

CSci 421
Introduction to Algorithms

Homework Assignment 3
Due: Friday, 26 Jan 2001

Winter 2001
W. L. Ruzzo

Handout 3
January 20, 2001

Reading Assignment:

Read Chapter 5, 6.11.2, 6.8.

Homework:

1. 5.10.
2. Simulate the Maximum Consecutive Subsequence algorithm on the following sequence.

1, 2, -2, 1, 1, 2, -6, 1, 3, 10

Show the values of `Suffix_Max` and `Global_Max` after each iteration through the main loop, as well as showing the starting and ending indices of the subsequences to which they implicitly refer.

3. Simulate the Longest Increasing Subsequence algorithm on the following sequence.

1, 7, 2, 8, 9, 3, 10, 4, 6, 5

Show successive values of `BIS(k).last` for each k , and for each such value v , draw an arrow to the `BIS(k-1).last` that would precede it in the length k increasing subsequence ending with v . Finally, list the elements of the (best) longest increasing subsequence.

4. Given two sorted lists of numbers $x_1 < x_2 < \dots < x_n$ and $y_1 < y_2 < \dots < y_m$, and a number Z , give an algorithm to find the set

$$\{(i, j) \mid 1 \leq i \leq n; 1 \leq j \leq m \text{ such that } x_i + y_j = Z\}.$$

Analyze its running time. Time $O(n + m)$ is possible.

5. 6.64.