# Assignment 1

## Subject: AI Lab

Name: Sarthak Kapaliya

## Instructions

WAP to solve the given water jug problem using DFS.

You are given two jugs with m liter and a n liter capacity. Both the jugs are initially empty. The jugs don’t have markings to allow measuring smaller quantities. You have to use the jugs to measure d liters of water where d is less than n.

**Code:**

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#  Water Jug problem

MaxA = 5

MaxB = 4

def getChild(node):

    a = node[0]

    b = node[1]

    child = []

    # Empty:

    if a != 0:

        child.append([0, b])

        # transfer A to B

        if b < MaxB:

            child.append([max(0, a+b-MaxB), min(MaxB, a+b)])

    if b != 0:

        child.append([a, 0])

        # transfer B to A

        if a < MaxA:

            child.append([min(MaxA, a+b), max(0, a+b-MaxA)])

    # Fill:

    if a < MaxA:

        child.append([MaxA, b])

    if b < MaxB:

        child.append([a, MaxB])

    return child

def dfs(start, goal, stack):

    child = getChild(start)

    stack.append(start)

    if start == goal:

        return [start]

    for i in child:

        if i not in stack:

            leaf = dfs(i, goal, stack)

            if leaf != None:

                if goal in leaf:

                    print(start)

                    return leaf.append(start)

    return [stack]

start = [0,0]

goal = [2,0]

path = dfs(start, goal, [])

print("path: ", path[::-1])

**Output:**

