CSCI 321 Computer Science III Summer 2019

Assignment 3

***Maintain a task heap***

You have a set of tasks and each task has its priority. A task is a pair [String name, Integer priority]. For example, [Task1, 5], [Task2, 2]. We need to add these tasks into a priority queue. As we know, heaps are usually used as the underlying data structures of priority queues. In Java, there are several constructors for implementing a priority queue. Please see the reference below:

https://docs.oracle.com/javase/7/docs/api/java/util/PriorityQueue.html

Part a. Regarding the default priority queue constructor, can you show it (PriorityQueue) is implemented with Min-Heap, that is the top element is the minimum one in the heap. Write a program to demonstrate. Attach your code and screenshots of the output. You need to add a set of tasks (with priority) into the priority queue first. For example, you add [Task1, 5], [Task2, 2], [Task3, 1], and you should show (print out) the following in your output after utilizing the “poll” method (check the reference link above for details).

[Task3, 1]

[Task2, 2]

[Task1, 5]

Part b. Can you construct a Max-Heap using a comparator? Please review the sample code in Lecture 4 Activity 1. Write a program to demonstrate. Attach your code and screenshots of the output. For example, you add [Task1, 5], [Task2, 2], [Task3, 1], and you should show (print out) the following in your output after utilizing the “poll” method (check the reference link above for details).

[Task1, 5]

[Task2, 2]

[Task3, 1]