Ch 1 Priority Queue

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Priority Queues

Queues : first-in-first-out (FIFO)

Priority Queue : search key + priority value

application : 醫院急症室分流
↳ 1級 : 最緊急.
5級 : 最不緊急.

↓

☆ sorting ☆

Data
↓ InsertPQ (dataItem, priority)
PQ < sorting algorithm (☆efficiency)
↓ DeletePQ / call Pull
result

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selection sort .

- select the smallest / largest value from the array in each loop ✓
  ↳ 醫院急症室 : suitable but no the most efficient
  - pqInsert() : O(1) constant time — add to the end of list (pointer for end of queue etc.)
  - pqDelect() : O(n) look for smallest → look thru all data once ↳ O(n)
  - unsorted list

Insertion sort

- insert data into a sorted list
  - pqInsert() : O(n) find the suitable place to insert → worst case : go thru every data
  - pqDelete() : O(1) ∵ sorted list → always the first node.

Tree sort (binary search Tree)

- sort using binary tree right : ≥ left : <
  - pqInsert() : O(log n) } related to tree height
  - pqDelete() : O(log n) } not worst case

worst case :  // best case : balanced tree

- pqInsert() : O(n) } look thru all nodes.
- pqDelete() : O(1) }

Application .

1. Nearset Neighbor (NN)
   - map
   - eg. nearest コンビニ?

   a) group nearby elements

   b) calculation