For this task, use **Titanic dataset** from Kaggle.

It is available at the link after registration.

Titanic

Visualizing Survival Rates Across Different Demographics

Objective: Create interactive visualizations using Bokeh to explore the survival rates of passengers on the Titanic based on various demographic factors such as age, gender, and class.

Task Requirements:

1. **Data Preparation:**
    - Handle missing values in the **Age**, **Cabin**, and **Embarked** columns appropriately.
    - Create a new column **AgeGroup** to categorize passengers into age groups (e.g., Child, Young Adult, Adult, Senior).
    - Create a **SurvivalRate** column to calculate the percentage of passengers who survived within each group.
2. **Visualization:**
    - **Age Group Survival:** Create a bar chart showing survival rates across different age groups.
    - **Class and Gender:** Create a grouped bar chart to compare survival rates across different classes (1st, 2nd, 3rd) and genders (male, female).
    - **Fare vs. Survival:** Create a scatter plot with **Fare** on the x-axis and **survival** status on the y-axis, using different colors to represent different classes.
3. **Interactivity:**
    - Add hover tools to display detailed information when hovering over any bar or point.
    - Implement filtering options to allow users to filter visualizations by class or gender.
4. **Output:**
    - Save the visualizations as HTML files that can be viewed in a web browser.

Execution and Verification:

- Ensure that the visualizations are interactive and provide meaningful insights.
- Test the visualizations with different filters to verify their functionality.

Deliverables:

- A Python script (.py file) containing the data preparation, Bokeh visualization code, and necessary functions.
- HTML files for each visualization created.