**EECS 330 Lab 08: Binary Heap**

**Objective**

* Get familiar with basic binary heap implementation with C++.

**Specification of the ADT**

1. Implement a binary heap class MyBinaryHeap<ComparableType>. We assume larger numbers have higher priorities. The class should be implemented with MyVector.
2. Implement bool verifyHeapProperty(void) to determine whether the heap satisfies heap property. Return TRUE if yes, and FALSE if no.
3. Implement void increaseKey(const size\_t p, const unsigned int d) to increase the priority of the pth element (as in the array) by d, and restructure the heap to ensure heap property.
4. Implement void decreaseKey(const size\_t p, const unsigned int d) to decrease the priority of the pth element (as in the array) by d, and restructure the heap to ensure heap property. If the priority is lower than , set the priority to 0.
5. Implement MyBinaryHeap& merge(MyBinaryHeap<ComparableType> && rhs) to merge rhs with the current heap. The merged heap should satisfy heap property. Your implementation should run in linear time w.r.t the total size of the two heaps being merged.

**Testing and Grading**

We will test your implementation using the tester main function posted online. The posted input and output examples should be used for a testing purpose, while we will use another set of inputs for grading. Your code will be compiled under Ubuntu 20.04.01 LTS using g++ version 9.4.0 (default) with C++11 standard.

Your final score will be determined by the success percentage of your program when fed with many random inputs. Note that if your code does not compile (together with our tester main function), you will receive 0. Therefore, it is very important that you ensure your implementation can be successfully compiled before submission.

**Submission**

Please submit your implementation as two .h files, with names “MyVector\_[YourKUID].h” (the same as your Lab 01 submission) and “MyBinaryHeap\_[YourKUID].h”. For example, if my KU ID is c123z456, my submission will be three files named “MyVector\_c124z456.h” and “MyBinaryHeap\_c124z456.h”. Please compress all files into a single “.zip” file before submission. Submissions that do not comply with the naming specification will not be graded. All submissions will go through Canvas.