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Homework 2

**Question 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?**

The first 12 (r,c) coordinates popped off the stack are as follows:

(6,4); (6,3); (6,5); (7,5); (8,5); (8,6); (8,7); (8,8); (7,8); (6, 6); (5,4);(4,4)

**Question 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?)**

The first 12 (r,c) coordinates popped off the queue are as follows:

(6,4); (5,4); (6,5); (6,3); (4,4); (6,6); (7,5); (3,4); (4,5); (8,5); (2,4); (4,6);

The queue moved once in each branch, then did another round of moving once in each branch and kept repeating this process until one of the branches reached the end. This happens because the queue enqueues the next steps for each branch in order, but then actually works on the front, which is the other side. Thus, it does not work on the most recently found possible path, and instead works on the oldest found possible path. On the other hand, the stack finished a maze branch completely, and then went to complete the closest parent branch which still had unexplored portions. This happens because when a branch finds possible subbranches, these possible subbranches are added at the top, and the stack then completes the next step which it finds at the top (which thus causes the stack to complete the most recently found possible path).