Module 7: Overview

Overview

In this module we will study max-heaps, heapsort, and priority queues. A basic function in max-heap is the heapify operation, which is used in many other functions. Buildheap can turn an array of n elements into a max-heap in $\Theta(n)$ time. ExtractMax takes $O(\log n)$ time. IncreaseKey takes $O(\log n)$ time. Insertion takes $O(\log n)$ time. While the max-heap is not designed for searching, we can perform search as well, just like searching in an array. Symmetric to max-heaps, there is the min-heap data structure. Heapsort can sort an array of n elements in $O(n \log n)$ time.

Learning Objectives

By the end of this module, you will be able to:

1. Study the priority queue data structure, using binary heap as an example

Readings

Read the following:

- Section 6.1
- Section 6.2
- Section 6.3
- Section 6.4
- Section 6.5