```
# Cell 1: Import required libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

# Cell 2: Load the dataset and inspect the first few rows
df = pd.read_csv('train.csv')  # File must be in the same folder

# Show first 5 rows
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
```

```
# Cell 3: Data information and summary statistics
# Display data info and summary statistics
df.info()
df.describe()
```

```
<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
```

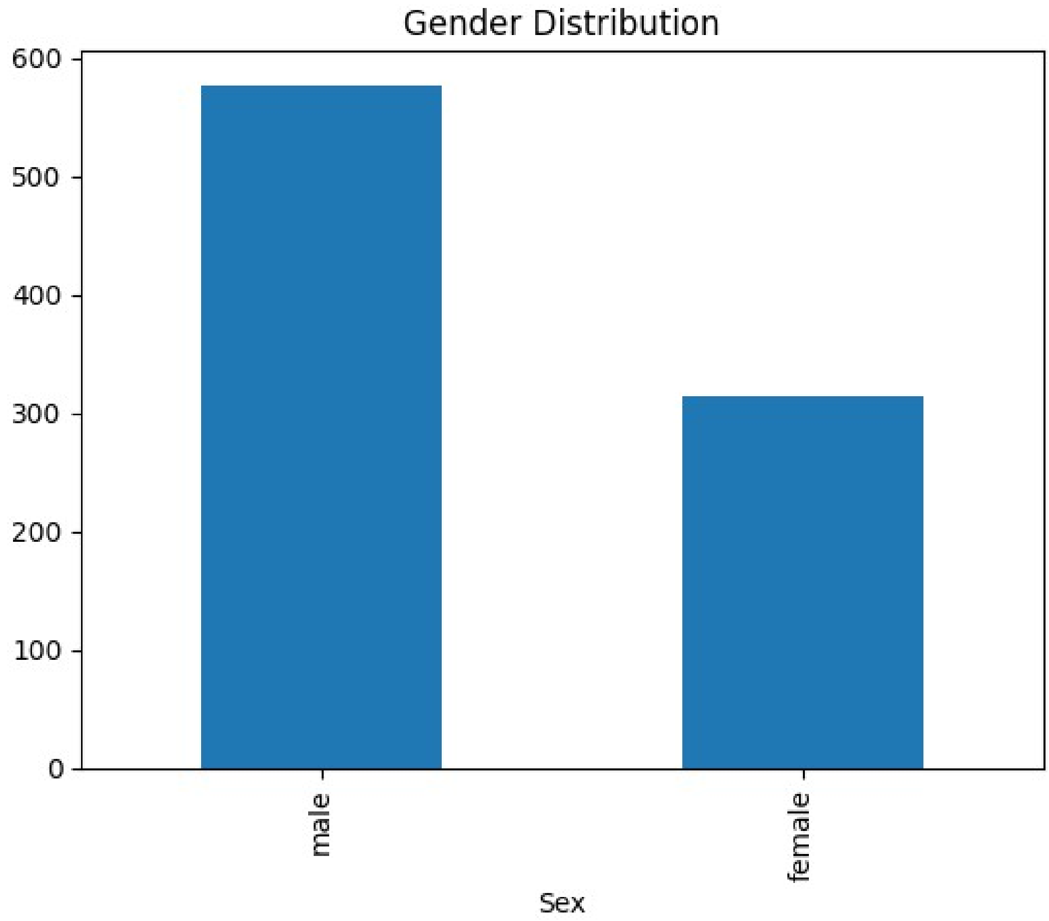
```
       PassengerId    Survived      Pclass         Age       SibSp  \
count   891.000000  891.000000  891.000000  714.000000  891.000000   
mean    446.000000    0.383838    2.308642   29.699118    0.523008   
std     257.353842    0.486592    0.836071   14.526497    1.102743   
min       1.000000    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  
```

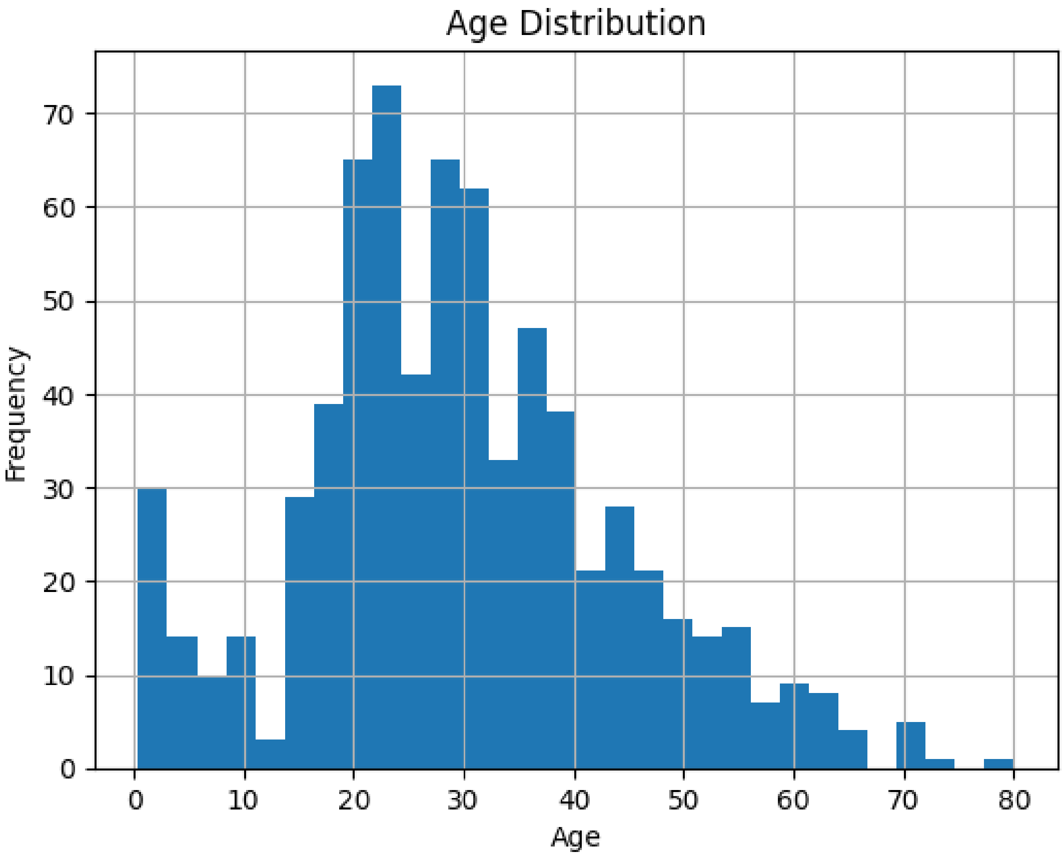
```
# Cell 4: Check for missing values
df.isnull().sum()
```

```
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
```

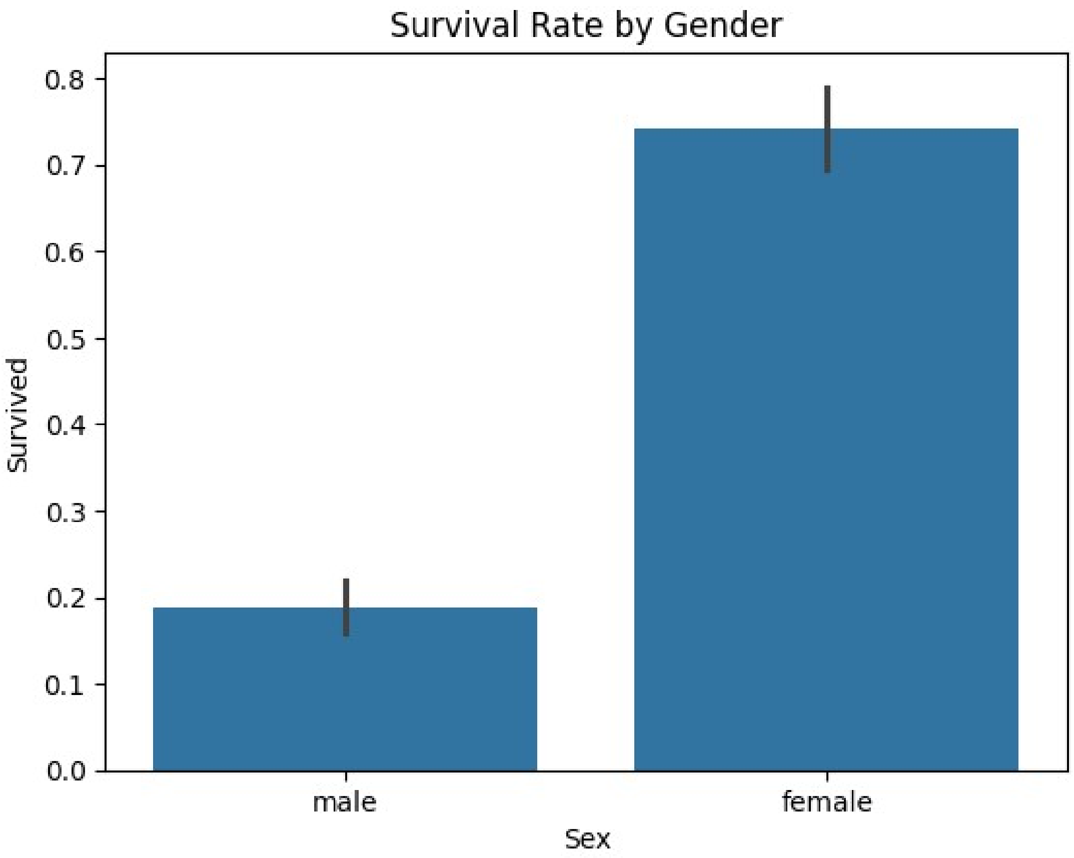
```python
# Cell 5: Gender Distribution Bar Plot
df['Sex'].value_counts().plot(kind='bar')
plt.title('Gender Distribution')
plt.show()
```



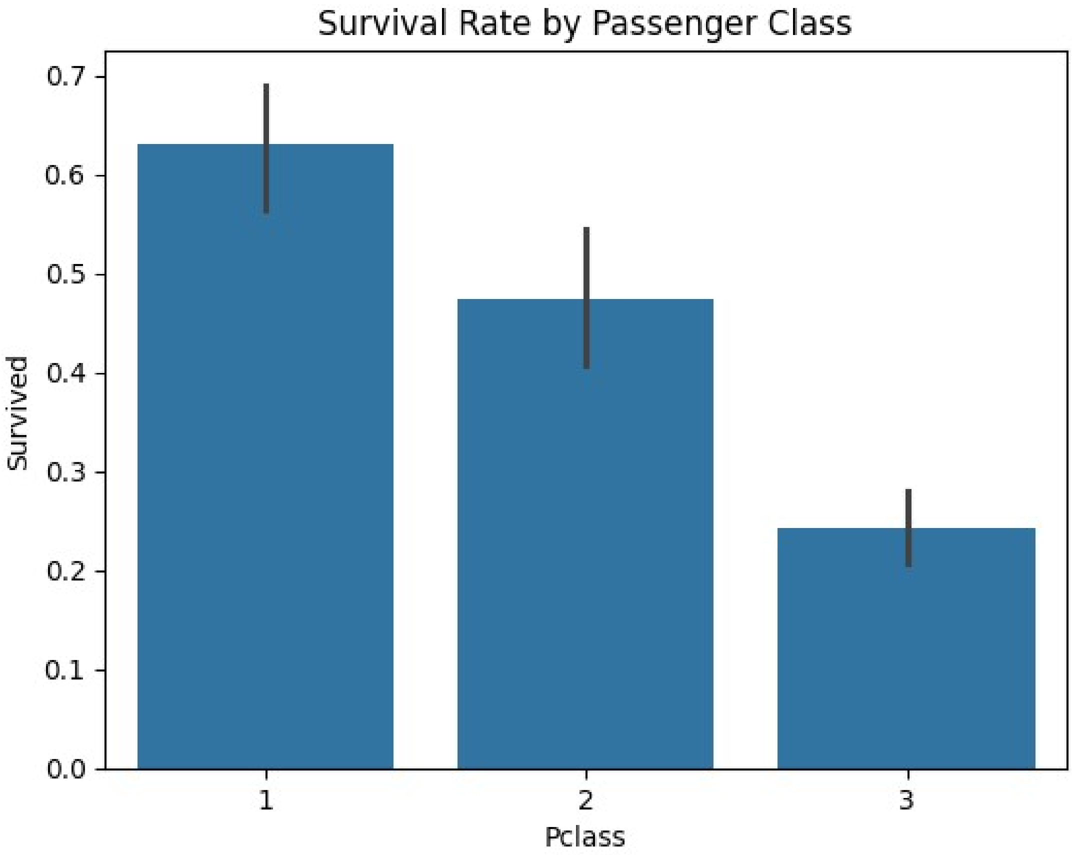
```python
# Cell 6: Age Distribution Histogram
df['Age'].hist(bins=30)
plt.title('Age Distribution')
plt.xlabel('Age')
plt.ylabel('Frequency')
plt.show()
```



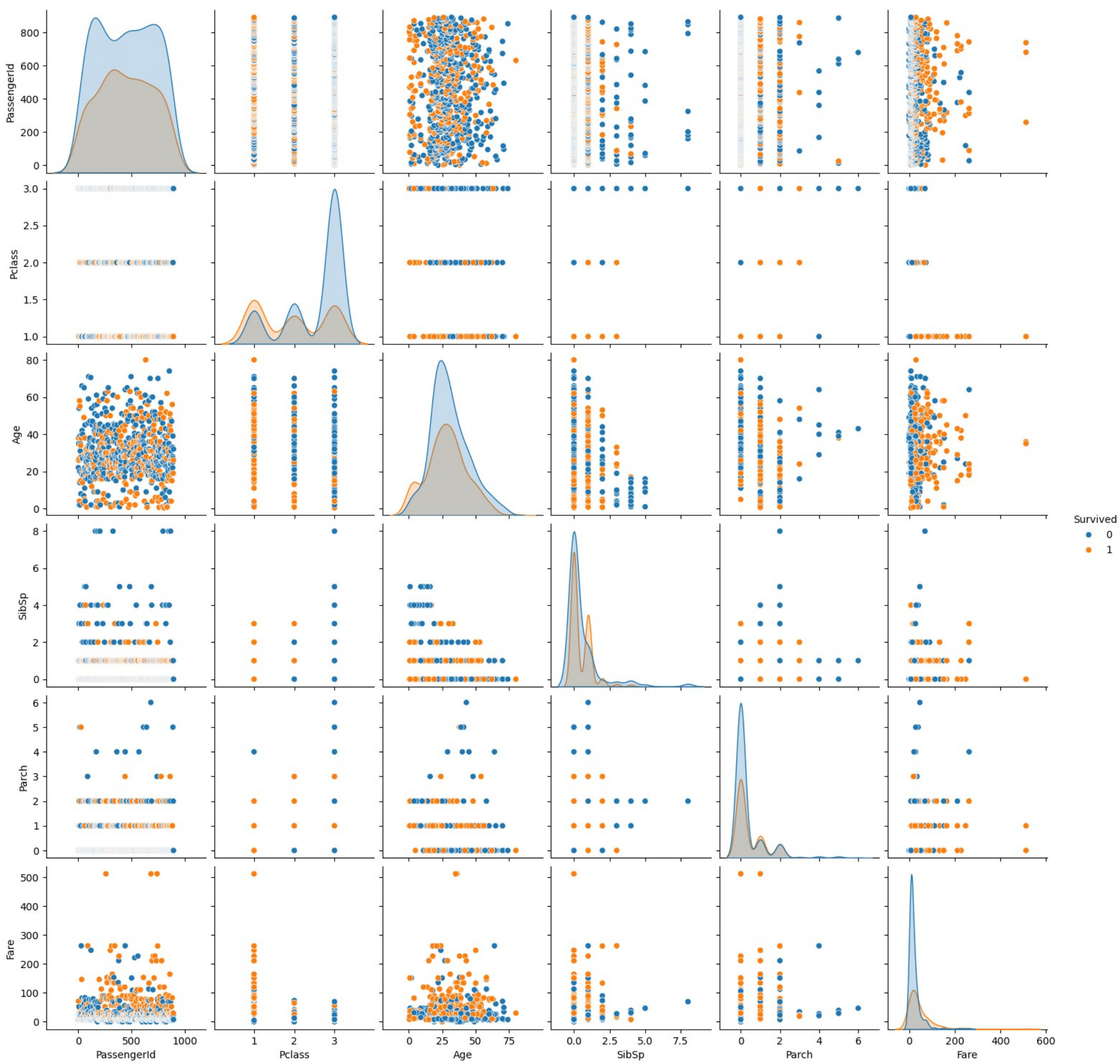
```
# Cell 7: Survival Rate by Gender (Bar Plot)
sns.barplot(x='Sex', y='Survived', data=df)
plt.title('Survival Rate by Gender')
plt.show()
```



```
# Cell 8: Survival Rate by Passenger Class (Bar Plot)
sns.barplot(x='Pclass', y='Survived', data=df)
plt.title('Survival Rate by Passenger Class')
plt.show()
```

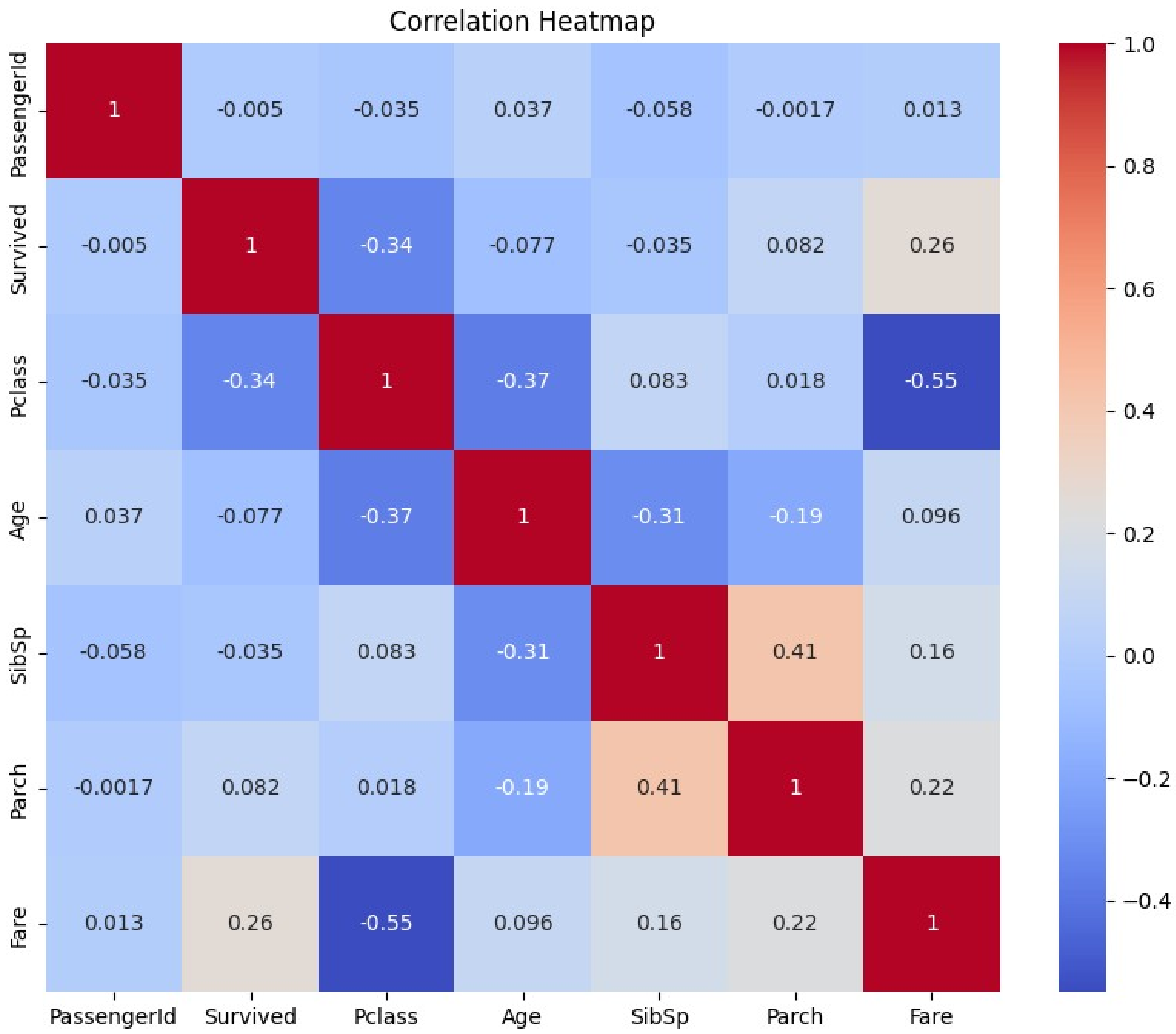


```
# Cell 9: Pairplot (Visualize relationships between features)
sns.pairplot(df, hue='Survived')
plt.show()
```

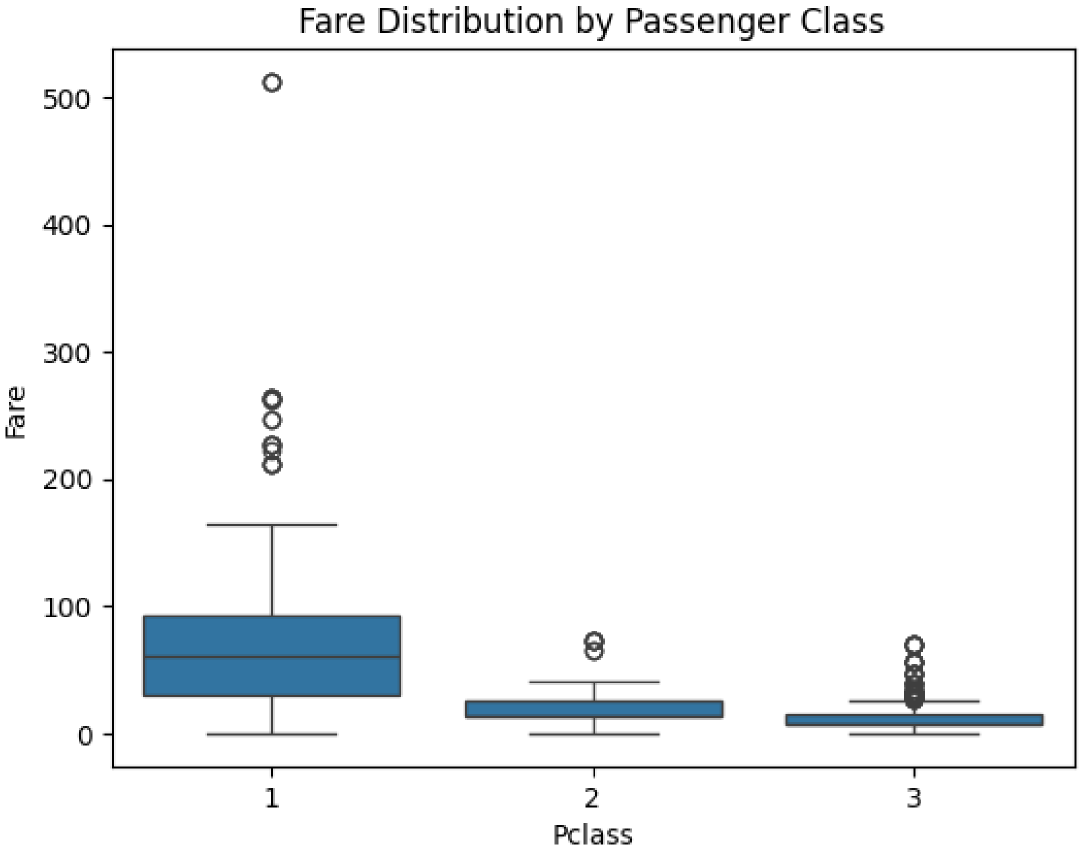


```
# Cell 10: Correlation Heatmap (Exclude non-numeric columns)
# Select only numeric columns for correlation
numeric_df = df.select_dtypes(include=['number'])

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



```
# Cell 11: Fare Distribution by Class (Boxplot)
sns.boxplot(x='Pclass', y='Fare', data=df)
plt.title('Fare Distribution by Passenger Class')
plt.show()
```


Fare Distribution by Passenger Class
Fare
500
400
300
200
100
0
1
2
3
Pclass