

2018-03-06 Priority Queues

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HSU hackathon

- Lumberhacks.org

Priority Queues

- Generalized abstraction (abstract data type).
 - Multiple ways to implement
- One property:
 - The most important thing comes out first
 - [min priority; class default] - The smallest thing comes out first
 - [max priority] - The largest thing comes out first

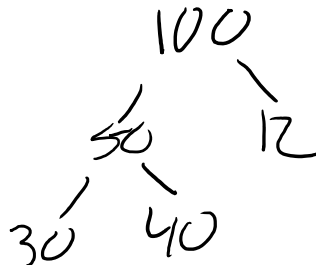
Naïve, implementations

- Idea: maintain a sorted vector, dequeue from the front
 - Enqueue: Find correct place (binary search) + shift (N moves) $O(N)$
 - Dequeue: N shifts $O(N)$
- Better idea: maintain reverse sorted
 - Enqueue still $O(N)$
 - Dequeue $O(1)$
- Other idea: use a AVL Tree
 - Enqueue: $\log(N)$
 - Dequeue: $\log(N)$

Better Implementation #1

- Binary Heap implementation
- Binary heaps are binary trees but not BSTs
- Different rule:
 - Everything below is less important
 - Tree must be complete

Example Max heap



Example min heap

