In [2]:
```
import pandas as pd

url = 'https://raw.githubusercontent.com/datasciencedojo/datasets/master/titanic.cs
titanic_df = pd.read_csv(url)
titanic_df.head()
```

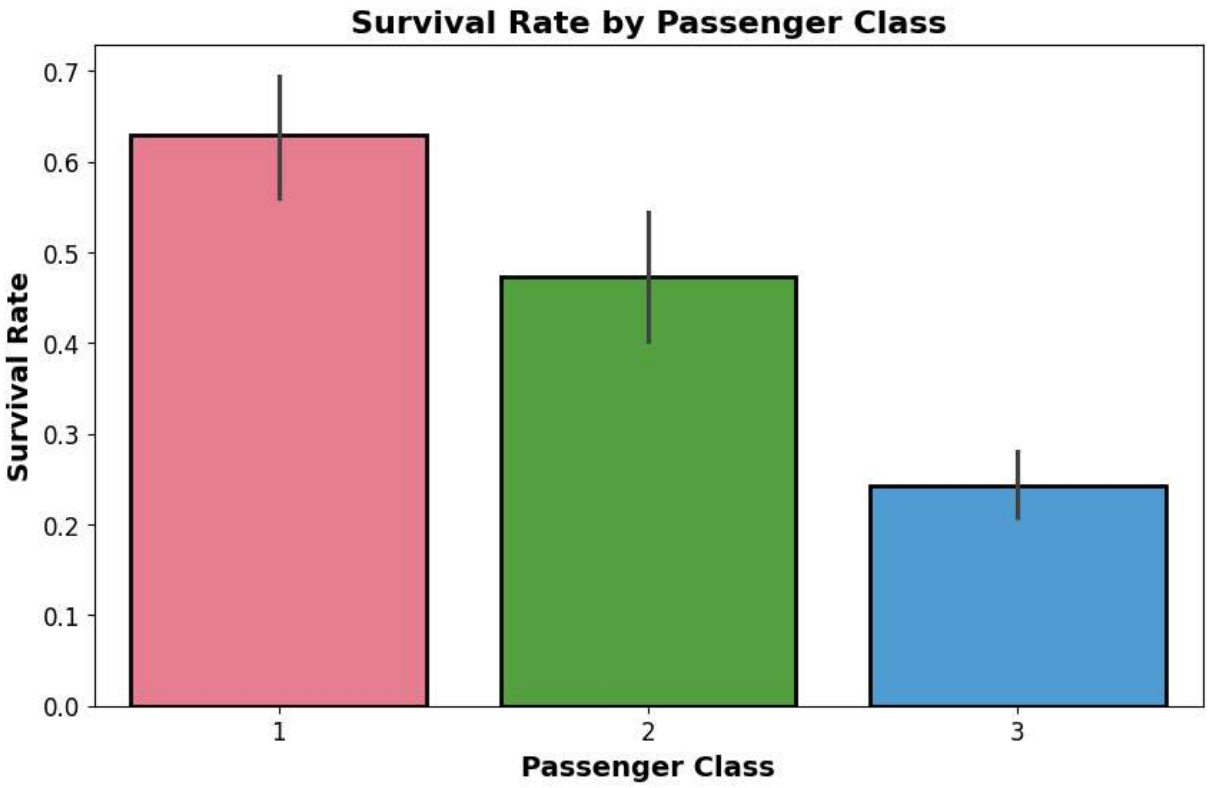
Out[2]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500

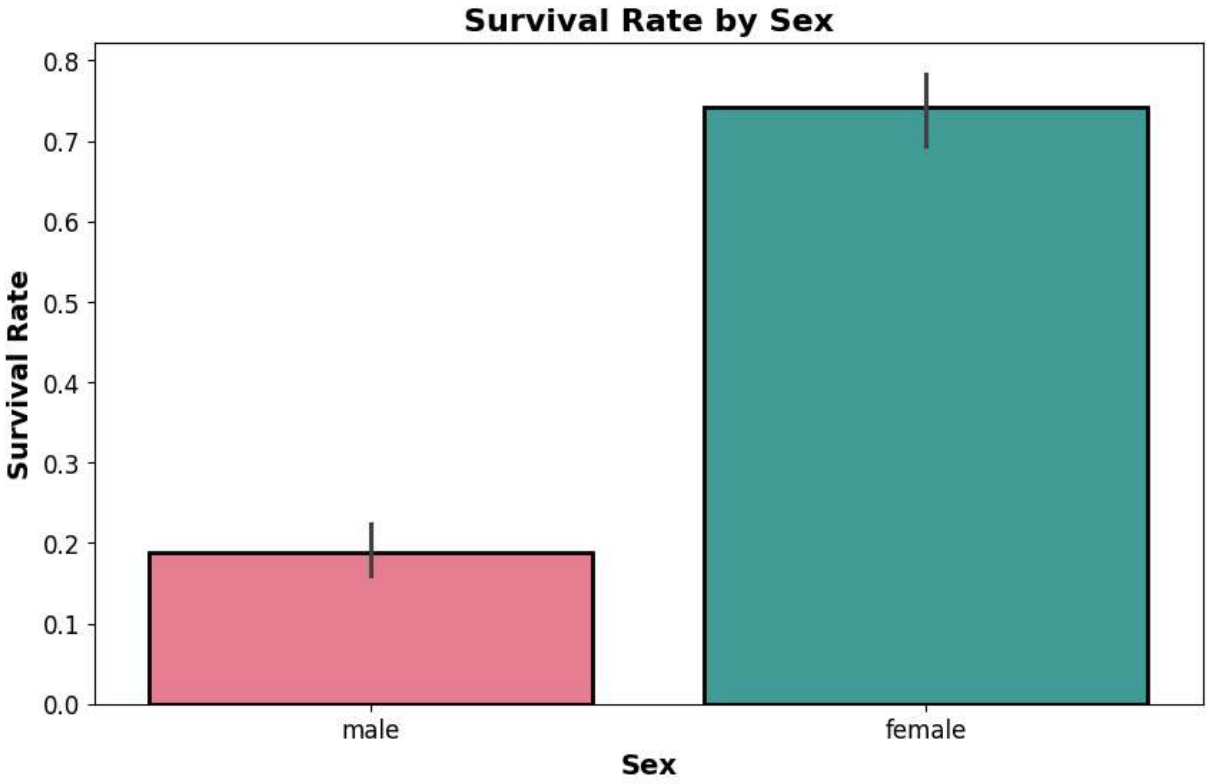
In [3]:
```
print(titanic_df.isnull().sum())
titanic_df['Age'] = titanic_df['Age'].fillna(titanic_df['Age'].median())
titanic_df['Embarked'] = titanic_df['Embarked'].fillna(titanic_df['Embarked'].mode(
if 'Cabin' in titanic_df.columns:
    titanic_df = titanic_df.drop(columns=['Cabin'])
print(titanic_df.isnull().sum())
```

