1. Descriptive Statistics (df.describe())

- The average passenger age was approximately **29.7 years**, with a wide range from **0.42 to 80 years**, indicating a diverse age group onboard.
- The **fare prices** ranged widely (min: **0**, max: **512**), with a significant difference between **mean (32.2)** and **median**, suggesting a **right-skewed distribution**.
- Most passengers had **0 siblings/spouses (SibSp)** and **0 parents/children (Parch)** aboard, implying many traveled alone.

2. Value Counts

- **Survival Rate**: 38.4% survived (0: 549, 1: 342). The majority perished.
- **Pclass**: Most passengers were in **3rd class** (491), followed by 1st (216) and 2nd (184).
- **Sex**: Males (577) significantly outnumbered females (314), yet females had a much higher survival rate.
- **Embarked**: Most passengers embarked from **Southampton (S)**, followed by **Cherbourg (C)** and **Queenstown (Q)**.

3. Pairplot (sns.pairplot)

- Strong visual evidence that **first-class passengers** had **higher survival rates**.
- **Females survived more than males**, especially in higher classes.
- Survivors tended to be **younger**, though children in all classes had better survival chances.
- Fares for survivors skew higher, especially in **Pclass 1**, suggesting a link between **wealth and survival**.

4. Correlation Heatmap

- Fare is **moderately negatively correlated** with Pclass, confirming that 1st class paid more.
- Survived has a **positive correlation** with Fare and Pclass , supporting the survival advantage of higher class and wealth.

- Other variables (like SibSp, Parch) show very weak correlation with Survived, implying limited impact individually.

5. Histograms

- **Age** distribution is right-skewed, with a concentration of passengers between **20-40 years**.
- **Fare** histogram shows most paid **under $100**, but a few outliers paid much more.
- **Survived** histogram clearly shows **more deaths (0)** than **survivors (1)**.

6. Boxplots

- **Survived vs. Age**: Survivors generally include **more children** and slightly fewer older individuals.
- **Survived vs. Fare**: Survivors tended to have **higher fares**, with several high-end outliers among 1st class.
- **Pclass vs. Age**: 1st class passengers were **older on average**; 3rd class had **younger and broader distribution**.

7. Scatterplots (e.g., Age vs Fare, colored by Survival)

- Survivors are concentrated in **high fare + low-to-mid age** range.
- Clusters of **non-survivors exist in low-fare, high-density areas**, especially in 3rd class.

Summary of Key Findings

1. **Survival was strongly influenced by class and gender**: First-class passengers and females had **significantly higher survival rates**.
2. **Fare and survival are positively correlated**: Passengers who paid more had better access to lifeboats or were prioritized.
3. **Age mattered**: Children had relatively higher survival, indicating the **"women and children first"** evacuation policy.
4. **Embarkation port had slight effects**: Passengers from Cherbourg had higher survival rates, possibly due to class distribution.

5. **Most passengers traveled alone**: Low SibSp and Parch counts suggest that family groups were a minority.
6. **Class disparity was stark**: 3rd class bore the brunt of the fatalities, reinforcing reports of limited access to lifeboats.