Water jug.

Aim:

The aim of the water jug problem is to measure an exact amount of water using two jugs with given capacity. find a series of operations that allows one of the jugs to contain the desired target amount of water.

Code:

```
def dfs-water-jug(x, y, target):
    stack = [(0,0)]
    visited = set()
  while stack:
      jug1, jug2 = stack.pop().
  if (jug1, jug2) in visited:
          continue.
  visited.add((jug1, jug2))
  if jug1 == target or jug2 == target:
    print(f"solution found: jug1 = {jug1}, jug2 =
          {jug2}")
      return true.
    stack.append((x, jug2))
    stack.append((jug1, y))
    stack.append.((0, jug2))
    stack.append((jug1, 0))
    stack.append((max(jug1-(y-jug2), 0)
          min(jug2+jug1, y)))
    stack.append((min(jug1+jug2, x),
        max(jug2-(x-jug1), 0))).
    print("no solution")
    return false
```

Algorithm of waterjug

* Start
* Initialize the problem (jug 1, jug 2)
* Define operations

  jug1 → full

  jug2 → full

  empty → jug1

  empty → Jug2

  pour jug1 to jug2 until jug1 is empty & jug2 is full

  pour jug 2 into jug1 until jug2 is empty & jug1 is full

* perform DFS to explore all possible states.
  * if the target amount is acheived, return success.
* if the no solution found return failure

* Termination
* Stop.

Result:

Thus the program is successfully executed and output is verified.

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