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Professor Smallberg

CS 32 – Winter 2021

2 February 2021

Homework 2

**Stack coordinates:**

(6, 4), (6, 3), (6, 5), (7, 5), (8, 5), (8, 6), (8, 7), (8, 8), (7, 8), (6, 6), (5, 4), (4, 4)

**Queue coordinates:**

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

**How the 2 algorithms differ:**

The algorithms for a stack and a queue differ because a stack operates using a last-in-first-out algorithm while a queue utilizes the first-in-first-out method. For a stack, the program performs a depth-first search in which the stack follows one path until it hits a dead end and then returns to the last junction and continues until it hits another dead end. This is because the items that were most recently pushed onto the stack are the first to be popped off, so the stack will always explore the most recent junction before continuing. On the other hand, the queue operates by adding elements to the end of the queue and analyzing the first element in the queue (first in first out). Therefore, since the oldest element is explored first, the queue explores the maze the same way ripples in a pond; new squares are added to the end of the queue and squares closer to the starting square are explored before squares farther away. In other words, queues perform a breadth first search, in contrast to the depth first search performed by stacks.