In [664]:
```
import pandas as pd
```

In [665]:
```
data=pd.read_csv("/home/placement/Desktop/csv/Titanic Dataset.csv")
```

In [666]:
```
data.describe()
```

Out[666]:

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594	32.204208
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057	49.693429
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000	7.910400
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000	14.454200
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000	31.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000	512.329200

In [667]:
```
data.head()
```

Out[667]:

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

In [668]:
```
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
```

In [669]:
```
list(data)
```

Out[669]:
```
['PassengerId',
 'Survived',
 'Pclass',
 'Name',
 'Sex',
 'Age',
 'SibSp',
 'Parch',
 'Ticket',
 'Fare',
 'Cabin',
 'Embarked']
```

```
data.head()
```

In [670]:
```
data.head(10)
```

Out[670]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S
5	6	0	3	Moran, Mr. James	male	NaN	0	0	330877	8.4583	NaN	Q
6	7	0	1	McCarthy, Mr. Timothy J	male	54.0	0	0	17463	51.8625	E46	S
7	8	0	3	Palsson, Master. Gosta Leonard	male	2.0	3	1	349909	21.0750	NaN	S
8	9	1	3	Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)	female	27.0	0	2	347742	11.1333	NaN	S
9	10	1	2	Nasser, Mrs. Nicholas (Adele Achem)	female	14.0	1	0	237736	30.0708	NaN	C

In [671]:
```
data.isna().sum()
```

Out[671]:
```
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
```

In [672]:
```
data.Pclass.unique()
```

Out[672]:
```
array([3, 1, 2])
```

In [673]:
```
data.Survived.unique()
```

Out[673]:
```
array([0, 1])
```

In [674]:
```
data.SibSp.unique()
```

Out[674]:
```
array([1, 0, 3, 4, 2, 5, 8])
```

In [675]:
```
data.Parch.unique()
```

Out[675]:
```
array([0, 1, 2, 5, 3, 4, 6])
```

In [676]:
```
data.Age.unique()
```

Out[676]:
```
array([22.  , 38.  , 26.  , 35.  ,   nan, 54.  ,  2.  , 27.  , 14.  ,
        4.  , 58.  , 20.  , 39.  , 55.  , 31.  , 34.  , 15.  , 28.  ,
        8.  , 19.  , 40.  , 66.  , 42.  , 21.  , 18.  ,  3.  ,  7.  ,
       49.  , 29.  , 65.  , 28.5 ,  5.  , 11.  , 45.  , 17.  , 32.  ,
       16.  , 25.  ,  0.83, 30.  , 33.  , 23.  , 24.  , 46.  , 59.  ,
       71.  , 37.  , 47.  , 14.5 , 70.5 , 32.5 , 12.  ,  9.  , 36.5 ,
       51.  , 55.5 , 40.5 , 44.  ,  1.  , 61.  , 56.  , 50.  , 36.  ,
       45.5 , 20.5 , 62.  , 41.  , 52.  , 63.  , 23.5 ,  0.92, 43.  ,
       60.  , 10.  , 64.  , 13.  , 48.  ,  0.75, 53.  , 57.  , 80.  ,
       70.  , 24.5 ,  6.  ,  0.67, 30.5 ,  0.42, 34.5 , 74.  ])
```

In [677]:
```
data.Pclass.unique()
```

Out[677]:
```
array([3, 1, 2])
```

In [678]:
```
data1=data.drop(['PassengerId','Name','Ticket','Cabin','SibSp','Parch','Embarked'],axis=1)
```

In [679]:
```
data1
```

Out[679]:

	Survived	Pclass	Sex	Age	Fare
0	0	3	male	22.0	7.2500
1	1	1	female	38.0	71.2833
2	1	3	female	26.0	7.9250
3	1	1	female	35.0	53.1000
4	0	3	male	35.0	8.0500
...	...	...	...	...	...
886	0	2	male	27.0	13.0000
887	1	1	female	19.0	30.0000
888	0	3	female	NaN	23.4500
889	1	1	male	26.0	30.0000
890	0	3	male	32.0	7.7500

