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.

```
# 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')


      # Next tile
        if row % 2 == 0:          # Even rows the bot moves right to
the next tile
            if col < m-1:
                col += 1
            else:
              row += 1  # Move to next row if we reached the last col


        elif row % 2 == 1:        # Odd rows the bot moves left to the
next tile
```

```
            if 0 < col:
                col -= 1
            else:
            row += 1  # Move to next row if we reached the last col

        tiles_checked += 1
        print('---------------')

    print('Cleaned!!!')

def print_floor(floor, row, col):
    temp = floor[row][col]
    floor[row][col] = 'VC'
    for x in floor:
        print(x)

    floor[row][col] = temp
# Call the function
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]
Sucked the dirt
---------------
[0, 0, 0, 0]
['VC', 0, 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!!!
```