

# CST246 – Homework Assignment #2

## *A Doubly Linked Circular Bag Implementation*

### Introduction

We have been discussing implementations of the Bag Abstract Data Type (ADT). To reinforce your understanding and to get you to think about alternative design approaches we will implement the Bag interface with a doubly linked circular chain. By this I mean that the last element in the chain points to the first element of the chain and the first element of the chain points to the last element of the chain. All Nodes have two pointers, one to the `next` element of the chain and one to the `previous` element of the chain. The actual Bag implementation class will contain two data members. One will reference to first element of the chain (usually called the `head`). The other will contain the `count` of the number of elements in the Bag. See Figure 3.11 on page 83 of the textbook (with the description modified as above).

### **interface BagInterface**

The source code for this file is available on the D2L Content area for the course. Download this file and reference it in the class that you write.

### **class CircularBag<T>** *this is what YOU will write*

This class will contain the inner class `Node` (as shown in the textbook, but modified to have two `Node` references instead of one). You must implement all of the methods declared in the interface. This implementation differs from that in the textbook in that `add()` and `remove()` methods add to and remove from the `tail` of the chain rather than the head of the chain.

### Testing Your Class Definition

Also included on the D2L Content area is a test program: `TestCircularBag`. Running this program linked with your class, `CircularBag`, should produce a reasonable output so that you can verify the correct behavior of your class. My output can be found in the file `TestCircularBag.txt` for you to compare with your output.

### What To Submit

Please submit just your source file: `CircularBag.java` to the Dropbox.