CSE 232 Spring 2016

Programming Project 11 (Last)

This assignment is worth 65 points (6.5% of the course grade) and must be **completed and turned in before 11:59 on Monday, April 25th , 2016.**

The Problem

We are going to implement a templated type using an underlying singly linked list. This will be a combination of pretty much everything we have done so far. The data structure we will be implementing will be a `Bag` class, specifically a `Bag` class with an associated receipt. Classes are `Node` and `RBag`

Some Background

A `Bag` class is pretty much like it sounds. It is a container class that is ***not sequential*** (there is no order) that has no limit on what it can hold. If we implement it as a Singly Linked List, it has no bounds on how much it can hold. What we add to this class is the concept of a `receipt`. Whenever we add a `Node` to our `RBag`, the system automatically generates a random number which acts as a `receipt`. It is only via the `receipt` that we can find/search for the `Node` in the `RBag`. If you lose your receipt, you cannot search for a `Node`!

Because the process of searching for a `Node` in a Singly Linked List is an O(n) operation, we make the assumption that the `Principal of Locality (PoL)` might apply. The `PoL` says that if an element is searched for once, it is likely to be searched for again in the near future. Thus it would be effective to place the found `Node` at the front of the list. When we search for it again (again, assuming `PoL`), it will take less time.

Given

You are given the file `class-11-skeleton.h`, which has the class declarations and the skeleton methods. By skeleton, I mean the methods are declared and are ready to be defined, along with comments on how to define them. Your jobs is to fill in those methods. There are lots of comments there, take a look. Copy this file to `class-11.h` and begin your work

You are also given a `main-11.cpp` to test your file against.

Deliverables

Turn in your version of the `class-11.h` using the handin program.
Save a copy to your H drive.

Notes

Notes are in the .h file, look there first.

- The Node struct is fully public so you can work with it better, try things out in the main etc. In practice it would probably be a class with private members.

Test

Implement your class and get it to run with the provided `main-11.cpp`. Do it in stages.