M4: Hands-On: Stacks and Queues

Due Mar 19 at 11:59pm **Points** 3 **Questions** 3 **Time Limit** None
Allowed Attempts Unlimited

Instructions

Hands-On: Stacks and Queues

This activity focuses on the fundamental mechanics of working with stacks and queues.

Operations on stacks and queues

1. Open the lecture notes on Stacks and Queues.
2. Review the note set to refresh your memory on these data structures.

Submission

The submission page for this activity asks you to apply your understanding of stacks and queues to a problem and then submit it for a grade.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
KEPT	Attempt 3	less than 1 minute	3 out of 3
LATEST	Attempt 3	less than 1 minute	3 out of 3
	Attempt 2	less than 1 minute	1 out of 3
	Attempt 1	9 minutes	1 out of 3

Score for this attempt: **3** out of 3

Submitted Mar 19 at 5:11pm

This attempt took less than 1 minute.

Question 1

1 / 1 pts

What does the stack `s` contain after the following sequence of operations? Note that the top of stack `s` is the left-most element listed.

```
s.push(1); s.push(2); s.push(3);
s.push(s.pop());
s.pop();
s.push (4); s.push(5);
s.pop();
```

A. *top* | 1, 4, 5

B. *top* | 5, 4, 1

C. *top* | 4, 2, 1

D. *top* | 1, 2, 4

- ○ A
- ○ B
- ◉ C
- ○ D

Correct!

Question 2

1 / 1 pts

What does the queue `q` contain after the following sequence of operations? Note that the front of queue `q` is the left-most element listed and the rear of queue `q` is the right-most element listed.

```
q.enqueue(1); q.enqueue(2); q.enqueue(3);
q.enqueue(q.dequeue());
q.dequeue();
q.enqueue (4); q.enqueue(5);
q.dequeue();
```

A. *front* | 1, 2, 4 | *rear*

B. *front* | 1, 4, 5 | *rear*

C. *front* | 5, 4, 1 | *rear*

D. *front* | 4, 2, 1 | *rear*

- ○ A
- ◉ B
- ○ C
- ○ D

Correct!

Question 3

1 / 1 pts

Suppose we were to implement a queue using an array such that both `enqueue` and `dequeue` have $O(1)$ worst-case time complexity. Recall that to ensure constant time operations, we had to treat the array as *circular*. Assume that the `front` and `rear` markers begin at index 0. Suppose also that the queue has a fixed capacity of 5. That is, there is no array resizing done. Which choice below depicts the contents of the array after the following sequence of operations? (The array is shown from left to right beginning at index 0. The symbol • is used to denote an empty cell.)

```
q.enqueue(1); q.enqueue(2); q.enqueue(3); q.enqueue(4);
q.dequeue(); q.dequeue();q.dequeue();
q.enqueue(5); q.enqueue(6); q.enqueue(7);
q.dequeue();
```

A. `[5, 6, 7, •, •]`

B. `[6, 7, •, •, 5]`

C. `[•, •, 5, 6, 7]`

D. `[•, 7, 6, 5, •]`

- ○ A
- ◉ B
- ○ C
- ○ D

Correct!

Quiz Score: 3 out of 3