COEN 79L - Object-Oriented Programming and Advanced Data Structures

Lab 9

- **The Bag Class with a Binary Search Tree**

The Assignment:
Implement the bag template class using a binary search tree to store the items.

Binary Search Tree (BST) storage rules:

- The entry in node n is never less than an entry in its left subtree (though it may be equal to one of these entries)
- The entry in node n is less than every entry in its right subtree

BSTs also can store a collection of strings, or real numbers, or anything that can be compared using some sort of less-than comparison. This provides higher search efficiency compared to the implementations using array or linked-list. The higher efficiency of searching in a BST motivates us to implement the bag class with a BST.

Invariants:

- The items in the bag are stored in a binary search tree
- The root pointer of the binary search tree is stored in the member variable `root_ptr` (which may be NULL for an empty tree)

Refer to Slide Set 10 for the explanation of this assignment and its relevant functions.

Files that you must complete:

1. `bag_bst.h`
2. `bintree.h`

Other files that you may find helpful:

1. `bagtest.cpp:` A simple interactive test program.
2. `bagexam.cpp:` A test program that will be used to grade the correctness of your bag class.