**3 Write the python program for Water Jug Problem**

**Program:**

from collections import deque

def water\_jug\_bfs(jug1, jug2, target):

visited = set()

q = deque()

q.append((0, 0)) # initial state (0, 0)

while q:

a, b = q.popleft()

if (a, b) in visited:

continue

visited.add((a, b))

print(f"Jug1: {a} | Jug2: {b}")

if a == target or b == target:

print("Reached the target!")

return

q.append((jug1, b)) # Fill Jug1

q.append((a, jug2)) # Fill Jug2

q.append((0, b)) # Empty Jug1

q.append((a, 0)) # Empty Jug2

q.append((0, a + b)) if a + b <= jug2 else q.append((a - (jug2 - b), jug2)) # Pour Jug1 → Jug2

q.append((a + b, 0)) if a + b <= jug1 else q.append((jug1, b - (jug1 - a))) # Pour Jug2 → Jug1

print("No solution found.")

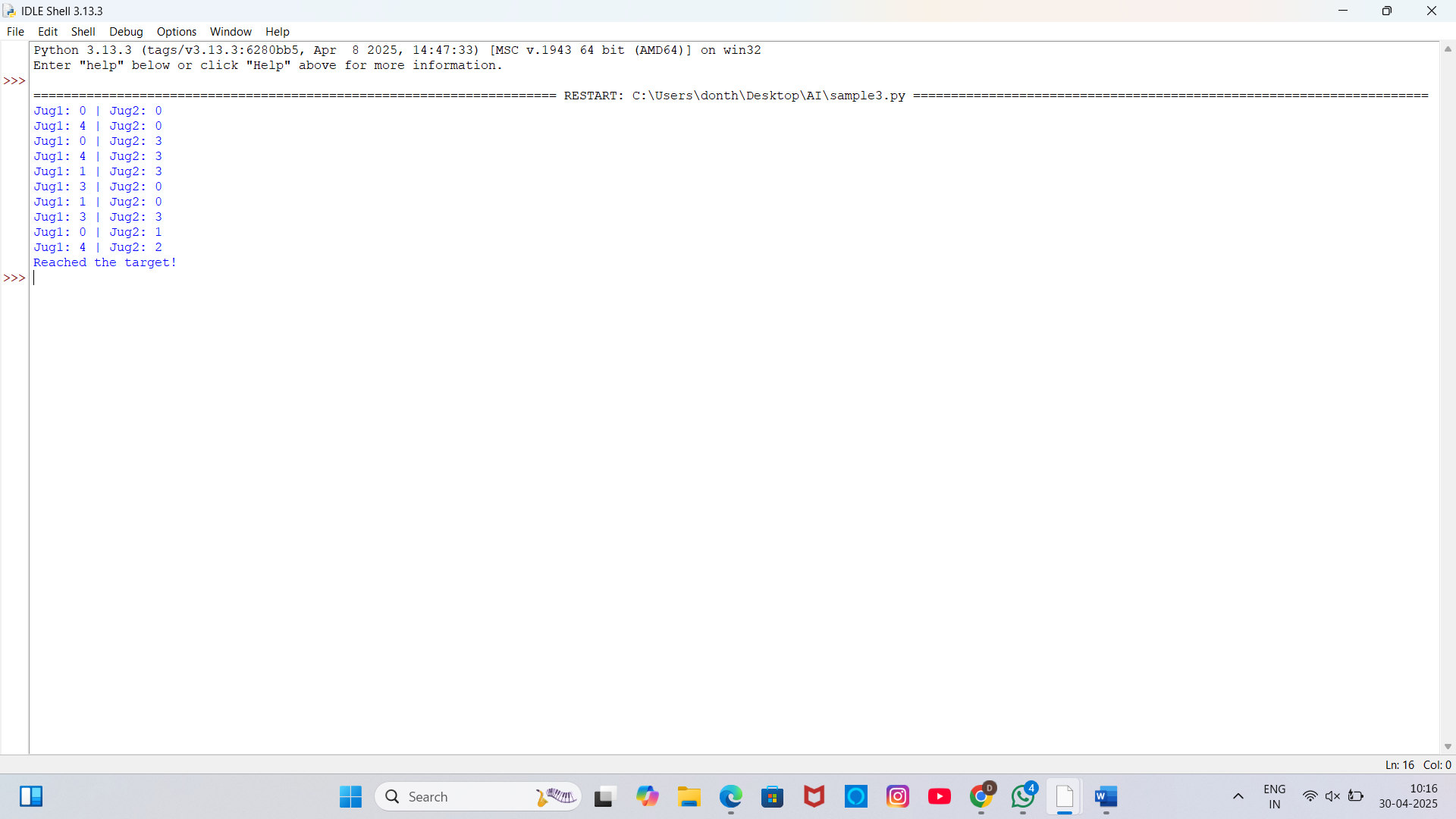
jug1\_capacity = 4

jug2\_capacity = 3

target\_amount = 2

water\_jug\_bfs(jug1\_capacity, jug2\_capacity, target\_amount)

**output:**

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