

Solving the Mazes using Stacks

Also known as Rat in a Maze Problem

- Right
 - Down
 - Up
 - Left
- Start →
- | | | | | | |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 0 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 1 |
- End
- 1 = movement allowed
 - 0 = blockage (movement not allowed)

- R
- D
- U
- L
- Stack: <R>

1	1	1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- R
 - D
 - U
 - L
- Stack: <R, R>

1	1	1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- R
- D
- U
- L

1	1	1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, R, R>
- Moving to Right, Up and Down not possible
- Now, backtrack (POP) and move in reverse direction

1	1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, R>
- Note that moved in **Left** Direction
- Blocked that position to avoid re-visit

1	1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, R>
- Moving to Right, Up and Down not possible
- Now, backtrack (POP) and move in reverse direction⁷

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R>
- Note that moved in **Left** Direction
- Blocked that position to avoid re-visit

- R
- D
- U
- L

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R>
- Note that now moving **Right** not possible
- Move **Down** Now

- R
- D
- U
- L
- Stack: <R, D>

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- R
- D
- U
- L
- Stack: <R, D, D>

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- R
- D
- U
- L

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, D, D, R>

- R
- D
- U
- L

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, D, D, R, R>

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	-1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, D, D, R>

- R
- D
- U
- L

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	-1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, D, D, R, D>

1	-1	-1	0	0	1
1	0	0	1	1	1
1	1	-1	0	0	0
1	1	0	1	0	0
0	1	1	1	1	0
0	1	1	0	1	1

- Stack: <R, D, D, R, D, D, R, R, R, D, R>