Program 3

Assume that there are 3 floors and 4 rooms in each floor. Design the vacuum cleaner to ensure the rooms are clean. You may make suitable assumption for initial state.

main.py

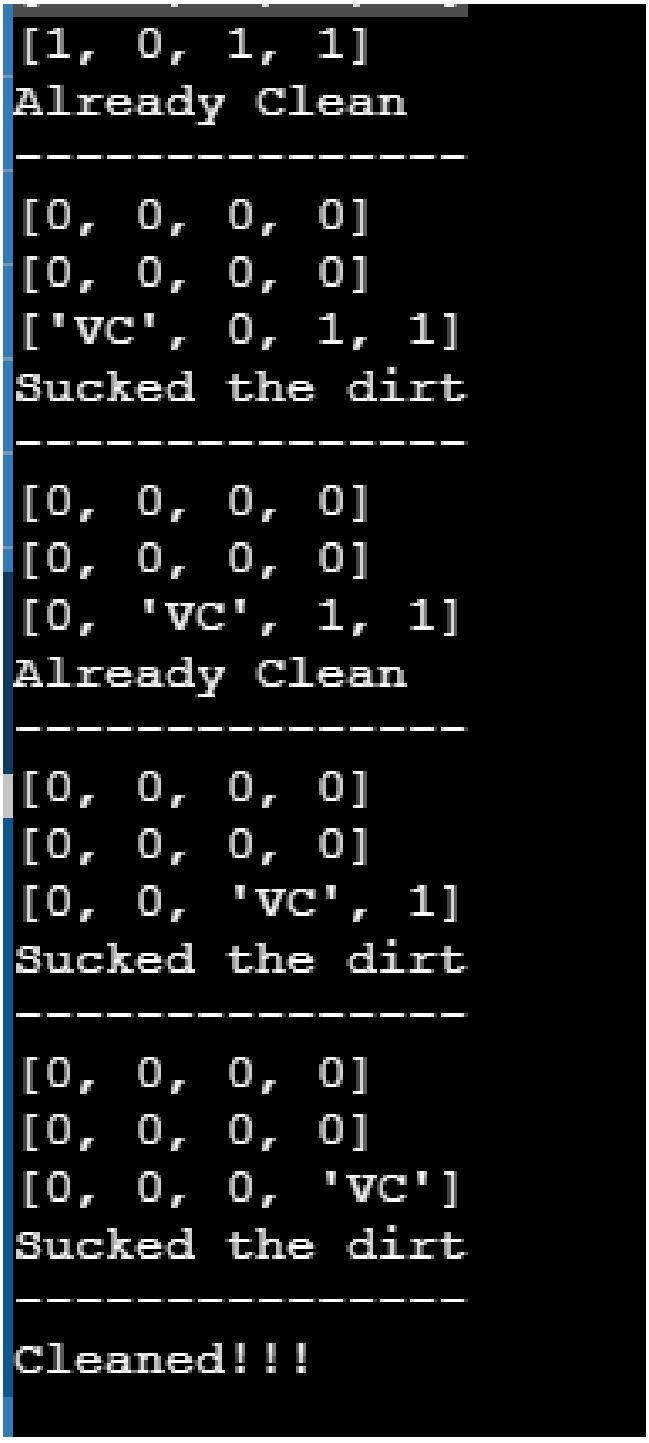
```
# Given M x N grid(floor) create an agent that moves around the grid until the entire grid is clean

floor = [[1, 0, 0, 0], # '1' represents dirty and '0' represents clean
         [0, 1, 0, 1],
         [1, 0, 1, 1]]


def clean(floor):
    m = len(floor[0]) # no of cols
    n = len(floor)    # no of rows
    no_of_tiles = m * n

    tiles_checked = 0

    row = 0
    col = 0
    while tiles_checked < no_of_tiles:
        # Current position
        print_floor(floor, row, col)

        # Suck if dirty
        if floor[row][col] == 1:
            floor[row][col] = 0
            print('Sucked the dirt')
        else:
            print('Already Clean')

```

```
28
29          # Next tile
30          if row % 2 == 0:          # Even rows the bot moves right to the next tile
31              if col < m-1:
32                  col += 1
33              else:
34                  row += 1  # Move to next row if we reached the last col
35
36          elif row % 2 == 1:        # Odd rows the bot moves left to the next tile
37              if 0 < col:
38                  col -= 1
39              else:
40                  row += 1  # Move to next row if we reached the last col
41
42          tiles_checked += 1
43          print('--------------')
44
45      print('Cleaned!!!')
46
47
48
49  def print_floor(floor, row, col):
50      temp = floor[row][col]
51      floor[row][col] = 'VC'
52      for x in floor:
53          print(x)
```

```
54
55          floor[row][col] = temp
56
57  # Call the function
58  clean(floor)
```

Output

```
['VC', 0, 0, 0]
[0, 1, 0, 1]
[1, 0, 1, 1]
Sucked the dirt
---------------
[0, 'VC', 0, 0]
[0, 1, 0, 1]
[1, 0, 1, 1]
Already Clean
---------------
[0, 0, 'VC', 0]
[0, 1, 0, 1]
[1, 0, 1, 1]
Already Clean
---------------
[0, 0, 0, 'VC']
[0, 1, 0, 1]
[1, 0, 1, 1]
Already Clean
---------------
[0, 0, 0, 0]
[0, 1, 0, 'VC']
[1, 0, 1, 1]
Sucked the dirt
---------------
[0, 0, 0, 0]
[0, 1, 'VC', 0]
[1, 0, 1, 1]
Already Clean
---------------
[0, 0, 0, 0]
[0, 'VC', 0, 0]
```


[1, 0, 1, 1]
Already Clean

[0, 0, 0, 0]
[0, 0, 0, 0]
['VC', 0, 1, 1]
Sucked the dirt

[0, 0, 0, 0]
[0, 0, 0, 0]
[0, 'VC', 1, 1]
Already Clean

[0, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 'VC', 1]
Sucked the dirt

[0, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 'VC']
Sucked the dirt

Cleaned!!!