**CS 32 Homework 2**

**2)** The first 12 (r,c) coordinates for 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)

**4)** The first 12 (r,c) coordinates for 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 two algorithms differ from each other based on their method of traversal. A stack uses a depth-first search whereas a queue uses a breath-first search because a stack starts from the most recently added value while a queue starts from the oldest added value. What this means is that a stack will follow one path all the way until it reaches the ending position or a dead end, and then pick another path to follow all the way. A queue will search every possible position one away from the starting, then two away from the starting, then three away and so on. Thus a queue will often be faster than a stack, and will find the shortest distance to a given point.