# PROJECT 4

**PRIORITY QUEUE USING HEAPIFY FUNCTION (50 pts)**

1. A **priority queue** is an [abstract data type](http://en.wikipedia.org/wiki/Abstract_data_type) which is like a regular [queue](http://en.wikipedia.org/wiki/Queue_(data_structure)) or some other data structures, but where additionally each element (node) has a "priority" associated with it. In a priority queue, an element with high priority is served before an element with low priority like scheduler.

If two elements have the same priority, they are served according to their order in the queue.

1. Use the heapify function or the heap sort algorithm discussed in the class to implement a priority queue program in Java or Python.
2. The program should be able to insert, delete and update the priority of the jobs.
3. The jobs should be heapified or be sorted according to their priorities.
4. Job priorities are to be assigned a number between 1 and 25.
5. Each job consists of Job #, Job Name, Submitter name, **Submission date,** and priority.
6. The program should take the job #, Job name, Submitter, **Submission date** and Priority as input into “Wait Queue”. Enter m jobs to Wait queue where 10 < m < 15 not in sorted order.
7. Dislay the Wait Queue.
8. Heapify (or Heap Sort) the “Wait queue”, display the heapified or sorted Wait Queue
9. Move the highest priority job from Wait Queue to “Ready Queue”.

Move 5 times.

Heapify the Wait queue each time the Wait queue is changed.

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Display the result of both queues after 5 moves from Wait queue to Ready Queue.

1. Delete 3 jobs from Ready queue and display the result.

The Ready queue must be heapified each time the Ready Queue is changed.

Display the result.

1. Add 3 more jobs to Wait queue, move 4 jobs from Wait queue to

Ready queue, delete 2 jobs from Ready queue. Display the result.

1. Change the priority of 3 jobs in the Wait Queue, display the result.
2. You must do more deletions until no more jobs are in the Wait Queue and Ready Queue.
3. When you display the result, you must include the entire job information, not just job #.

When you swap the priorities of two nodes, you must also swap the associated attributes.

**When deleting or moving a job, you may assume you are deleting the job with the highest priority.**

**You must use the heapify or the heap sort function, and the priority queue functions to carry out the above job queue changes.**

1. **Your program output must show proper information to be understood well by the reader/viewer.**