CS2710 Assignment-8 HW

11 October,2016

Due date:16 October 2016

Question 1:

Abstract:
"A priority-queue is an ADT which is like a regular queue or stack data structure, but where additionally each element has a "priority" associated with it. In a priority queue, an element with high priority is served before an element with low priority. If two elements have the same priority, they are served according to their order in the queue."

Your task is to implement all operations on **priority-queue** listed in **pq.h** in **pq.c**.

Question 2:

Design klog k algorithm to find k^{th} smallest item in a binary Min-heap containing N items without modifying the original heap. You can use your heap-implementation done in lab to complete the task. **Note:** You are allowed to use only O(k) extra memory.

Input Description: First line of input contains **n**, number of elements in the heap. Second line contains space-separated min-heap elements. Third line contains **k**.
Output Description:
A single line containing k^{th} smallest element of the heap.

Example:
Input:
7
1 6 10 9 18 13 15
3
Output:
9

Question 3:

Given a text consisting of **alphanumeric characters**, encode the characters in it in such a way that they use the least number of bits and remain recognizable when encoded. Use your prirority queue implementation to complete the task.

Input Description: A single line consisting of the text as specified in the problem statement. **Note:** length of the text will not exceed 10000 characters. **Expected Output:** A many number of lines as the number of different characters in the text and each containing a character and it's binary encoding separated by space.

Example:
Input:
BACADAEAFABBAAAGAH
Output:
A 0
C 1010
E 1100
G 1110
B 100
D 1011
F 1101
H 1111