Reading File

Importing packages

In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import StandardScaler
from scipy import stats
import statsmodels.api as sm
from scipy.stats import skew
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score
from sklearn.model_selection import train_test_split
```

In [2]:
```
var = 'E:\\DATA_SCIENCE\\Intership\\Task-1\\tested.csv'

file = pd.read_csv(var)
```

In [3]:
```
data = pd.DataFrame(file)
```

In [4]:
```
data
```

Out[4]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	
0	892	0	3	Kelly, Mr. James	male	34.5	0	0	330911	7
1	893	1	3	Wilkes, Mrs. James (Ellen Needs)	female	47.0	1	0	363272	7
2	894	0	2	Myles, Mr. Thomas Francis	male	62.0	0	0	240276	9
3	895	0	3	Wirz, Mr. Albert	male	27.0	0	0	315154	8
4	896	1	3	Hirvonen, Mrs. Alexander (Helga E Lindqvist)	female	22.0	1	1	3101298	12
...	...	...	...	...	...	...	...	...	...	
413	1305	0	3	Spector, Mr. Woolf	male	NaN	0	0	A.5. 3236	8
414	1306	1	1	Oliva y Ocana, Dona. Fermina	female	39.0	0	0	PC 17758	108
415	1307	0	3	Saether, Mr. Simon Sivertsen	male	38.5	0	0	SOTON/O.Q. 3101262	7
416	1308	0	3	Ware, Mr. Frederick	male	NaN	0	0	359309	8
417	1309	0	3	Peter, Master. Michael J	male	NaN	1	1	2668	22

418 rows × 12 columns

Data Cleaning

In [5]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 418 entries, 0 to 417
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   PassengerId  418 non-null    int64  
 1   Survived     418 non-null    int64  
 2   Pclass       418 non-null    int64  
 3   Name         418 non-null    object 
 4   Sex          418 non-null    object 
 5   Age          332 non-null    float64
 6   SibSp        418 non-null    int64  
 7   Parch        418 non-null    int64  
 8   Ticket       418 non-null    object 
 9   Fare         417 non-null    float64
 10  Cabin        91 non-null     object 
 11  Embarked     418 non-null    object 
dtypes: float64(2), int64(5), object(5)
memory usage: 39.3+ KB
```

In [6]:
```
data.dtypes
```

Out[6]:
```
PassengerId      int64
Survived         int64
Pclass           int64
Name            object
Sex             object
Age            float64
SibSp            int64
Parch            int64
Ticket          object
Fare           float64
Cabin           object
Embarked        object
dtype: object
```

In [7]:
```
data.drop('PassengerId', axis = 1, inplace=True)
data.drop('Name', axis = 1, inplace=True)
data.drop('Cabin', axis = 1, inplace=True)
data.drop('Ticket', axis = 1, inplace=True)

data
```

Out[7]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked
0	0	3	male	34.5	0	0	7.8292	Q
1	1	3	female	47.0	1	0	7.0000	S
2	0	2	male	62.0	0	0	9.6875	Q
3	0	3	male	27.0	0	0	8.6625	S
4	1	3	female	22.0	1	1	12.2875	S
...	...	...	...	...	...	...	...	...
413	0	3	male	NaN	0	0	8.0500	S
414	1	1	female	39.0	0	0	108.9000	C
415	0	3	male	38.5	0	0	7.2500	S
416	0	3	male	NaN	0	0	8.0500	S
417	0	3	male	NaN	1	1	22.3583	C

418 rows × 8 columns

In [8]:
```
data.isna().sum()
```

Out[8]:
```
Survived     0
Pclass       0
Sex          0
Age         86
SibSp        0
Parch        0
Fare         1
Embarked     0
dtype: int64
```

In [9]:
```
data.shape
```

Out[9]:
```
(418, 8)
```

In [10]:
```
data['Embarked'] = data['Embarked'].map( {'Q': 0,'S':1,'C':2}).astype(int)
data['Sex'] = data['Sex'].map( {'female': 1,'male':0}).astype(int)
```

In [11]:
```
data.Age.fillna(data.Age.mean(),inplace=True)
```

In [12]:
```
data["Age"]=data["Age"].astype(int)
```

In [13]:
```
data
```

Out[13]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked
0	0	3	0	34	0	0	7.8292	0
1	1	3	1	47	1	0	7.0000	1
2	0	2	0	62	0	0	9.6875	0
3	0	3	0	27	0	0	8.6625	1
4	1	3	1	22	1	1	12.2875	1
...	...	...	...	...	...	...	...	...
413	0	3	0	30	0	0	8.0500	1
414	1	1	1	39	0	0	108.9000	2
415	0	3	0	38	0	0	7.2500	1
416	0	3	0	30	0	0	8.0500	1
417	0	3	0	30	1	1	22.3583	2

418 rows × 8 columns

In [14]:
```
data.isna().sum()
```

Out[14]:
```
Survived    0
Pclass      0
Sex         0
Age         0
SibSp       0
Parch       0
Fare        1
Embarked    0
dtype: int64
```

In [15]:
```
data.Fare.fillna(data.Fare.mean(),inplace=True)
```

In [16]:
```
data.isna().sum()
```

Out[16]:
```
Survived    0
Pclass      0
Sex         0
Age         0
SibSp       0
Parch       0
Fare        0
Embarked    0
dtype: int64
```

