C.RELATIONSHIPS AND TRENDS:

1.Gender & Survival

-Women survived far more than men.

-This reflects the *"women and children first"* rule.

2.Class (Pclass) & Survival

-1st Class passengers had the highest survival rate.

-3rd Class passengers had the lowest survival rate.

-Strong negative correlation between Pclass and survival.

3.Fare & Survival

-Higher fares → higher survival probability.

-Suggests that wealthier passengers had better access to lifeboats (linked to class).

4.Age & Survival

-Children (≤10 years) had a higher chance of survival.

-Older passengers had lower survival rates.

5.Family Size (SibSp + Parch) & Survival

-Small families (1–2 relatives) had better survival.

-Very large families had low survival chances.

-Single passengers also had lower survival compared to small families.

6.Embarked Port & Survival

-Passengers from Cherbourg (C) had a higher survival rate compared to Southampton (S).

7.Correlation Trends (from heatmap)

-Survived positively correlates with Fare, negatively with Pclass.

-Pclass is strongly tied to Fare (wealthy passengers traveled in 1st class).

-SibSp and Parch are moderately correlated → families traveling together.

OVERALL INSIGHTS

Survival was **not random**. It depended heavily on **gender, class, age, and wealth**. The strongest trends:

- **Females > Males**
- **1st Class > 2nd > 3rd**
- **Children > Adults > Elderly**
- **Wealthier passengers (high fare) > Poorer passengers (low fare)**

OBSERVATION OF EACH VISUAL:

1.Count plot:

A.

- The plot shows two bars: 0 = Did Not Survive, 1 = Survived.

-The “0” bar (non-survivors) is much taller than the “1” bar (survivors).

-This means the majority of passengers did not survive the Titanic disaster.

-The dataset survival rate is about 38% survived vs 62% did not survive.

B.First-class passengers had the highest survival rate, second-class had moderate survival, while third-class faced the lowest chances. This shows that socioeconomic status played a major role in survival on the Titanic.

2.Histoplot:

-Most passengers were between 20–40 years old.

-Fewer children and elderly passengers.

-Right-skew shows fewer older individuals (>60).

3.**pairplot**

- **Age vs Survival**

  Survivors are slightly younger on average.

  Children (<10 years old) show higher survival.

- **Fare vs Survival**

  Survivors often paid higher fares (linked to 1st class).

  Many low-fare passengers did not survive.

- **Pclass vs Survival**

  Strong split: 1st class passengers had much higher survival.

  3rd class dominated by non-survivors.

- **SibSp / Parch vs Survival**

  Small families (1–2 relatives) had better survival chances.

  Very large families had lower survival.

4.Heatmap

Fare has a **positive correlation** with survival (~0.26) → higher fares = better chance.

Pclass has a **negative correlation** (~ -0.34) → higher class number (3rd) = lower survival.

Age correlation with survival is weak (~ -0.08).

SibSp and Parch show weak correlations, but families of size 1–2 had better chances than singles or very large families.

5.Histoplot:

Most fares are low (<100), but there are outliers with very high fares.

6.box plot:

1st class fares are much higher on average compared to 2nd and 3rd.

7.scatter plot:

Survivors tend to cluster at **younger ages and higher fares**.

8.stripplot:

The stripplot shows that **females across most ages had higher survival**, while **many males, especially adults, did not survive**. This clearly reflects the "**women and children first**" evacuation pattern on the Titanic.

SUMMARY OF FINDINGS:

- In total, a greater number of passengers perished than survived.
- The fact that females lived longer than males indicates that gender had a significant impact on survival.
- Passengers in first class had the highest survival rate, while those in third class had the lowest.
- Higher fares were linked to better survival chances.
- Younger people and children, particularly girls, fared better in terms of survivability.
- Cherbourg (C) passengers fared better than Southampton (S) and Queenstown (Q) passengers.
- A heatmap and pairplot demonstrated that, although age alone had less of an impact, survival had a positive correlation with fare and class.