PROGRAM 22

AIM: Write a program to implement water jug problem with two jugs the capacity of both the jugs should be entered by user. The quantity of the water to be stored should also be dynamic. The output will show all the steps to get the final state.

CODE:

```python
n1=int(input("Enter the capacity of first jug: "))
n2=int(input("Enter the capacity of second jug: "))
n3=int(input("In which jug to be filled :"))
n4=int(input("How much to be filled: "))
class Waterjug:
    def __init__(self,am,bm,a,b,g):
        self.a_max = am;
        self.b_max = bm;
        self.a = a;
        self.b = b;
        self.goal = g;
    def fillA(self):
        self.a = self.a_max;
        print ('(', self.a, ',',self.b, ')')
    def fillB(self):
        self.b = self.b_max;
        print ('(', self.a, ',', self.b, ')')
    def emptyA(self):
        self.a = 0;
        print ('(', self.a, ',', self.b, ')')
    def emptyB(self):
        self.b = 0;
        print ('(', self.a, ',', self.b, ')')
    def transferAtoB(self):
        while (True):
            self.a = self.a - 1
            self.b = self.b + 1
            if (self.a == 0 or self.b == self.b_max):
                break
        print ('(', self.a, ',', self.b, ')')
    def main(self):
        while (True):
            if (self.a == self.goal or self.b == self.goal):
                break
            if (self.a == 0):
                self.fillA()
            elif (self.a > 0 and self.b != self.b_max):
                self.transferAtoB()
            elif (self.a > 0 and self.b == self.b_max):
                self.emptyB()
def pour(jug1, jug2):
    max1, max2, fill = n1, n2, n4
```

PROGRAM 22

```python
        print("%d\t%d" % (jug1, jug2))
        if jug2 is fill:
          return      elif jug2 is max2:

            pour(0, jug1)
        elif jug1 != 0 and jug2 is 0:
            pour(0, jug1)
        elif jug1 is fill:
            pour(jug1, 0)
        elif jug1 < max1:
            pour(max1, jug2)
        elif jug1 < (max2-jug2):
            pour(0, (jug1+jug2))
        else:
            pour(jug1-(max2-jug2), (max2-jug2)+jug2)
print("JUG1\tJUG2")
if(n3==2):
    pour(0, 0)
elif(n3==1):
  print ('(', '0',',', '0', ')')
  waterjug=Waterjug(n1,n2,0,0,n4);
  waterjug.main();
```

OUTPUT:

```
Enter the capacity of first jug: 5
Enter the capacity of second jug: 7
In which jug to be filled :2
How much to be filled: 2
JUG1    JUG2
0       0
5       0
0       5
5       5
3       7
0       3
5       3
1       7
0       1
5       1
0       6
5       6
4       7
0       4
5       4
2       7
0       2
```