In [17]:
```
data.describe()
```

Out[17]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare
count	418.000000	418.000000	418.000000	418.000000	418.000000	418.000000	418.000000
mean	0.363636	2.265550	0.363636	30.191388	0.447368	0.392344	35.627188
std	0.481622	0.841838	0.481622	12.654104	0.896760	0.981429	55.840500
min	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	0.000000	1.000000	0.000000	23.000000	0.000000	0.000000	7.895800
50%	0.000000	3.000000	0.000000	30.000000	0.000000	0.000000	14.454200
75%	1.000000	3.000000	1.000000	35.750000	1.000000	0.000000	31.500000
max	1.000000	3.000000	1.000000	76.000000	8.000000	9.000000	512.329200

In [18]:
```
data
```

Out[18]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embarked
0	0	3	0	34	0	0	7.8292	0
1	1	3	1	47	1	0	7.0000	1
2	0	2	0	62	0	0	9.6875	0
3	0	3	0	27	0	0	8.6625	1
4	1	3	1	22	1	1	12.2875	1
...	...	...	...	...	...	...	...	...
413	0	3	0	30	0	0	8.0500	1
414	1	1	1	39	0	0	108.9000	2
415	0	3	0	38	0	0	7.2500	1
416	0	3	0	30	0	0	8.0500	1
417	0	3	0	30	1	1	22.3583	2

418 rows × 8 columns

In [19]:
```
data.dtypes
```

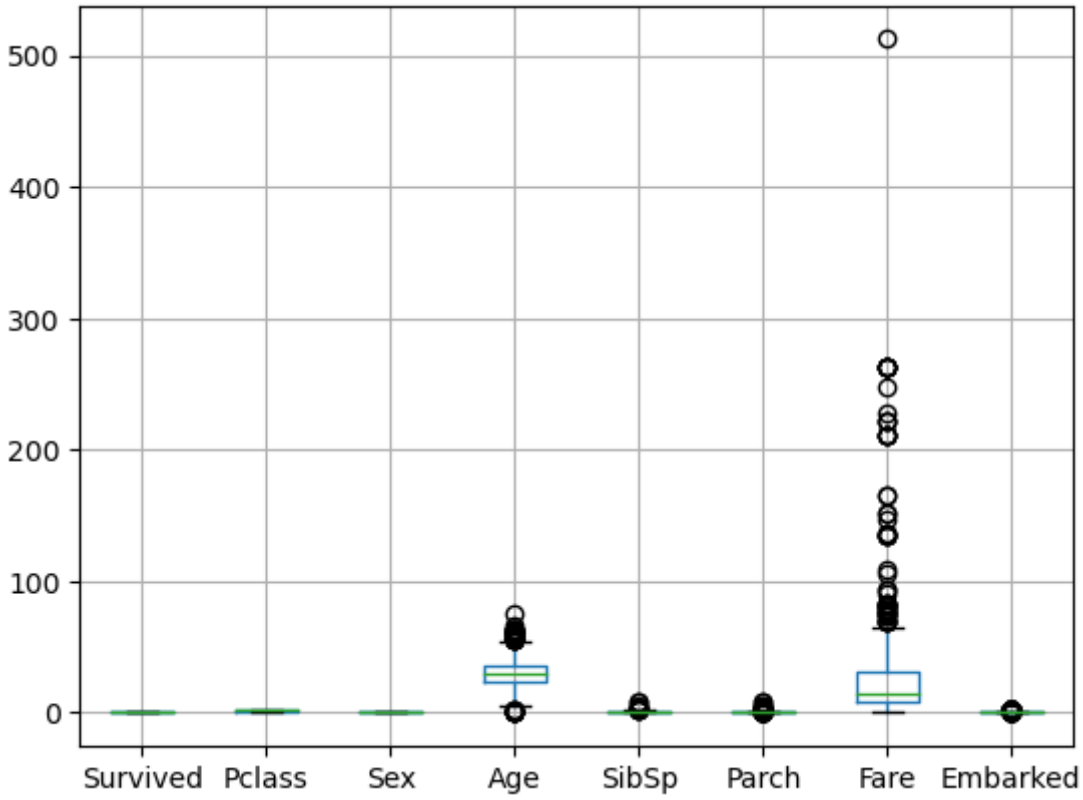
Out[19]:
```
Survived      int64
Pclass        int64
Sex           int32
Age           int32
SibSp         int64
Parch         int64
Fare        float64
Embarked      int32
dtype: object
```

