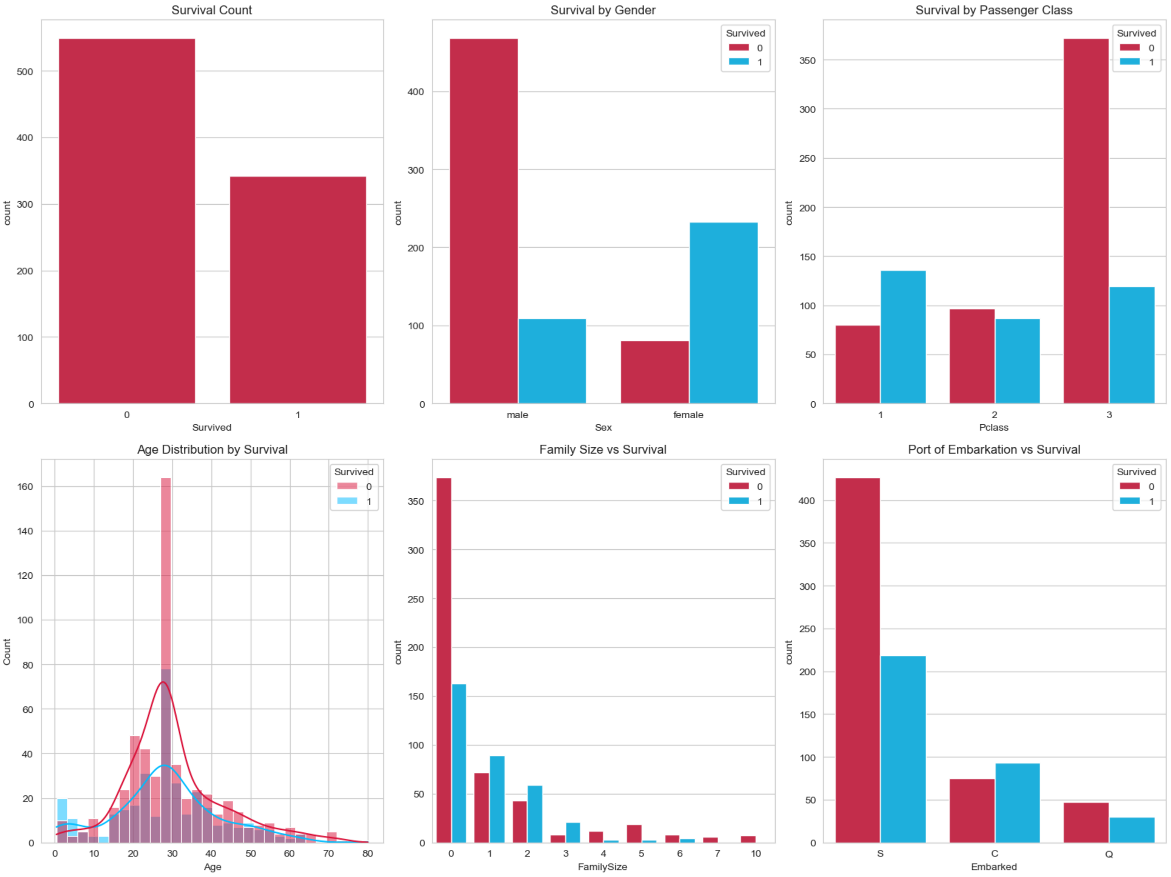
In [10]:

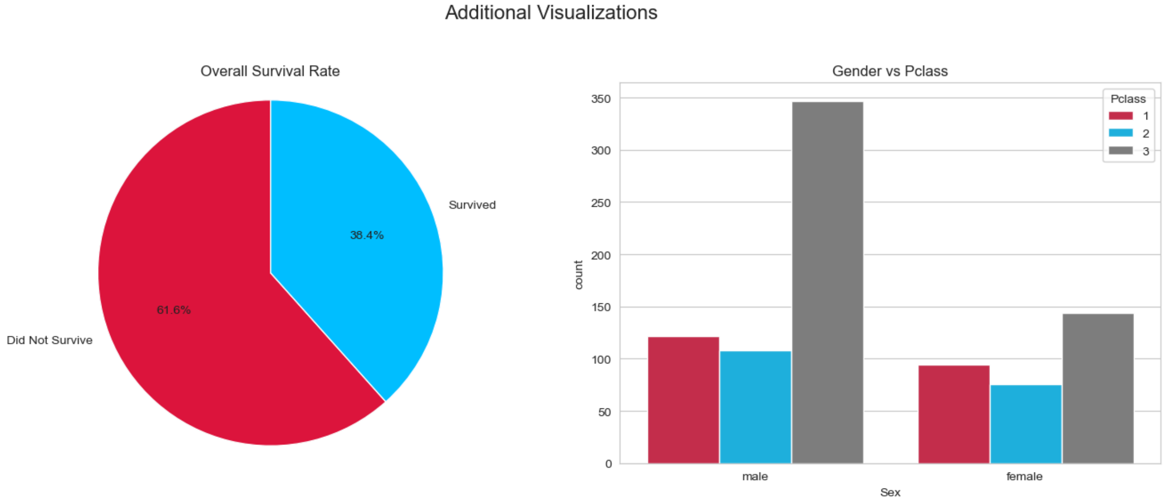
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.backends.backend_pdf import PdfPages
from IPython.display import display

