Exploratory Data Analysis (EDA)

1. Histogram of PassengerId

Observation:

- The histogram shows a roughly uniform distribution of PassengerId values.
- No clear peaks or clusters — the values are spread relatively evenly.

Interpretation:

- This makes sense — PassengerId is a unique identifier assigned sequentially.
- It doesn't carry meaningful information for modeling or pattern detection.
- This column is likely not useful for predictive modeling and can be excluded from feature engineering.

2. Boxplot of PassengerId

Observation:

- The boxplot shows a wide spread from the lowest to the highest Passenger ID.
- No outliers are visible (and it wouldn’t really matter even if there were).

Interpretation:

- Again, since PassengerId is not a variable describing passenger characteristics, the boxplot doesn’t provide valuable statistical insights.
- It merely reflects the range of IDs in the dataset.

3. Scatterplot: PassengerId vs Survived

Observation:

- The plot shows two horizontal lines — one at y=0 and one at y=1.
- Points are spread across the PassengerId axis.
- There’s no clear trend — survival doesn’t appear to be related to PassengerId in a meaningful way.

Interpretation:

- PassengerId seems to be just an identifier, not a predictive or meaningful variable.
- Survival is scattered randomly across passenger IDs — as expected.

Visual	**Observation**
Histogram	Passenger IDs are evenly distributed — no insight
Boxplot	Just confirms ID range, no statistical insight
Scatterplot	Survival is random across IDs
Heatmap	No correlation between PassengerId and Survived

Summary:

Aspect	**Key Insights**
Survival	Strongly associated with higher fare, 1st class, and being female.
Age	Young passengers, especially children, show slightly higher survival.
Fare	Passengers who paid more had better survival chances, likely due to access to lifeboats or better treatment.
Pclass	Higher class passengers (1st class) had higher survival rates.
Family	Smaller family sizes (1–2 SibSp/Parch) had higher survival than those alone or with large families.