

3. MXN Grid Vacuum cleaner

PROGRAM:

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:

Vaccumcleaner Draft saved

File Edit View Run Add-ons Help

+ [Icons] Code ▾

● Draft Session (0m)

H
D
D

C
P
U

R
A
M

Power

Refresh

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

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!!!

+ Code

+ Markdown