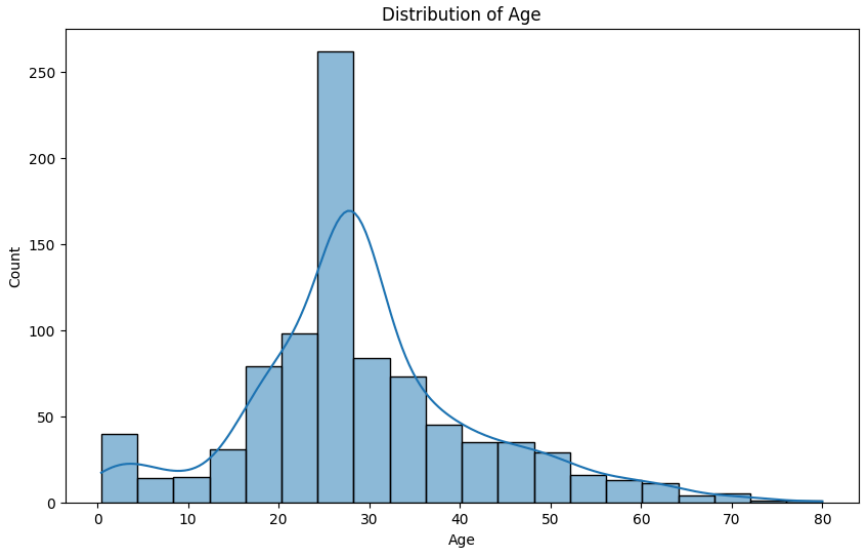
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

# Load the Titanic dataset
titanic_df = pd.read_csv('https://raw.githubusercontent.com/datasciencedojo/datasets/master/titanic.csv')

# Display the first few rows of the dataset
print(titanic_df.head())

# Check the data types and missing values
print(titanic_df.info())

# Summary statistics
print(titanic_df.describe())
```

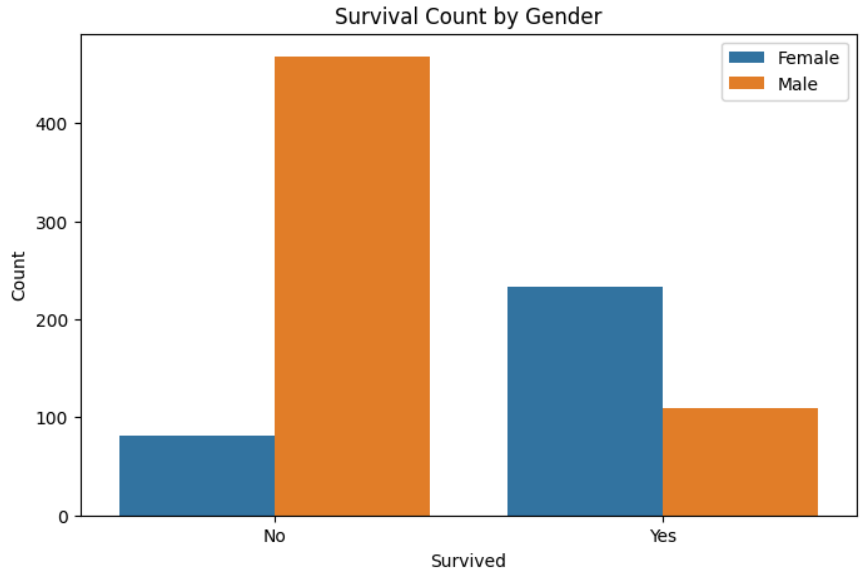
```
   PassengerId  Survived  Pclass  \
0            1         0       3
1            2         1       1
2            3         1       3
3            4         1       1
4            5         0       3

                                                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
<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
None
       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
```

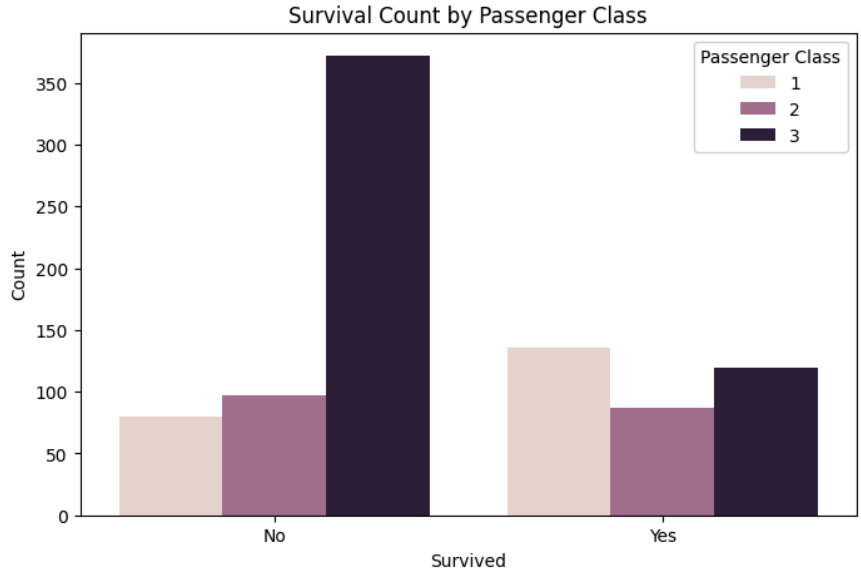
```
# Drop unnecessary columns
titanic_df = titanic_df.drop(['PassengerId', 'Name', 'Ticket', 'Cabin'], axis=1)

# Fill missing values in the Age column with the median age
titanic_df['Age'].fillna(titanic_df['Age'].median(), inplace=True)

# Fill missing values in the Embarked column with the mode
mode_embarked = titanic_df['Embarked'].mode()[0]
titanic_df['Embarked'].fillna(mode_embarked, inplace=True)

# Convert categorical variables into dummy/indicator variables
titanic_df = pd.get_dummies(titanic_df, columns=['Sex', 'Embarked'], drop_first=True)

# Check for any remaining missing values
print(titanic_df.isnull().sum())
```

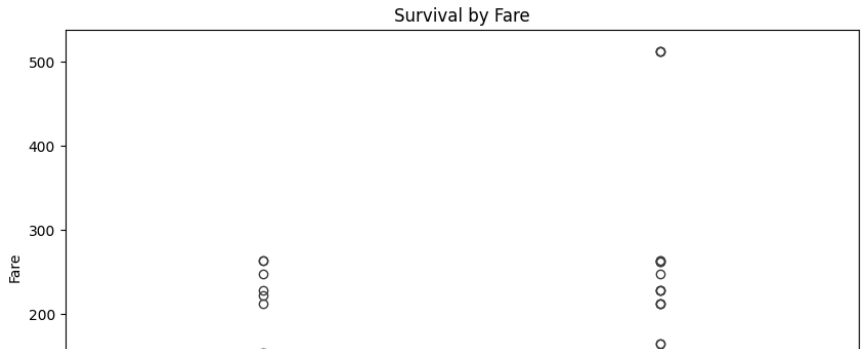
```
Survived      0
Pclass        0
Age           0
SibSp         0
Parch         0
Fare          0
Sex_male      0
Embarked_Q    0
Embarked_S    0
dtype: int64
```

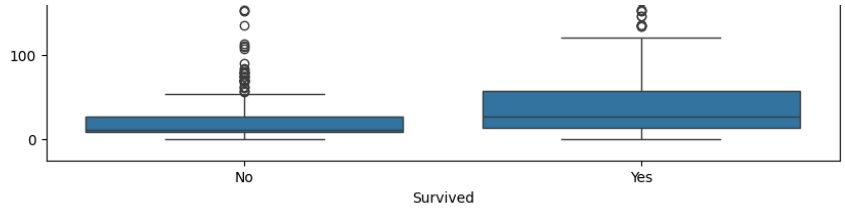
```
# Visualize the distribution of Age
plt.figure(figsize=(10, 6))
sns.histplot(titanic_df['Age'], bins=20, kde=True)
plt.title('Distribution of Age')
plt.xlabel('Age')
plt.ylabel('Count')
plt.show()

# Explore the survival rate by gender
plt.figure(figsize=(8, 5))
sns.countplot(x='Survived', hue='Sex_male', data=titanic_df)
plt.title('Survival Count by Gender')
plt.xlabel('Survived')
plt.ylabel('Count')
plt.xticks([0, 1], ['No', 'Yes'])
plt.legend(['Female', 'Male'])
plt.show()

# Explore the survival rate by passenger class
plt.figure(figsize=(8, 5))
sns.countplot(x='Survived', hue='Pclass', data=titanic_df)
plt.title('Survival Count by Passenger Class')
plt.xlabel('Survived')
plt.ylabel('Count')
plt.xticks([0, 1], ['No', 'Yes'])
plt.legend(title='Passenger Class')
plt.show()

# Explore the relationship between fare and survival
plt.figure(figsize=(10, 6))
sns.boxplot(x='Survived', y='Fare', data=titanic_df)
plt.title('Survival by Fare')
plt.xlabel('Survived')
plt.ylabel('Fare')
plt.xticks([0, 1], ['No', 'Yes'])
plt.show()
```


Distribution of Age
Count
Age
0
50
100
150
200
250
0
10
20
30
40
50
60
70
80


Survival Count by Gender
Female
Male
Count
Survived
No
Yes
0
100
200
300
400


Survival Count by Passenger Class
Passenger Class
1
2
3
Count
Survived
No
Yes
0
50
100
150
200
250
300
350


Survival by Fare
Fare
200
300
400
500


100
0
No
Yes
Survived