# 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.

Program:

```python
# 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:
```

```python
                row += 1  # Move to next row if we reached the last col

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

    print('Cleaned!!!')
```

# 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, 'VC', 1]
Sucked the dirt
----------------
[0, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 'VC']
Sucked the dirt
----------------
Cleaned!!!
```