**Report on Pai Lab Task 3**

**Overview:** Pai Lab Task 3 is a Python program that implements a solution to the **Water Jug Problem** using the **Depth-First Search (DFS) algorithm**. The program attempts to measure a target amount of water using two jugs of different capacities while keeping track of visited states to avoid repetition.

**Key Components:**

* **Class Structure:**
  + The program is structured using a WaterJug class, which takes the capacities of two jugs and the target amount as input.
  + A visited set is used to track visited states and prevent infinite loops.
* **DFS Implementation:**
  + The dfs() function explores all possible operations to reach the target:
    1. Filling either jug to its full capacity.
    2. Emptying either jug.
    3. Pouring water from one jug to another.
  + If the target amount is achieved, the solution path is printed.
  + If no solution is found, the program indicates failure.
* **Example Execution:**
  + The program attempts to find a way to measure **2 liters of water** using a **4-liter jug and a 3-liter jug**.
  + It prints the step-by-step solution if successful.

**Possible Improvements:**

* Adding **Breadth-First Search (BFS)** for an optimal solution with fewer steps.
* Implementing **graph visualization** to better illustrate the search process.