Assignment 7 CS206 Intro to Data Structures Fall 2013

(150 pts) due: December 4, 2013 11:59pm

Important Notes

- This assignment is to be done on your own. If you need help, see the instructor or TA.
- Please start the assignment as soon as possible and get your questions answered early.
- Read through this specification completely before you start.
- Some aspects of this specification are subject to change, in response to issues detected by students or the course staff.

1 Description

This assignment is for you to work on stacks and queues. There are two problems:

- Implement a queue using two stacks. More specifically, use ArrayBasedStack or LinkedStack that we have implemented in class. The definition for this class (using ArrayBasedStack) is as follows:

```java
public class MyQueue<E> {
    ArrayBasedStack<E> s1, s2;
    
    public MyQueue() { //constructor
    ...
    }
    public int size() {
    ...
    }
    public boolean add(E e) {
        //Inserts the specified element into this queue if it is possible to 
        //do so immediately without violating capacity restrictions.
        //returing true upon success and throwing an IllegalStateException 
        //if no space is currently available
        ...
    }
    public E element() {
        //Retrieves, but does not remove, the head of this queue.
        //Throws NoSuchElementException if this queue is empty
        ...
    }
    public E peek() {
        //Retrieves, but does not remove, the head of this queue,
        //or returns null if this queue is empty
        ...
    }
    public boolean offer(E e) {
```

1 November 19, 2013
• Implement the general case of converting an infix expression to a postfix expression. Refer to the slides titled “Stack Applications” page 8-10.

• Given a string containing just the characters ‘(’ and ‘)’, find the length of the longest valid (well-formed) parentheses substring.
  For “(()”, the longest valid parentheses substring is “()”, which has length = 2.
  Another example is “())())”, where the longest valid parentheses substring is “()()”, which has length = 4.
  The interface for this method is defined as below:

```
public class StackUtil {
    public int longestValidParentheses(String s) {
        ...
    }
}
```

2 Submission

Provide working code (as well as JUnit tests) for the class and method required for this assignment (50pts each problem). Turn in a zip file named LastnameFirstname-Assignment7.zip, containing all your source code. The package name for the assignment must be edu.brynmawr.cs206.assignment7. Include the Javadoc tag @author in each class source file. Do not turn in class files.