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AI Postlab Exp 3.

Q1] What is the time complexity of the water jug problem?

→ The time complexity of water jug problem using BFS is $O(n*m)$, where n and m are the quantity of jug1 and jug2 respectively.
In 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 depth of the search tree.

Q2] Why is DFS not used for solving a water jug problem?

→ It tends to search deeply into the search space before considering other branches. In 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 state space in this problem consists of all possible combinations of water levels 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.