Algorithms I

Tutorial 4

September 2, 2016

Problem 1

CLRS 9.2-1

Problem 2

Given n integers in the range 0 to k, describe an algorithm that pre-processes its input in $O(n+k)$ time, then answers an query about how many of the n integers fall into a range $[a, b]$ in $O(1)$ time. You can use $O(k)$ additional space.

Problem 3

CLRS 9.3-4

Problem 4

You are given n intervals in the form of $[l, r]$ where l and r are integers. An interval is said to be active at i if $l \leq i \leq r$. You need to find the maximum number of intervals that are active at any integer. Your algorithm should run in $O(n \log n)$ time.

~~Problem 5~~

~~You are given an array of size n where each element is either 0 or 1. You need to do an in-place stable sorting of the array in $O(n)$ time.~~