In [20]:
```
data.isna().sum()
```

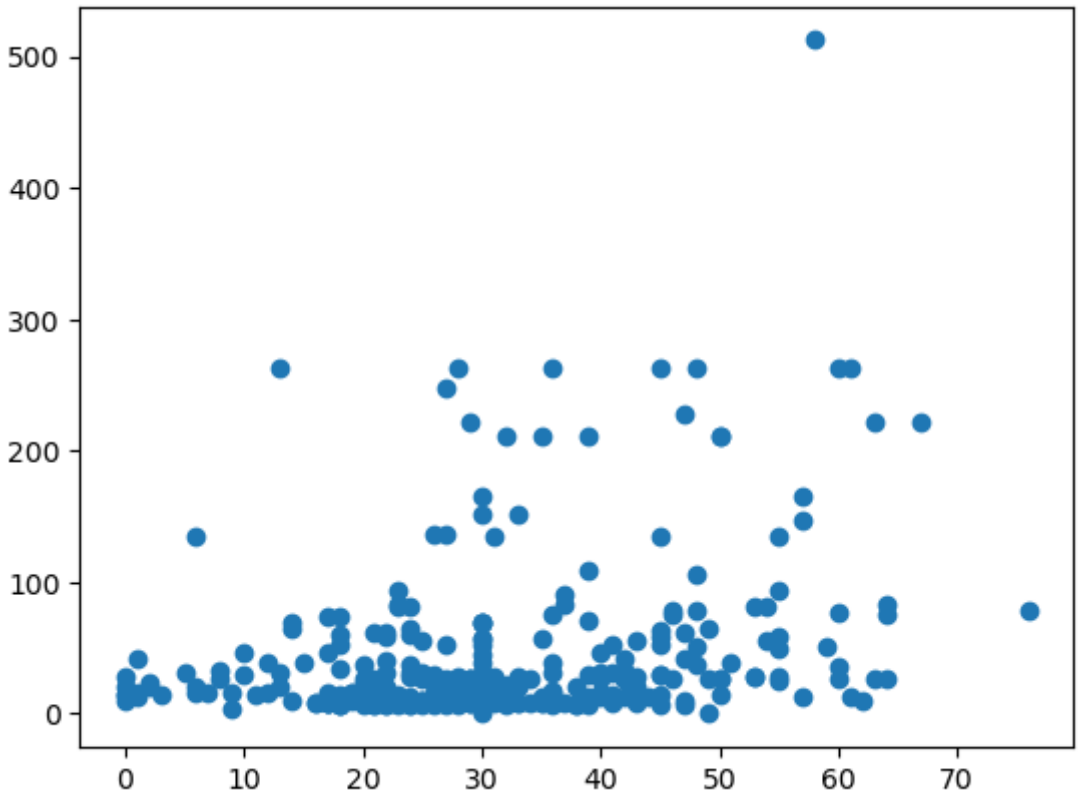
Out[20]:
```
Survived    0
Pclass      0
Sex         0
Age         0
SibSp       0
Parch       0
Fare        0
Embarked    0
dtype: int64
```

Data Analysis

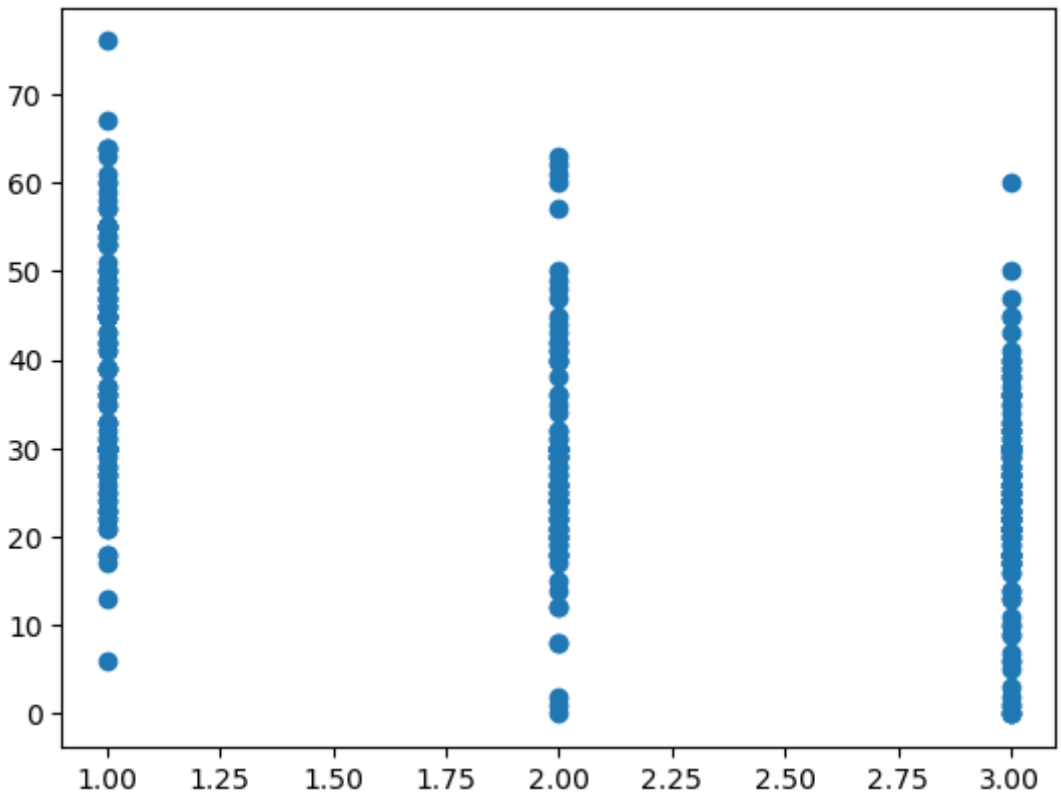
In [21]:
```
df = pd.DataFrame(data)
df.boxplot()
plt.show()
```



