Import Libraries

In [ ]:
```
import pandas as pd
import seaborn as sns
import numpy as np
import warnings
import matplotlib.pyplot as plt
warnings.filterwarnings('ignore')
from sklearn.preprocessing import StandardScaler
```

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

In [ ]:
```
dataset.tail()
```

Out[ ]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
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 Howell	male	26.0	0	0	111369	30.0
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7

Checking for NULL values

In [ ]:
```
dataset.isnull().sum()
```

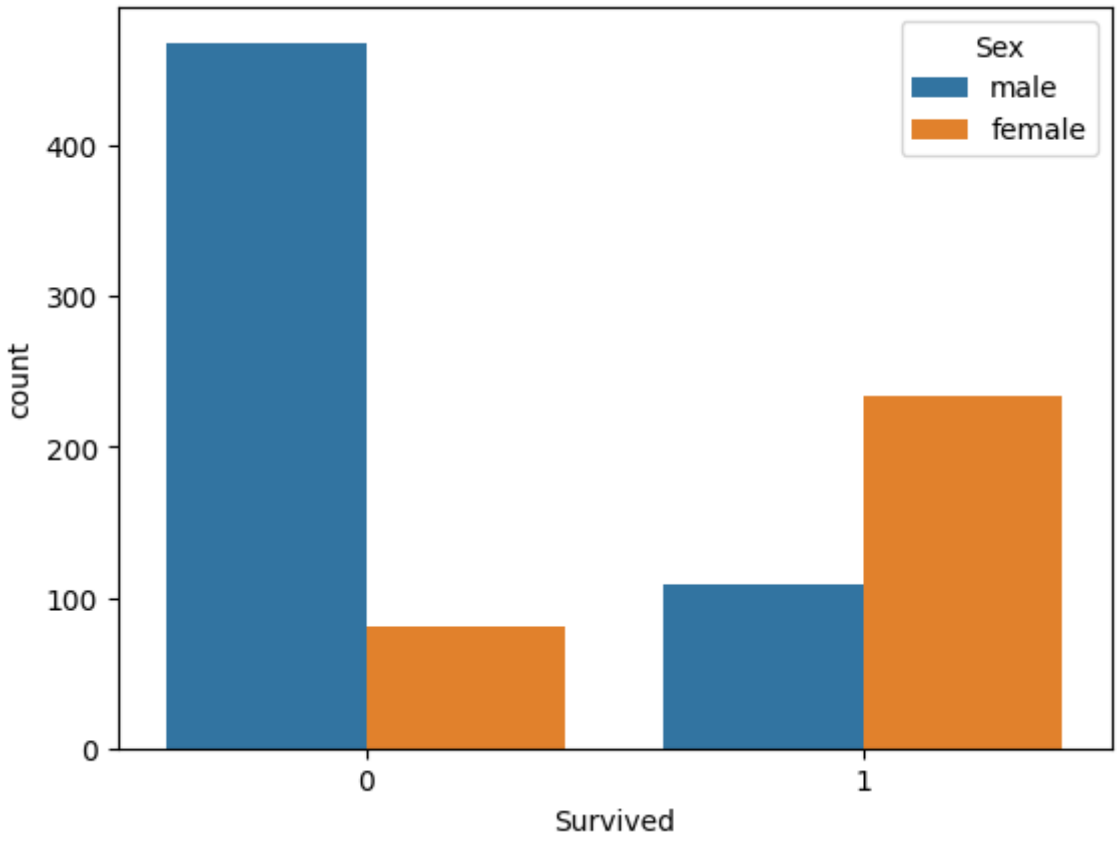
Out[ ]:
```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age            177
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         2
dtype: int64
```

Data Visualizations

Plot of survivors vs Non-survivors gender-wise

In [ ]:
```
sns.countplot(x='Survived',data=dataset,hue = 'Sex')
```

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



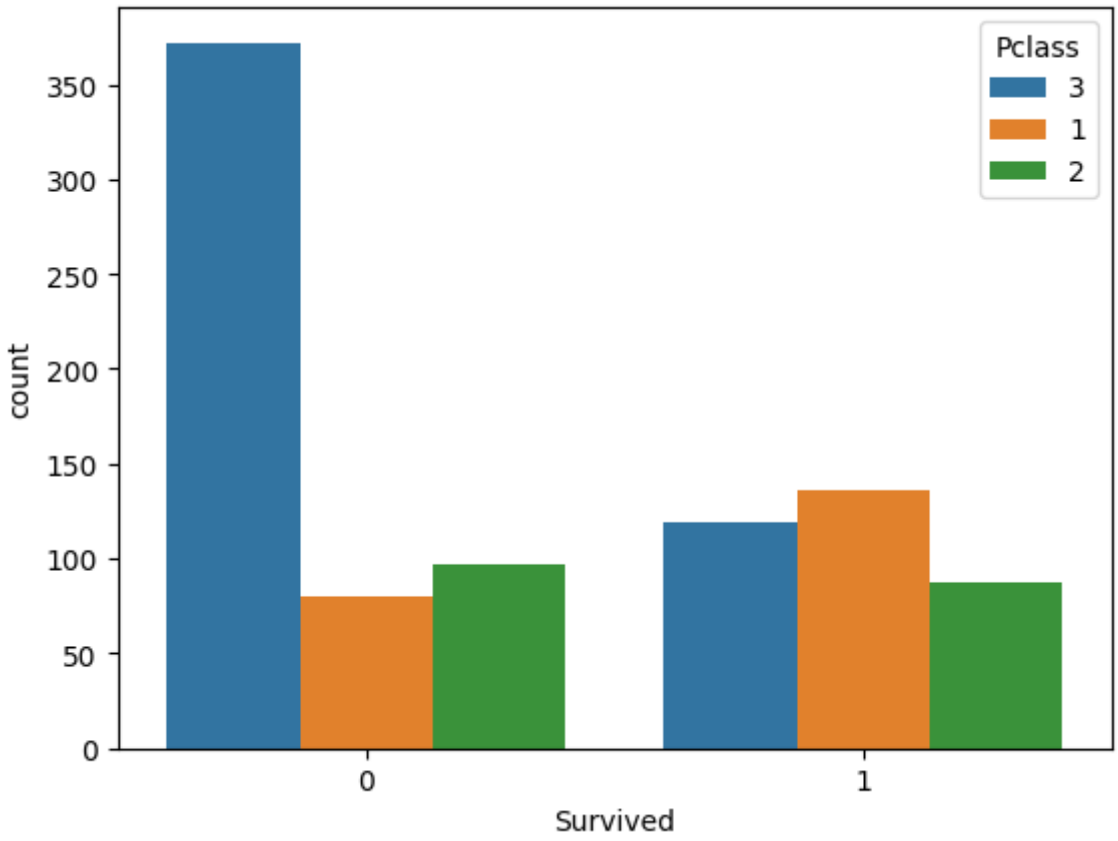
The number of female survivors are greater than the number of male survivors. Also, the numer of men who did not survive is also almost 4 times greater than the women who didn't.

Plot of survivors vs Non-survivors ticket-class wise

In [ ]:
```
dataset['Pclass'] = dataset['Pclass'].astype(str)
dataset['Survived'] = dataset['Survived'].astype(str)
```

```
sns.countplot(x='Survived',data=dataset, hue='Pclass')
print(f"The different types of classes of tickets are: {dataset['Pclass'].unique
print(f"The number of people in Class 3 tickets = {dataset['Pclass'].value_count
print(f"The number of people in Class 2 tickets = {dataset['Pclass'].value_count
print(f"The number of people in Class 1 tickets = {dataset['Pclass'].value_count
```

```
The different types of classes of tickets are: ['3' '1' '2']
The number of people in Class 3 tickets = 491
The number of people in Class 2 tickets = 184
The number of people in Class 1 tickets = 216
```



We can see that a lot of people who travelled by a Class 3 tikcket havent survived this could be due to the fact that the number of Class 3 tickets were higher in comparison to the other types.

NULL VALUE TREATMENT

We shall replace all the null values in column Cabin with a custom value 'YO', in embarked with the mode value and for age, we can find the median of the age with pclass and age as parameters.

In [ ]:
```
dataset.Embarked.fillna(dataset.Embarked.mode()[0], inplace = True)
dataset.Cabin = dataset.Cabin.fillna('YO')
grp = dataset.groupby(['Sex', 'Pclass'])
dataset['Age'] = grp['Age'].transform(lambda x: x.fillna(x.median()))
dataset.tail()
```

Out[ ]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Far
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	21.5	1	2	W./C. 6607	23.4
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.0
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.7

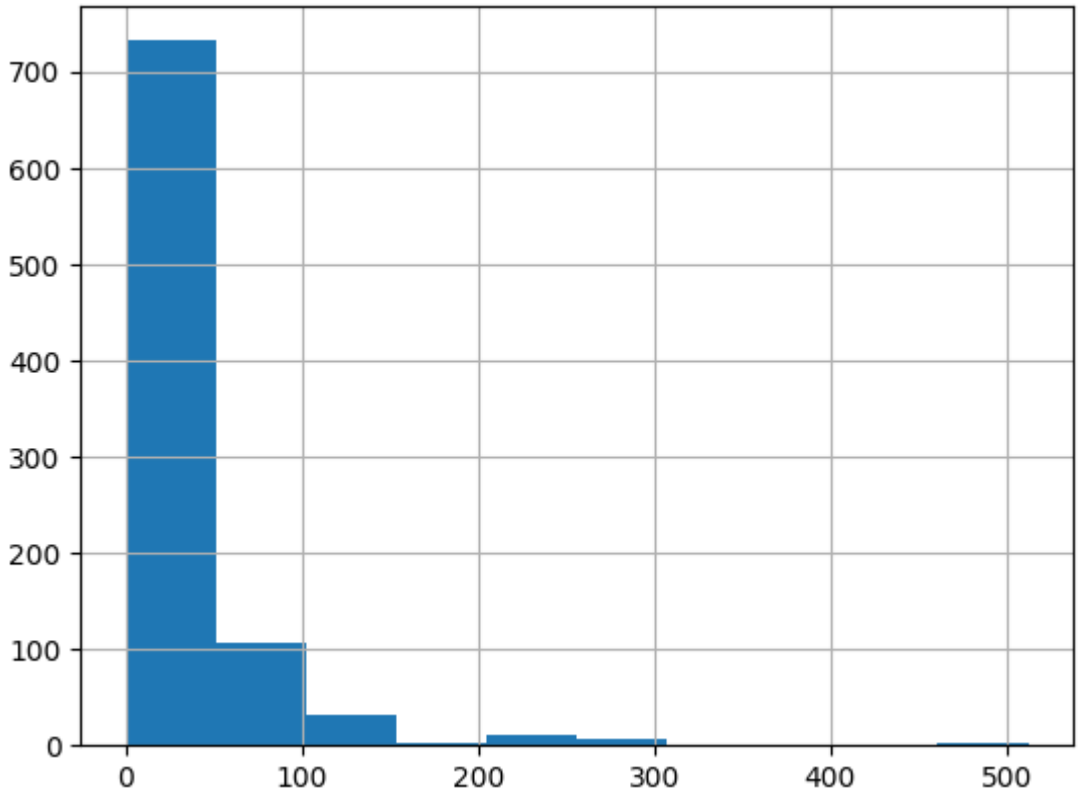
In [ ]:
```
print(f"NULL VALUES REMAINING: {dataset.isna().sum()}")
print(f"Overall: {dataset.isna().sum().sum()}")
```

```
NULL VALUES REMAINING: 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
Overall: 0
```

Outlier Detetction

In [ ]:
```
dataset['Fare'].hist()
print('skewness value of Fare: ',dataset['Fare'].skew())
```

```
skewness value of Fare:  4.787316519674893
```



Clearly, we can see that the data is skewed towards left, indicating outliers. Also, the skewness value is also not in the range [-1,1] which indicates that the distribution is not normal and hence has outliers.

Splitting dependent and independent variables

In [ ]:
```
X = dataset.drop('Survived', axis=1)  # Independent variables
y = dataset['Survived']  # Dependent variable
display(y)
```

```
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: object
```

Encoding

We shall use one-hot encoding for the Sex column

In [ ]:
```
X_encoded = pd.get_dummies(X, columns=['Sex'], drop_first=True)
```

Feature Scaling

We use Standard Scaler to scale the age column

In [ ]:
```
from sklearn.preprocessing import StandardScaler
scaler = StandardScaler()
X_encoded['Age'] = scaler.fit_transform(X_encoded[['Age']])
display(dataset)
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.
...	...	...	...	...	...	...	...	...	...	
886	887	0	2	Montvila, Rev. Juozas	male	27.0	0	0	211536	13.
887	888	1	1	Graham, Miss. Margaret Edith	female	19.0	0	0	112053	30.
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	21.5	1	2	W./C. 6607	23.
889	890	1	1	Behr, Mr. Karl Howell	male	26.0	0	0	111369	30.
890	891	0	3	Dooley, Mr. Patrick	male	32.0	0	0	370376	7.

891 rows × 12 columns