from collections import deque

def water\_jug\_problem(capacity\_a, capacity\_b, target):

visited = set()

queue = deque([(0, 0)]) # Start with both jugs empty

while queue:

a, b = queue.popleft()

if a == target or b == target:

return True

if (a, b) in visited:

continue

visited.add((a, b))

# Possible operations

queue.append((capacity\_a, b)) # Fill Jug A

queue.append((a, capacity\_b)) # Fill Jug B

queue.append((0, b)) # Empty Jug A

queue.append((a, 0)) # Empty Jug B

queue.append((min(a + b, capacity\_a), b - (min(a + b, capacity\_a) - a))) # Pour B into A

queue.append((a - (min(a + b, capacity\_b) - b), min(a + b, capacity\_b))) # Pour A into B

return False

# Example usage

print(water\_jug\_problem(4, 3, 2)) # Output: True

