

## Feedback — Stacks and Queues

You submitted this quiz on **Fri 19 Feb 2016 5:54 PM PST**. You got a score of **3.00** out of **3.00**.

To specify an array or sequence of values in an answer, separate the values in the sequence by whitespace. For example, if the question asks for the first ten powers of two (starting at 1), then the following answer is acceptable:

1 2 4 8 16 32 64 128 256 512

If you wish to discuss a particular question and answer in the forums, please post the entire question and answer, including the seed (which can be used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

### Question 1

(seed = 128390)

Suppose that an intermixed sequence of 10 push and 10 pop operations are performed on a LIFO stack. The push operations add the values 0 through 9 to the stack, in the order given; the intermixed pop operations delete and print out the return values. Which of the following output sequence(s) could occur? Check all that apply.

Your Answer	Score	Explanation
<input checked="" type="checkbox"/> 1 5 4 3 6 2 7 0 9 8	✓ 0.20	0 1 - 2 3 4 5 - - - 6 - - 7 - - 8 9 - -
<input type="checkbox"/> 1 4 5 3 6 8 2 7 9 0	✓ 0.20	When 8 is pushed, both 2 and 7 are still on the stack. So, 7 would be popped before 2.
<input checked="" type="checkbox"/> 0 1 2 4 3 7 6 9 8 5	✓ 0.20	0 - 1 - 2 - 3 4 - - 5 6 7 - - 8 9 - - -
<input checked="" type="checkbox"/> 2 1 0 3 4 5 6 7 8 9	✓ 0.20	0 1 2 - - - 3 - 4 - 5 - 6 - 7 - 8 - 9 -
<input type="checkbox"/> 2 3 4 6 1 7 8 9 5 0	✓ 0.20	When 6 is pushed, both 1 and 5 are still on the stack. So, 5 would be popped before 1.
Total	1.00 / 1.00	

## Question 2

(seed = 372773)

Suppose that an intermixed sequence of 10 enqueue and 10 dequeue operations are performed on a FIFO queue. The enqueue operations add the values 0 through 9 to the data structure, in the order given; the dequeue operations delete and print out the return values.

Which of the following output sequence(s) could occur? Check all that apply.

Your Answer	Score	Explanation
<input type="checkbox"/> 0 1 2 3 4 5 7 9 8 6	✓ 0.20	The seventh item enqueued is 6 but the seventh item dequeued is 7.
<input checked="" type="checkbox"/> 0 1 2 3 4 5 6 7 8 9	✓ 0.20	0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 -
<input type="checkbox"/> 0 8 2 6 9 3 4 7 5 1	✓ 0.20	The second item enqueued is 1 but the second item dequeued is 8.
<input type="checkbox"/> 0 1 2 3 4 5 7 6 9 8	✓ 0.20	The seventh item enqueued is 6 but the seventh item dequeued is 7.
<input type="checkbox"/> 0 1 4 5 6 3 7 8 9 2	✓ 0.20	The third item enqueued is 2 but the third item dequeued is 4.
Total	1.00 / 1.00	

### Question 3

(seed = 423010)

Consider an object of type `MysteryBox` that stores  $N$  items of type `long` in an array `items[]` of length  $N$ .

```
public class MysteryBox {  
    private int N;  
    private long[] items;  
  
    ...  
}
```

Using the 64-bit memory cost model from the lecture, how many bytes does it use as a function of  $N$ ? Include all memory referenced by the object and use tilde notation to simplify your answer. For example, enter  $\sim 4N$  if the number of bytes as a function of  $N$  is  $4N + 32$ .

You entered:

8N

Your Answer		Score	Explanation
8N	✓	1.00	
Total		1.00 / 1.00	

#### Question Explanation

A correct answer matches the regular expression: `\s*~?\s*8\s*N\s*`

For example, the following is a correct answer:  $\sim 8N$

Below is a detailed accounting:

<code>public class MysteryBox {</code>	<code>//</code>	16 (object overhead)
<code>    private int N;</code>	<code>//</code>	4 (int)
<code>    private long[] items;</code>	<code>//</code>	8 (reference to array)
<code>    ...</code>	<code>//</code>	$8N + 24$ (array of long)
<code>}</code>		4 (padding to round up to a multiple of 8)
		-----
		$8N + 56 \sim 8N$