Lab 2
Due: at the end of class

1   Reading

Read chapters 6.1 – 6.4 of the textbook.

2   Exercises

Write out solutions to the exercises below. Please include the names of everyone in your group.

1. Where in a min-heap might the **largest** element reside, assuming that all elements are unique?

2. If you want to search a min-heap of size n (backed by an array) for its largest element, *exactly* how many values would you have to examine, assuming that all elements are unique? (The answer may be a function of n.)

3. If a min-heap may contain non-unique elements, describe *all* locations in the min-heap where the largest element might reside.

4. **Write pseudocode** for an $O(n \lg k)$-time algorithm that takes k separate sorted lists as input, and merges them into one large sorted list. n is the total number of elements across all of the input lists combined. **Analyze** your time complexity. (*Hint:* Use an intermediate min-heap.)

   Assume that each value is marked with the list that it originally came from.

3 Grading

Exercise 1: 20%

Exercise 2: 15%

Exercise 3: 15%

Exercise 4: 50%