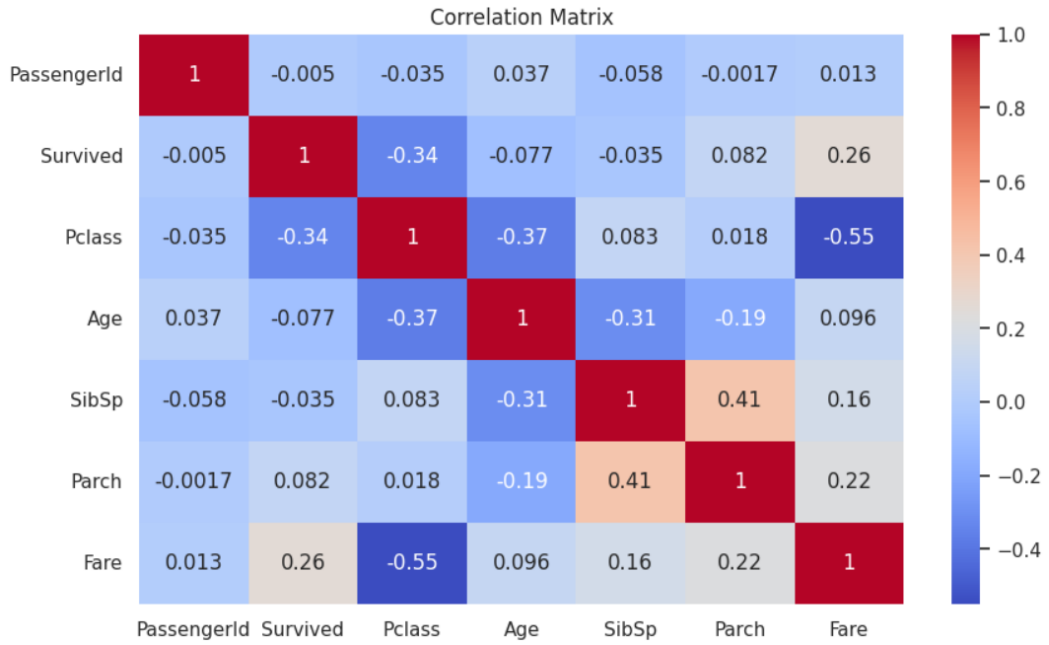
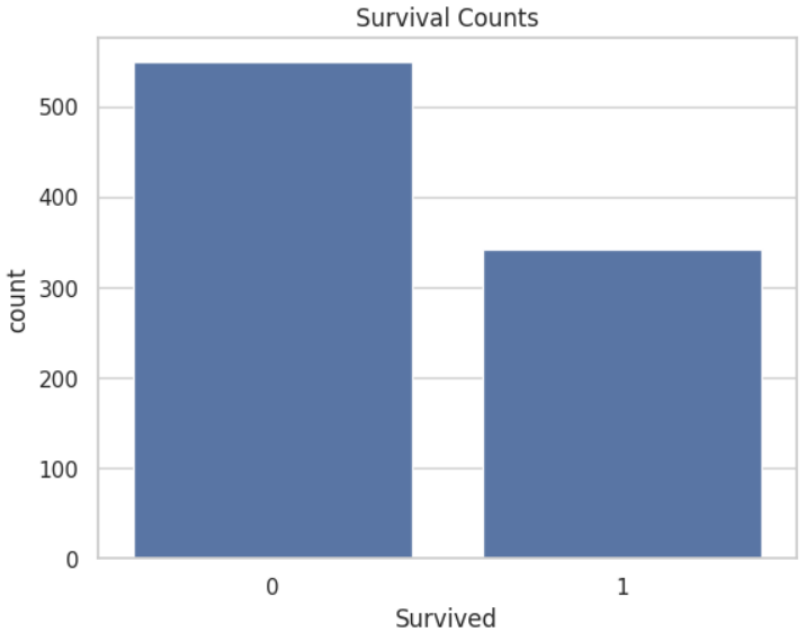
This report presents an exploratory data analysis of the Titanic dataset using visualizations.

