Import Libraries and Load Dataset

In [68]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [69]:
```
df=pd.read_csv("Titanic-Dataset.csv")
```

In [70]:
```
df.head()
```

Out[70]:

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

Data Cleaning

In [72]:
```
# 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 [73]:
```
# Fill missing Age with median value
df['Age'] = df['Age'].fillna(df['Age'].median())

# Drop rows with missing Embarked
df = df.dropna(subset=['Embarked'])
```

In [74]:
```
print(df.isnull().sum())
```

```
PassengerId      0
Survived         0
Pclass           0
Name             0
Sex              0
Age              0
SibSp            0
Parch            0
Ticket           0
Fare             0
Cabin          687
Embarked         0
dtype: int64
```

Data Analysis

In [76]:
```
# Who Survived More: Males or Females?
survival_by_gender = df.groupby('Sex')['Survived'].sum()
print(survival_by_gender)
```

```
Sex
female    231
male      109
Name: Survived, dtype: int64
```

In [77]:
```
#  Did passenger class affect survival chances?
survival_by_class = df.groupby('Pclass')['Survived'].mean()
print(survival_by_class)
```

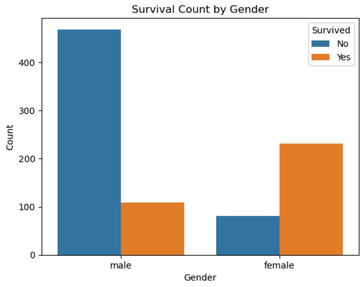
```
Pclass
1    0.626168
2    0.472826
3    0.242363
Name: Survived, dtype: float64
```

In [78]:
```
# What was the survival rate by age group?

# Define age groups
bins = [0, 12, 18, 35, 60, 80]
labels = ['Child', 'Teen', 'Young Adult', 'Adult', 'Senior']
df['AgeGroup'] = pd.cut(df['Age'], bins=bins, labels=labels)

# Calculate survival rate by age group
survival_by_age_group = df.groupby('AgeGroup')['Survived'].mean()
print("\n Survival Rate by Age Group:")
print(survival_by_age_group)
```

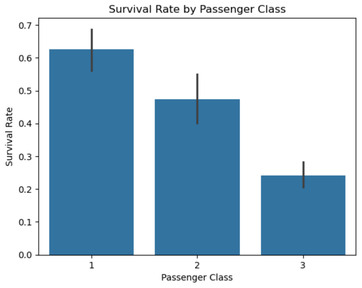
```
 Survival Rate by Age Group:
AgeGroup
Child          0.579710
Teen           0.428571
Young Adult    0.353271
Adult          0.396907
Senior         0.190476
Name: Survived, dtype: float64
C:\Users\Akshay Besekar\AppData\Local\Temp\ipykernel_8700\932853998.py:9: FutureWarning: The default of observed=False is deprecated and will be changed to True in a future version of pandas. Pass observed=False to retain current behavior or observed=True to adopt the future default and silence this warning.
  survival_by_age_group = df.groupby('AgeGroup')['Survived'].mean()
```

Data Visualization

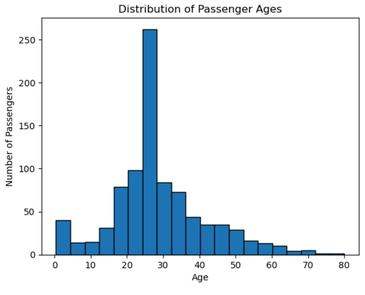
In [80]:
```
# Bar Chart of Survival by Gender

sns.countplot(x='Sex', hue='Survived', data=df)
plt.title('Survival Count by Gender')
plt.xlabel('Gender')
plt.ylabel('Count')
plt.legend(title='Survived', labels=['No', 'Yes'])
plt.show()
```



In [91]:
```
# Bar Chart of Survival by Class

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()
```



In [93]:
```
# Histogram of Passenger Ages

plt.hist(df['Age'], bins=20, edgecolor='black')
plt.title('Distribution of Passenger Ages')
plt.xlabel('Age')
plt.ylabel('Number of Passengers')
plt.show()
```



Conclusion

In [ ]:

1. Females had a significantly higher survival rate than males.
2. First-class passengers had higher survival chances compared to second and third classes.
3. Younger passengers (especially children) had higher survival rates than adults or seniors.