%matplotlib inline

plt.style.use("default")
sns.set_style("whitegrid")
sns.set_palette(['crimson', 'deepskyblue'])

df = pd.read_csv("/Users/shrutijha/Downloads/train.csv")

from IPython.display import HTML, display

display(df.head())
display(df.describe())
df.info()

df['Age'] = df['Age'].fillna(df['Age'].median())
df['Embarked'] = df['Embarked'].fillna(df['Embarked'].mode()[0])
df = df.drop(columns=['Cabin'])
df['FamilySize'] = df['SibSp'] + df['Parch']

df.describe().to_csv("describe.csv")
df.head().to_csv("head.csv", index=False)

with PdfPages("Titanic_EDA_Clean.pdf") as pdf:
    plt.figure(figsize=(16, 12))

    plt.subplot(2, 3, 1)
    sns.countplot(x='Survived', data=df)
    plt.title('Survival Count')

    plt.subplot(2, 3, 2)
    sns.countplot(x='Sex', hue='Survived', data=df)
    plt.title('Survival by Gender')

    plt.subplot(2, 3, 3)
    sns.countplot(x='Pclass', hue='Survived', data=df)
    plt.title('Survival by Passenger Class')

    plt.subplot(2, 3, 4)
    sns.histplot(data=df, x='Age', hue='Survived', kde=True, bins=30)
    plt.title('Age Distribution by Survival')

    plt.subplot(2, 3, 5)
    sns.countplot(x='FamilySize', hue='Survived', data=df)
    plt.title('Family Size vs Survival')

    plt.subplot(2, 3, 6)
    sns.countplot(x='Embarked', hue='Survived', data=df)
    plt.title('Port of Embarkation vs Survival')

    plt.tight_layout()
    pdf.savefig()
    plt.show()
    plt.close()

    fig, axes = plt.subplots(1, 2, figsize=(14, 6))
    fig.suptitle('Additional Visualizations', fontsize=16)

    survived_counts = df['Survived'].value_counts()
    labels = ['Did Not Survive', 'Survived']
    colors = ['crimson', 'deepskyblue']
    axes[0].pie(survived_counts, labels=labels, colors=colors, autopct='%
    axes[0].set_title('Overall Survival Rate')
    axes[0].axis('equal')

    sns.countplot(data=df, x='Sex', hue='Pclass', palette=['crimson', 'de
    axes[1].set_title('Gender vs Pclass')

    plt.tight_layout(rect=[0, 0.03, 1, 0.95])
    pdf.savefig()
    plt.show()
    plt.close()

    plt.figure(figsize=(8, 6))
    sns.heatmap(df.corr(numeric_only=True), annot=True, cmap='coolwarm',
    plt.title("Correlation Between Numerical Features", fontsize=14)
    plt.tight_layout()
    pdf.savefig()
    plt.show()
    plt.close()
```

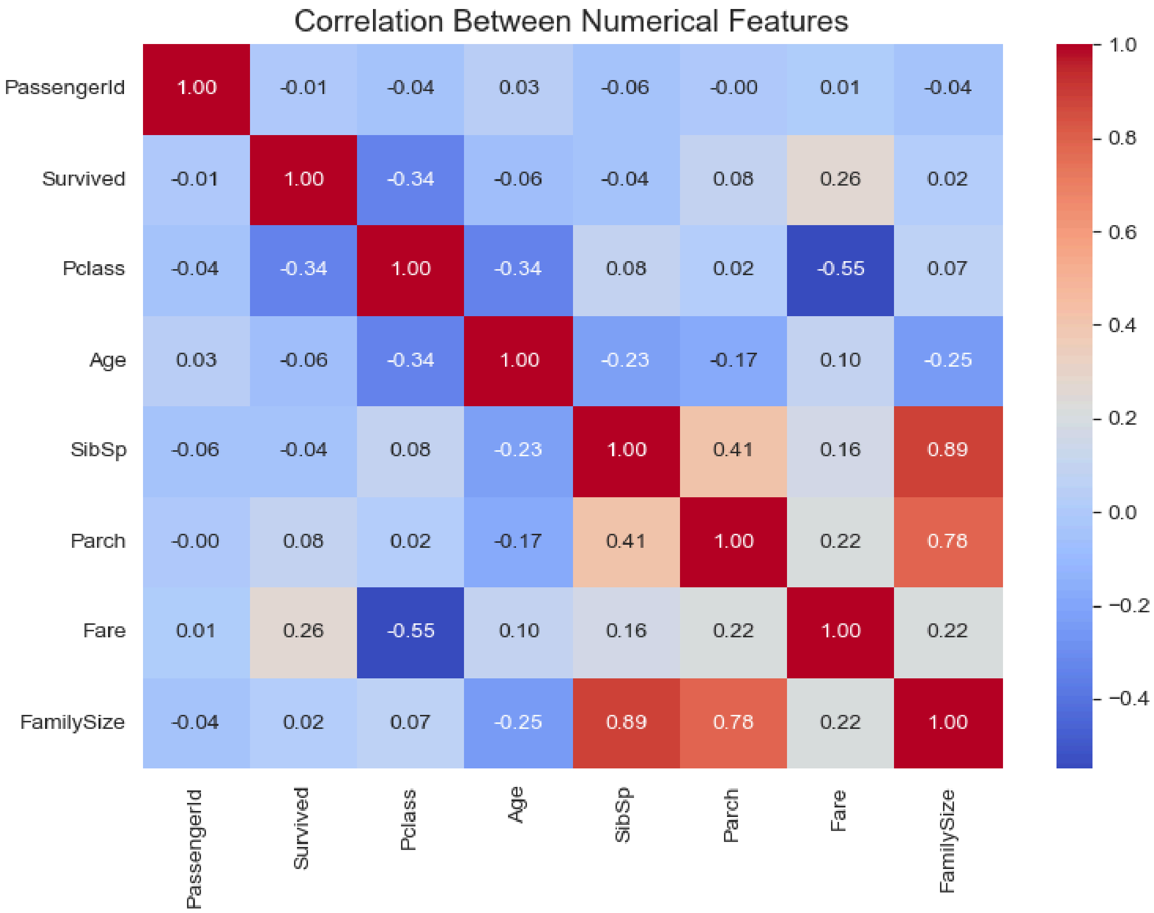
	PassengerId	Survived	Pclass	Age	SibSp	Parch
count	891.000000	891.000000	891.000000	714.000000	891.000000	891.000000
mean	446.000000	0.383838	2.308642	29.699118	0.523008	0.381594
std	257.353842	0.486592	0.836071	14.526497	1.102743	0.806057
min	1.000000	0.000000	1.000000	0.420000	0.000000	0.000000
25%	223.500000	0.000000	2.000000	20.125000	0.000000	0.000000
50%	446.000000	0.000000	3.000000	28.000000	0.000000	0.000000
75%	668.500000	1.000000	3.000000	38.000000	1.000000	0.000000
max	891.000000	1.000000	3.000000	80.000000	8.000000	6.000000

PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket
1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171
2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Thayer)	female	38.0	1	0	PC 17599
3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282
4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803
5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450

```
<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
```


Survival Count
count
0
100
200
300
400
500
0
1
Survived
Survival by Gender
count
0
100
200
300
400
Survived
0
1
male
female
Sex
Survival by Passenger Class
count
0
50
100
150
200
250
300
350
Survived
0
1
1
2
3
Pclass
Age Distribution by Survival
Count
0
20
40
60
80
100
120
140
160
Survived
0
1
0
10
20
30
40
50
60
70
80
Age
Family Size vs Survival
count
0
50
100
150
200
250
300
350
Survived
0
1
0
1
2
3
4
5
6
7
10
FamilySize
Port of Embarkation vs Survival
count
0
50
100
150
200
250
300
350
400
Survived
0
1
S
C
Q
Embarked


Additional Visualizations
Overall Survival Rate
Survived
38.4%
61.6%
Did Not Survive
Gender vs Pclass
count
0
50
100
150
200
250
300
350
Pclass
1
2
3
male
female
Sex



Correlation Between Numerical Features

	PassengerId	Survived	Pclass	Age	SibSp	Parch	Fare	FamilySize
PassengerId	1.00	-0.01	-0.04	0.03	-0.06	-0.00	0.01	-0.04
Survived	-0.01	1.00	-0.34	-0.06	-0.04	0.08	0.26	0.02
Pclass	-0.04	-0.34	1.00	-0.34	0.08	0.02	-0.55	0.07
Age	0.03	-0.06	-0.34	1.00	-0.23	-0.17	0.10	-0.25
SibSp	-0.06	-0.04	0.08	-0.23	1.00	0.41	0.16	0.89
Parch	-0.00	0.08	0.02	-0.17	0.41	1.00	0.22	0.78
Fare	0.01	0.26	-0.55	0.10	0.16	0.22	1.00	0.22
FamilySize	-0.04	0.02	0.07	-0.25	0.89	0.78	0.22	1.00

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In [ ]:
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