Name: Hitesh Choudhary

Prn no. 20200802146

Water Jug

Code:

```python
from collections import defaultdict
jug1, jug2, aim = 40, 30, 10

visited = defaultdict(lambda: False)
def waterJugSolver(amt1, amt2):
    if (amt1 == aim and amt2 == 0) or (amt2 == aim and amt1 == 0):
        print(amt1, amt2)
        return True

    if visited[(amt1, amt2)] == False:
        print(amt1, amt2)
        visited[(amt1, amt2)] = True
        return (waterJugSolver(0, amt2) or
                waterJugSolver(amt1, 0) or
                waterJugSolver(jug1, amt2) or
                waterJugSolver(amt1, jug2) or
                waterJugSolver(amt1 + min(amt2, (jug1-amt1)),
                    amt2 - min(amt2, (jug1-amt1))) or
                waterJugSolver(amt1 - min(amt1, (jug2-amt2)),
                    amt2 + min(amt1, (jug2-amt2))))
    else:
        return False

print("Steps: ")
waterJugSolver(0, 0)
```

Output:

```
...    Steps:
       0 0
       40 0
       40 30
       0 30
       30 0
       30 30
       40 20
       0 20
       20 0
       20 30
       40 10
       0 10

       True
```