Water Jug Problem Using BFS implemented in JAVA

Lab Assignment-1

CSE3002 : Artificial Intelligence

Submitted by:

Jayakumar MHK (18BCE7031)

Under the Guidance of

Prof. Manomita Chakraborty

SCOPE

VIT-AP

Task:

Water Jug problem

Solution:

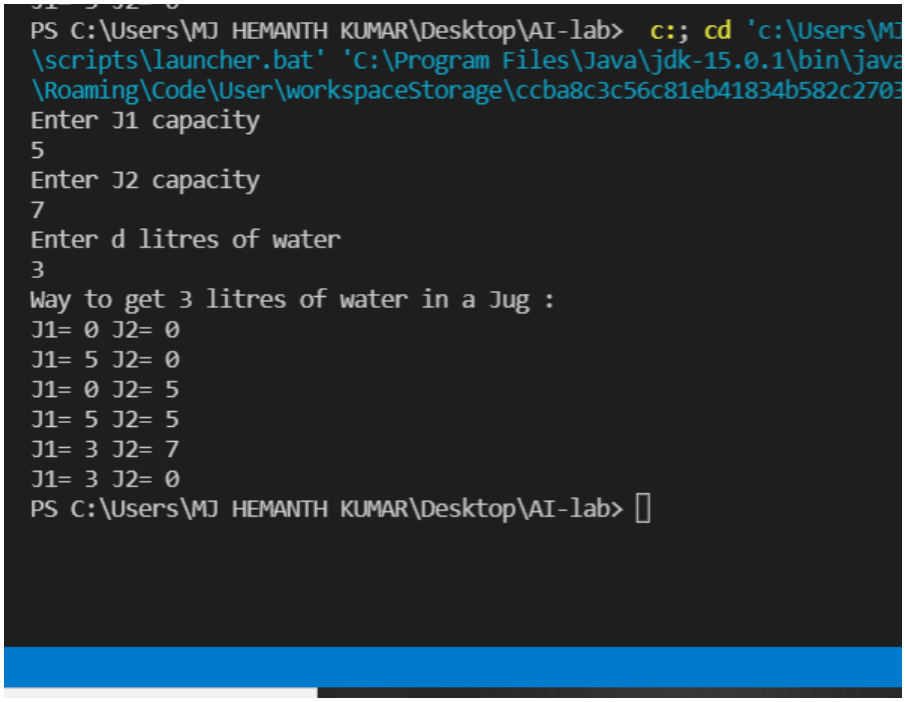
I have used BFS algorithm to solve this problem using Java

Below is the source code of the same.

```
import java.util.*;
public class lab1
{
    static class Jpair{
        int j1;
        int j2;
        public Jpair(int j1,int j2){
            this.j1=j1;
            this.j2=j2;
        }
    }
    public static void main(String[] args) {
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter J1 capacity");
    int m=sc.nextInt();
    System.out.println("Enter J2 capacity");
    int n=sc.nextInt();
    System.out.println("Enter d litres of water");
    int d=sc.nextInt();
    System.out.println("Way to get "+d+" litres of water in a Jug :");
    pourwater(m,n,d);
    }

    public static void pourwater(int m,int n,int d){
       Queue<Jpair> q=new LinkedList<>();
       q.add(new Jpair(0,0));

       while(q.size()>0 ){
           Jpair rem=q.remove();
           int j1=rem.j1;
           int j2=rem.j2;
```

```
            System.out.println("J1= "+j1+" J2= "+j2);
            if(j1==d || j2==d){
                if(j1==d){
                    j2=0;
                }
                else{
                    j1=0;
                }
                System.out.println("J1= "+j1+" J2= "+j2);
                System.exit(0);
            }

            if(j1==0 && j2==0){
                q.add(new Jpair(m,0));
            }
            if(j1!=0 && j2==0){
                q.add(new Jpair(0,j1));
            }
            if(j1==0 && j2!=0){
                q.add(new Jpair(m,j2));
            }
            if(j1!=0 && j2!=0){
                if(j2<n){
                    int tv=n-j2;
                    j2+=tv;
                    j1-=tv;
                }
                else{
                    j2=0;
                }
                q.add(new Jpair(j1,j2));
            }
        }
    }
}
```

Output below :


PS C:\Users\MJ HEMANTH KUMAR\Desktop\AI-lab> c:; cd 'c:\Users\MJ
\scripts\launcher.bat' 'C:\Program Files\Java\jdk-15.0.1\bin\java
\Roaming\Code\User\workspaceStorage\ccba8c3c56c81eb41834b582c270
Enter J1 capacity
5
Enter J2 capacity
7
Enter d litres of water
3
Way to get 3 litres of water in a Jug :
J1= 0 J2= 0
J1= 5 J2= 0
J1= 0 J2= 5
J1= 5 J2= 5
J1= 3 J2= 7
J1= 3 J2= 0
PS C:\Users\MJ HEMANTH KUMAR\Desktop\AI-lab>