# Problem Statement:

You are provided with a raw dataset containing missing values, inconsistent formats, and duplicated records. Your task is to clean the data and perform basic exploratory data analysis (EDA).

# Dataset:

You will use the "Titanic: Machine Learning from Disaster" dataset available at Kaggle: <https://www.kaggle.com/c/titanic/data>

# Tasks:

1. Download the dataset and create an IPython Notebook or a Google Colab notebook for this assignment.
2. Load the dataset into a pandas data frame and display the first 10 rows of the data frame to gain familiarity with the data structure.
3. Data Cleaning:
   * Identify and handle missing values appropriately.
   * Remove any duplicated records.
   * Convert all date-related columns into a standard format (if applicable).
   * Create a new column for the passenger's age group ("Child," "Adult," "Senior") based on the 'Age' column.
4. Data Exploratory Data Analysis:
   * Provide a summary of the dataset using descriptive statistics.
   * Visualize the distribution of passengers by gender using a bar plot.
   * Create a histogram for the age distribution.
   * Visualize the survival rate by gender and class.
   * You can add any interesting visualizations
5. Basic Statistical Analysis:
   * Calculate the mean, median, and mode for the 'Fare' and 'Age' columns.
   * Perform a t-test to determine if there's a significant difference in survival rate based on gender.
   * You can add any interesting statistical analysis,
6. Documentation:
   * Explain the rationale for each data cleaning step.
   * Interpret and explain the visualizations and statistical findings.

# Evaluation Criteria:

Your assignment will be evaluated based on the following criteria:

1. Completeness - You have answered all parts of the assignment and have submitted both .ipynb and .pdf files.
2. Code Quality - Your code is well-written, properly documented, and easy to understand.
3. Analysis and Interpretation - Your plots, analysis, and interpretation are clear, concise, and backed up with supporting evidence.
4. Creativity - You have used various visualization techniques and demonstrated a good sense of data exploration and storytelling.

# Submission:

Submit the final .ipynb and .pdf files through the specified submission platform or email them to the specified email address.

# Resources:

1. Python Pandas Documentation - <https://pandas.pydata.org/pandas-docs/stable/>
2. Matplotlib Documentation - <https://matplotlib.org/documentation/index.html>
3. Seaborn Documentation - <https://seaborn.pydata.org/documentation.html>
4. NumPy Documentation - <https://numpy.org/documentation/>
5. SciPy Documentation - <https://docs.scipy.org/doc/scipy/reference/index.html>

# Note:

Please make sure to comment on your code and explain your thought process in the Jupyter Notebook or Python script. During an interview, you may be asked to explain the reasoning behind your data-cleaning steps.