Vedant Pathare
9564, Comps-A
Batch B
AI

* Experiment-3:- (Postlab)

Q.1) What is the time complexity of the Water Jug problem?

Ans:- The time complexity of solving the water jug problem using DFS is exponential in the worst case, dependent on the branching factor and depth of the search tree. For BFS, the time complexity can be exponential in the worst case.

Q.2) Why is DFS not used for solving a water jug problem?

Ans:- Depth-First-Search (DFS) is not typically used for solving the water jug problem because it does not guarantee finding the shortest sequence of steps to reach the target volume. DFS explores one branch of the search tree as deeply as possible before backtracking, which means it may ~~not~~ find a solution but not necessarily the shortest one. In the context of the water jug problem, DFS might find a solution that involves a large number of steps before backtracking, resulting

in a longer sequence of steps compared to the shortest path. Additionally, DFS can get stuck in infinite loops if cycles exist in the state space. While DFS is suitable for certain types of problems, such as searching for a path in a maze or graph traversal, its lack of optimality and potential for infinite loops make it less suitable for finding the shortest sequence of steps in the water jug problem. Therefore, BFS is preferred over this problem as it guarantees finding the shortest path if one exists.