891 rows × 5 columns

Type *Markdown* and LaTeX: α^2

In [680]:
```
data1.shape
```

Out[680]:
```
(891, 5)
```

In [681]:
```
data1['Sex']=data['Sex'].map({'male':1,'female':0})
data1
```

Out[681]:

	Survived	Pclass	Sex	Age	Fare
0	0	3	1	22.0	7.2500
1	1	1	0	38.0	71.2833
2	1	3	0	26.0	7.9250
3	1	1	0	35.0	53.1000
4	0	3	1	35.0	8.0500
...	...	...	...	...	...
886	0	2	1	27.0	13.0000
887	1	1	0	19.0	30.0000
888	0	3	0	NaN	23.4500
889	1	1	1	26.0	30.0000
890	0	3	1	32.0	7.7500

891 rows × 5 columns

In [682]:
```
data2=data1.fillna(data.median())
```

```
/tmp/ipykernel_7586/1290514040.py:1: FutureWarning: The default value of numeric_only in DataFrame.median i
s 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.
  data2=data1.fillna(data.median())
```

In [683]:
```
data2
```

Out[683]:

	Survived	Pclass	Sex	Age	Fare
0	0	3	1	22.0	7.2500
1	1	1	0	38.0	71.2833
2	1	3	0	26.0	7.9250
3	1	1	0	35.0	53.1000
4	0	3	1	35.0	8.0500
...	...	...	...	...	...
886	0	2	1	27.0	13.0000
887	1	1	0	19.0	30.0000
888	0	3	0	28.0	23.4500
889	1	1	1	26.0	30.0000
890	0	3	1	32.0	7.7500

