CptS 223 Micro Assignment #6 - Heap Percolating

For this micro assignment, you must implement the following functions found inside BinaryHeap.java. Note that our heap is a min-heap (smallest items at the top)!

void percolateDown(int index)
void insert(AnyType item)

These functions cause the items at the supplied locations to "percolate down" and “percolate up” the heap until the min-heap property is satisfied. The percolateDown() method is called on deleteMin() operation; see the deleteMin() function inside Heap class to see how percolateDown is called. Note that we're being good programmers and allowing the heap to percolate down at any valid index, not just the root! Doing so allows us to evoke the percolate down functionality in other situations (e.g. buildHeap).

The percolateUp function is called on insert() calls and moves any given index up in the tree until it satisfies the heap properties of our min heap.

All of the code that you should have to do is in the BinaryHeap.java file, down at the bottom. Look for the “MA TODO” comments.

The nomenclature for the API mostly follows the book’s library BinaryHeap class, but we’re not implementing the full class interface

As per usual, there’s a Makefile with make test and if you merge in the latest CI merge request to pick up a new .gitlab-ci.yml file, the server CI will run. This assignment was added to your Git repo on a new branch with a merge request to master. Execute the merge request ASAP to avoid diverging your master branch too far, which can cause merge conflicts that you get to resolve.

Feel free to read through the tests and the rest of the code to see how the tests expose the various Heap features and behaviors. Once your functions are in place, then all of the tests should start passing.

Grading

Your submission will be graded based on the following:

1. [10] Your solution builds, does not cause any runtime issues, and passes all test cases

Due Date

This assignment must be submitted by committing it to your class git repository. Upload a small file to Blackboard to let the TAs know that you’ve completed the assignment. They will clone your repo and check the code from there.

For the small file, I suggest something humorous, but it’s truly up to you.