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Postlab-3

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

→ In the worst-case scenario, we would need to visit every possible state to find a solution. Each state has six possible next states (filling, emptying or pouring each jug), so the branching factor is 6. Therefore, the time complexity is exponential $O(6^d)$, where d is the depth of the search tree.

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

→ DFS is not typically used for solving the water jug problem efficiently because DFS tends to search deeply into the search space before considering other branches. In the water jug problem, the search space can be quite large, and DFS may end up exploring a large portion of it before finding a solution, which can be inefficient. The water jug problem involves finding a sequence of steps to measure out a certain volume of water using jugs of different capacities. The state space in this problem consists of all possible combinations of water level in the jugs. While DFS can be used to solve the problem, it may not be the most efficient approach because it doesn't prioritize exploring the most promising paths first.