

Priority Queue

Thursday, March 15, 2018 7:52 AM

Operations

- Insert item with k
- Remove item with max k

Unsorted: insert = $O(1)$, remove = $O(n)$

Sorted: insert = $O(n)$, remove = $O(1)$

(Binary) Heap

- Heap property:
 - o Complete binary tree
 - o Search key in every node \geq children
- Can be represented with an array
- Bubble up/ down to maintain heap property
 - o $O(h) = O(\log n)$ complexity

Heap Construction

- Analyse from the bottom up, swap when necessary
- Build heap = $O(n \cdot h) = O(n)$
- Retrieve top k pages = $O(k \log n)$

Heap Sort

- Heap region \rightarrow sorted region
- In-place, but not stable
- $O(n \log n)$
- Ascending: Maximum Heap
- Descending: Minimum Heap

Indirect Heap

- Change value within heap: find value, bubble
- 4 arrays: heap, key, into (key \rightarrow heap), out of (heap \rightarrow key)
- Key table = hash table