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Homework 2

Problem 2:

Given the algorithm, main function, and maze shown at the end of problem 1, what are the first 12 (r,c) coordinates popped off the stack by the algorithm?

1. 6, 4
2. 6, 3
3. 6, 5
4. 7, 5
5. 8, 5
6. 8, 6
7. 8, 7
8. 8, 8
9. 7, 8
10. 6, 6
11. 5, 4
12. 4, 4

Problem 4:

Given the same main function and maze as are shown at the end of problem 1, what are the first 12 (r,c) coordinates popped from the queue in your queue-based algorithm?

How do the two algorithms differ from each other? (Hint: how and why do they visit cells in the maze in a different order?)

Coordinates:

1. 6, 4
2. 5, 4
3. 6, 5
4. 6, 3
5. 4, 4
6. 6, 6
7. 7, 5
8. 3, 4
9. 4, 5
10. 8, 5
11. 2, 4
12. 4, 6

Difference between stacks and queues:

While stacks add new coordinates to the top and then pop them from there, queues add new coordinates the end of the structure, popping off the oldest coordinates in the queue. This allows queue-based maze solvers to move in a type of concentric circle around points, testing a greater breadth of paths in a briefer span of time than its depth-first counterpart (stacks), which follows a certain path until it either leads to the ending point or hits a dead end.