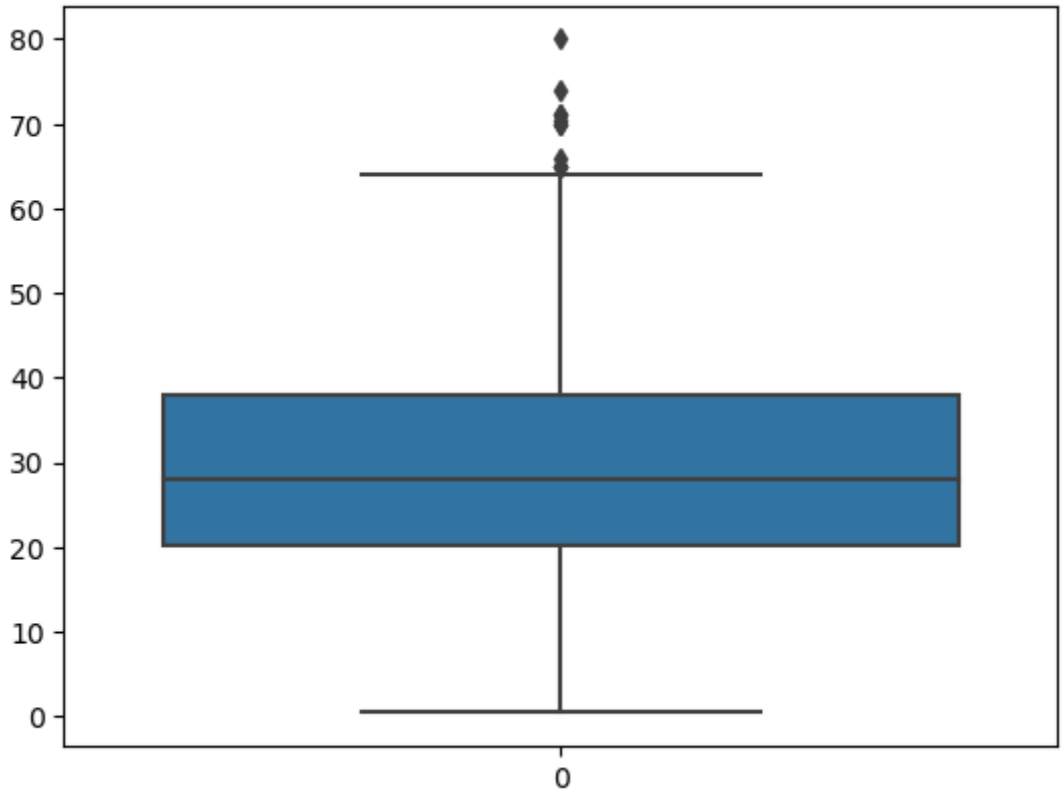
891 rows × 5 columns

In [684]:
```
data2.isna().sum()
```

Out[684]:
```
Survived    0
Pclass      0
Sex         0
Age         0
Fare        0
dtype: int64
```

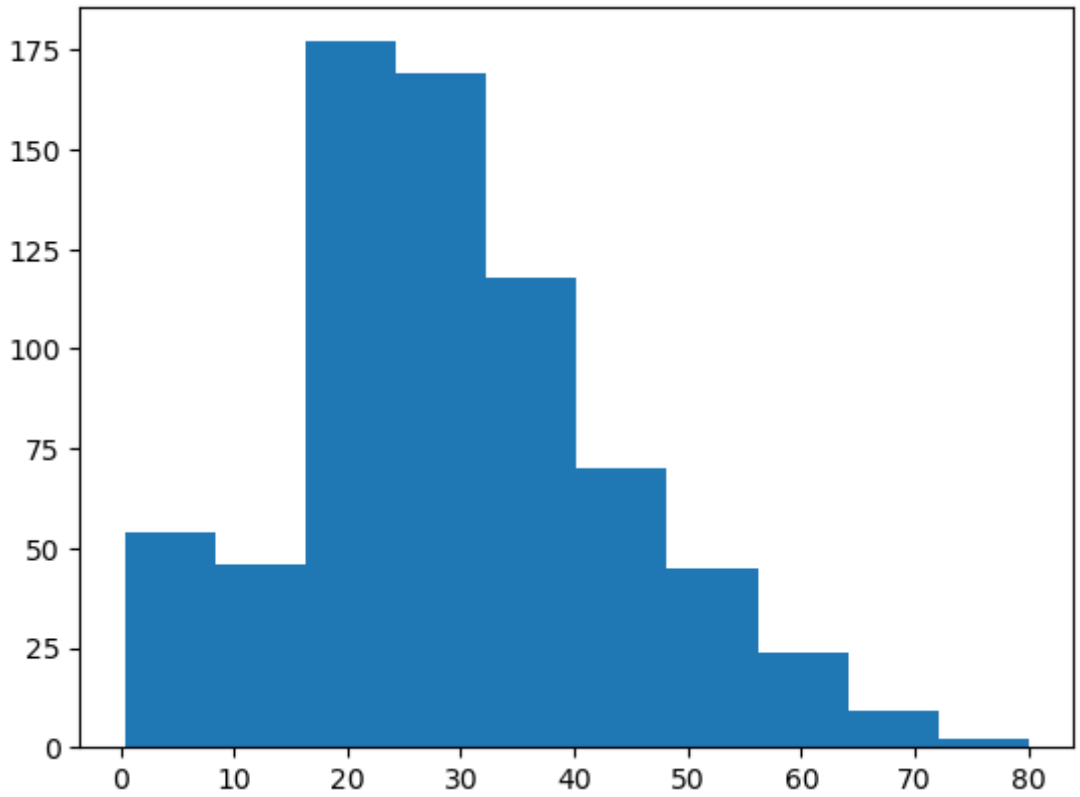
In [685]:
```
import seaborn as sns
import matplotlib.pyplot as plt
sns.boxplot(data.Age)
```

