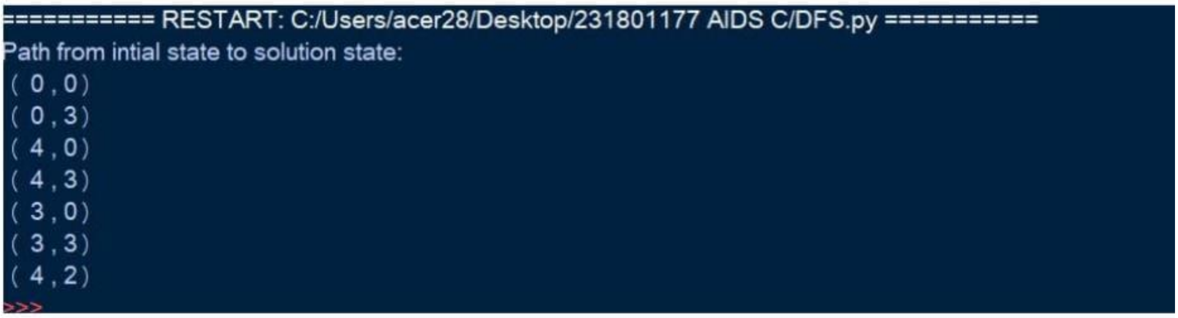
WATER JUG PROGRAM USING DFS

Name: SARANYA V **Reg No.:23801155**

PROGRAM:

```
from collections import deque
 def DFS(a, b, target):
    m = {}
    isSolvable = False
     path = []
    q = deque()
    q.append((0, 0))
    while len(q) > 0:
         u = q.popleft()
        if (u[0], u[1]) in m:
            continue
        if u[0] > a or u[1] > b or u[0] < 0 or u[1] < 0:
            continue
        path.append([u[0], u[1]])
         m[(u[0], u[1])] = 1
         if u[0] == target or u[1] == target:
            isSolvable = True
            if u[0] == target:
                if u[1] != 0:
                    path.append([u[0], 0])
                else:
                    if u[0] != 0:
                        path.append([0, u[1]])
                         q.append([u[0], b])
                        q.append([a, u[1]])
        for ap in range(max(a, b) + 1):
            c = u[0] + ap
            d = u[1] – ap
            if c == a or (d == 0 and d >= 0):
                q.append([c, d])
                c = u[0] – ap
                d = u[1] + ap
            if (c == 0 and c >= 0) or d == b:
                q.append([c, d])
                q.append([a, 0])
                q.append([0, b])
            if not isSolvable:
                print(“No solution”)
            else:
                for I in range(len(path)):
                    print(“(“, path[i][0], “,”, path[i][1], “)”)
Jug1, Jug2, target = 4, 3, 2
print(“Path from initial state to solution state:”)
 DFS(Jug1, Jug2, target)
```

OUTPUT:



```
=========== RESTART: C:/Users/acer28/Desktop/231801177 AIDS C/DFS.py ===========
Path from intial state to solution state:
 ( 0 , 0 )
 ( 0 , 3 )
 ( 4 , 0 )
 ( 4 , 3 )
 ( 3 , 0 )
 ( 3 , 3 )
 ( 4 , 2 )
>>>
```