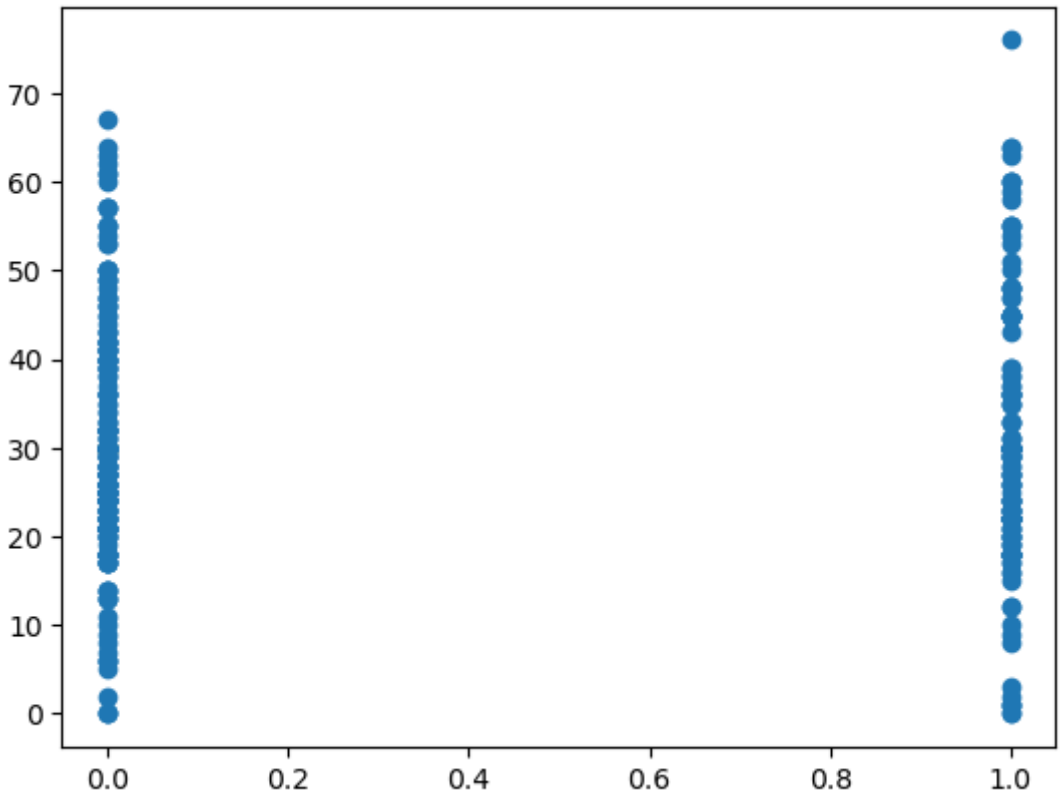
In [22]:
```
df = pd.DataFrame(data)
plt.scatter(df['Age'], df['Fare'])
plt.show()
```



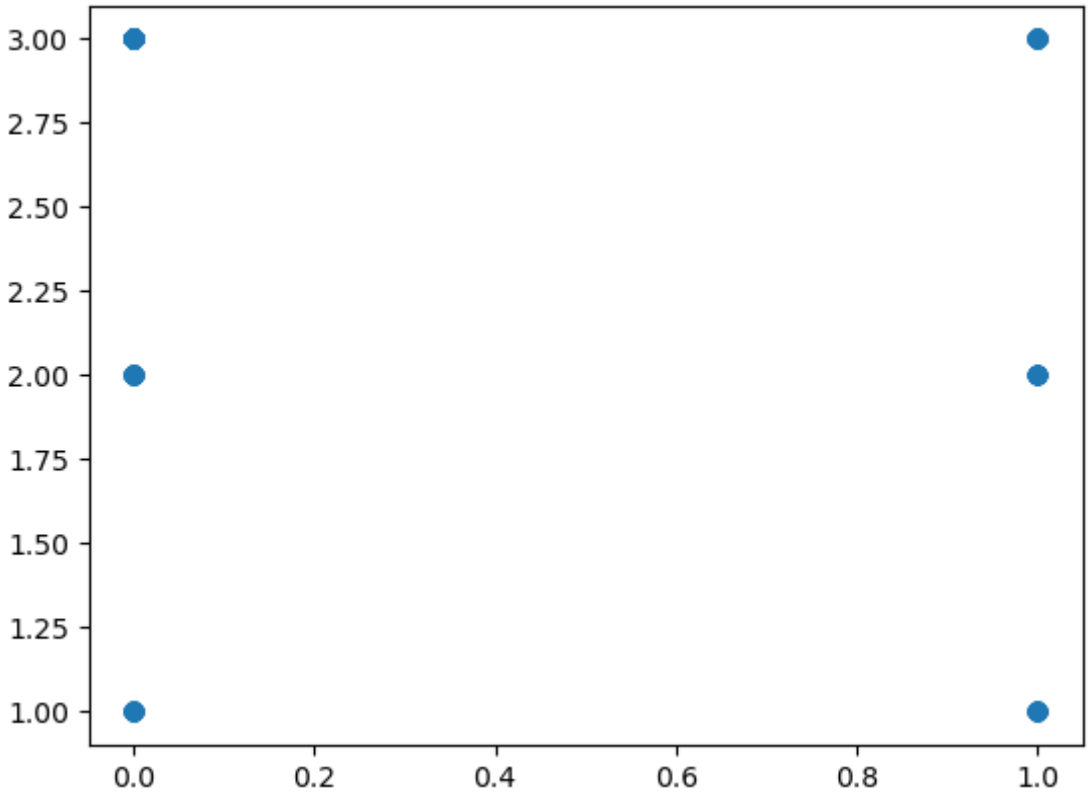
In [23]:
```
plt.scatter(df['Pclass'],df['Age'] )
plt.show()
```



In [24]:
```
plt.scatter(df['Survived'],df['Age'] )
plt.show()
```



In [25]:
```
plt.scatter(df['Survived'],df['Pclass'] )
plt.show()
```

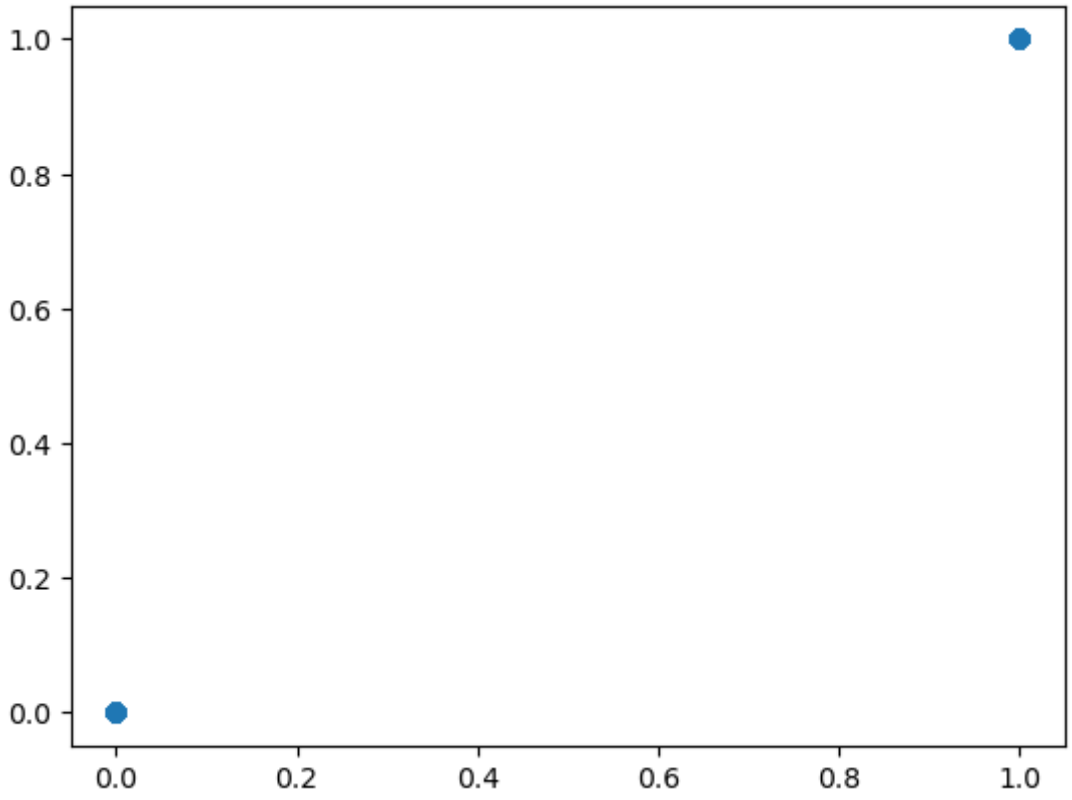


In [26]:
```
data.corr()
```

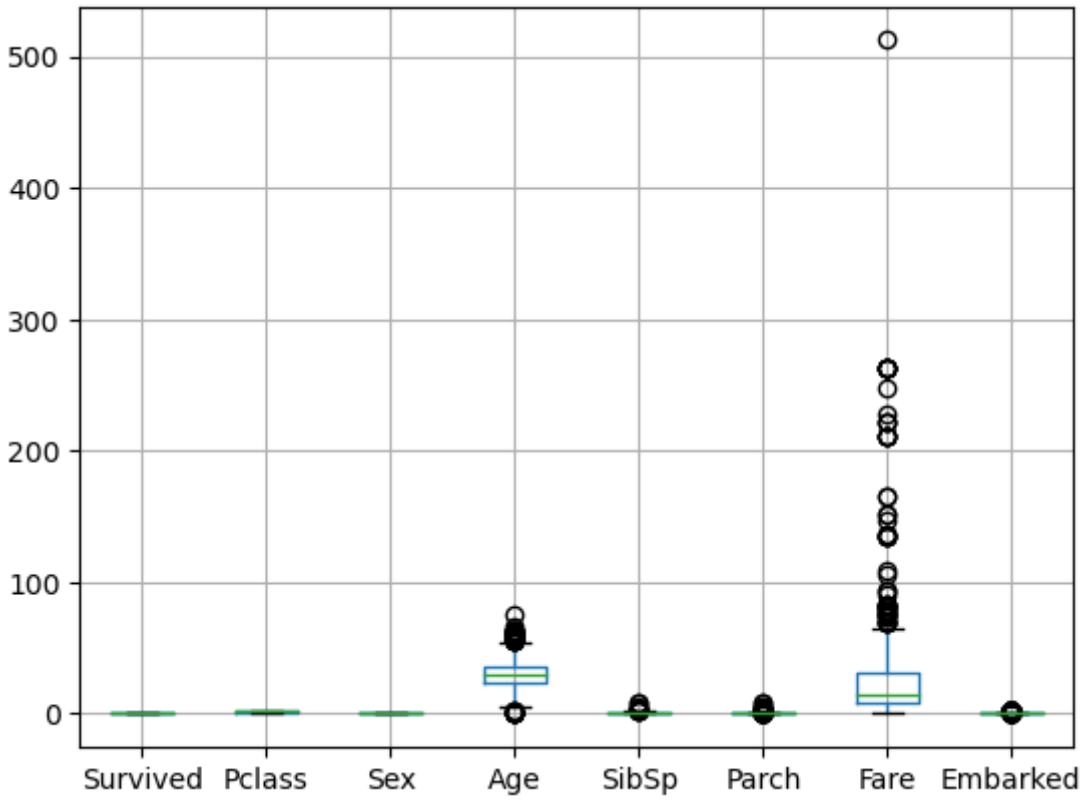
Out[26]:

	Survived	Pclass	Sex	Age	SibSp	Parch	Fare	Embark
Survived	1.000000	-0.108615	1.000000	0.001538	0.099943	0.159120	0.191382	-0.0374
Pclass	-0.108615	1.000000	-0.108615	-0.443531	0.001087	0.018721	-0.576619	-0.3723
Sex	1.000000	-0.108615	1.000000	0.001538	0.099943	0.159120	0.191382	-0.0374
Age	0.001538	-0.443531	0.001538	1.000000	-0.079203	-0.045259	0.328250	0.1277
SibSp	0.099943	0.001087	0.099943	-0.079203	1.000000	0.306895	0.171488	0.0412
Parch	0.159120	0.018721	0.159120	-0.045259	0.306895	1.000000	0.230001	0.0674
Fare	0.191382	-0.576619	0.191382	0.328250	0.171488	0.230001	1.000000	0.3151
Embarked	-0.037432	-0.372344	-0.037432	0.127749	0.041221	0.067474	0.315129	1.0000

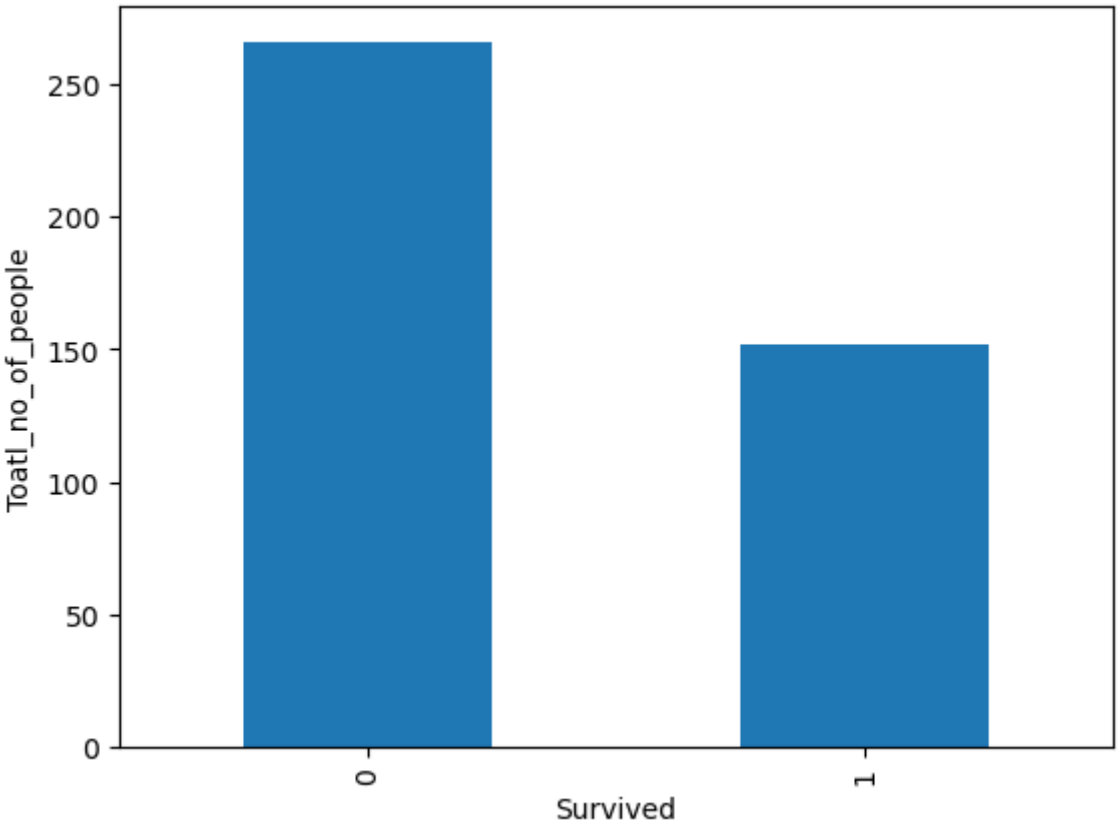
In [27]:
```
plt.scatter(df['Survived'],df['Sex'] )
plt.show()
```



