CS32 HW2 Questions

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**2.**

First 12 Coordinates using Stack:

1) (6, 5)

2) (6, 6)

3) (6, 4)

4) (7, 4)

5) (8, 4)

6) (8, 3)

7) (8, 2)

8) (8, 1)

9) (7, 1)

10) (6, 3)

11) (5, 5)

12) (4, 5)

**4.**

First 12 Coordinates using Queue:

1) (6, 5)

2) (5, 5)

3) (6, 4)

4) (6, 6)

5) (4, 5)

6) (6, 3)

7) (7, 4)

8) (3, 5)

9) (4, 4)

10) (8, 4)

11) (2, 5)

12) (4, 3)

The reason they visit the mazes differently is due to the order in which the coordinates in the maze paths are popped. Because stack is Last In, First Out structure, when the loop gets to a split where more than one path is valid, it will check the north, west, south, then east directions—in that order—for valid paths, then it will go through the entirety of the first path until it hits a dead end because the newest valid coordinate is continually pushed and popped until there are no more valid coordinates to move to, then the loop will jump back to where the split occurs and check through the next path until a dead end and so on until a path to the end point is found or until all the paths are found to be dead ends.

On the other hand, because queue is First In, First Out structure, when the loop gets to a split, it will check all the directions for valid paths, but then it will move through the first path one space, then jump to another path and move one space, then jump to the next path and move one space (assuming three directions are valid paths) then move back to the first path and move one space again and so on until the target point is found or all the paths lead to dead ends. This is because the queue takes in the latest valid coordinate for a path and pushes it in the back, but then it pops from the front, which is the next valid path in the split.