

COS126 Stack and Queue Exercises 4.3

(answers on reverse side)

4.3.3. Suppose that a client performs an intermixed sequence of (stack) push and pop operations. The push operations put the integers 0 through 9 in order on to the stack; the pop operations print out the return value. Which of the following sequence(s) could not occur?

- (a) 4 3 2 1 0 9 8 7 6 5
- (b) 4 6 8 7 5 3 2 9 0 1
- (c) 2 5 6 7 4 8 9 3 1 0
- (d) 4 3 2 1 0 5 6 7 8 9
- (e) 1 2 3 4 5 6 9 8 7 0
- (f) 0 4 6 5 3 8 1 7 2 9
- (g) 1 4 7 9 8 6 5 3 0 2
- (h) 2 1 4 3 6 5 8 7 9 0

4.3.16. Suppose that a client performs an intermixed sequence of (queue) enqueue and dequeue operations. The enqueue operations put the integers 0 through 9 in order on to the queue; the dequeue operations print out the return value. Which of the following sequence(s) could not occur?

- (a) 0 1 2 3 4 5 6 7 8 9
- (b) 4 6 8 7 5 3 2 9 0 1
- (c) 2 5 6 7 4 8 9 3 1 0
- (d) 4 3 2 1 0 5 6 7 8 9

- Recommended book exercises: 4.3.1 (array implementation), 4.3.4, 4.3.8, 4.3.9 (linked list implementation)

Answers:

4.3.3. b, f and g cannot occur. Once an item has been stacked on top of another item, there is no way to pop them in a different order.

(b) 0 1 cannot occur.

(f) 1 7 cannot occur.

(g) 0 2 cannot occur.

4.3.16. b, c and d cannot occur. Queues always preserve order.