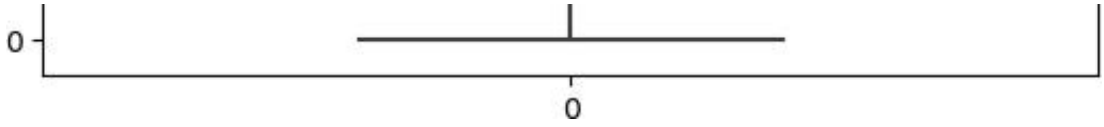
Out[25]:
```
PassengerId     446.000000
Survived          0.000000
Pclass            3.000000
Age              29.699118
SibSp             0.000000
Parch             0.000000
Fare             14.000000
dtype: float64
```

In [26]:
```
df["Fare"]=np.where(df["Fare"]>upperlimit,14,df['Fare'])
```

In [27]:
```
sns.boxplot(df.Fare)
```

Out[27]:
```
<Axes: >
```





In [28]:
```
q1 = df.Fare.quantile(0.25)
q3 = df.Fare.quantile(0.75)
print(q1)
print(q3)
```

```
7.9104
18.75
```

In [29]:
```
q3-q1
upperlimit = q3+1.5*(q3-q1)
upperlimit
lowerlimit = q1-1.5*(q3-q1)
lowerlimit
df.median()
```

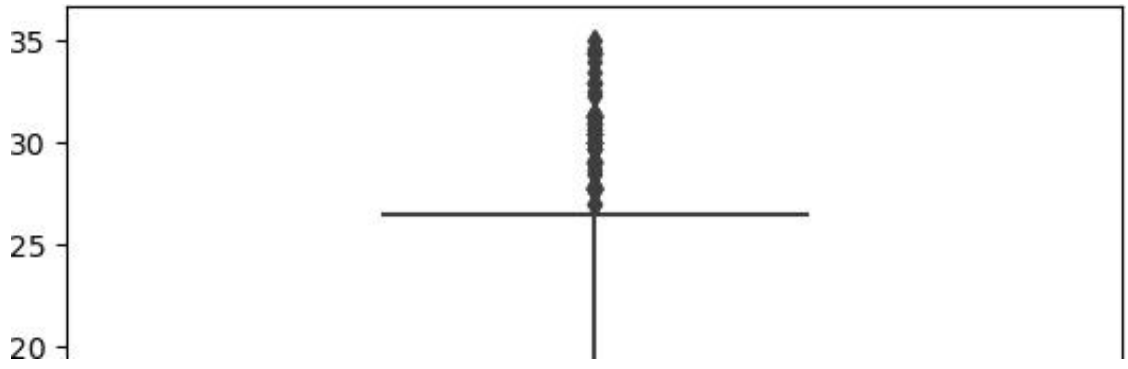
```
/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/1
306267861.py:6: FutureWarning: The default value of numeric_only i
n DataFrame.median is deprecated. In a future version, it will def
ault to False. In addition, specifying 'numeric_only=None' is depr
ecated. Select only valid columns or specify the value of numeric_
only to silence this warning.
  df.median()
```

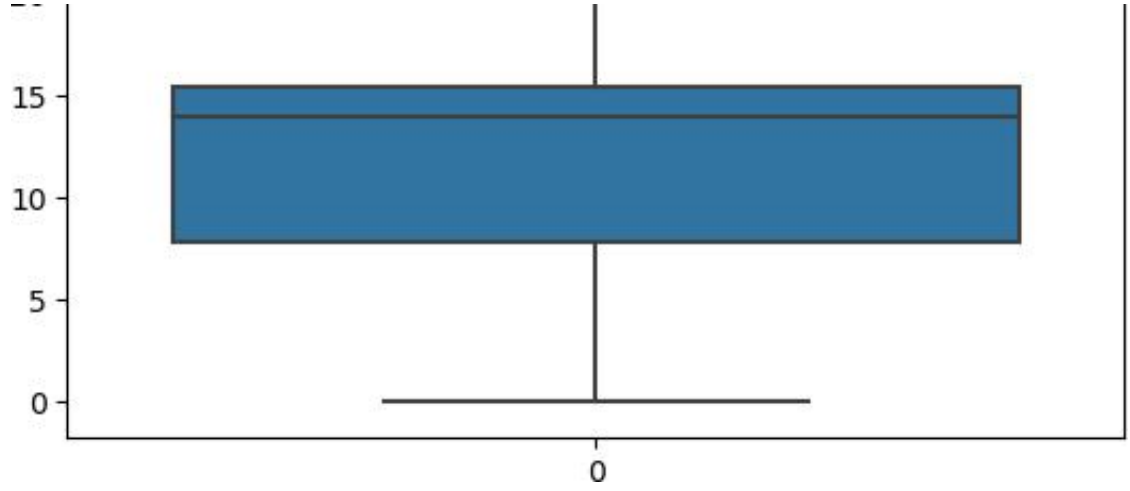
Out[29]:
```
PassengerId     446.000000
Survived          0.000000
Pclass            3.000000
Age              29.699118
SibSp             0.000000
Parch             0.000000
Fare             14.000000
dtype: float64
```