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

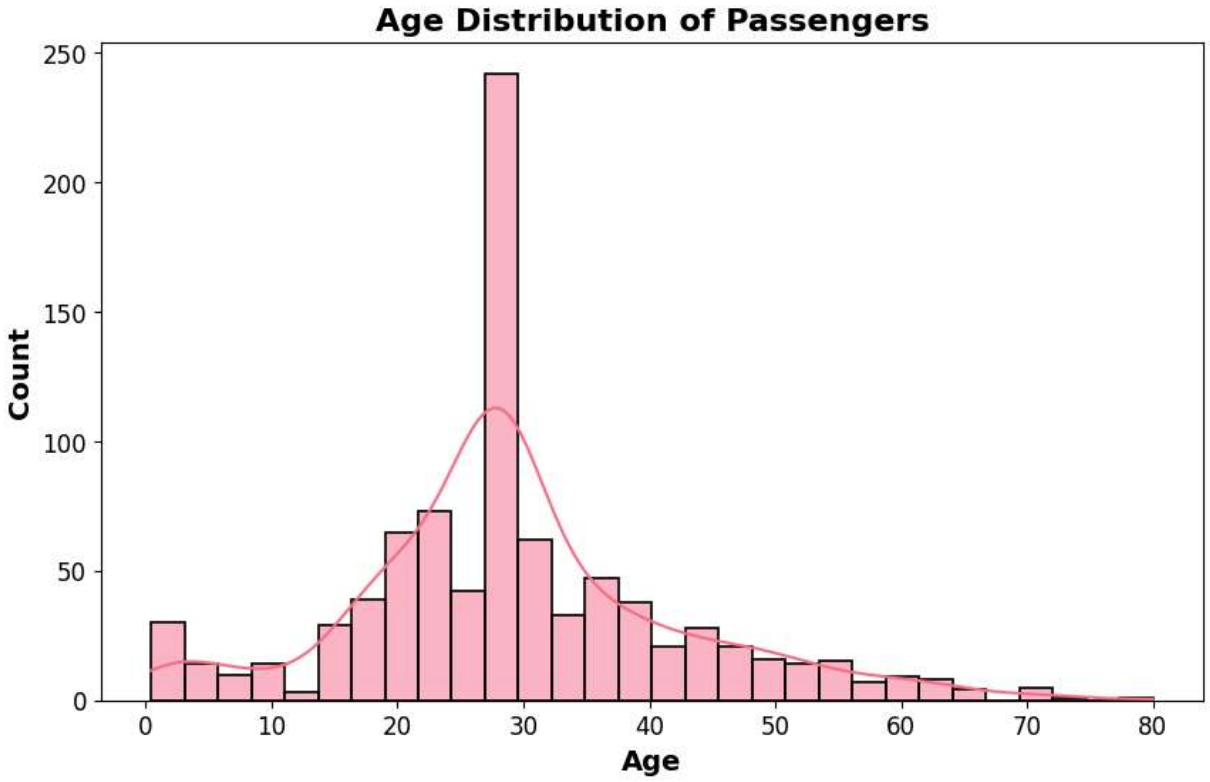
In [4]:
```
import matplotlib.pyplot as plt
import seaborn as sns


palette = sns.color_palette("husl", 3)  # HUSL color palette with 3 colors
plt.figure(figsize=(10, 6))  # Adjust the figure size
sns.barplot(x='Pclass', y='Survived', hue='Pclass', data=titanic_df, palette=palett
plt.title('Survival Rate by Passenger Class', fontsize=16, weight='bold')
plt.xlabel('Passenger Class', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.legend([], [], frameon=False)
plt.show()
```



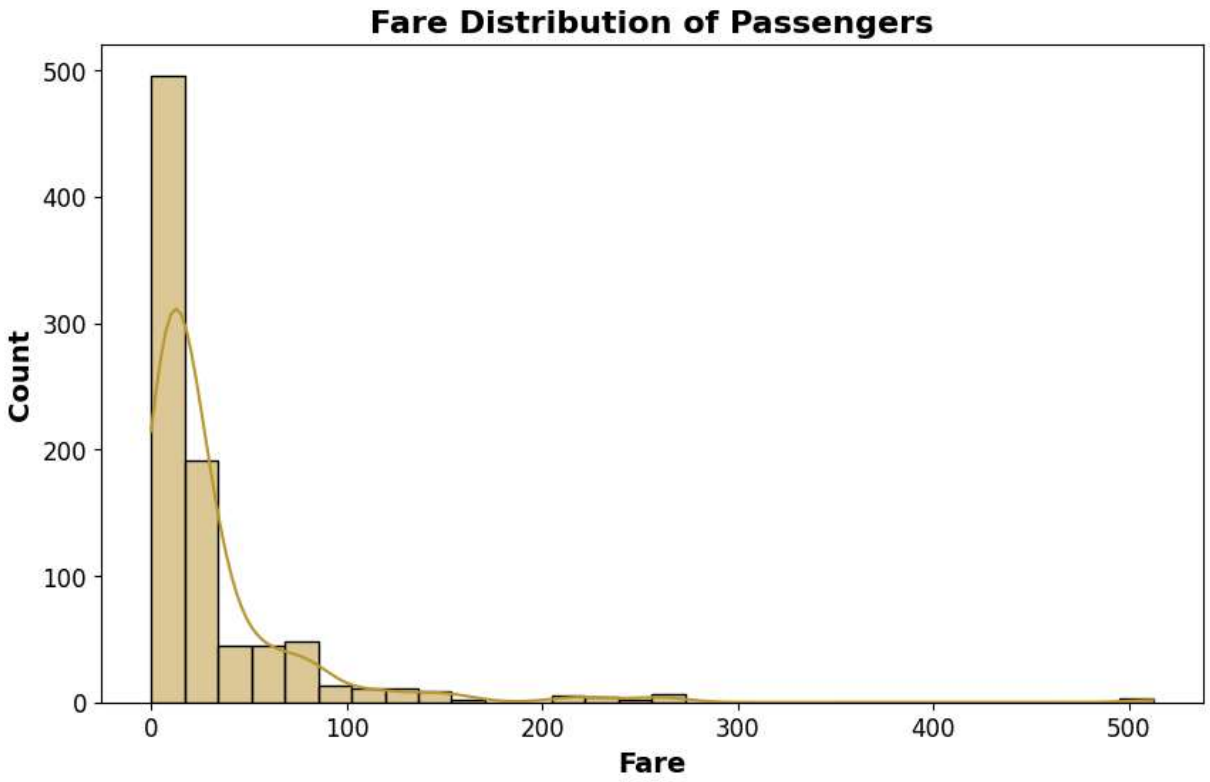
In [5]:
```
palette = sns.color_palette("husl", 2)  # HUSL color palette with 2 colors
plt.figure(figsize=(10, 6))  # Adjust the figure size
sns.barplot(x='Sex', y='Survived', hue='Sex', data=titanic_df, palette=palette, edg
plt.title('Survival Rate by Sex', fontsize=16, weight='bold')
plt.xlabel('Sex', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.legend([], [], frameon=False)
plt.show()
```



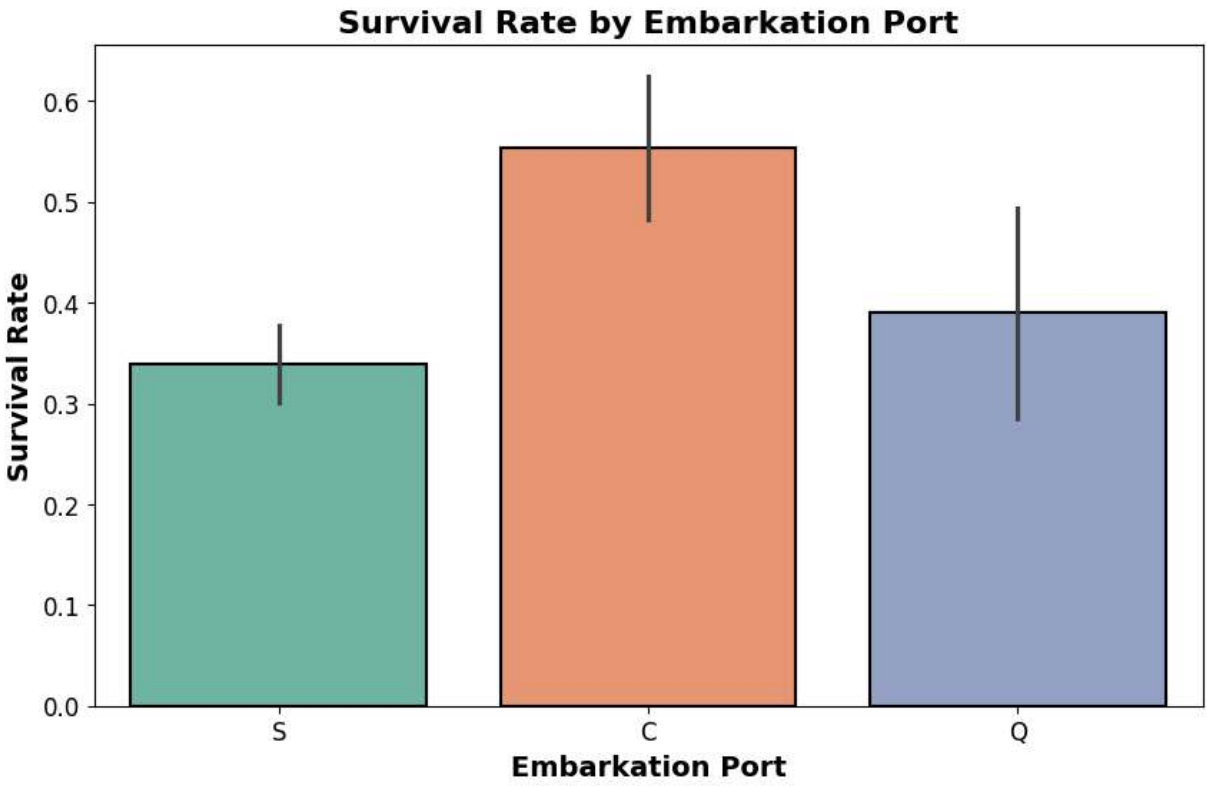
In [6]:
```
palette = sns.color_palette("husl")
plt.figure(figsize=(10, 6))  # Adjust the figure size
sns.histplot(titanic_df['Age'], bins=30, kde=True, color=palette[0], edgecolor='bla
plt.title('Age Distribution of Passengers', fontsize=16, weight='bold')
plt.xlabel('Age', fontsize=14, weight='bold')
plt.ylabel('Count', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.show()
```



