**CS 32 Homework 2**

**Problem 2**

The first 12 (r, c) coordinates that are popped off the stack by the stack-based algorithm are as follows:

* (4, 3)
* (3, 3)
* (5, 3)
* (5, 2)
* (5, 1)
* (6, 1)
* (7, 1)
* (8, 1)
* (8, 2)
* (6, 3)
* (4, 4)
* (4, 5)

**Problem 4**

The first 12 (r, c) coordinates that are popped off the stack by the queue-based algorithm are as follows:

* (4, 3)
* (4, 4)
* (5, 3)
* (3, 3)
* (4, 5)
* (6, 3)
* (5, 2)
* (4, 6)
* (5, 5)
* (5, 1)
* (4, 7)
* (6, 5)

The algorithms for the queue and stack differ as follows. The stack-based algorithm always explores the last position pushed on top of the stack whereas the queue-based algorithm always explores the oldest position pushed into the queue (i.e. the front of the queue). Thus, we see that the stack-based algorithm explores one complete path until it reaches a dead end before exploring a different path (depth-first search). The queue-based algorithm explores multiple different paths, position by position, simultaneously (breadth-first search).