Out[685]: <Axes: >



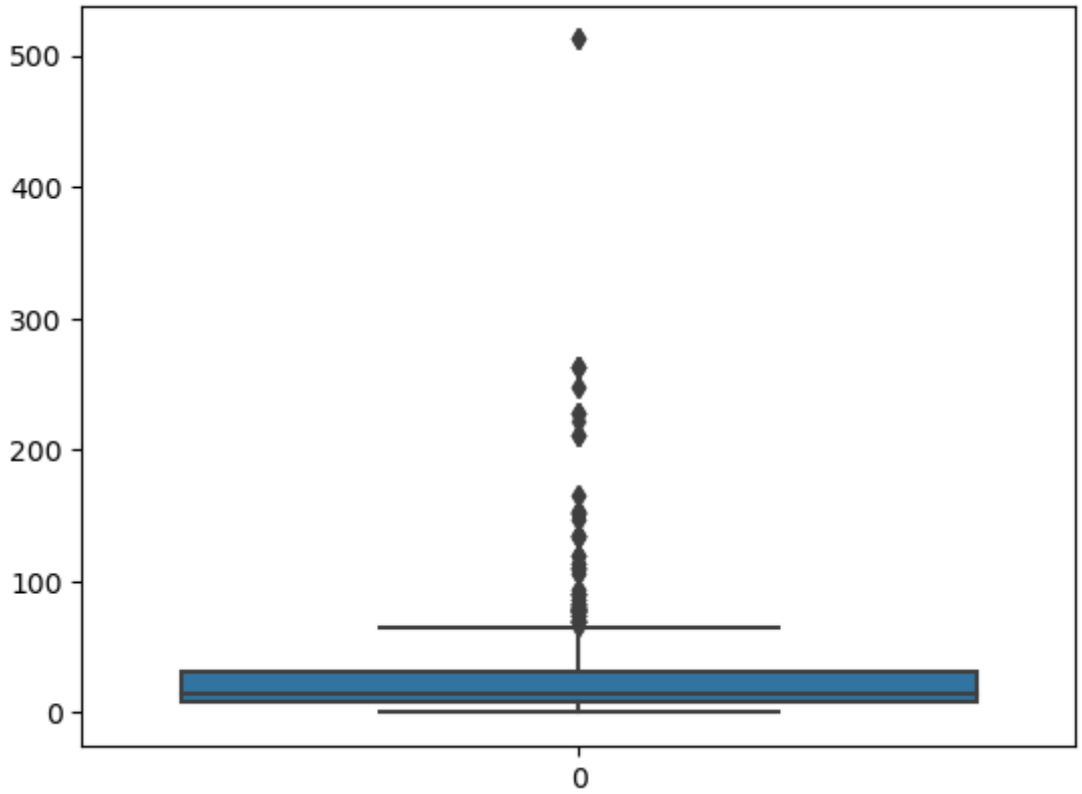
In [686]:
```
plt.hist(data['Age'])
```

Out[686]:
```
(array([ 54.,  46., 177., 169., 118.,  70.,  45.,  24.,   9.,   2.]),
 array([ 0.42 ,  8.378, 16.336, 24.294, 32.252, 40.21 , 48.168, 56.126,
        64.084, 72.042, 80.   ]),
 <BarContainer object of 10 artists>)
```



