WATER JUG PROGRAM USING BFS

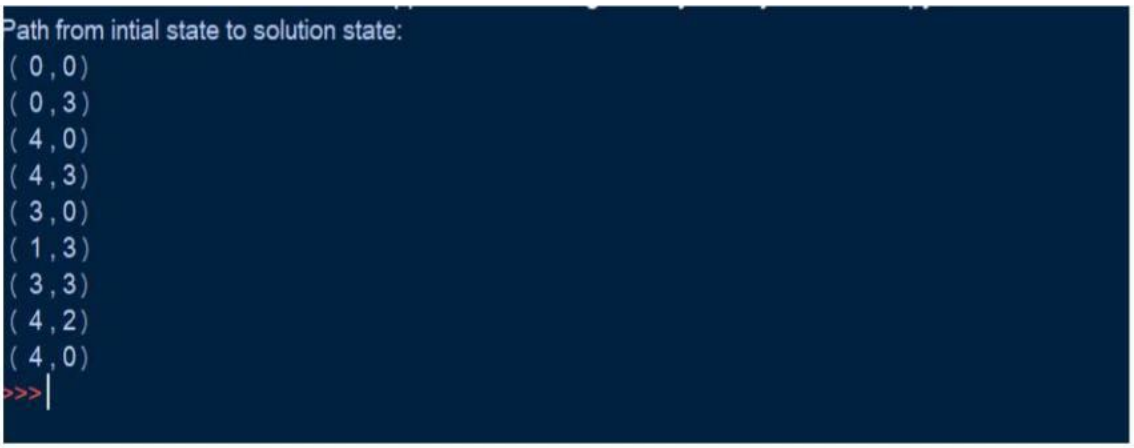
Name: SARANYA V **Reg No.:231801155**

PROGRAM:

```
from collections import deque

 def BFS(a, b, target):

m = {}

isSolvable = False

path = []

q = deque()

q.append((0, 0))

while len(q) > 0:

        u = q.popleft() # Use popleft to get the first element (breadth-first)

         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]])

                        sz = len(path) for I in range(sz):
```

```
                print("(", path[i][0], ",", path[i][1], ")")
                return # Exiting the function after finding the solution
            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")
if name == ' main ':-
Jug1, Jug2, target = 4, 3, 2
print("Path from initial state to solution state:")
BFS(Jug1, Jug2, target)
```

OUTPUT:


Path from intial state to solution state:
(0 , 0)
(0 , 3)
(4 , 0)
(4 , 3)
(3 , 0)
(1 , 3)
(3 , 3)
(4 , 2)
(4 , 0)
>>>