In [30]:
```
df["Fare"]=np.where(df["Fare"]>upperlimit,14,df['Fare'])
```

In [31]:
```
sns.boxplot(df.Fare)
```

Out[31]:
```
<Axes: >
```





In [32]:
```
q1 = df.Fare.quantile(0.25)
q3 = df.Fare.quantile(0.75)
print(q1)
print(q3)
```

```
7.9104
15.5
```

In [33]:
```
q3-q1
upperlimit = q3+1.5*(q3-q1)
upperlimit
lowerlimit = q1-1.5*(q3-q1)
lowerlimit
df.median()
```

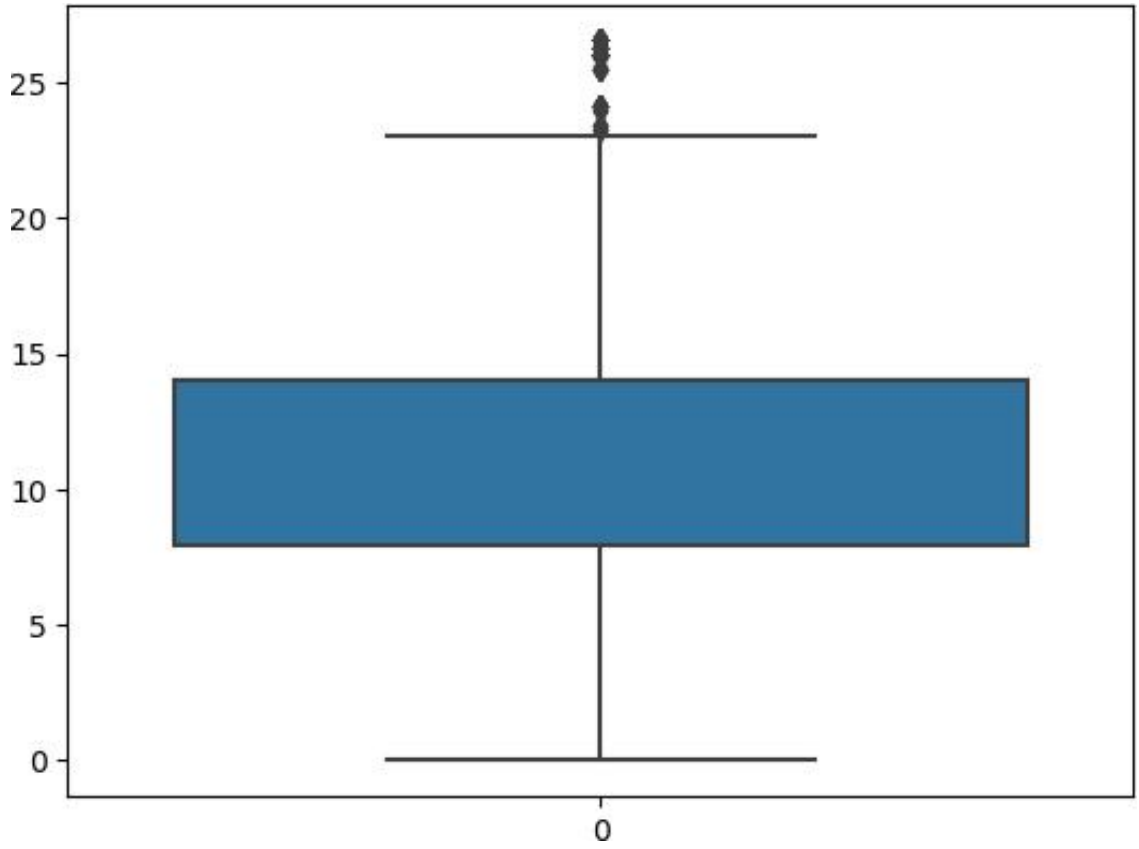
```
/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/1
306267861.py:6: FutureWarning: The default value of numeric_only i
n DataFrame.median is deprecated. In a future version, it will def
ault to False. In addition, specifying 'numeric_only=None' is depr
ecated. Select only valid columns or specify the value of numeric_
only to silence this warning.
  df.median()
```

Out[33]:
```
PassengerId     446.000000
Survived          0.000000
Pclass            3.000000
Age              29.699118
SibSp             0.000000
Parch             0.000000
Fare             14.000000
dtype: float64
```

