Quiz 2 (Sept 27)

By taking this quiz, you agree to adhere to the honor code of the class.

Name: netid:

Write your name and netid on **both** sides of the paper. Write your solution **first on this side**. If space is not enough, write to the other side. You can ask for extra paper if necessary.

Name: netid:

Implement a `stack` using the data structure `queue`. Concretely, implement the three methods specified below. You can only use `queue` as auxiliary variables, but you can create more if needed. Recall that `queue` has methods `void enqueue(E element)`, `E dequeue()`, `int size()` (8 pt).

```
public class QueueBasedStack<E> implements Stack<E> {
     private Queue<E> queue; // change here if needed
     public QueueBasedStack();
     public void push(E element);
     public E pop();
}
```

What is the time complexity for `push` and `pop`? (2pt)

Signatures

Reference solution

```
3  public class QueueBasedStack<E> implements Stack<E> {
4      private Queue<E> queue;
5      public QueueBasedStack() {
6          queue = new LinkedQueue<E>();
7      }
8      public void push(E element) {
9          Queue<E> new_queue = new LinkedQueue<E>();
10         new_queue.enqueue(element);
11         for (int i=0; i<queue.size(); i++) {
12             new_queue.enqueue(queue.dequeue());
13         }
14         queue = new_queue;
15     }
16     public E pop() {
17         return queue.dequeue();
18     }
19     public int size() {
20         return queue.size();
21     }
22 }
```