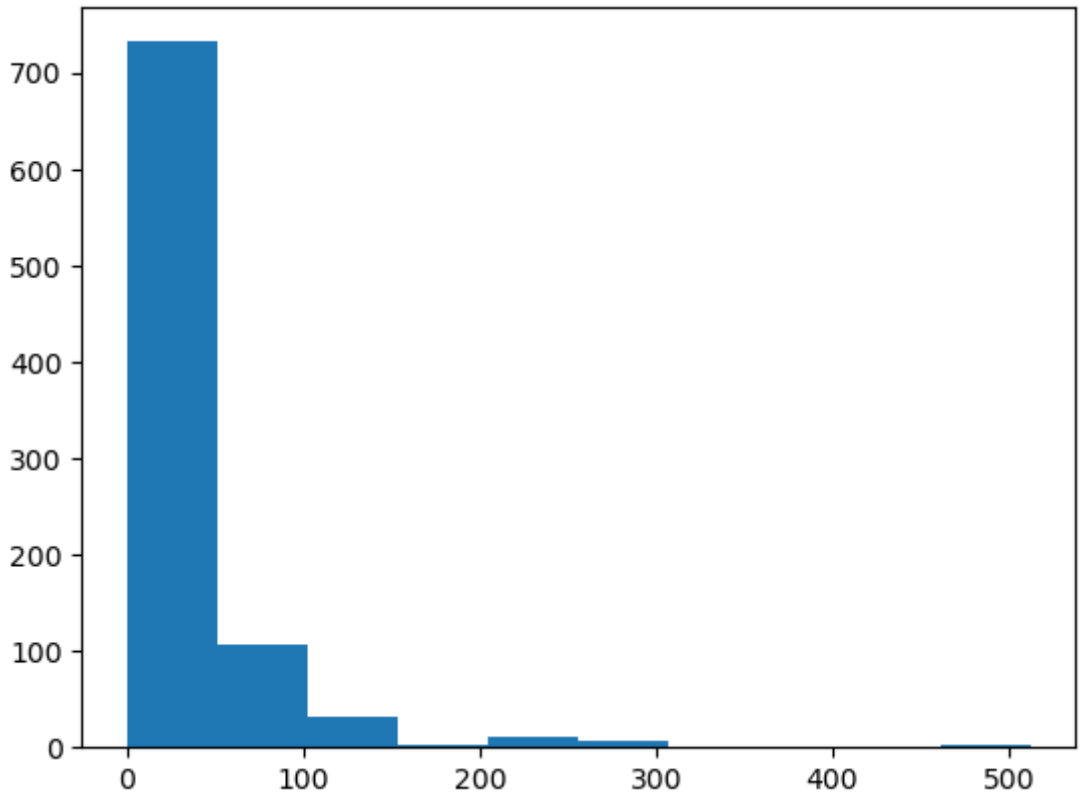
In [687]:
```
import seaborn as sns
import matplotlib.pyplot as plt
sns.boxplot(data.Fare)
```

Out[687]: <Axes: >



In [688]:
```
plt.hist(data['Fare'])
```

Out[688]:
```
(array([732., 106.,  31.,   2.,  11.,   6.,   0.,   0.,   0.,   3.]),
 array([  0.     ,  51.23292, 102.46584, 153.69876, 204.93168, 256.1646 ,
        307.39752, 358.63044, 409.86336, 461.09628, 512.3292 ]),
 <BarContainer object of 10 artists>)
```



In [689]:
```
data2.isna().sum()
```

Out[689]:
```
Survived    0
Pclass      0
Sex         0
Age         0
Fare        0
dtype: int64
```

In [690]:
```
data2.describe()
```

Out[690]:

	Survived	Pclass	Sex	Age	Fare
count	891.000000	891.000000	891.000000	891.000000	891.000000
mean	0.383838	2.308642	0.647587	29.361582	32.204208
std	0.486592	0.836071	0.477990	13.019697	49.693429
min	0.000000	1.000000	0.000000	0.420000	0.000000
25%	0.000000	2.000000	0.000000	22.000000	7.910400
50%	0.000000	3.000000	1.000000	28.000000	14.454200
75%	1.000000	3.000000	1.000000	35.000000	31.000000
max	1.000000	3.000000	1.000000	80.000000	512.329200

In [691]:
```
data2["Age"].unique()
```

Out[691]:
```
array([22.  , 38.  , 26.  , 35.  , 28.  , 54.  ,  2.  , 27.  , 14.  ,
        4.  , 58.  , 20.  , 39.  , 55.  , 31.  , 34.  , 15.  ,  8.  ,
       19.  , 40.  , 66.  , 42.  , 21.  , 18.  ,  3.  ,  7.  , 49.  ,
       29.  , 65.  , 28.5 ,  5.  , 11.  , 45.  , 17.  , 32.  , 16.  ,
       25.  ,  0.83, 30.  , 33.  , 23.  , 24.  , 46.  , 59.  , 71.  ,
       37.  , 47.  , 14.5 , 70.5 , 32.5 , 12.  ,  9.  , 36.5 , 51.  ,
       55.5 , 40.5 , 44.  ,  1.  , 61.  , 56.  , 50.  , 36.  , 45.5 ,
       20.5 , 62.  , 41.  , 52.  , 63.  , 23.5 ,  0.92, 43.  , 60.  ,
       10.  , 64.  , 13.  , 48.  ,  0.75, 53.  , 57.  , 80.  , 70.  ,
       24.5 ,  6.  ,  0.67, 30.5 ,  0.42, 34.5 , 74.  ])
```