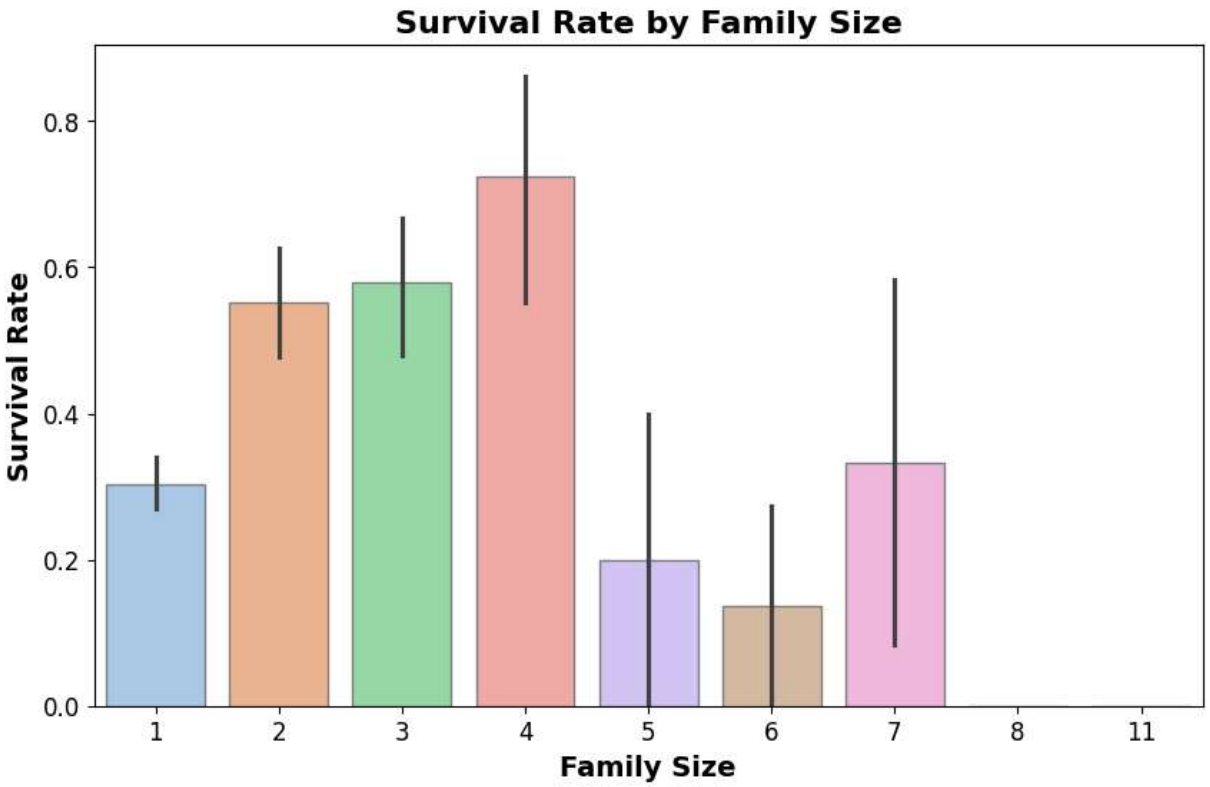
In [7]:
```
palette = sns.color_palette("husl")
plt.figure(figsize=(10, 6))  # Adjust the figure size
sns.histplot(titanic_df['Fare'], bins=30, kde=True, color=palette[1], edgecolor='bl
plt.title('Fare Distribution of Passengers', fontsize=16, weight='bold')
plt.xlabel('Fare', fontsize=14, weight='bold')
plt.ylabel('Count', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.show()
```



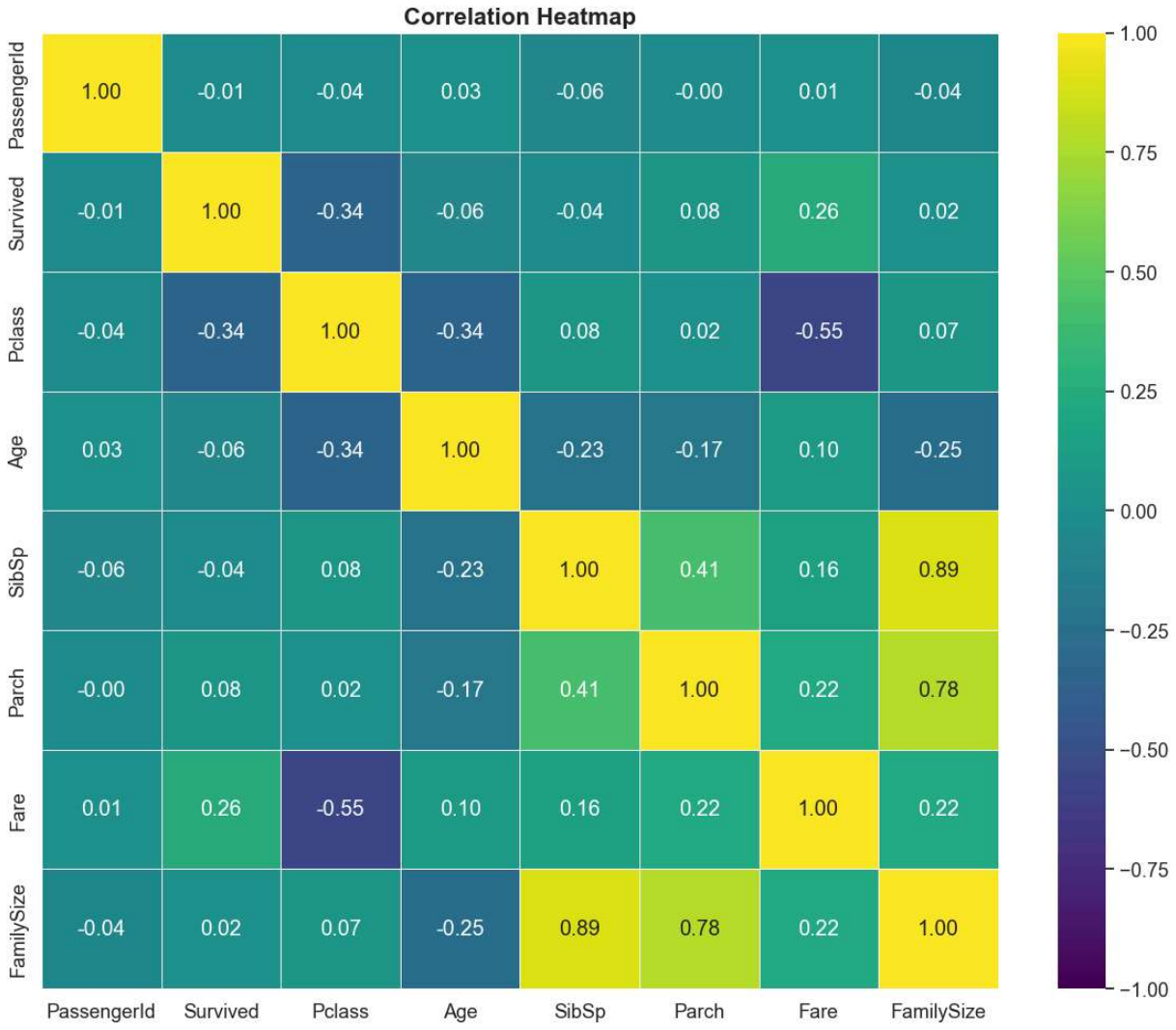
In [8]:
```
palette = sns.color_palette("Set2", 3)
plt.figure(figsize=(10, 6))  # Adjust the figure size
sns.barplot(x='Embarked', y='Survived', data=titanic_df, hue='Embarked', palette=pa
plt.title('Survival Rate by Embarkation Port', fontsize=16, weight='bold')
plt.xlabel('Embarkation Port', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.legend([], [], frameon=False)
plt.show()
```