1. **Correlation Matrix (Heatmap)**



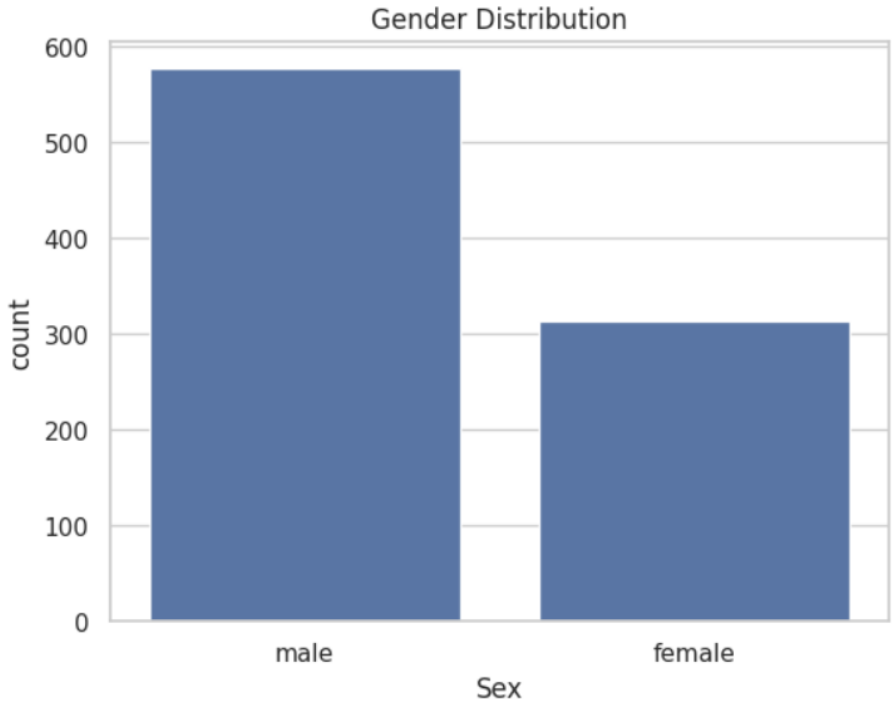
- Displays the relationships between numerical features.
- There is a moderate positive correlation between **SibSp** and **Parch**, suggesting that passengers with siblings/spouses also often had parents/children aboard.
- **Fare** is slightly positively correlated with **Survived**, indicating that passengers who paid higher fares had a better chance of survival.
- Most correlations with **Survived** are weak, suggesting no single strong predictor among numeric features alone.

2. **Survival Counts**



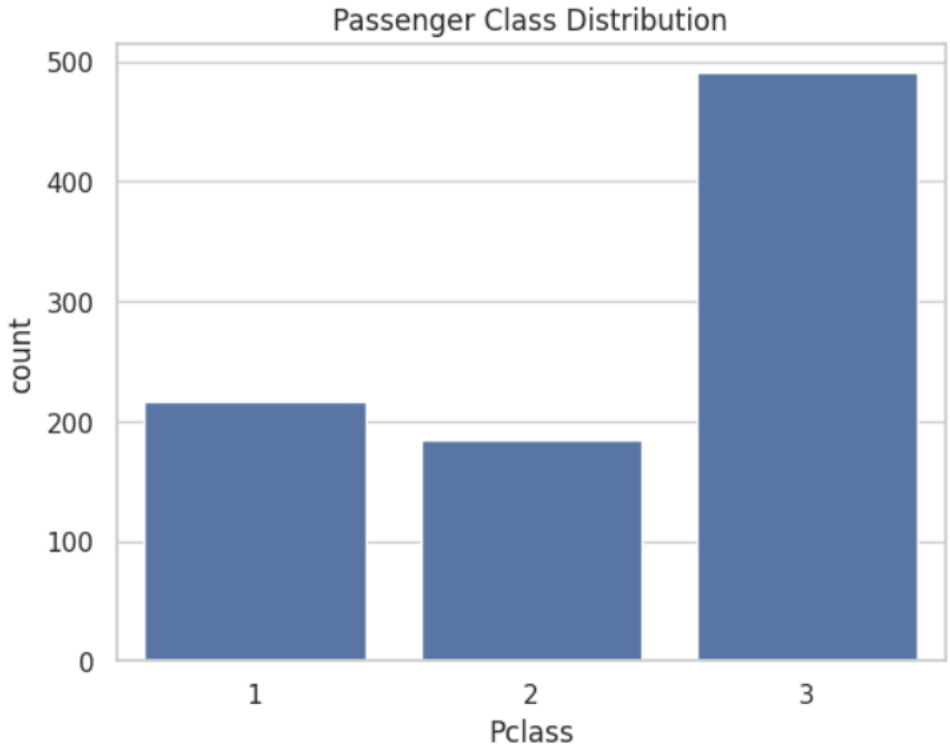
- More passengers died (549) than survived (342).
- This indicates a survival rate of approximately 38%, reflecting a significant loss of life.

3. **Gender Distribution**



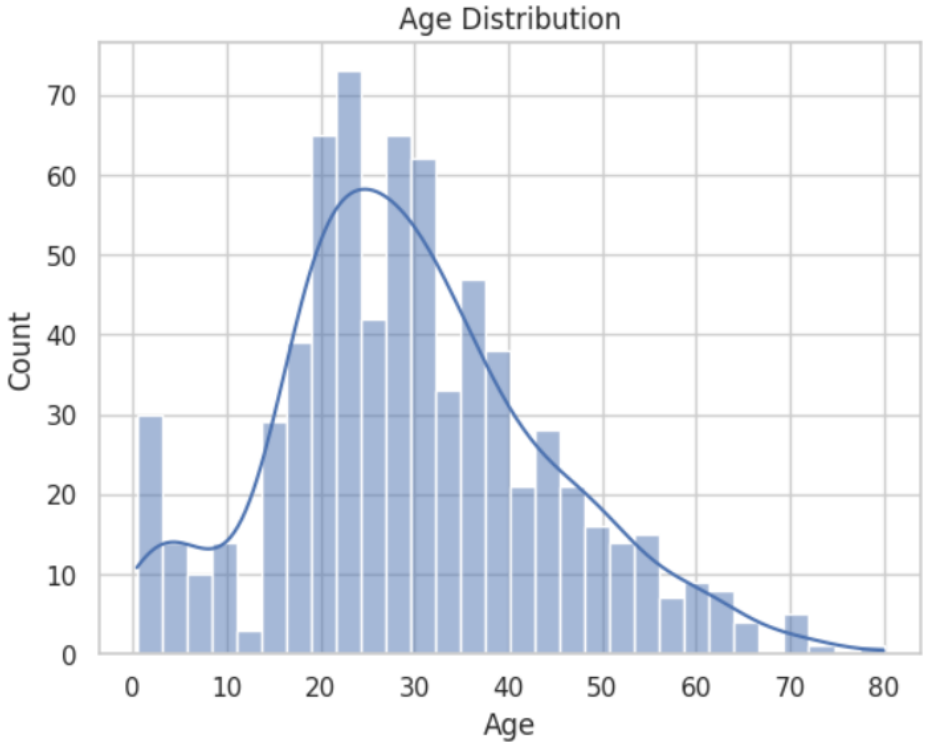
- The majority of passengers were male (577), with 314 female passengers.
- Males comprised about 65% of the passengers.

4. **Passenger Class Distribution**



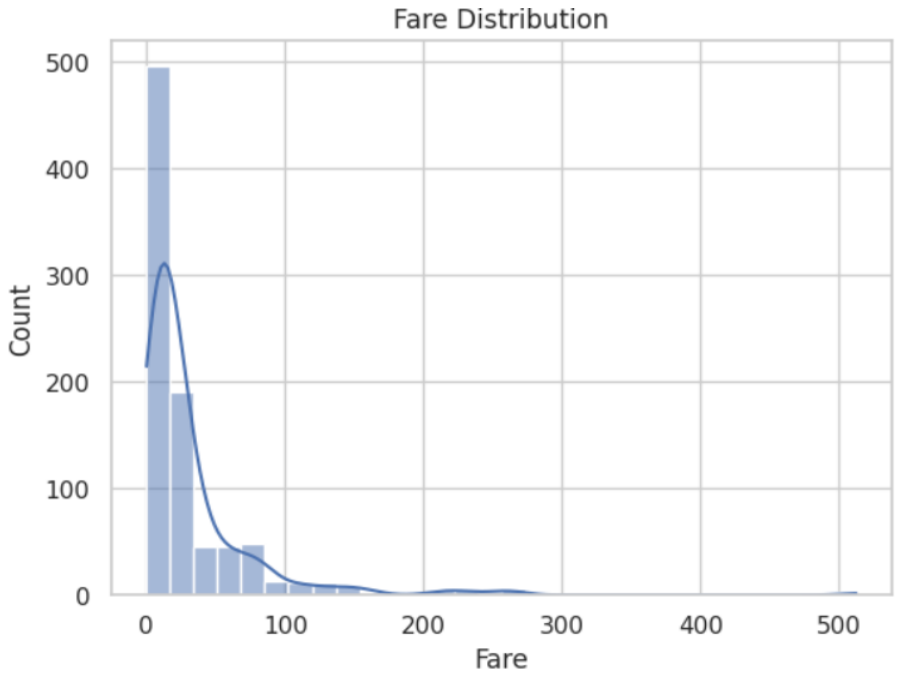
- Most passengers were in 3rd class (491), followed by 1st class (216) and 2nd class (184).
- This reflects a larger portion of lower-class travellers on board.

5. **Age Distribution (Histogram with KDE)**



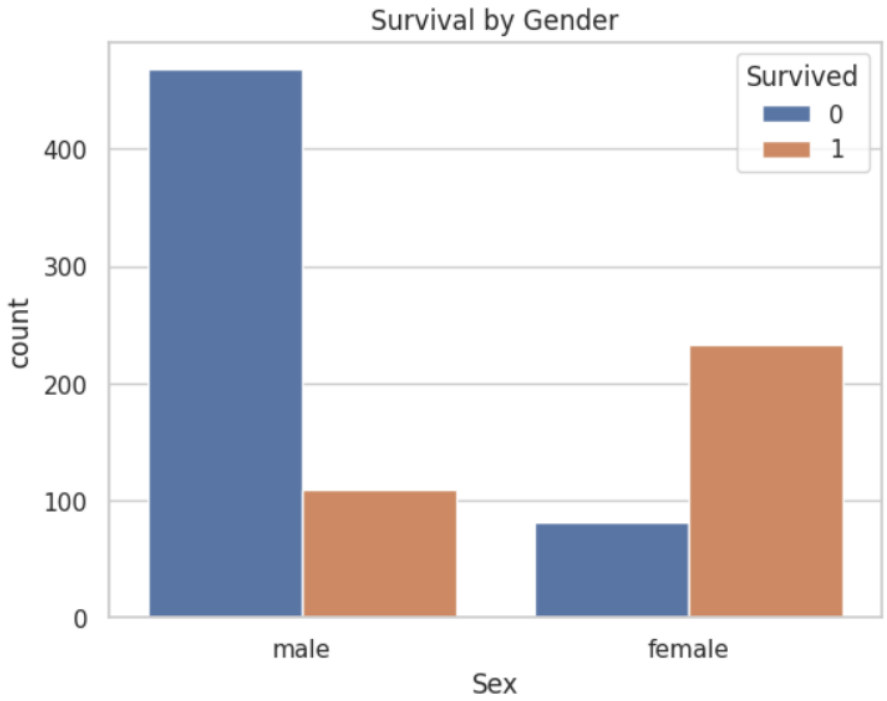
- Passenger ages are concentrated between 20 to 40 years.
- There are smaller groups of infants, children, and elderly passengers.
- The age data includes missing values which were excluded for this plot.

6. **Fare Distribution**



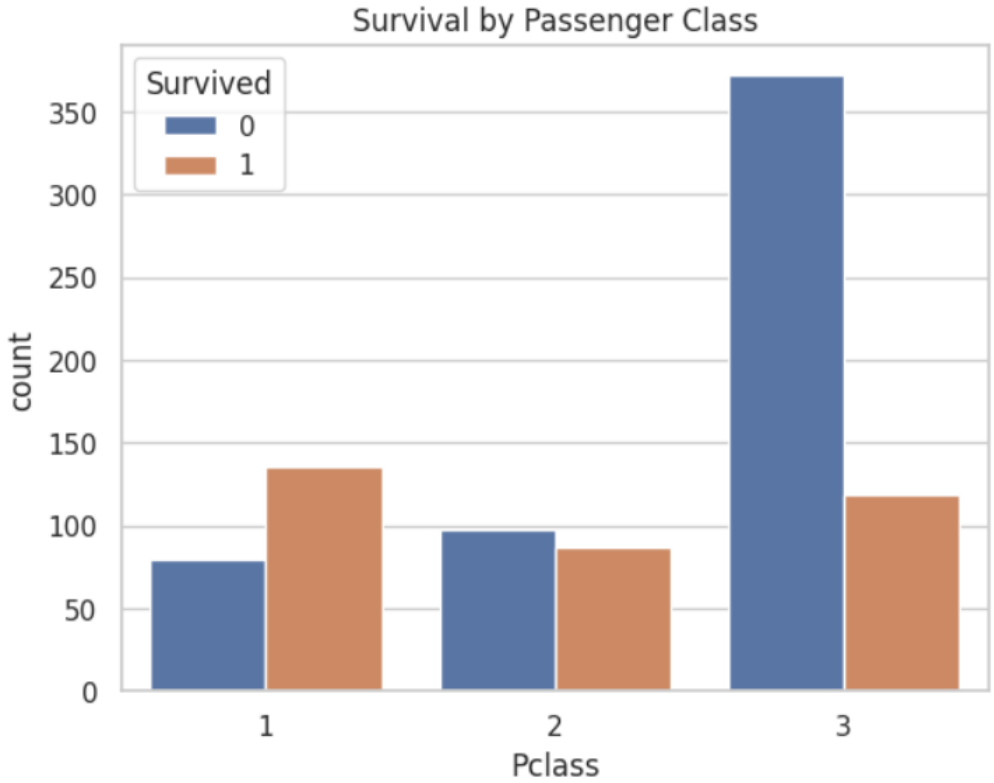
- The distribution of fare prices is right-skewed.
- Most fares are low, with a few high outliers, corresponding to passengers in 1st class.

7. **Survival by Gender**



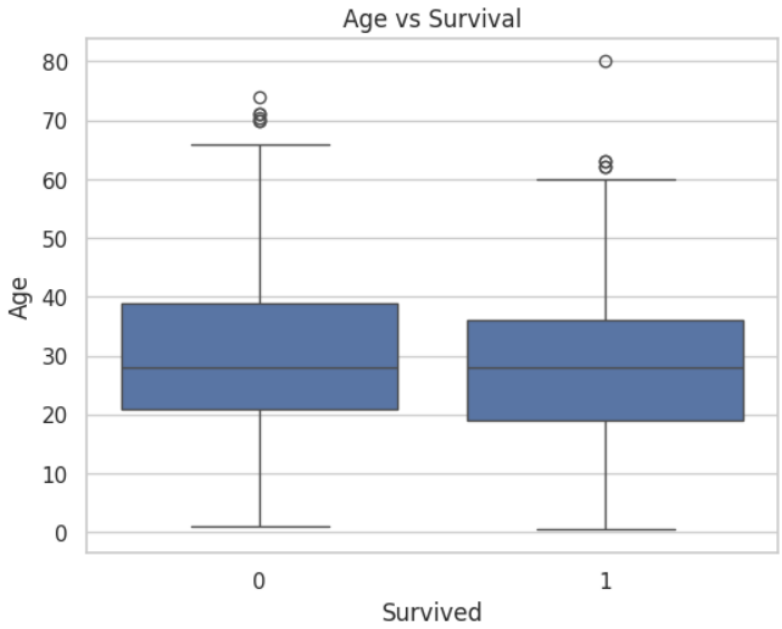
- Females had a significantly higher survival rate than males.
- The majority of male passengers did not survive, consistent with the prioritization of women during evacuation.

8. Survival by Passenger Class



- 1st class passengers had the highest survival rates.
- 3rd class passengers, despite being the largest group, had the lowest survival rates.
- This suggests that access to lifeboats and rescue resources was more available to higher-class passengers.

9. Age vs. Survival (Boxplot)



- Survivors were generally younger than non-survivors.
- Children, especially infants, had better survival outcomes.
- The median age for survivors is slightly lower than for those who did not survive.

Summary of Findings

- **Survival Rates**: Only 38% of passengers survived. The majority of fatalities occurred among males and 3rd class passengers.
- **Gender Influence**: Females had a much higher survival rate than males, indicating that gender played a significant role during evacuation.
- **Class Disparity**: 1st class passengers had better survival outcomes, highlighting inequality in access to lifeboats and rescue efforts.
- **Age Factor**: Younger passengers had a higher chance of survival, particularly children and infants.