In [692]:
```
data.groupby(["Age"]).count()
```

Out[692]:

Age	PassengerId	Survived	Pclass	Name	Sex	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0.42	1	1	1	1	1	1	1	1	1	0	1
0.67	1	1	1	1	1	1	1	1	1	0	1
0.75	2	2	2	2	2	2	2	2	2	0	2
0.83	2	2	2	2	2	2	2	2	2	0	2
0.92	1	1	1	1	1	1	1	1	1	1	1
...	...	...	...	...	...	...	...	...	...	...	...
70.00	2	2	2	2	2	2	2	2	2	1	2
70.50	1	1	1	1	1	1	1	1	1	0	1
71.00	2	2	2	2	2	2	2	2	2	1	2
74.00	1	1	1	1	1	1	1	1	1	0	1
80.00	1	1	1	1	1	1	1	1	1	1	1

88 rows × 11 columns

In [693]:
```
data['Pclass']=data1['Pclass'].map({1:'F',2:'s',3:'Third'})
data
```

Out[693]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	Third	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	F	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	Third	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	F	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	Third	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S
...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	s	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.0000	NaN	S
887	888	1	F	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.0000	B42	S
888	889	0	Third	Johnston, Miss. Catherine Helen "Carrie"	female	NaN	1	2	W./C. 6607	23.4500	NaN	S
889	890	1	F	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0000	C148	C
890	891	0	Third	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7500	NaN	Q

891 rows × 12 columns

In [694]:
```
data1=pd.get_dummies(data)
data1
```

Out[694]:

	PassengerId	Survived	Age	SibSp	Parch	Fare	Pclass_F	Pclass_Third	Pclass_s	Name_Abbing, Mr. Anthony	...	Cabin_F G73	Cabin_F2	Cabin_F33
0	1	0	22.0	1	0	7.2500	0	1	0	0	...	0	0	0
1	2	1	38.0	1	0	71.2833	1	0	0	0	...	0	0	0
2	3	1	26.0	0	0	7.9250	0	1	0	0	...	0	0	0
3	4	1	35.0	1	0	53.1000	1	0	0	0	...	0	0	0
4	5	0	35.0	0	0	8.0500	0	1	0	0	...	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
886	887	0	27.0	0	0	13.0000	0	0	1	0	...	0	0	0
887	888	1	19.0	0	0	30.0000	1	0	0	0	...	0	0	0
888	889	0	NaN	1	2	23.4500	0	1	0	0	...	0	0	0
889	890	1	26.0	0	0	30.0000	1	0	0	0	...	0	0	0
890	891	0	32.0	0	0	7.7500	0	1	0	0	...	0	0	0