In [34]:
```
df["Fare"]=np.where(df["Fare"]>upperlimit,14,df['Fare'])
```

In [35]:
```
sns.boxplot(df.Fare)
```

Out[35]:
```
<Axes: >
```



In [36]:
```
q1 = df.Fare.quantile(0.25)
q3 = df.Fare.quantile(0.75)
print(q1)
print(q3)
q3-q1
upperlimit = q3+1.5*(q3-q1)
upperlimit
lowerlimit = q1-1.5*(q3-q1)
lowerlimit
df.median()
```

```
7.9104
14.0

/var/folders/ks/ljk00dm1703810nybztmtjgw0000gn/T/ipykernel_82763/3
315198721.py:10: FutureWarning: The default value of numeric_only
in DataFrame.median is deprecated. In a future version, it will de
fault to False. In addition, specifying 'numeric_only=None' is dep
recated. Select only valid columns or specify the value of numeric
_only to silence this warning.
  df.median()
```

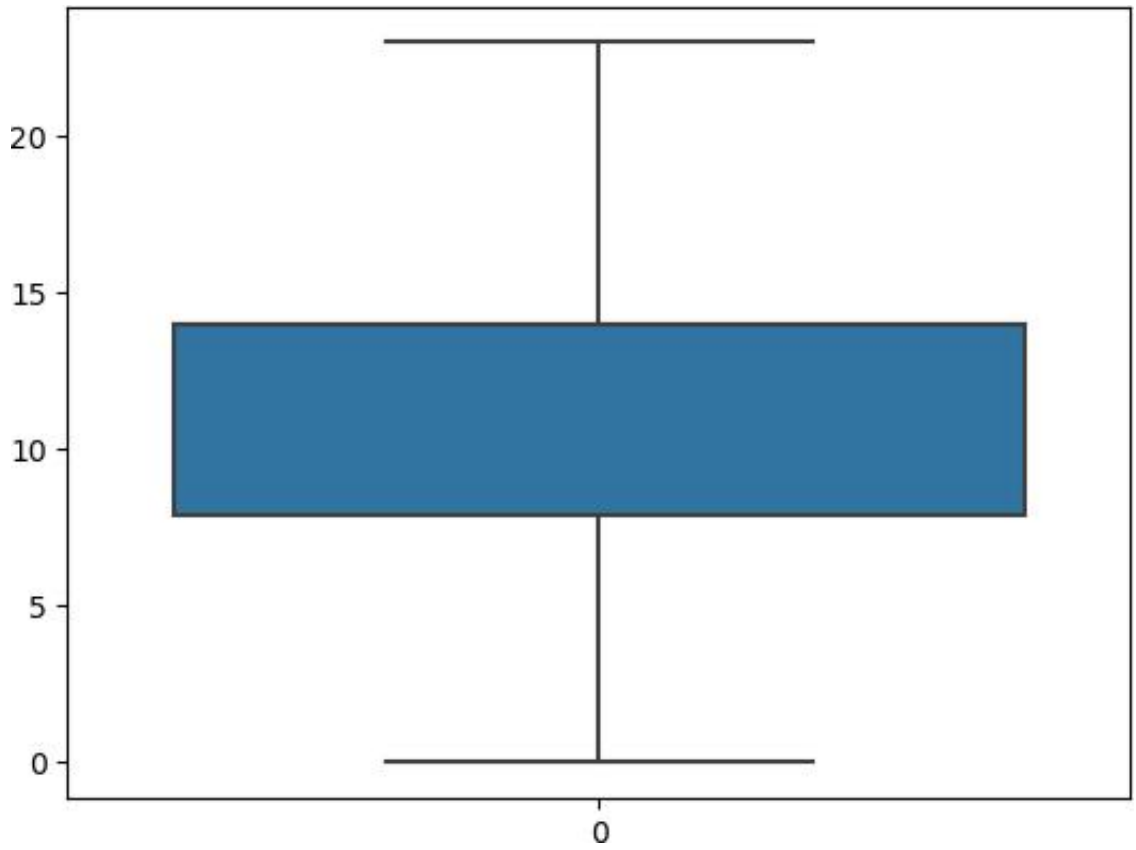
Out[36]:
```
PassengerId     446.000000
Survived          0.000000
Pclass            3.000000
Age              29.699118
SibSp             0.000000
Parch             0.000000
Fare             14.000000
```

```
dtype: float64
```

In [37]:
```
df["Fare"]=np.where(df["Fare"]>upperlimit,14,df['Fare'])
```

In [38]:
```
sns.boxplot(df.Fare)
```

Out[38]:
```
<Axes: >
```



In [39]:
```
x = df.drop('Survived',axis=1)
y = df['Survived']
```

In [40]:
```
x.head()
```

Out[40]:

	PassengerId	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	E
0	1	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.250	B96 B98	
1	2	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	14.000	C85	
2	3	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.925	B96 B98	

3	4	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	14.000	C123
4	5	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.050	B96 B98

In [41]:
```
y.head()
```

Out[41]:
```
0    0
1    1
2    1
3    1
4    0
Name: Survived, dtype: int64
```

In [42]:
```
x = df.iloc[:,4:13]
x
```

Out[42]:

	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	male	22.000000	1	0	A/5 21171	7.250	B96 B98	S
1	female	38.000000	1	0	PC 17599	14.000	C85	C
2	female	26.000000	0	0	STON/O2. 3101282	7.925	B96 B98	S
3	female	35.000000	1	0	113803	14.000	C123	S
4	male	35.000000	0	0	373450	8.050	B96 B98	S
...	...	...	...	...	...	...	...	...
886	male	27.000000	0	0	211536	13.000	B96 B98	S
887	female	19.000000	0	0	112053	14.000	B42	S
888	female	29.699118	1	2	W./C. 6607	14.000	B96 B98	S
889	male	26.000000	0	0	111369	14.000	C148	C
890	male	32.000000	0	0	370376	7.750	B96 B98	Q

891 rows × 8 columns

In [43]:
```
print(type(x))
```

```
<class 'pandas.core.frame.DataFrame'>
```

In [44]:
```
print(type(y))
```

```
<class 'pandas.core.series.Series'>
```

In [45]:
```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
```

In [46]:
```
x["Sex"] = le.fit_transform(x["Sex"])
x["Sex"]
```

Out[46]:
```
0       1
1       0
2       0
3       0
4       1
       ..
886     1
887     0
888     0
889     1
890     1
Name: Sex, Length: 891, dtype: int64
```

In [47]:
```
x["Sex"].value_counts()
```

Out[47]:
```
1    577
0    314
Name: Sex, dtype: int64
```

In [48]:
```
x["Sex"].nunique()
```

Out[48]:
```
2
```

In [49]:
```
x["Ticket"] = le.fit_transform(x["Ticket"])
x["Ticket"]
```

Out[49]:
```
0       523
1       596
2       669
3        49
4       472
       ...
886     101
887      14
888     675
889       8
890     466
Name: Ticket, Length: 891, dtype: int64
```

In [50]:
```
x["Ticket"].value_counts()
```

Out[50]:
```
333     7
568     7
80      7
249     6
566     6
       ..
```

```
513     1
98      1
212     1
606     1
466     1
Name: Ticket, Length: 681, dtype: int64
```

In [51]:
```
x["Ticket"].nunique()
```

Out[51]:
```
681
```

In [52]:
```
x["Cabin"] = le.fit_transform(x["Cabin"])
x["Cabin"].value_counts()
```

Out[52]:
```
47      691
145       4
63        4
62        3
142       3
        ...
124       1
76        1
72        1
125       1
60        1
Name: Cabin, Length: 147, dtype: int64
```

In [53]:
```
x["Cabin"].nunique()
```

Out[53]:
```
147
```

In [54]:
```
x["Embarked"] = le.fit_transform(x["Embarked"])
x["Embarked"].value_counts()
```

Out[54]:
```
2     646
0     168
1      77
Name: Embarked, dtype: int64
```

In [55]:
```
x["Embarked"].nunique()
```

Out[55]:
```
3
```

In [56]:
```
x.head()
```

Out[56]:

	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	22.0	1	0	523	7.250	47	2
1	0	38.0	1	0	596	14.000	81	0
2	0	26.0	0	0	669	7.925	47	2

3	0	35.0	1	0	49	14.000	55	2
4	1	35.0	0	0	472	8.050	47	2

In [57]:
```
from sklearn.preprocessing import MinMaxScaler
ms = MinMaxScaler()
x_scaled = ms.fit_transform(x)
```

In [58]:
```
x_scaled = pd.DataFrame(ms.fit_transform(x),columns =x.columns)
```

In [59]:
```
x_scaled.head()
```

Out[59]:

	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1.0	0.271174	0.125	0.0	0.769118	0.315217	0.321918	1.0
1	0.0	0.472229	0.125	0.0	0.876471	0.608696	0.554795	0.0
2	0.0	0.321438	0.000	0.0	0.983824	0.344565	0.321918	1.0
3	0.0	0.434531	0.125	0.0	0.072059	0.608696	0.376712	1.0
4	1.0	0.434531	0.000	0.0	0.694118	0.350000	0.321918	1.0

In [60]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size = 0.
```

In [61]:
```
print(x_train.shape,y_train.shape,x_test.shape,y_test.shape)
```

```
(623, 8) (623,) (268, 8) (268,)
```

In [ ]: