Joyce Chen Homework 2 Report

2) Stack Implementation Coordinates

(5, 3)

(6, 3)

(4, 3)

(4, 2)

(4, 1)

(3, 1)

(2, 1)

(1, 1)

(1, 2)

(3, 3)

(5, 4)

(5, 5)

4) Queue Implementation Coordinates

(5, 3)

(5, 4)

(4, 3)

(6, 3)

(5, 5)

(3, 3)

(4, 2)

(5, 6)

(4, 5)

(4, 1)

(5, 7)

(3, 5)

**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 stack implementation uses “depth-first search” when visiting the cells, meaning that it explores a singular possibility from the start until it hits a dead end. In the worst case, it could explore up to the cell very near the end before turning back and exploring another possibility starting at the top again. This is because everytime we find a new unexplored open cell, we add it to the top of the stack; so the newest cells will always be explored first once we pop the top of the stack.

Meanwhile, the queue implementation uses “breadth-first search” when visiting the cells, in a sort of ripple-like manner. Instead of exploring deep into one possible route, it slowly explores all the surrounding cells of the current cells – if they are open, they are added into the queue. We won’t be exploring deeper once we hit a dead end, but we’re still concurrently exploring the other pathways at the same “level” of the cell. Everytime we find a new unexplored cell, we add it to the end of the queue, so we will finish exploring all surrounding cells of the current cell before moving onto the surrounding cells of those surrounding cells. Like peeling away an onion layer by layer.