In [28]:
```
data.boxplot()
plt.show()
```

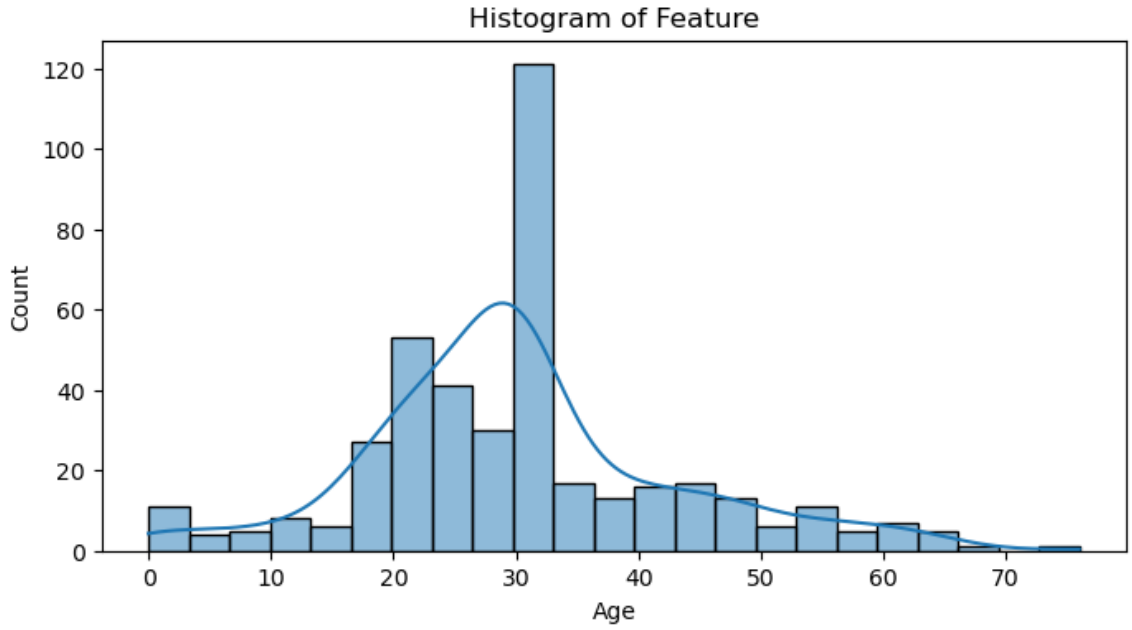


In [29]:
```
total_survived = data["Survived"].value_counts()
total_survived.plot(kind="bar")
plt.ylabel("Toatl_no_of_people")
plt.show()
```

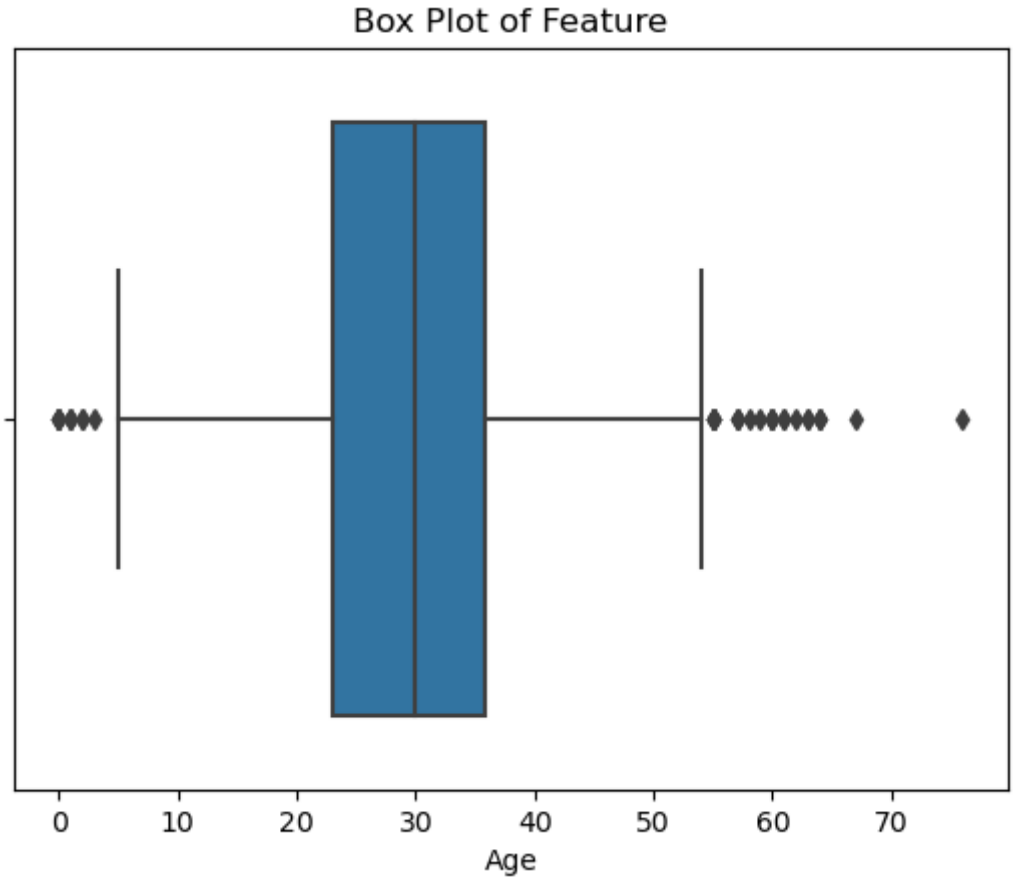


In [30]:
```
scaler = StandardScaler()
standardized_data = scaler.fit_transform(data)
```

