In [ ]:

```
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TASK NO:2
Prodigy InfoTech
```

In [1]:

```
import pandas as pd

# Load the Titanic dataset
df = pd.read_csv('titanic.csv')

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

```
   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  
```

In [2]:

```
# Get a summary of the dataframe
print(df.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
None
```

In [3]:

```
# Check for missing values
print(df.isnull().sum())
```

```
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
```

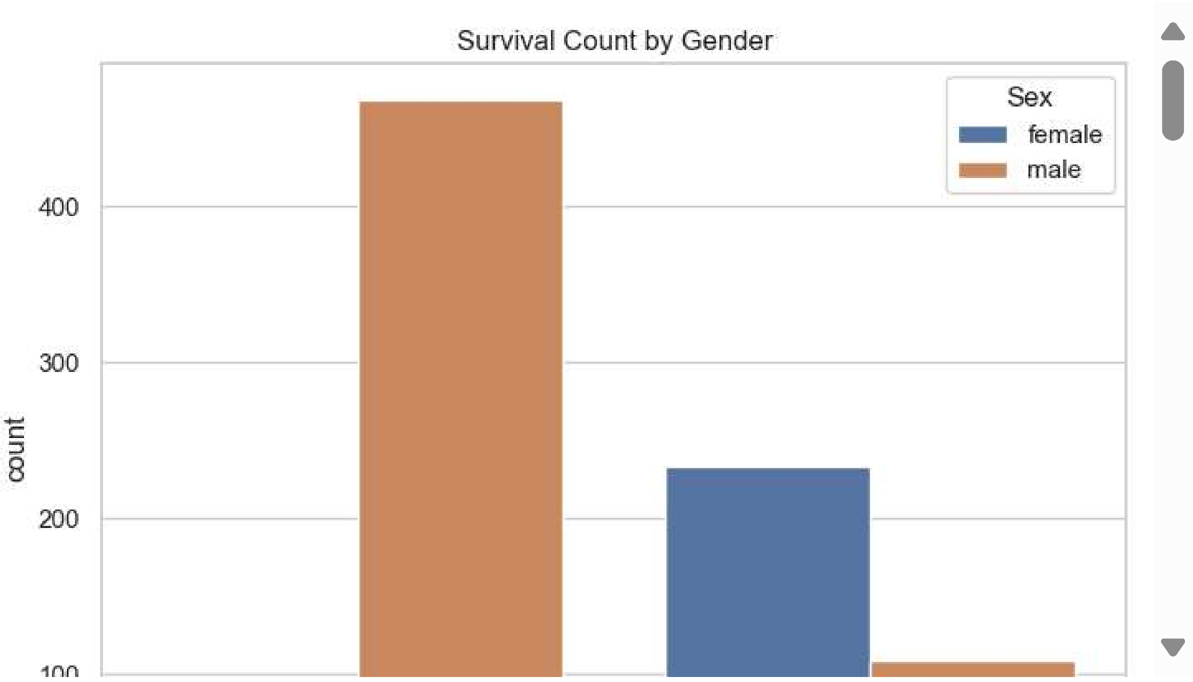
In [4]:

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

# Fill missing 'Embarked' values with the mode (most common value)
df['Embarked'].fillna(df['Embarked'].mode()[0], inplace=True)

# Drop the 'Cabin' column because it has too many missing values
df.drop(columns=['Cabin'], inplace=True)

# Convert 'Sex' and 'Embarked' to categorical variables
df['Sex'] = df['Sex'].astype('category')
df['Embarked'] = df['Embarked'].astype('category')

# Verify that there are no more missing values
print(df.isnull().sum())
```

```
PassengerId    0
Survived       0
Pclass         0
Name           0
Sex            0
Age            0
SibSp          0
Parch          0
Ticket         0
Fare           0
Embarked       0
dtype: int64
```

In [7]:

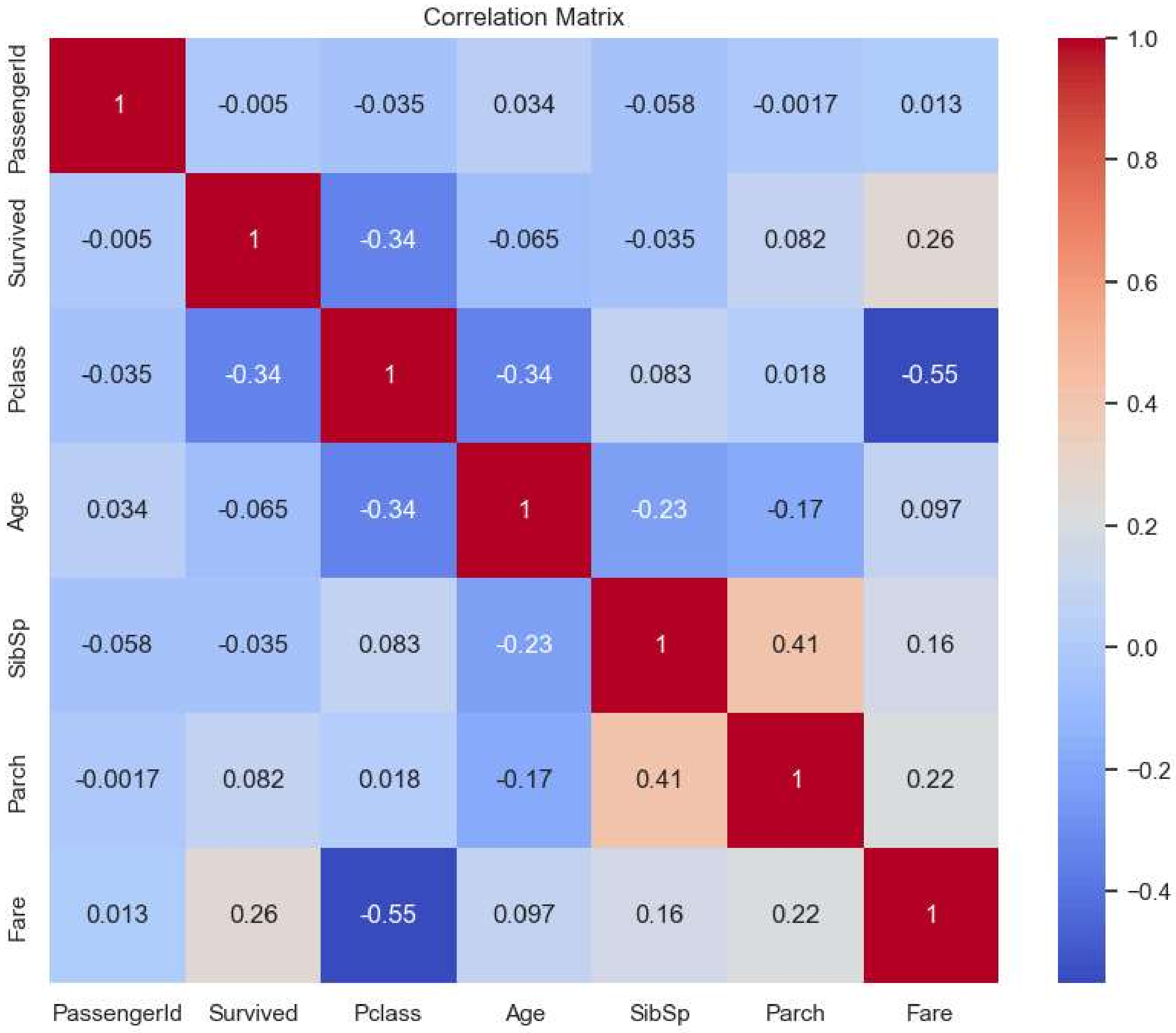
```
import matplotlib.pyplot as plt
import seaborn as sns

# Set the style for the plots
sns.set(style="whitegrid")

# Plot the survival rate by gender
plt.figure(figsize=(8, 6))
sns.countplot(x='Survived', hue='Sex', data=df)
plt.title('Survival Count by Gender')
plt.show()

# Plot the distribution of ages
plt.figure(figsize=(8, 6))
sns.histplot(df['Age'], bins=30, kde=True)
plt.title('Age Distribution')
plt.show()

# Plot the survival rate by age
plt.figure(figsize=(8, 6))
sns.histplot(data=df, x='Age', hue='Survived', multiple='stack', bins=30)
plt.title('Survival Rate by Age')
plt.show()

# Plot the survival rate by passenger class
plt.figure(figsize=(8, 6))
sns.countplot(x='Pclass', hue='Survived', data=df)
plt.title('Survival Rate by Passenger Class')
plt.show()

# Plot the survival rate by embarkation point
plt.figure(figsize=(8, 6))
sns.countplot(x='Embarked', hue='Survived', data=df)
plt.title('Survival Rate by Embarkation Point')
plt.show()
```

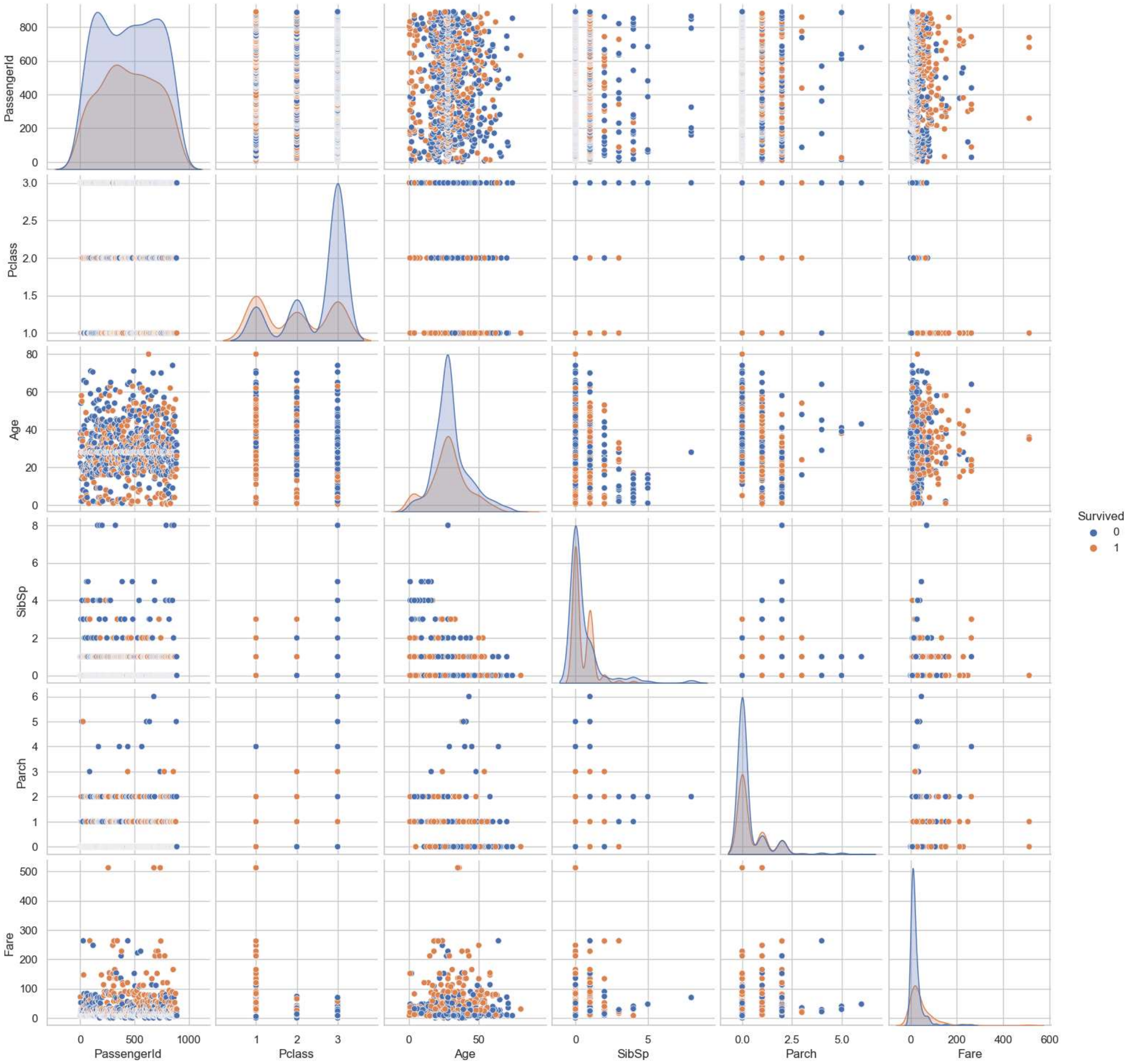

Survival Count by Gender
Sex
female
male
400
300
200
100
count

In [8]:

```
# Plot the correlation matrix
plt.figure(figsize=(10, 8))
sns.heatmap(df.corr(), annot=True, cmap='coolwarm')
plt.title('Correlation Matrix')
plt.show()

# Pair plot to explore relationships between features
sns.pairplot(df, hue='Survived', diag_kind='kde')
plt.show()
```

```
C:\Users\Karthika\AppData\Local\Temp\ipykernel_9024\2245879067.py:3: FutureWa
rning: The default value of numeric_only in DataFrame.corr is deprecated. In
a future version, it will default to False. Select only valid columns or spec
ify the value of numeric_only to silence this warning.
  sns.heatmap(df.corr(), annot=True, cmap='coolwarm')
```




PassengerId
Pclass
Age
SibSp
Parch
Fare
Survived
0
1
0
200
400
600
800
1.0
1.5
2.0
2.5
3.0
0
20
40
60
80
0
2
4
6
8
0
1
2
3
4
5
6
0
100
200
300
400
500
0
500
1000
1
2
3
0
50
0
5
0.0
2.5
5.0
0
200
400
600

In [ ]: