Heatmap to Visualize Null Values

Observation:

- The heatmap shows missing values prominently in columns like **Age** and **Cabin**.

- The **Cabin** column has many missing values, which might affect model performance if not handled.

- The visual helps decide which columns to impute or drop.

Heatmap After Replacing Null Values

Observation:

- The updated heatmap shows that all missing values have been addressed.

- This confirms that the data is now clean and ready for modeling.

Confusion Matrix

Observation:

- The confusion matrix provides insight into the classification performance.

- Diagonal values represent correct predictions (True Positives and True Negatives).

- Off-diagonal values indicate misclassifications (False Positives and False Negatives).

- Helps in understanding whether the model is biased toward one class.

Pair Plot

Observation:

- **Age vs Fare** and **Age vs Sex** show some clustering by survival status.

- **Fare** tends to be higher for those who survived.

- The plot reveals potential relationships between features & the target variable is Survived.

Histograms

Observation:

- **Age** is normally distributed with a peak in the 20–30 range.

- **Fare** has a right-skewed distribution—most passengers paid low fares, but a few paid significantly more.

- **SibSp** and **Parch** are mostly zero, indicating most passengers traveled without siblings/spouses or parents/children.

- Highlights potential feature distributions and class imbalance.

Box Plot

Observation:

- **Age vs Survival**:

  - Median age is slightly lower for survivors compared to non-survivors.

  - There's a wider age range among survivors.

  - Outliers (especially older passengers) existed in both groups.

- **Fare vs Survival**:

- Survivors generally paid higher fares.

- There is a significant number of high-fare outliers among the survivors.

- Indicates class and fare price had a strong effect on survival.

Scatter Plot

Observation:

- Survivors (hue-colored) cluster more in **lower-age, higher-fare** regions.

- Many non-survivors are seen in the **low-fare, broad-age** range.

- Younger passengers who paid higher fares had better survival rates, suggesting that **ticket class and possibly family connections influenced survival**.