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Homework 2

1. The first twelve coordinates popped off the stack in the stack-based maze algorithm are:
   * + 1. (4,3)
       2. (3,3)
       3. (5,3)
       4. (5,2)
       5. (5,1)
       6. (6,1)
       7. (7,1)
       8. (8,1)
       9. (8,2)
       10. 6,3)
       11. (4,4)
       12. (4,5)
2. The first twelve coordinates popped off the queue in the queue-based maze algorithm are:
   * + 1. (4, 3)
       2. (4, 4)
       3. (5, 3)
       4. (3, 3)
       5. (4, 5)
       6. (6, 3)
       7. (5, 2)
       8. (4, 6)
       9. (5, 5)
       10. (5, 1)
       11. (4, 7)
       12. (6, 5)

The difference between the stack and queue based approaches is as follows: the stack takes a single cell and evaluates the cells surrounding it one at a time, pursuing a given path if it is valid. This is known as a depth first search, because the algorithm goes as deep into the maze structure in one particular direction as it can. This is because stack is a first in, first out data structure. On the other hand, the queue checks all the neighboring cells first before moving on to the next one. This is known as a breadth first search, because the algorithm first broadly scans the neighboring nodes at the current level before moving on to the next level. This is because the queue is a first in, first out data structure.