Titanic Dataset Analysis Report

Objective

To extract meaningful insights from the Titanic dataset using Python (Pandas, Matplotlib) through visual and statistical exploration.

Tools Used
- **Pandas** – for data loading, cleaning, and analysis

- **Matplotlib** – for data visualization

Steps Performed
1. **Data Loading** – Imported Titanic dataset using Pandas.

2. **Data Exploration** – Used `.info()`, `.describe()`, and `.value_counts()` to understand data structure, missing values, and distributions.

3. **Data Cleaning** – Filled missing `Age` and `Embarked` values using mean and mode.

4. **Visualization** – Created multiple charts using Pandas and Matplotlib:
   - Histograms for Age distribution

   - Bar charts for Survival counts

   - Grouped bar plots for Survival by Gender and Class

   - Scatterplot for Age vs Fare

5. **Observation** – Noted trends and patterns after each visual.

Visual Insights & Observations
1. **Age Distribution** – Most passengers were between 20–40 years of age.

2. **Survival Count** – Around 38% passengers survived, 62% did not.

3. **Survival by Gender** – Females had a much higher survival rate.

4. **Survival by Passenger Class** – 1st class passengers had the highest survival chance.

5. **Age vs Fare** – Higher fares were usually paid by older, wealthier passengers.

Key Findings

- Gender and class were the strongest predictors of survival.

- Females and 1st class passengers survived the most.

- Most non-survivors belonged to 3rd class.

- The dataset shows clear social and economic influence on survival chances.

Conclusion

This analysis demonstrates how data visualization and statistical methods reveal real-world insights.
The survival probability was significantly influenced by gender, passenger class, and fare.
Through Pandas, trends and relationships became clear, showing how data-driven exploration uncovers meaningful patterns.

Outcome

- Data exploration and cleaning using Pandas

- Creating visual insights using Matplotlib

- Summarizing findings in a structured report