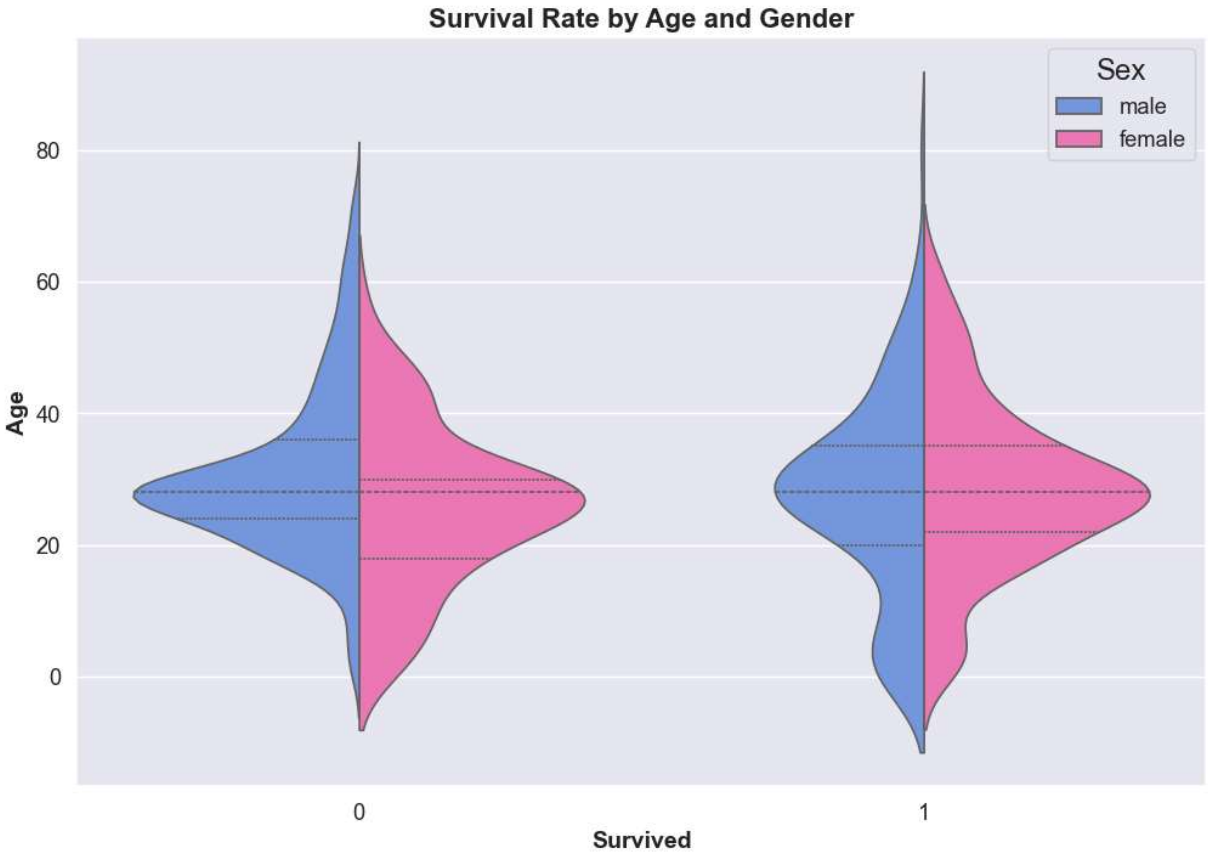
In [9]:
```
palette = sns.color_palette("pastel", 9)
titanic_df['FamilySize'] = titanic_df['SibSp'] + titanic_df['Parch'] + 1
plt.figure(figsize=(10, 6))
sns.barplot(x='FamilySize', y='Survived', data=titanic_df, hue='FamilySize', palett
plt.title('Survival Rate by Family Size', fontsize=16, weight='bold')
plt.xlabel('Family Size', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.legend([], [], frameon=False)
plt.show()
```



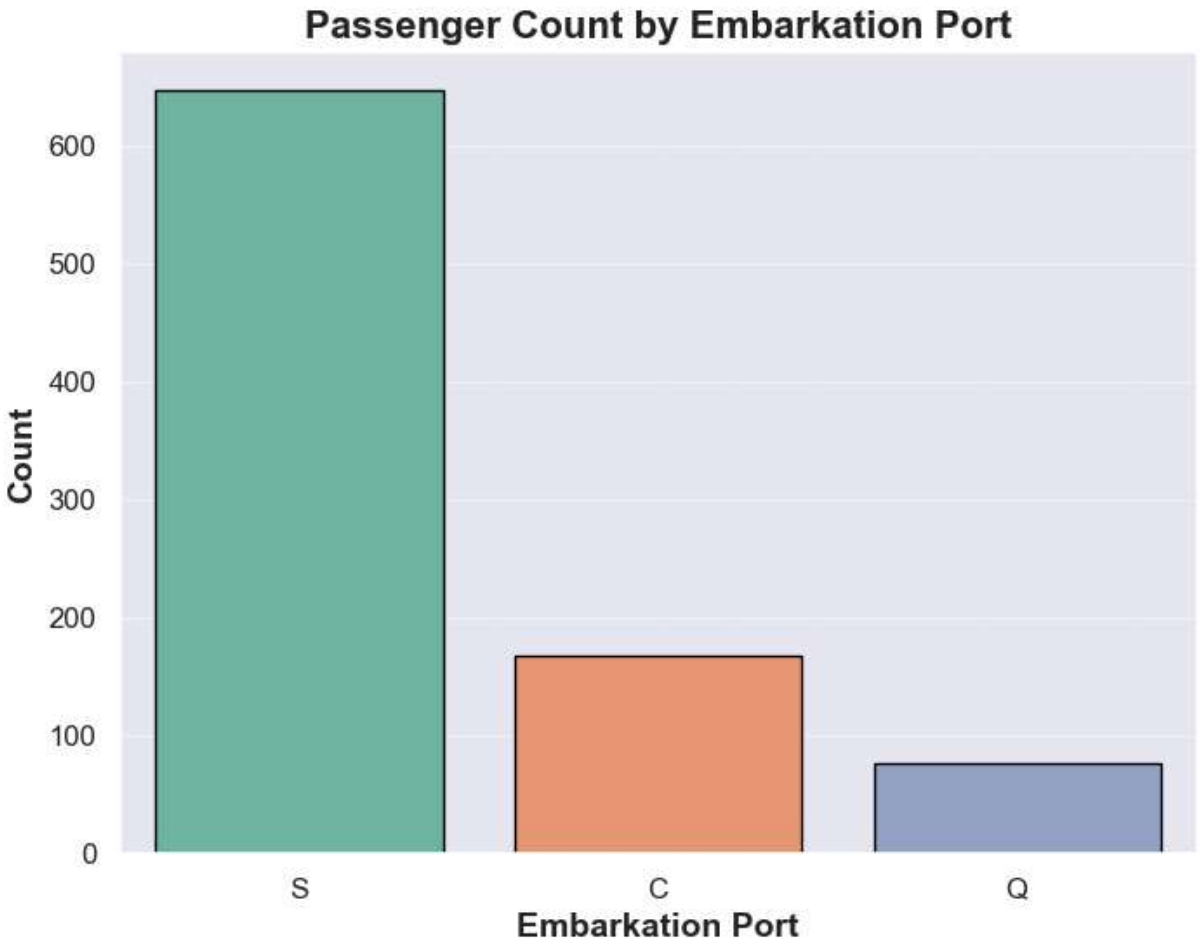
In [10]:
```
numerical_df = titanic_df.select_dtypes(include=['number'])
plt.figure(figsize=(12, 10))
sns.set(font_scale=1.2)
sns.heatmap(numerical_df.corr(), annot=True, cmap='viridis', fmt='.2f', vmin=-1, vm
plt.title('Correlation Heatmap', fontsize=16, weight='bold')
plt.tight_layout()
plt.show()
```



