

Homework Assignment 6

Due date: November 4th, 11:55pm EST

Problem 1

```
public static <E> void enqueue (E item)
{
    // Creates a new node
    TwoWayNode<E> newTail = new TwoWayNode<E>(item);

    // Creates a temporary node pointing to the old tail
    TwoWayNode<E> tempTail = getTail();

    // Points the current tail's next node to be a new node
    getTail().setNext(newTail);
    setTail(newTail);

    // Sets the new tail's previous node to be the previous tail
    getTail().getPrevious() = tempTail;

} // End of the enqueue method

public static E <E> dequeue ()
{
    // Makes a temp node to store a reference to the following node
    TwoWayNode<E> tempNode = getHead();

    // Points the head to the next node
    setHead(getHead().getNext());

    // Points the new head's previous node to be null
    getHead().getPrevious() = null;

    // Returns the former head's data value
    return tempNode.getData();

} // End of the dequeue method
```

Problem 2

- a) $1\ 2 + 3 *$
Postfix Notation: $(1 + 2) * 3$: Valid 9
- b) $1\ 2\ 3 + *$
Postfix Notation: Valid 5
- c) $1\ 2 + * 3$
Postfix Notation: $(1 + 2)\ 3*$: Not Valid
- d) $1 + 2 * 3$
Prefix & Postfix Notation: Not Valid
- e) $+ 1 * 2\ 3$
Prefix Notation: Valid 7
- f) $+ * 1\ 2\ 3$

- Prefix Notation: **Valid 5**
g) $3\ 2\ 1 + 5 * + 4 -$
Postfix Notation: **Valid 14**
h) $3 + 2\ 1 * 5 + 4 -$
Postfix Notation: **Not Valid**
i) $- 3 + 2 * 1 + 5\ 4$
Prefix Notation: **Valid -8**
j) $- 3 + 2 * 1\ 5 + 4$
Prefix Notation: **Not Valid**

Problem 3

Tree #	Not a Tree	General Tree	Binary Tree	Binary Search Tree
1		X	X	X
2		X	X	X
3	X			
4		X	X	
5		X		
6		X	X	X