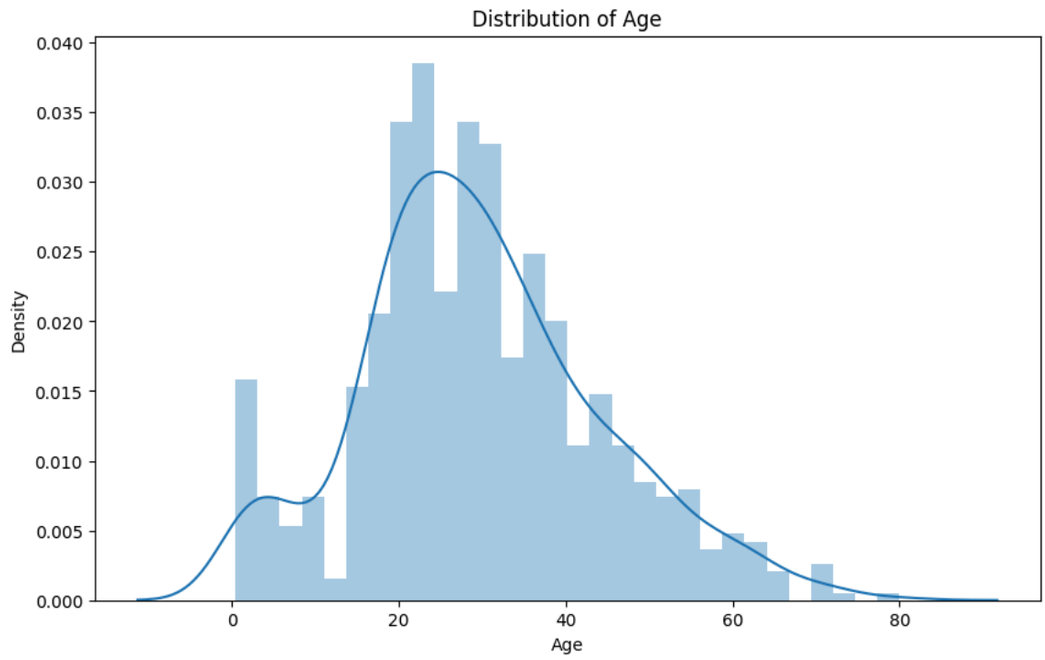
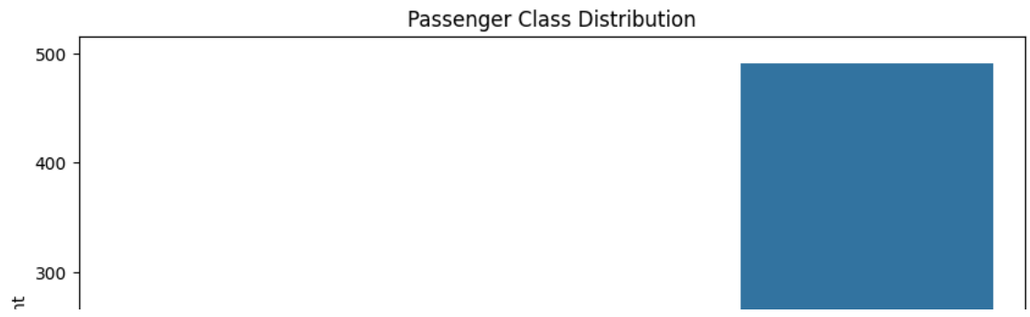
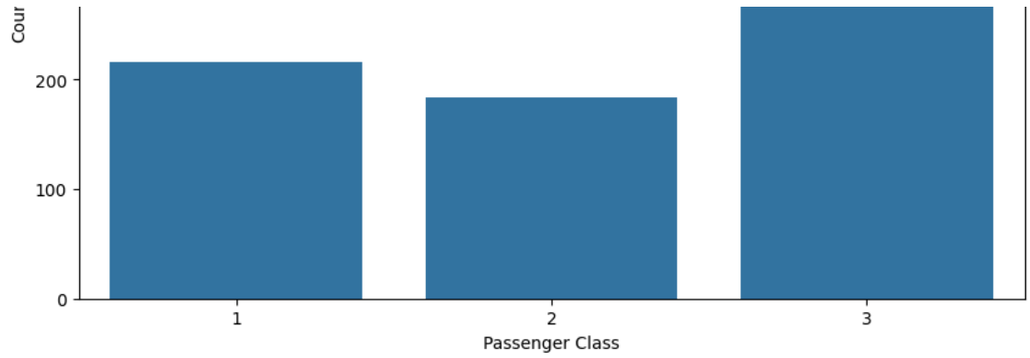
```
import pandas as pd  # pip install pandas
import matplotlib.pyplot as plt # pip install matplotlib
import seaborn as sns # pip install seaborn

# Load the dataset
# Assuming the dataset is saved as 'titanic.csv'
df = pd.read_csv('titanic.csv')

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

# Basic statistics of numeric columns
print(df.describe())

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


''' Data Visualization and EDA Techniques
1. Distribution of Numeric Features
To understand the distribution of numeric
features, such as ages of passengers or fare prices, histograms
are very useful.'''


# Histogram of the Age column
plt.figure(figsize=(10, 6))
sns.distplot(df['Age'].dropna(), kde=True, bins=30)
plt.title('Distribution of Age')
plt.xlabel('Age')
plt.ylabel('Density')
plt.show()


'''2. Categorical Data Analysis
Bar charts and count plots can show the distribution of categorical data,
like the number of passengers in each class or the number of survivors.'''
# Count plot for the 'Pclass' column
plt.figure(figsize=(10, 6))
sns.countplot(x='Pclass', data=df)
plt.title('Passenger Class Distribution')
plt.xlabel('Passenger Class')
plt.ylabel('Count')
plt.show()


'''3. Correlation Heatmap
Understanding how different features are related to each other can be crucial.
A heatmap can visualize the correlation matrix.'''
# Correlation heatmap
plt.figure(figsize=(10, 8))
sns.heatmap(df.corr(), annot=True, cmap='coolwarm')
plt.title('Correlation between Features')
plt.show()

''' 4. Comparing Survival Rates
Comparing the survival rates across different groups can provide insights into
what factors might have influenced survival on the Titanic.'''

# Survival rate by passenger class
plt.figure(figsize=(10, 6))
sns.barplot(x='Pclass', y='Survived', data=df)
plt.title('Survival Rate by Passenger Class')
plt.xlabel('Passenger Class')
plt.ylabel('Survival Rate')
plt.show()


# Survival rate by gender
plt.figure(figsize=(10, 6))
sns.barplot(x='Sex', y='Survived', data=df)
plt.title('Survival Rate by Gender')
plt.xlabel('Gender')
plt.ylabel('Survival Rate')
plt.show()


''' 5. Pairplot
A pairplot can help visualize the distribution of individual variables and
the relationships between them, for a subset of features.'''

# Pairplot for a subset of variables
sns.pairplot(df[['Survived', 'Pclass', 'Age', 'Fare']], hue='Survived')
plt.show()
```

```
   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
       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
max      6.000000  512.329200
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
<ipython-input-2-b06cb08e993d>:28: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751
```

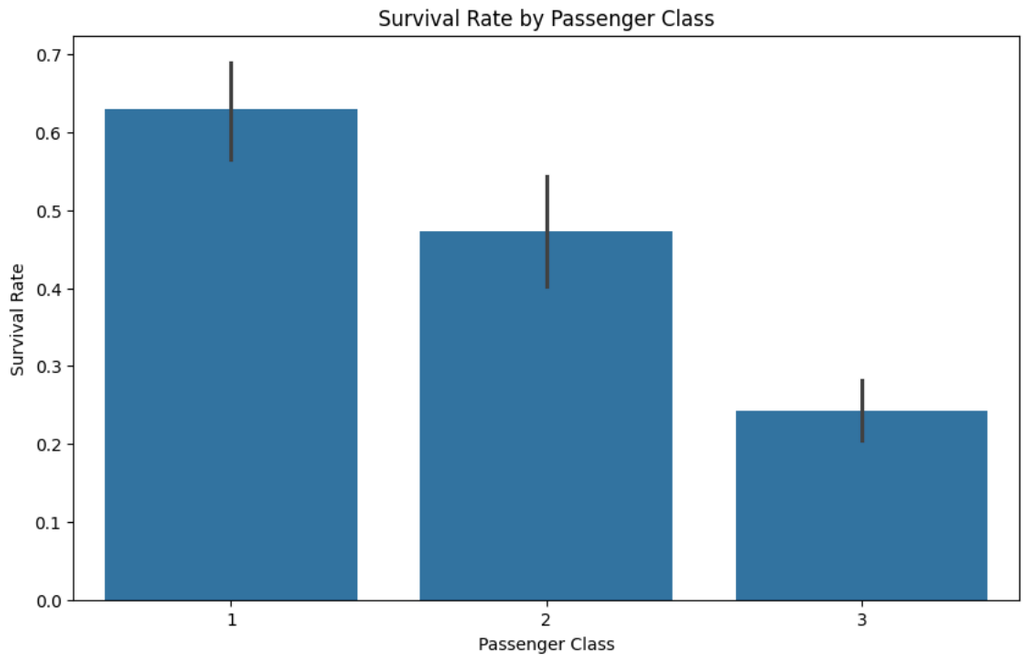
```
sns.distplot(df['Age'].dropna(), kde=True, bins=30)
```

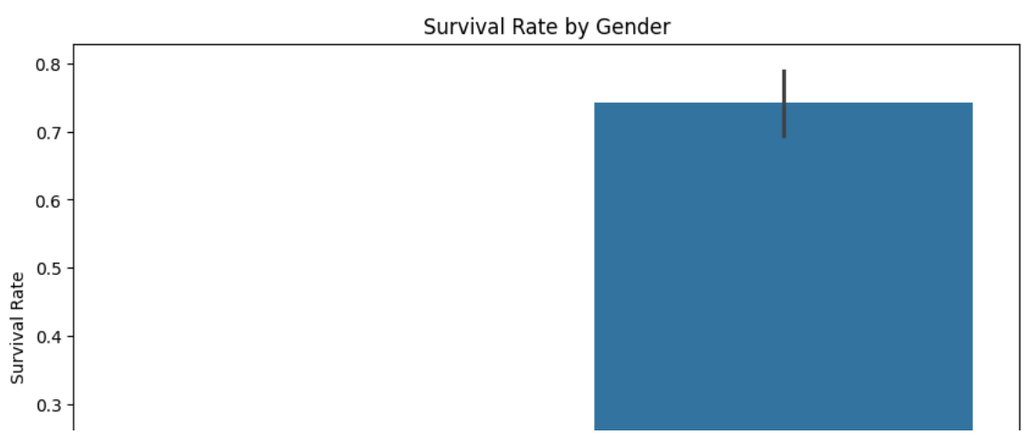


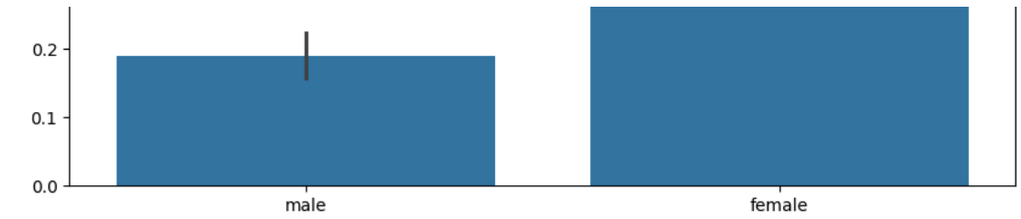


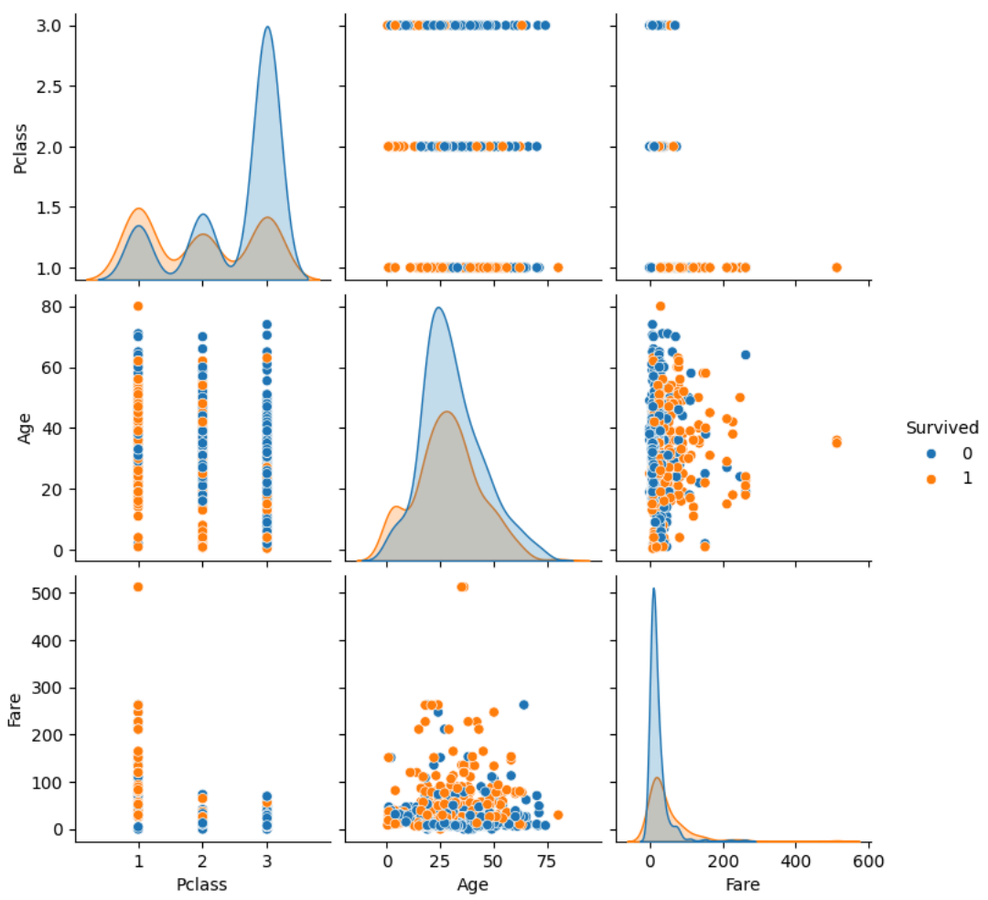



```
<ipython-input-2-b06cb08e993d>:52: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version
  sns.heatmap(df.corr(), annot=True, cmap='coolwarm')
```






0.2
0.1
0.0
male
female
Gender


Pclass
Age
Fare
Survived
0
1
Pclass
Age
Fare