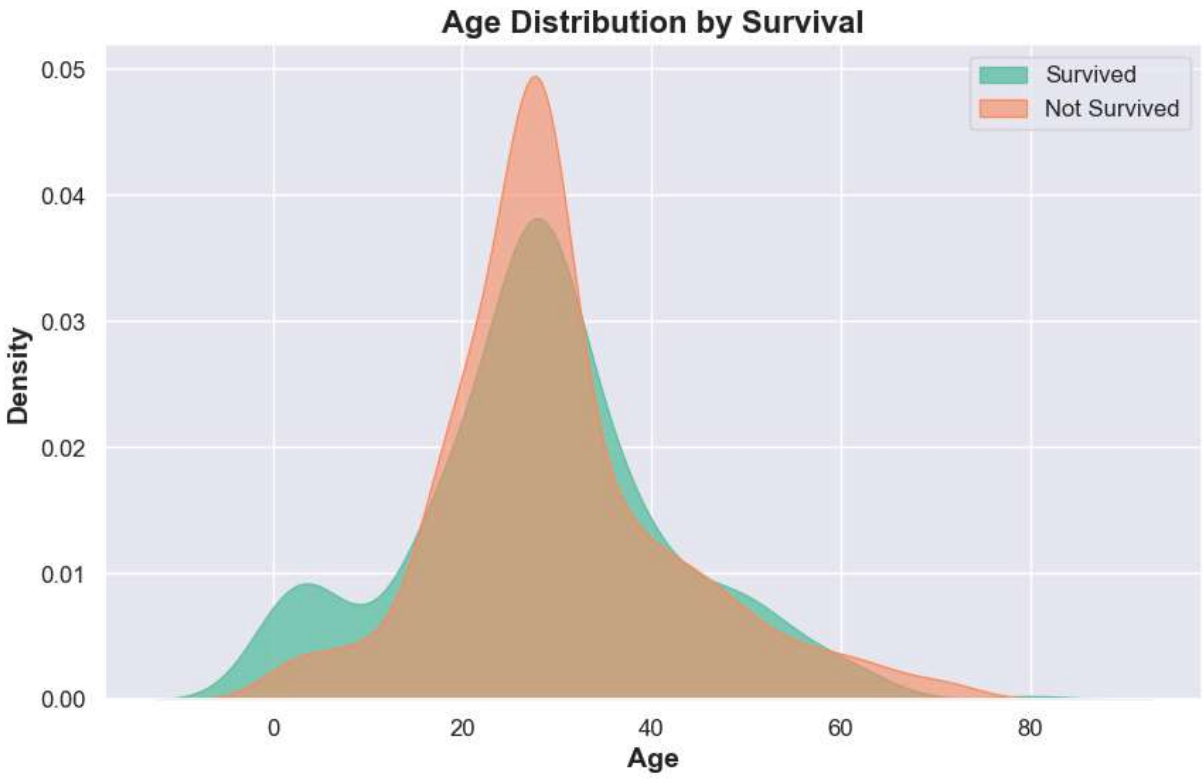
In [11]:
```
palette = {"male": "#6495ED", "female": "#FF69B4"}
plt.figure(figsize=(12, 8))
sns.violinplot(x='Survived', y='Age', hue='Sex', data=titanic_df, split=True, palet
plt.title('Survival Rate by Age and Gender', fontsize=16, weight='bold')
plt.xlabel('Survived', fontsize=14, weight='bold')
plt.ylabel('Age', fontsize=14, weight='bold')
plt.legend(title='Sex', title_fontsize='large', loc='upper right')
plt.show()
```



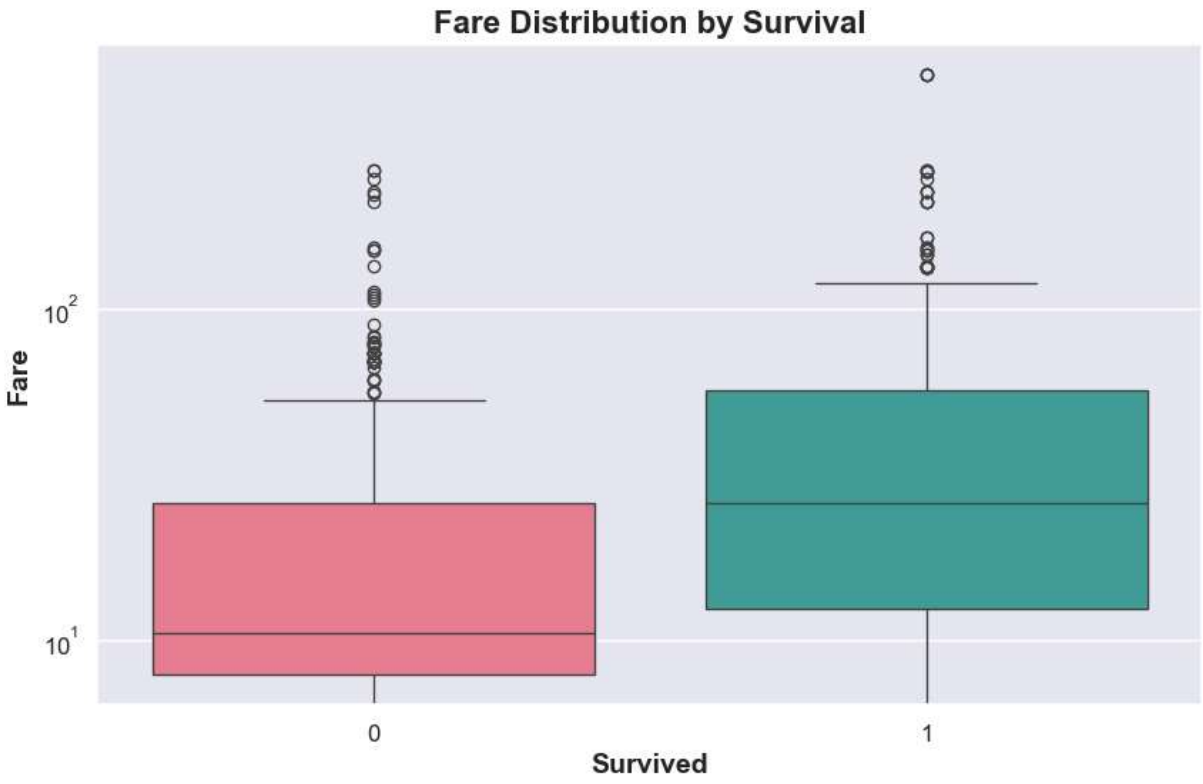
In [12]:
```
import seaborn as sns
import matplotlib.pyplot as plt
palette = sns.color_palette("Set2", 3)
plt.figure(figsize=(8, 6))
sns.countplot(x='Embarked', data=titanic_df, palette=palette, edgecolor='black', hu
plt.title('Passenger Count by Embarkation Port', fontsize=16, weight='bold')
plt.xlabel('Embarkation Port', fontsize=14, weight='bold')
plt.ylabel('Count', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.grid(True, axis='y', linestyle='--', linewidth=0.5)
plt.legend([],[], frameon=False)  # Disable the legend
plt.show()
```