891 rows × 1733 columns

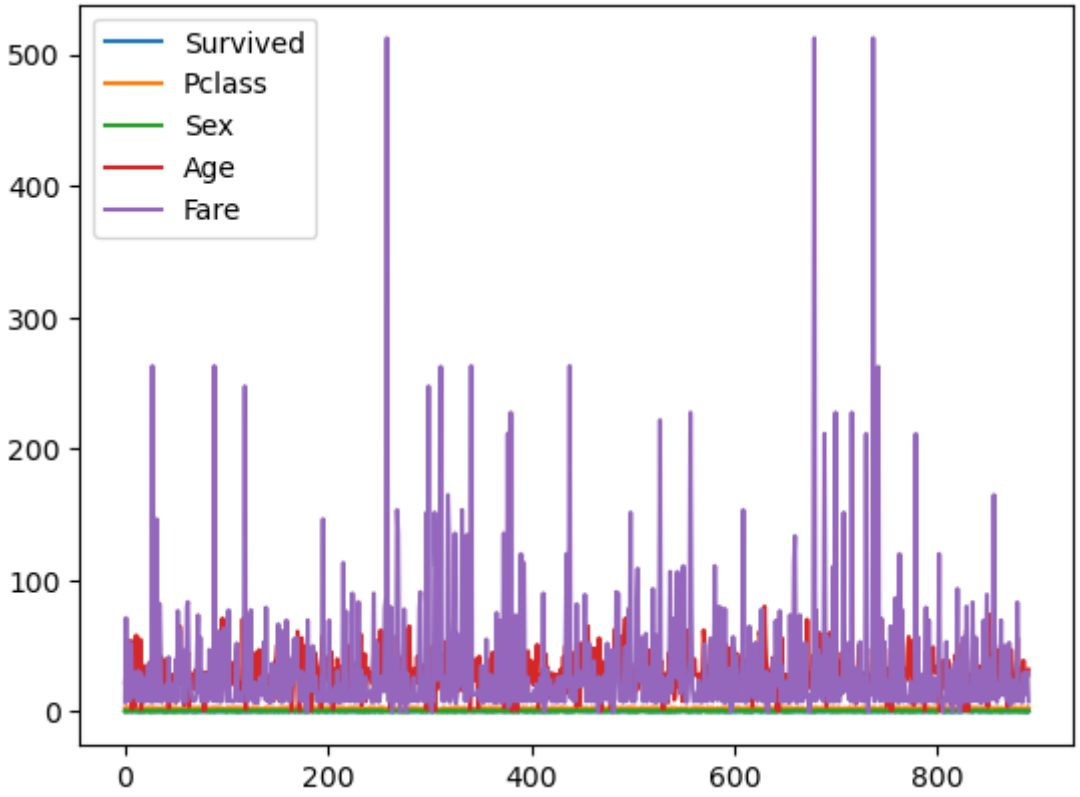
In [695]:
```
cor=data2.corr()
cor
```

Out[695]:

	Survived	Pclass	Sex	Age	Fare
Survived	1.000000	-0.338481	-0.543351	-0.064910	0.257307
Pclass	-0.338481	1.000000	0.131900	-0.339898	-0.549500
Sex	-0.543351	0.131900	1.000000	0.081163	-0.182333
Age	-0.064910	-0.339898	0.081163	1.000000	0.096688
Fare	0.257307	-0.549500	-0.182333	0.096688	1.000000

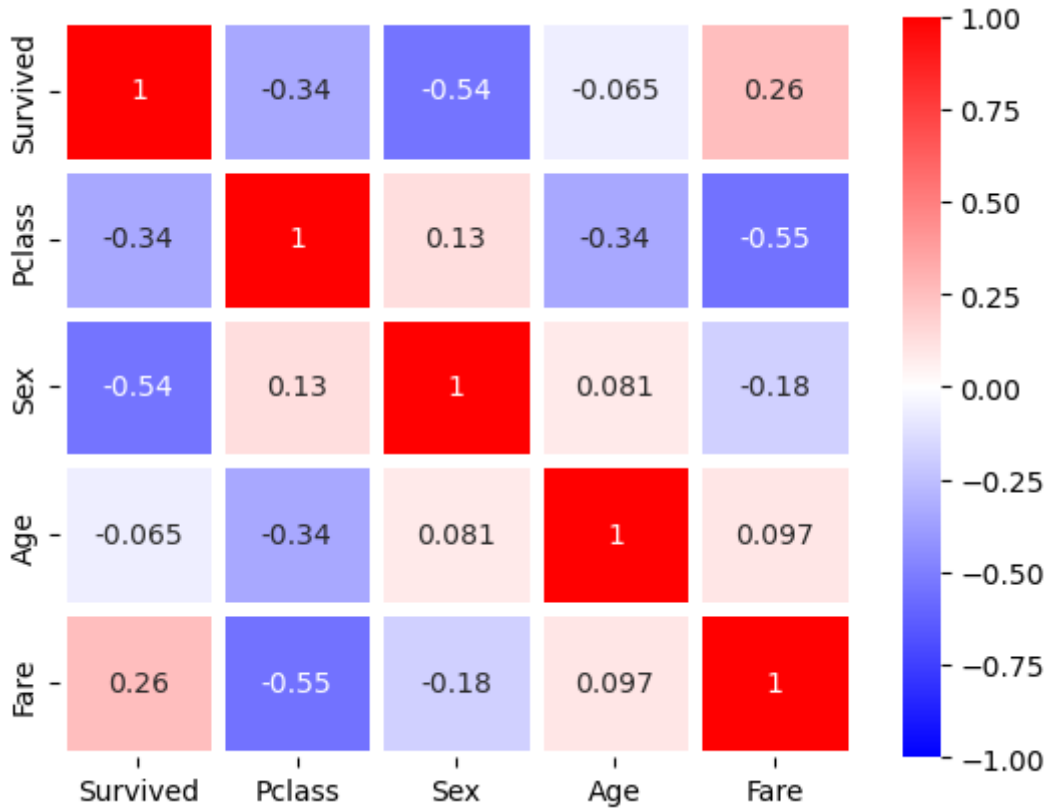
In [696]:
```
data2.plot()
```

Out[696]: <Axes: >



In [697]:
```
import seaborn as sns
sns.heatmap(cor,vmax=1,vmin=-1,annot=True,linewidths=5,cmap='bwr')
```

Out[697]: <Axes: >



In [698]:
```
data2.groupby(['Survived']).count()
```

Out[698]:

Survived	Pclass	Sex	Age	Fare
0	549	549	549	549
1	342	342	342	342

In [699]:
```
y=data1['Survived']
x=data2.drop('Survived',axis=1)
```

In [700]:
```
y
```

Out[700]:
```
0      0
1      1
2      1
3      1
4      0
      ..
886    0
887    1
888    0
889    1
890    0
Name: Survived, Length: 891, dtype: int64
```

In [701]:
```
x
```

Out[701]:

	Pclass	Sex	Age	Fare
0	3	1	22.0	7.2500
1	1	0	38.0	71.2833
2	3	0	26.0	7.9250
3	1	0	35.0	53.1000
4	3	1	35.0	8.0500
...	...	...	...	...
886	2	1	27.0	13.0000
887	1	0	19.0	30.0000
888	3	0	28.0	23.4500
889	1	1	26.0	30.0000
890	3	1	32.0	7.7500

891 rows × 4 columns

In [703]:
```
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.33,random_state=42)
```

In [704]:
```
from sklearn.linear_model import LogisticRegression
classifier=LogisticRegression()
classifier.fit(x_train,y_train)
```

Out[704]:
```
▾ LogisticRegression

LogisticRegression()
```

In [714]:
```
y_pred=classifier.predict(x_test)
```

In [715]:
```
y_pred
```

Out[715]:
```
array([0, 0, 0, 1, 1, 1, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0,
       1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 0, 1,
       0, 0, 0, 1, 1, 1, 0, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 0, 1, 1,
       0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0,
       1, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0,
       0, 1, 0, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 1,
       0, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0,
       1, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0,
       1, 1, 0, 1, 1, 0, 0, 1, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0,
       0, 1, 0, 0, 0, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1, 1, 1, 1, 0, 0, 1,
       0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 1, 0,
       0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0,
       1, 0, 0, 0, 0, 0, 1, 1, 0])
```

In [722]:
```
from sklearn.metrics import confusion_matrix
confusion_matrix(y_test,y_pred)
```

Out[722]:
```
array([[152,  23],
       [ 34,  86]])
```

In [723]:
```
from sklearn.metrics import accuracy_score
accuracy_score(y_test,y_pred)
```

Out[723]:
```
0.8067796610169492
```

In [724]:
```
y
```

Out[724]:
```
0      0
1      1
2      1
3      1
4      0
      ..
886    0
887    1
888    0
889    1
890    0
Name: Survived, Length: 891, dtype: int64
```

In [ ]:
```

```