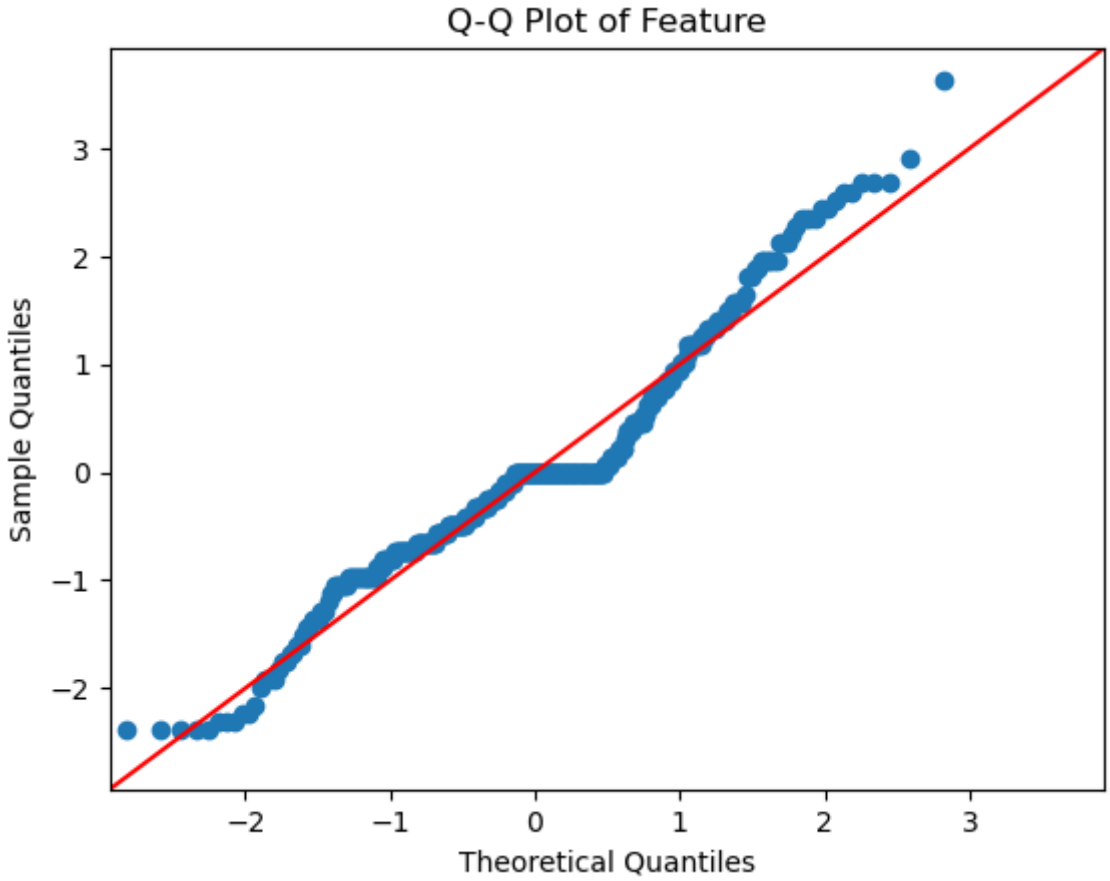
In [31]:
```
plt.figure(figsize=(8, 4))
sns.histplot(data=data, x='Age', kde=True)
plt.title('Histogram of Feature')
plt.show()
```



In [32]:
```
sns.boxplot(data=df, x='Age')
plt.title('Box Plot of Feature')
plt.show()
```



In [33]:
```
# Create a Q-Q plot
sm.qqplot(df['Age'], line='45', fit=True, dist=stats.norm)
plt.title('Q-Q Plot of Feature')
plt.show()
```



In [34]:
```
skewness = skew(df['Age'])
print(f'Skewness of Feature: {skewness}')
```

```
Skewness of Feature: 0.5142262435570987
```

Model Building

In [35]:
```
Train_data_set = df.drop(['Survived'], axis=1)
Test_data_set = df.iloc[:,1]
X_train, X_test, y_train, y_test = train_test_split(Train_data_set,Test_data
model = LogisticRegression(solver='liblinear',max_iter=250)
model.fit(X_train, y_train)
y_pred = model.predict(X_test)
sc = accuracy_score(y_pred,y_test)
print('Logistic regression accuracy: {:.2f}%'.format(sc*100))
```

```
Logistic regression accuracy: 92.86%
```

In [36]:
```
new_user_data = {
    'Pclass': 3,
    'Sex': 1,
    'Age': 25,
    'SibSp': 1,
    'Parch': 0,
    'Fare': 7.25,
    'Embarked': 1,
}

new_user_df = pd.DataFrame([new_user_data])

prediction = model.predict(new_user_df)


if prediction:
    print("Survived")
else:
    print("dead")
```

```
Survived
```

In [ ]: