In [1]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import classification_report, accuracy_score
```

In [3]:
```
data=pd.read_csv(r"C:\Users\Praveen T\Downloads\titanic.csv")
```

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

Out[4]:

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

891 rows × 12 columns

In [5]:
```
# number of columns present in the dataset.
len(data.columns)
```

Out[5]:
```
12
```

In [6]:
```
# number of rows present in the dataset.
len(data)
```

Out[6]: 891

In [7]:
```
# Descriptive statistics
data.describe()
```

Out[7]:

	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 [8]:
```
# finding number of missing values
data.isna().sum()
```

Out[8]:
```
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 [9]:
```
# solving the missing values -> 1 : Export Product Share (%) contains 100 in all the

data['Age'].fillna(data['Age'].mean(),inplace=True)
```

In [12]:
```
# Fill missing Cabin values with the most common Cabin value
most_common_cabin = data['Cabin'].mode()[0]
data['Cabin'].fillna(most_common_cabin, inplace=True)
```

In [16]:
```
# Fill missing Embarked values using backward fill method
data['Embarked'].fillna(method='bfill', inplace=True)
```

In [17]:
```
data.isna().sum()
```

Out[17]:
```
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 [18]:
```
data
```

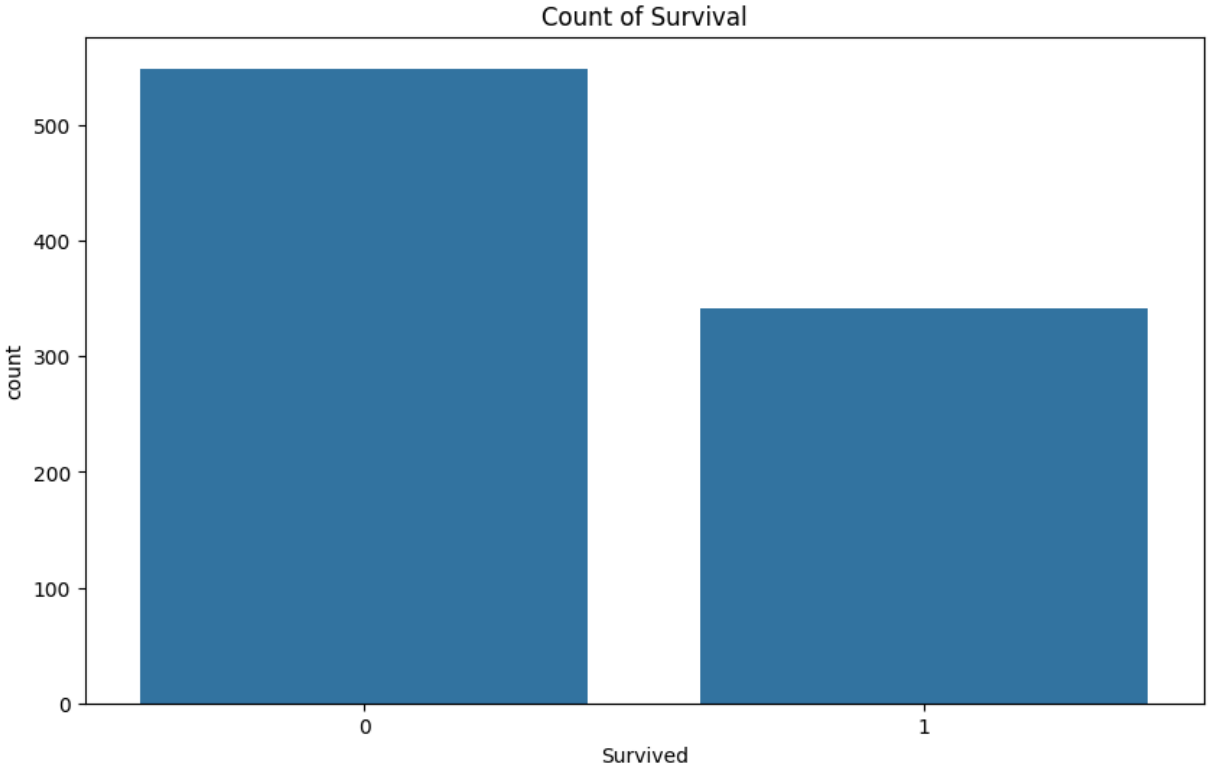
Out[18]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare
0	1	0	3	Braund, Mr. Owen Harris	male	22.000000	1	0	A/5 21171	7.2500
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.000000	1	0	PC 17599	71.2833
2	3	1	3	Heikkinen, Miss. Laina	female	26.000000	0	0	STON/O2. 3101282	7.9250
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.000000	1	0	113803	53.1000
4	5	0	3	Allen, Mr. William Henry	male	35.000000	0	0	373450	8.0500
...	...	...	...	...	...	...	...	...	...	...
886	887	0	2	Montvila, Rev. Juozas	male	27.000000	0	0	211536	13.0000
887	888	1	1	Graham, Miss. Margaret Edith	female	19.000000	0	0	112053	30.0000
888	889	0	3	Johnston, Miss. Catherine Helen "Carrie"	female	29.699118	1	2	W./C. 6607	23.4500
889	890	1	1	Behr, Mr. Karl Howell	male	26.000000	0	0	111369	30.0000
890	891	0	3	Dooley, Mr. Patrick	male	32.000000	0	0	370376	7.7500

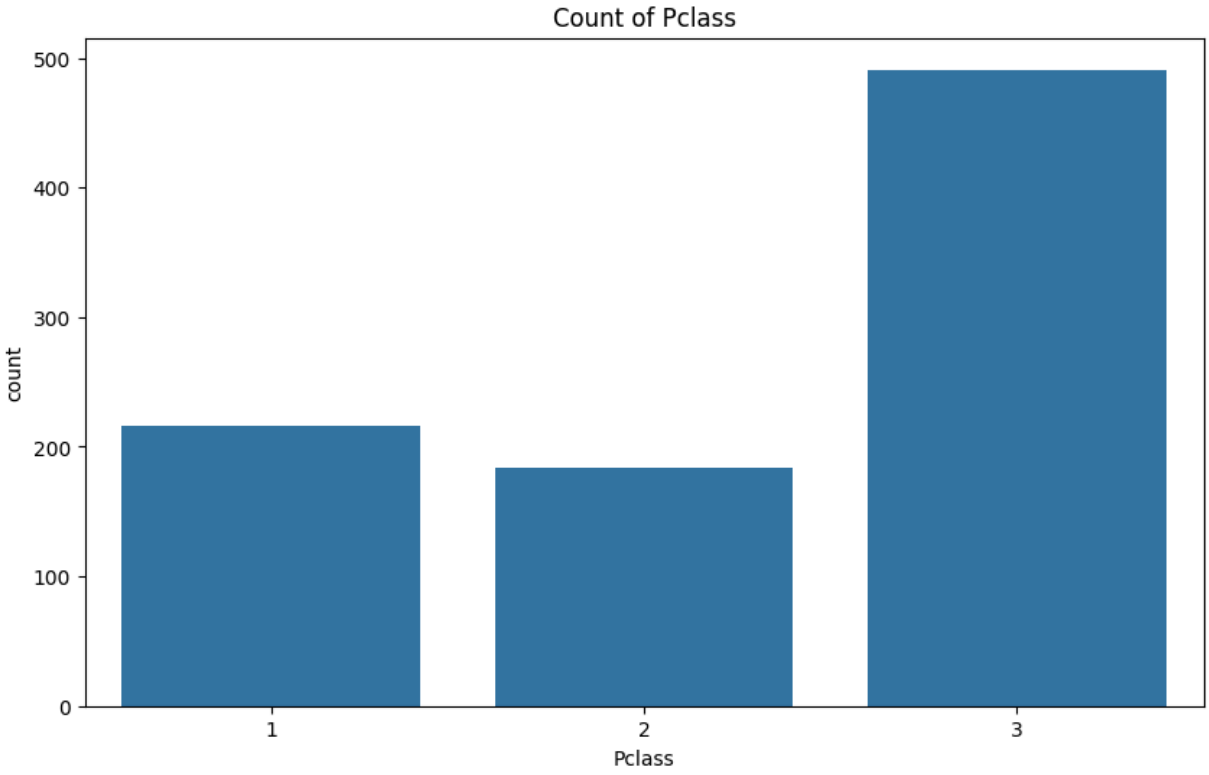
891 rows × 12 columns

In [21]:

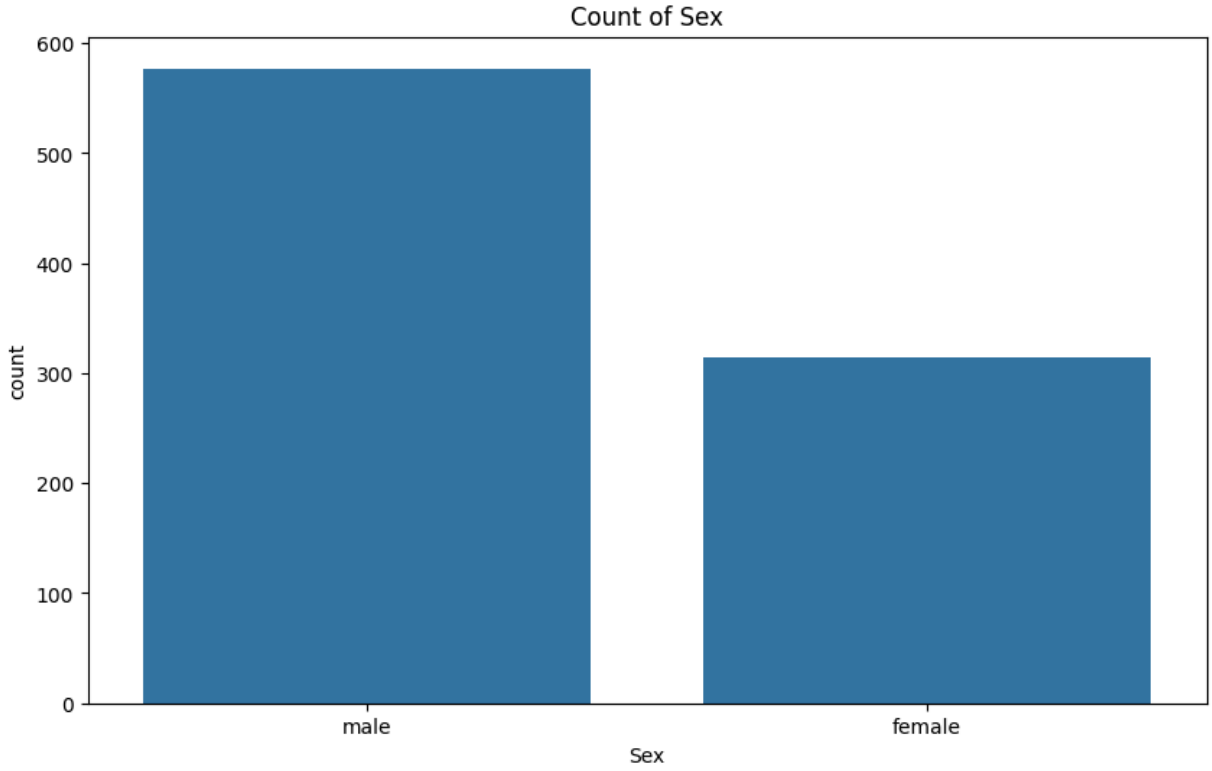
```
plt.figure(figsize=(10, 6))
sns.countplot(data=data, x='Survived')
plt.title('Count of Survival')
plt.show()
```



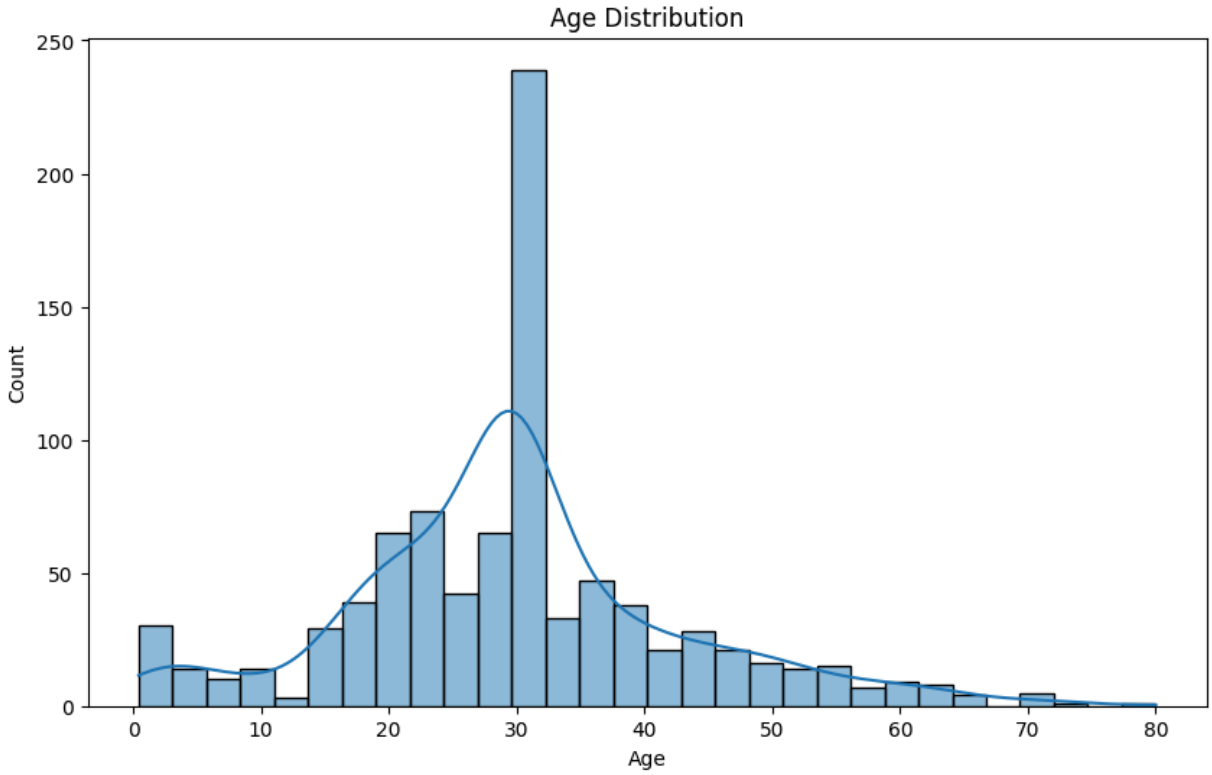
In [22]:
```
# Countplot of Pclass
plt.figure(figsize=(10, 6))
sns.countplot(data, x='Pclass')
plt.title('Count of Pclass')
plt.show()
```



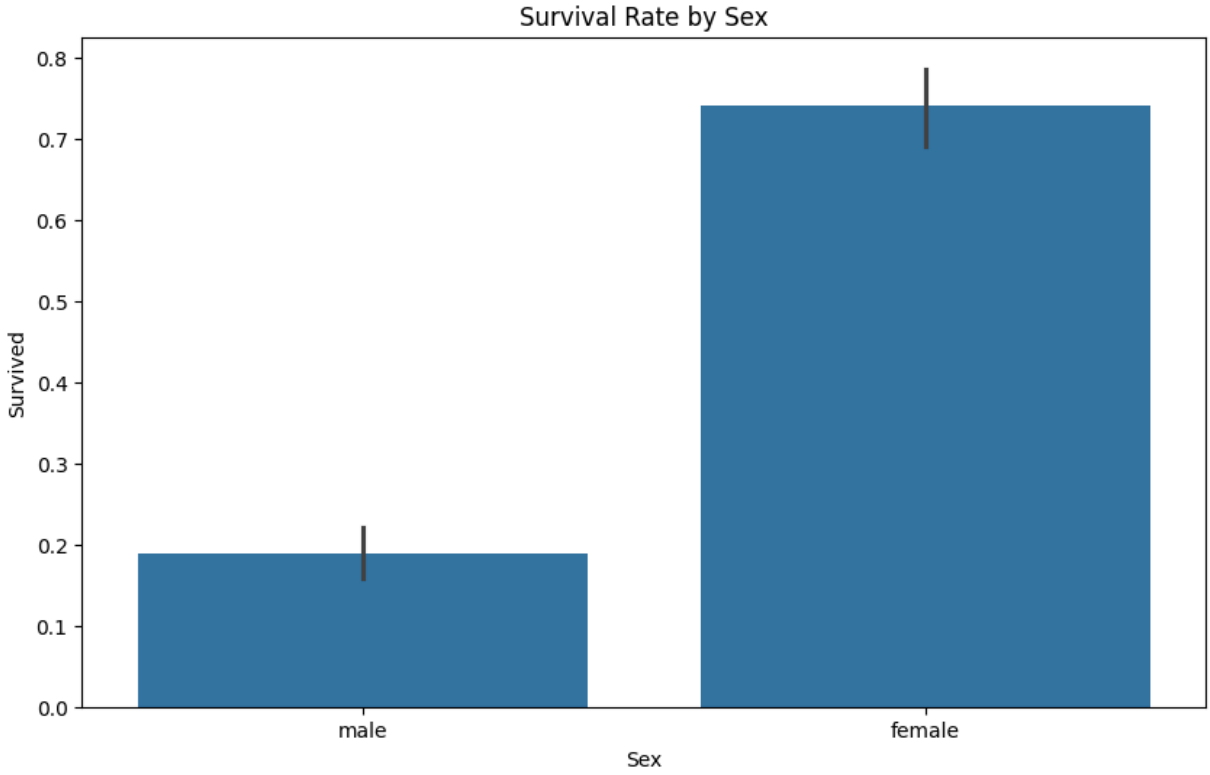
In [30]:
```
# Countplot of Sex
plt.figure(figsize=(10, 6))
sns.countplot(data, x='Sex')
plt.title('Count of Sex')
plt.show()
```



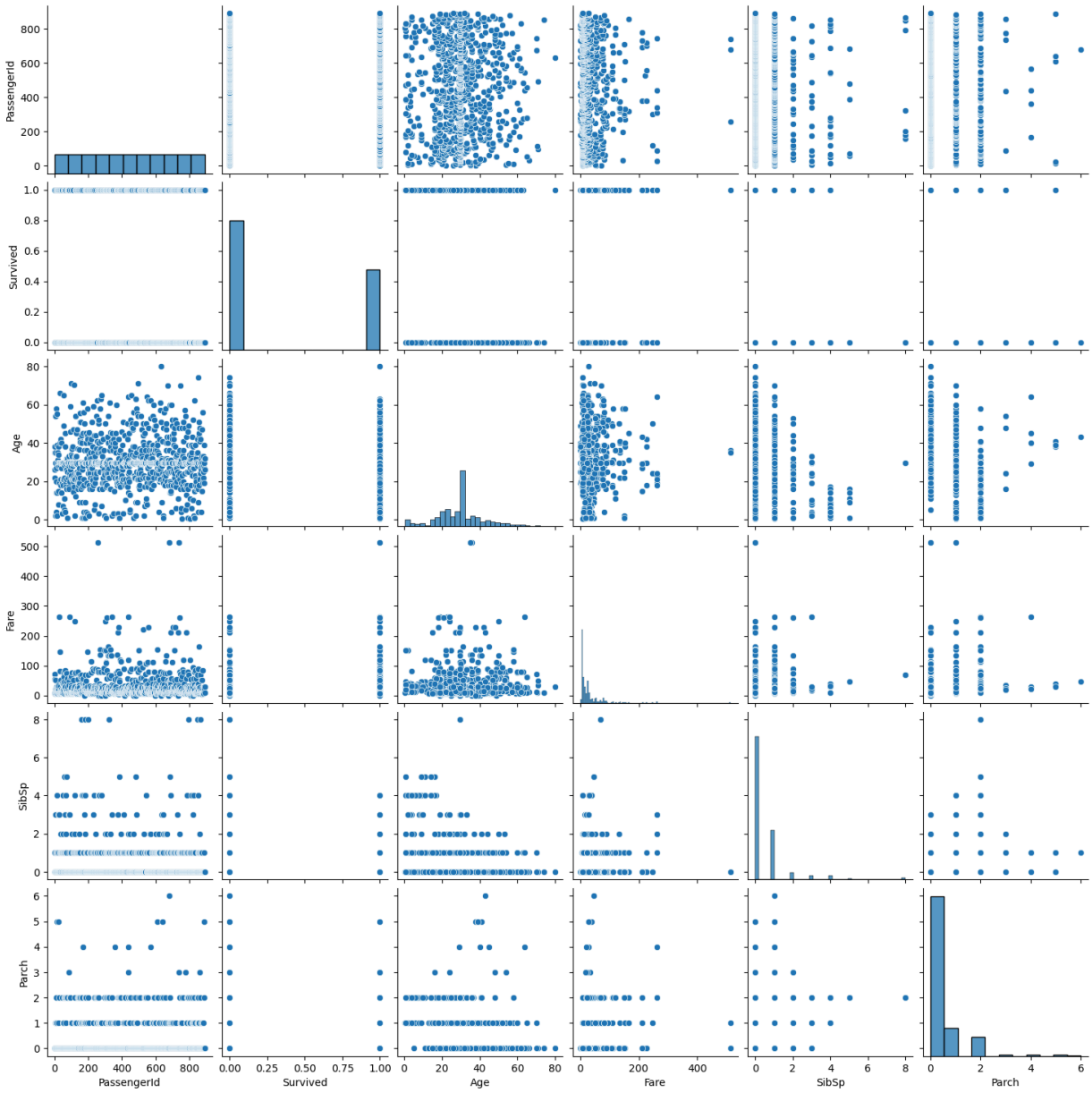
In [23]:
```
# Age distribution
plt.figure(figsize=(10, 6))
sns.histplot(data, x='Age', kde=True)
plt.title('Age Distribution')
plt.show()
```



In [24]:
```
# Survival rate by Sex
plt.figure(figsize=(10, 6))
sns.barplot(data, x='Sex', y='Survived')
plt.title('Survival Rate by Sex')
plt.show()
```

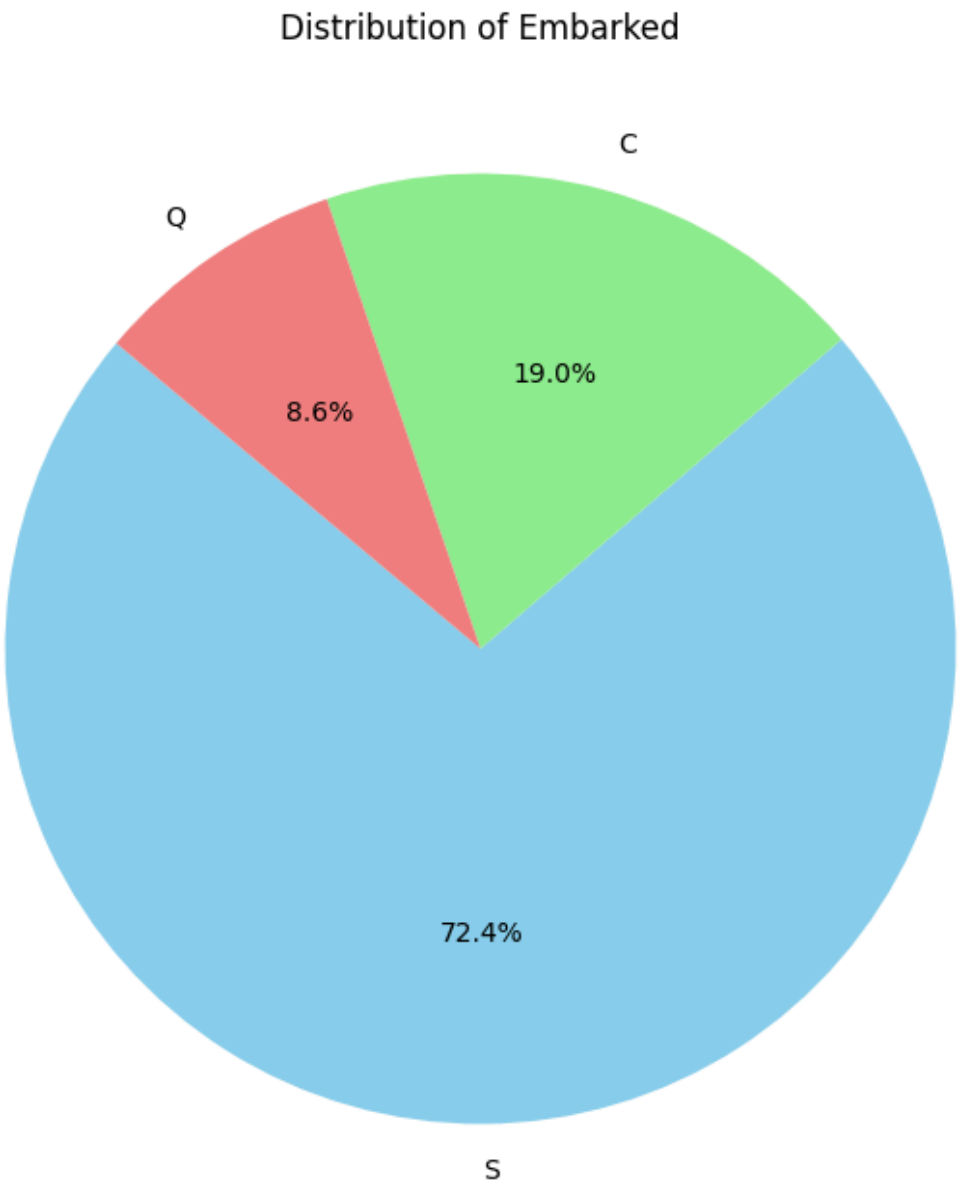


In [29]:
```
# Pairplot for numerical features
sns.pairplot(data[['PassengerId','Survived', 'Age', 'Fare', 'SibSp', 'Parch']])
plt.show()
```



In [31]:

```
# Create a pie chart for the 'Embarked' column
embarked_counts = data['Embarked'].value_counts()
plt.figure(figsize=(8, 8))
plt.pie(embarked_counts, labels=embarked_counts.index, autopct='%1.1f%%', startangle=
plt.title('Distribution of Embarked')
plt.show()
```



In [ ]: