**Summary of Findings**

**1. Data Composition**

* **Rows:** 891 passengers
* **Key Features:**
  + **Numerical:** Age, Fare, SibSp (siblings/spouse), Parch (parents/children)
  + **Categorical:** Sex, Pclass (ticket class), Embarked (port of embarkation)
* **Missing Values:**
  + Age: 19% missing, filled with median.
  + Embarked: 2 missing, filled with mode (most common).
  + Cabin: 77% missing — considered dropping or feature engineering.

**2. Univariate Analysis (Histograms)**

* **Age:** Right-skewed — majority between 20–40 years.
* **Fare:** Highly skewed — most passengers paid low fares; few high-paying outliers.
* **Pclass:** Most passengers were in 3rd class (Pclass=3).
* **Survived:** Dataset is imbalanced (~38% survived, ~62% did not).

**3. Outlier Detection (Boxplots)**

* **Fare:** Extreme outliers — luxury ticket holders.
* **Age:** Some elderly passengers (>70 years) considered outliers.
* **SibSp and Parch:** Most people traveled with 0–1 relatives; large family groups are rare.

**4. Bivariate Relationships (Scatterplots and Pairplots)**

* **Fare vs Age:**
  + Survivors tended to pay higher fares.
  + Younger passengers had slightly better survival rates.
* **SibSp vs Parch:**
  + Moderate family sizes (1-2) were associated with higher survival chances.
  + Very large families or solo travelers had lower survival.

**5. Correlations (Heatmap)**

* Pclass negatively correlates with Survived → 1st Class passengers more likely to survive.
* Fare positively correlates with Survived → Higher fare means higher survival.
* SibSp and Parch are moderately positively correlated → logical (families travel together).
* Sex is extremely important (female survival rate is much higher — verified background knowledge).

# ****Key Insights:****

* **Pclass, Fare, Sex, and Age** are strong predictors of survival.
* **Being female**, **younger**, **wealthier**, or **in first-class** greatly increased the chance of survival.
* **Embarked location** might matter slightly (we can explore survival rate by port if needed).
* **Large families or solo travelers** had lower survival compared to those traveling with 1–2 relatives.