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Lab – 2 Vacuum World Cleaner

Code:

```
print("----Vacuum  Cleaner-----")
c = 0
rooms = int(input("Enter number of rooms(2/4)"))
if(rooms==2):
  Goal_state = {'A':0 , 'B': 0}
  Curr_state = {'A': 0  , 'B': 0}
else:
  Goal_state = {'A':0 , 'B': 0 ,'C':0 ,'D': 0}
  Curr_state = {'A': 0  , 'B': 0 , 'C':0 ,'D': 0}
if(rooms==2):
  r = (input("Enter robot position (A/B): "))
else:
  r = (input("Enter robot position (A/B/C/D): "))
Curr_state['A'] = int(input("Enter 0 or 1 for dust in  position A: "))
Curr_state['B'] = int(input("Enter 0 or 1 for dust in position B: "))
if(rooms==4):
  Curr_state['C'] = int(input("Enter 0 or 1 for dust in  position C: "))
  Curr_state['D'] = int(input("Enter 0 or 1 for dust in position D: "))
print("-----------------")
def suck(loc, c):
    print(f"Location {loc} is dirty")
    print("Suck operation done")
    print(f"Position  {loc} is cleaned")
```

```
    c += 1
    print("Cost =", c)
    Curr_state[loc] = 0
    print("Curr_state",Curr_state)
    print("-----------------")
    return c
def left():
    print("Position C is clean")
    print("Curr_state",Curr_state)
    print("Moving Left")
    print("-----------------")
    return 'D'
def right():
    print("Position A is clean")
    print("Curr_state",Curr_state)
    print("Moving Right")
    print("-----------------")
    return 'B'
def up():
    print("Position D is clean")
    print("Curr_state",Curr_state)
    print("Moving Up")
    print("-----------------")
    return 'A'
def down():
    print("Position B is clean")
```

```
    print("Curr_state",Curr_state)
    print("Moving Down")
    print("-----------------")
    return 'C'
def vacuum_cleaner(loc, sta, c):
    if sta == 1:
        c = suck(loc, c)
    elif loc == 'A':
        loc = right()
    elif loc == 'C':
        loc = left()
    elif loc == 'B':
        loc = down()
    elif loc == 'D':
        loc = up()
    return loc, c
while True:
    print("Robot location ",r)
    sta = Curr_state[r]
    r, c = vacuum_cleaner(r, sta, c)
    if (Goal_state==Curr_state):
        print("All positions are clean!")
        print("Goal state")
        print(Goal_state)
        print("Total cost is ",c)
        Break
```

Output:

1) Two rooms

```
----Vacuum  Cleaner-----
Enter robot position (A-B): B
Enter 0 or 1 for dust in  position A: 1
Enter 0 or 1 for dust in position B: 1
-----------------
Robot location  B
Location B is dirty
Suck operation done
Position  B is cleaned
Cost = 1
-----------------
Robot location  B
Position B is clean
Moving Left
-----------------
Robot location  A
Location A is dirty
Suck operation done
Position  A is cleaned
Cost = 2
-----------------
All positions are clean!
Goal state
{'A': 0, 'B': 0}
Total cost is  2
```

2) four rooms

```
----Vacuum  Cleaner-----
Enter number of rooms(2/4)4
Enter robot position (A/B/C/D): B
Enter 0 or 1 for dust in  position A: 0
Enter 0 or 1 for dust in position B: 1
Enter 0 or 1 for dust in  position C: 1
Enter 0 or 1 for dust in position D: 0
-----------------
Robot location  B
Location B is dirty
Suck operation done
Position  B is cleaned
Cost = 1
Curr_state {'A': 0, 'B': 0, 'C': 1, 'D': 0}
-----------------
Robot location  B
Position B is clean
Curr_state {'A': 0, 'B': 0, 'C': 1, 'D': 0}
Moving Down
-----------------
Robot location  C
Location C is dirty
Suck operation done
Position  C is cleaned
Cost = 2
Curr_state {'A': 0, 'B': 0, 'C': 0, 'D': 0}
-----------------
All positions are clean!
Goal state
{'A': 0, 'B': 0, 'C': 0, 'D': 0}
Total cost is  2
```