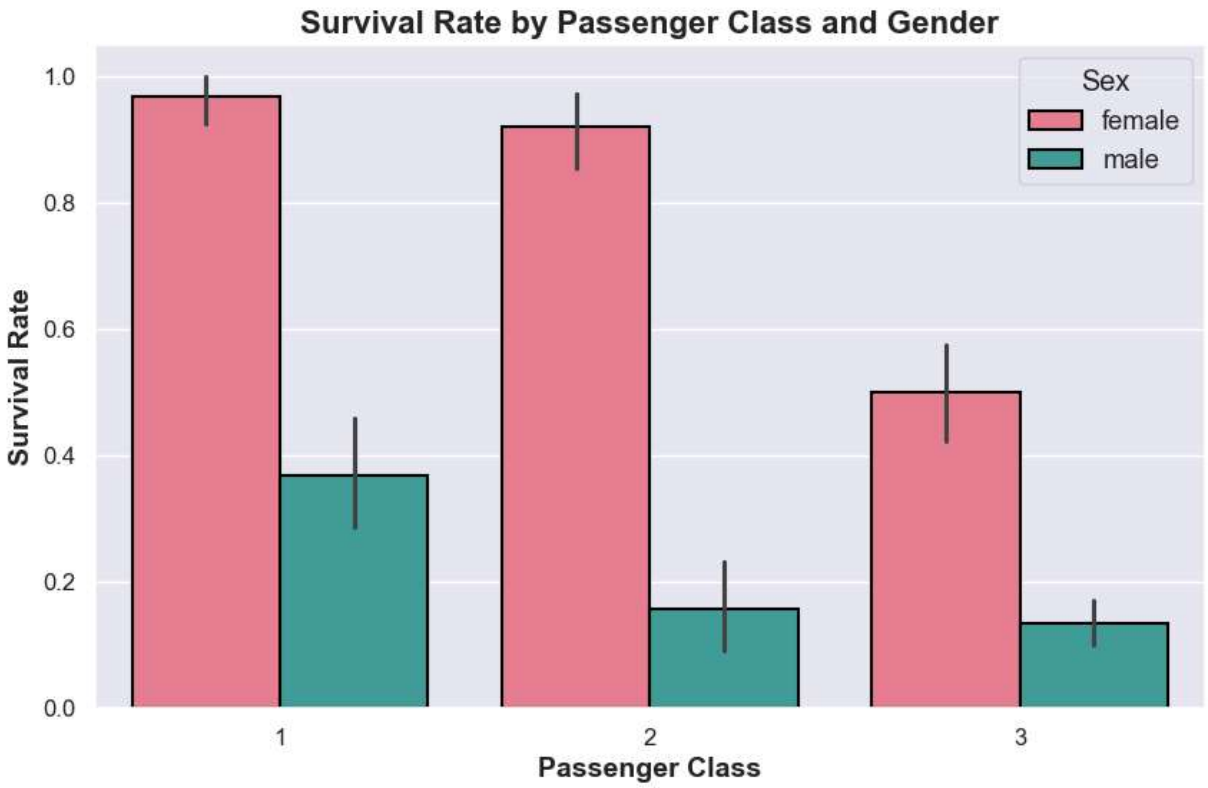
In [13]:
```
palette = sns.color_palette("Set2")
plt.figure(figsize=(10, 6))
sns.kdeplot(titanic_df[titanic_df['Survived'] == 1]['Age'], label='Survived', fill=
sns.kdeplot(titanic_df[titanic_df['Survived'] == 0]['Age'], label='Not Survived', f
plt.title('Age Distribution by Survival', fontsize=16, weight='bold')
plt.xlabel('Age', fontsize=14, weight='bold')
plt.ylabel('Density', fontsize=14, weight='bold')
plt.legend(fontsize=12)
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.show()
```



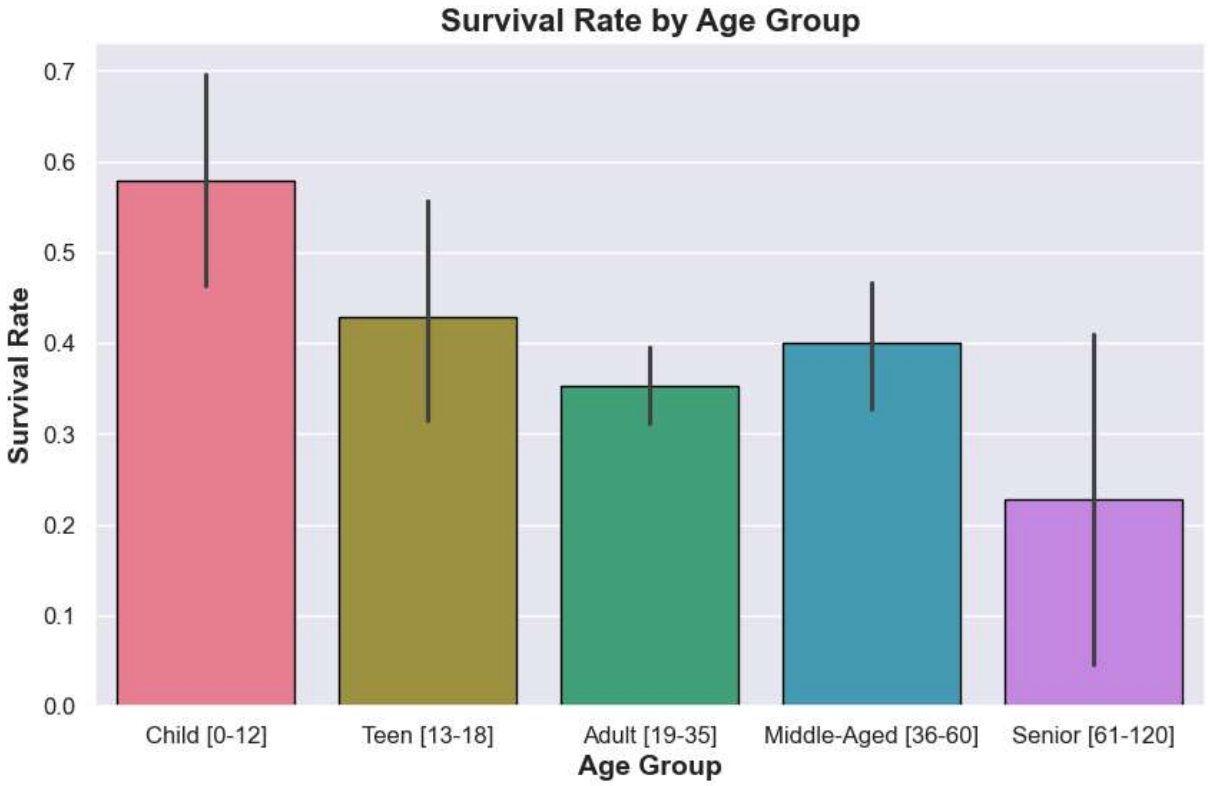
In [14]:
```
palette = sns.color_palette("husl", 2)
plt.figure(figsize=(10, 6))
sns.boxplot(x='Survived', y='Fare', hue='Survived', data=titanic_df, palette=palett
plt.title('Fare Distribution by Survival', fontsize=16, weight='bold')
plt.xlabel('Survived', fontsize=14, weight='bold')
plt.ylabel('Fare', fontsize=14, weight='bold')
plt.yscale('log')
plt.legend().set_visible(False)
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.show()
```



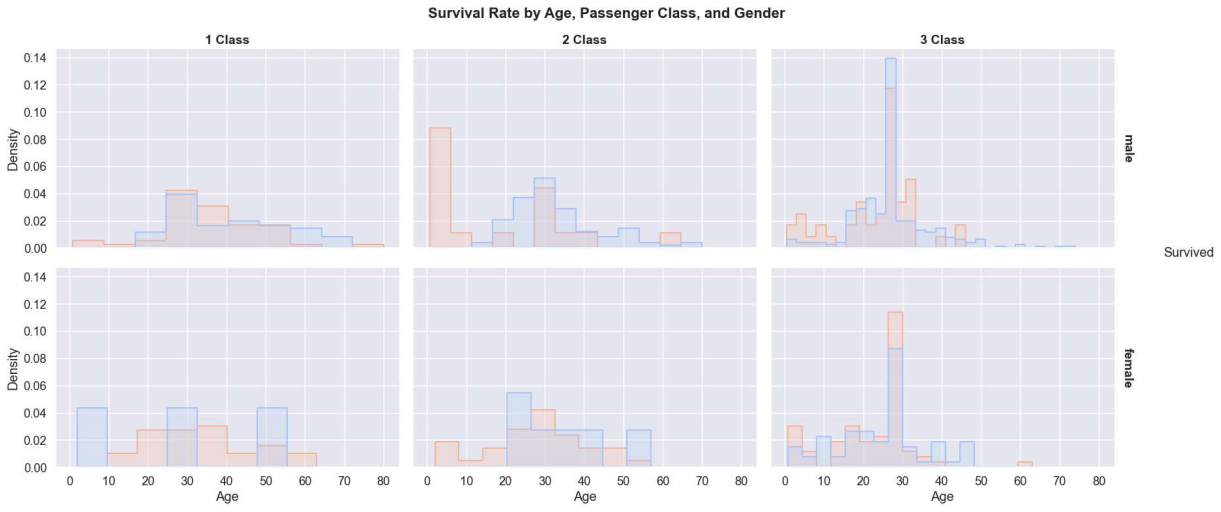
In [15]:
```
palette = sns.color_palette("husl", 2)
plt.figure(figsize=(10, 6))
sns.barplot(x='Pclass', y='Survived', hue='Sex', data=titanic_df, palette=palette,
plt.title('Survival Rate by Passenger Class and Gender', fontsize=16, weight='bold'
plt.xlabel('Passenger Class', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.show()
```



In [20]:
```
import seaborn as sns
import matplotlib.pyplot as plt
bins = [0, 12, 18, 35, 60, 120]
labels = ['Child [0-12]', 'Teen [13-18]', 'Adult [19-35]', 'Middle-Aged [36-60]', '
titanic_df['AgeGroup'] = pd.cut(titanic_df['Age'], bins=bins, labels=labels)
palette = sns.color_palette("husl", len(labels))
plt.figure(figsize=(10, 6))
sns.barplot(x='AgeGroup', y='Survived', data=titanic_df, hue='AgeGroup', palette=pa
plt.title('Survival Rate by Age Group', fontsize=16, weight='bold')
plt.xlabel('Age Group', fontsize=14, weight='bold')
plt.ylabel('Survival Rate', fontsize=14, weight='bold')
plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.legend([], [], frameon=False)
plt.show()
```

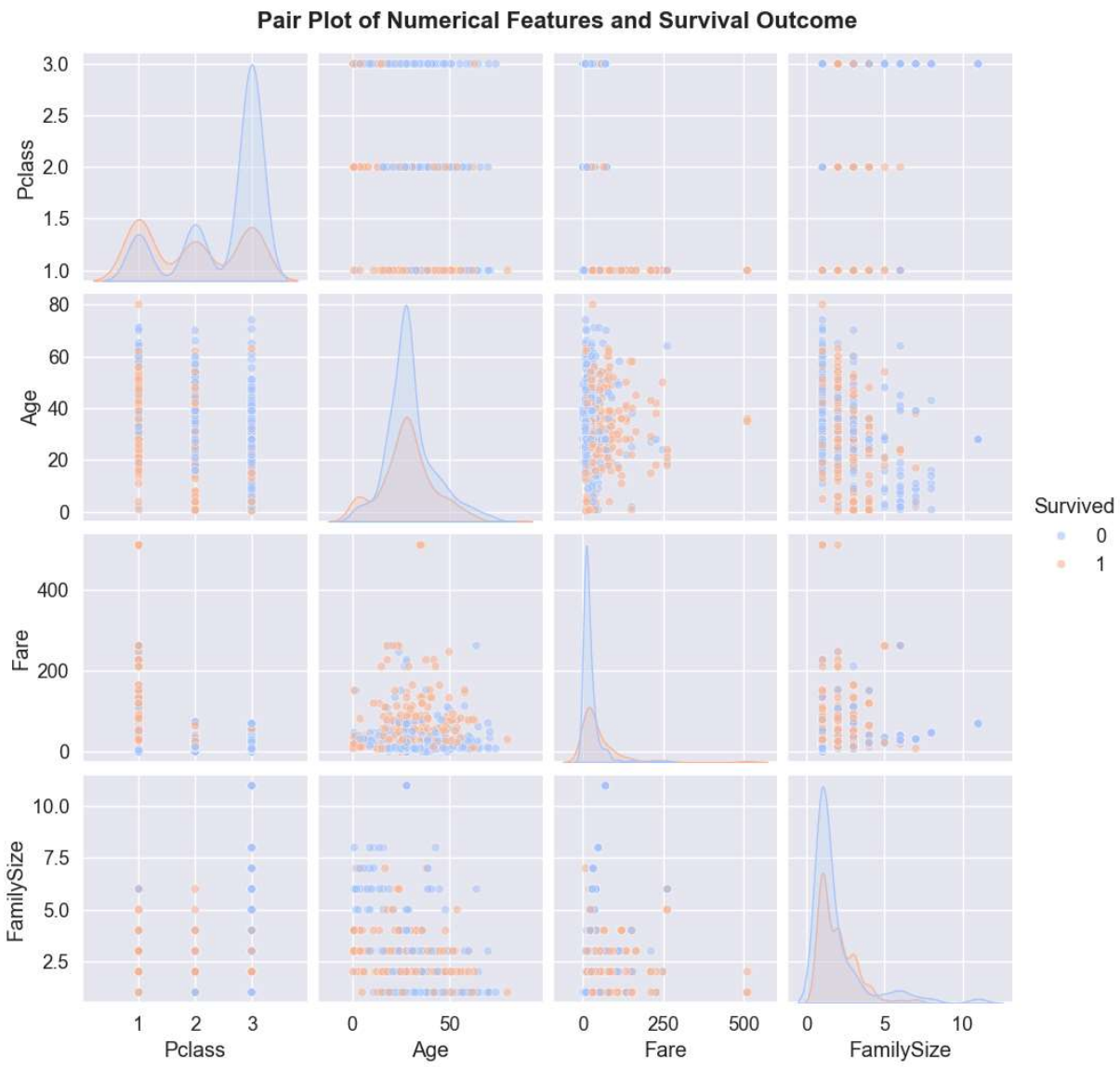


In [18]:
```
import seaborn as sns
import matplotlib.pyplot as plt
palette = 'coolwarm'
g = sns.FacetGrid(titanic_df, col='Pclass', row='Sex', margin_titles=True, height=4
g.map_dataframe(sns.histplot, x='Age', hue='Survived', element='step', stat='densit
g.set_axis_labels('Age', 'Density')
g.add_legend(title='Survived', fontsize=12)
g.set_titles(col_template='{col_name} Class', row_template='{row_name}', fontweight
plt.subplots_adjust(top=0.9)
g.fig.suptitle('Survival Rate by Age, Passenger Class, and Gender', fontsize=16, fo
plt.show()
```

