**Lab 5**

**1. Given a 4-gallon jug (X) and a 3-gallon jug (Y), fill X with exactly 2 gallons of water**

**(assume an infinite amount of water is available)**

**• Implement the above mentioned problem of water jug problem using Python.**

**\*You can implement using these rules or you can give It a try on your own**

**customized method.**

**Rule 1: If X = 0 then X = 4 (fill X)**

**Rule 2: If Y = 0 then Y = 3 (fill Y)**

**Rule 3: If X > 0 then X = 0 (empty X)**

**Rule 4: If Y > 0 then Y = 0 (empty Y)**

**Rule 5: If X + Y >= 3 and X > 0 then X = X – (3 – Y) and Y = 3 (fill Y from X)**

**Rule 6: If X + Y >= 4 and Y > 0 then X = 4 and Y = Y – (4 – X) (fill X from Y)**

**Rule 7: If X + Y <= 3 and X > 0 then X = 0 and Y = X + Y (empty X into Y)**

**Rule 8: If X + Y <= 4 and Y > 0 then X = X + Y and Y = 0 (empty Y into X)**

**Code:**

j1 = 0

j2 = 0

x = 4

y = 3

print("Initial state: (0, 0)")

print("Capacities: (4, 3)")

print("Goal state: (2, 0 or any number)")

while j1 != 2:

print("Choose a rule to apply:")

print("1: Fill Jug X (if X is 0)")

print("2: Fill Jug Y (if Y is 0)")

print("3: Empty Jug X (if X > 0)")

print("4: Empty Jug Y (if Y > 0)")

print("5: Fill Jug Y from Jug X (if X + Y >= 3 and X > 0)")

print("6: Fill Jug X from Jug Y (if X + Y >= 4 and Y > 0)")

print("7: Empty Jug X into Jug Y (if X + Y <= 3 and X > 0)")

print("8: Empty Jug Y into Jug X (if X + Y <= 4 and Y > 0)")

r = int(input("Enter the rule: "))

if (r == 1):

j1 = x

elif (r == 2):

j2 = y

elif (r == 3):

j1 = 0

elif (r == 4):

j2 = 0

elif (r == 5):

t = y-j2

j2 = y

j1 -= t

if j1 < 0:

j1 = 0

elif (r == 6):

t = x-j1

j1 = x

j2 -= t

if j2 < 0:

j2 = 0

elif (r == 7):

j2 += j1

j1 = 0

if j2 > y:

j2 = y

elif (r == 8):

j1 += j2

j2 = 0

if j1 > x:

j1 = x

print(j1, j2)

Output:



