

The task is to develop an algorithm to mow rectangular surfaces.

- Combinations of the commands F,L,R to direct the mower.
- Different mowers may not occupy the same space at the same time (Avoid collision).

To design the Mower with the specifications we can try with the concept of Graph Traversing.

- There are two main algorithms used to traverse in the rectangular surface via grid they are
- BFS(Breadth First Search) and DFS(Depth First Search)

For our task we can try DFS with Adjacency matrix to traverse the rectangular surface in the grid manner.

Let us assume the mower in the initial position(0,0) Lower left

5						
4						
3						
2						
1						
0	M					
	0	1	2	3	4	5

- The direction to the mower is placed by the adjacency matrix of the next grid.
- The point where the x and y represent the row and columns of the matrix and it moves to the next grid .



- Here we just created an orientation to mower

```

1 # Func to define the grid ,position current position Length and breadth
2 def dfs(grid,pos,curr,length,breadth):
3     x = pos[0]
4     y = pos[1]
5     if grid[x][y]==1:
6         return None
7     elif grid[x][y] ==2:
8         return None
9
10
11     if y+1 < width and last != 'LEFT':
12         curr.append('RIGHT')
13         dfs2(grid,(x,y+1),curr,length,breadth)
14         curr.pop()
15     if x+1 < height and last != 'Forward':
16         curr.append('Forward')
17         dfs2(grid,(x+1,y),curr,length,breadth)
18         curr.pop()
19     if y-1>=0 and last != 'RIGHT':
20         curr.append('LEFT')
21         dfs2(grid,(x,y-1),curr,length,breadth)
22         curr.pop()
23
24

```

- Direction Vectors

```
#Direction Vectors  
#TO define the directions for north,south,east and west  
  
dir_row = [-1,+1,0,0]  
dir_col = [0,0,+1,-1]  
  
#since we have four directions we loop through each positions  
  
for(i = 0; i<4;i++):  
    new_r = r + dir_row[i]  
    new_c = c + dir_col[i]
```

- To run multiple mowers, we can also use the concept of threading

To get the code visit

<https://github.com/Vickyapril/lawnMower/wiki>