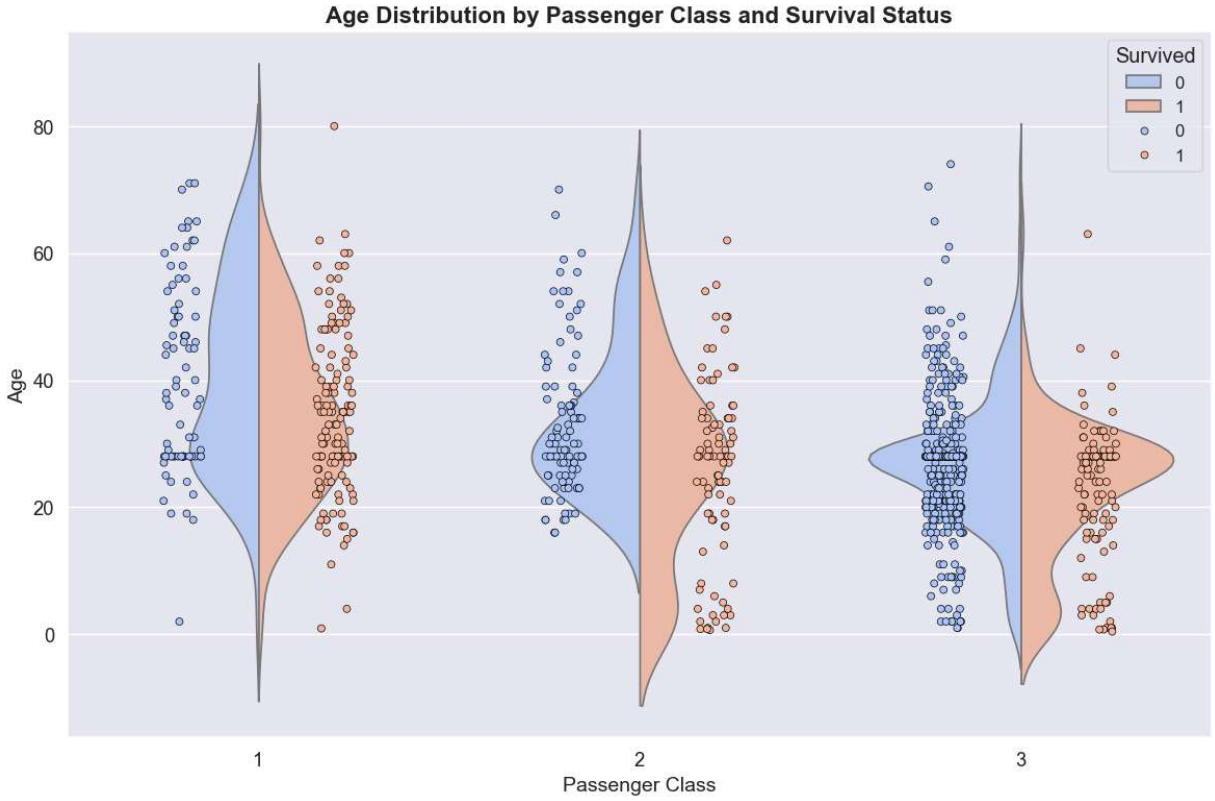


In [55]:
```
import matplotlib.pyplot as plt
palette = 'coolwarm'
pairplot_df = titanic_df[['Survived', 'Pclass', 'Age', 'Fare', 'FamilySize']]
sns.pairplot(pairplot_df, hue='Survived', palette=palette, diag_kind='kde', plot_kw
```

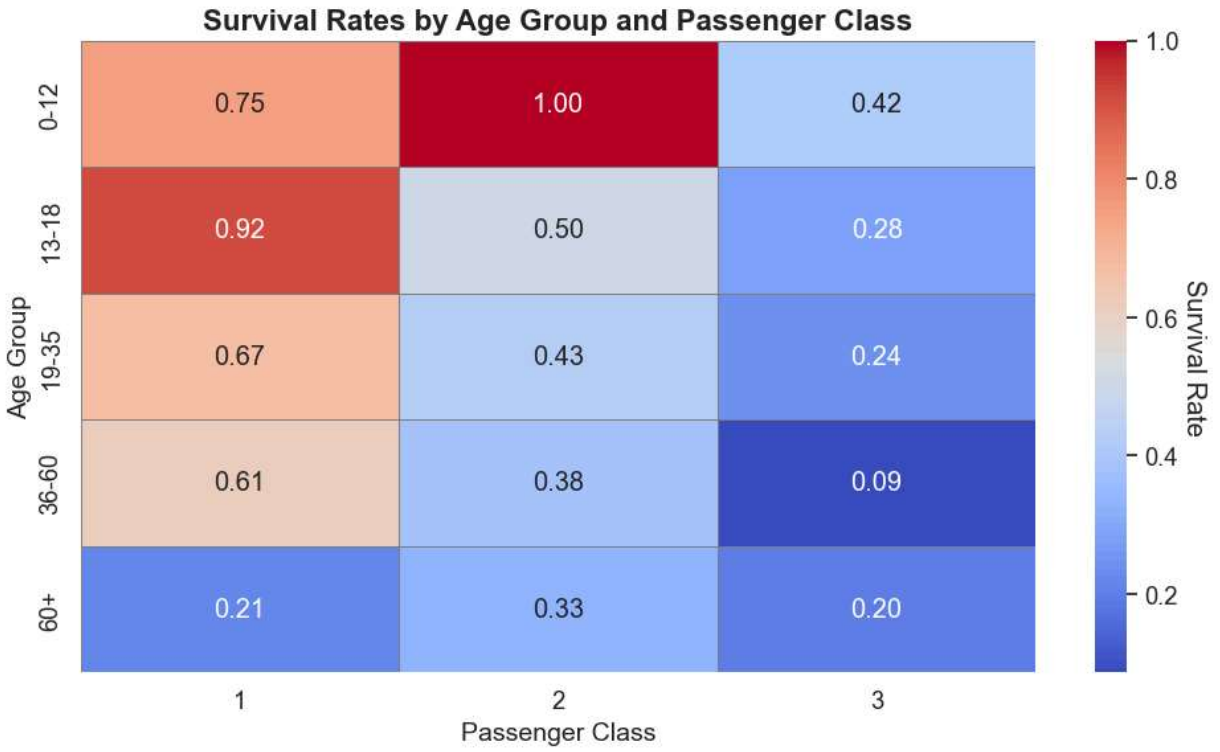
```
plt.suptitle('Pair Plot of Numerical Features and Survival Outcome', y=1.02, fontsi
plt.show()
```



In [58]:
```
import seaborn as sns
import matplotlib.pyplot as plt
plt.figure(figsize=(12, 8))
sns.violinplot(x='Pclass', y='Age', hue='Survived', data=titanic_df, split=True, in
sns.stripplot(x='Pclass', y='Age', hue='Survived', data=titanic_df, dodge=True, edg
plt.title('Age Distribution by Passenger Class and Survival Status', fontsize=16, f
plt.xlabel('Passenger Class', fontsize=14)
plt.ylabel('Age', fontsize=14)
plt.legend(title='Survived', loc='upper right', fontsize=12)
plt.tight_layout()
plt.show()
```



In [62]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
titanic_df['AgeGroup'] = pd.cut(titanic_df['Age'], bins=[0, 12, 18, 35, 60, 100], l
survival_rates = titanic_df.pivot_table(values='Survived', index='AgeGroup', column
plt.figure(figsize=(10, 6))
heatmap = sns.heatmap(survival_rates, annot=True, cmap='coolwarm', fmt='.2f', linew
cbar = heatmap.collections[0].colorbar
cbar.set_label('Survival Rate', rotation=270, labelpad=15)
plt.title('Survival Rates by Age Group and Passenger Class', fontsize=16, fontweigh
plt.xlabel('Passenger Class', fontsize=14)
plt.ylabel('Age Group', fontsize=14)
plt.tight_layout()
plt.show()
```


Survival Rates by Age Group and Passenger Class
0-12
13-18
19-35
36-60
60+
Age Group
0.75
1.00
0.42
0.92
0.50
0.28
0.67
0.43
0.24
0.61
0.38
0.09
0.21
0.33
0.20
1
2
3
Passenger Class
1.0
0.8
0.6
0.4
0.2
Survival Rate

In [ ]: