

CSc 21200 – 2018 Fall  
Homework 5  
Due April 18<sup>th</sup>, 2019

Name your implementation file as LastName(3 to 5 letters)\_FirstNameInitial\_HW5\_QX.cpp  
Note: You can only use iostream, cassert, ctype, cmath, cstdio, and cstdlib.

1. Create a template class called `btNode` with the following:
  - a. Non-member **template** functions for in/post/pre-order traversal
  - b. Non-member functions for a tree to print, copy, height, and number of nodes.
2. Create a template class for a binary tree using `btNode` (Q1) with the spec in the given header file.
3. Create a template class for a binary tree using dynamic array with the spec in the given header file.
4. Create a template class for a Binary Search Tree using the `btNode` binary tree class (Q2).
  - a. Member functions to add, remove, minimum, maximum, and search.
5. Create a template class for a Heap using the dynamic array binary tree class (Q3).
  - a. Member functions to add, remove, minimum, and maximum.
  - b. Heapsort, return a sorted array.