

CMPT 307-08-2 Assignment 12

(From lecture on July 29, 2008)

Deadline: August 5, 5:30pm

Problem 12.1. Suppose that instead of always selecting the first activity to finish, we select the last activity to start from S_{ij} . Describe the greedy properties of this approach, and prove that it yields an optimal solution. Write an iterative version of the new algorithm.

Problem 12.2. Show on an example, that the greedy approach of selecting the activity of least duration from S_{ij} does not work.

Problem 12.3. Show that a full binary tree with n leaves has $n - 1$ internal vertices.

Hint: use induction.

Problem 12.4. Prove that the total cost $B(T)$ of a tree T can be computed as the sum of frequencies of all internal nodes (assigned by the algorithm).

Problem 12.5. Suppose a data file contains a sequence of 8-bit characters such that all 256 characters are about as common: the maximum character frequency is less than twice the minimum character frequency. Prove that Huffman coding in this case is no more efficient than using an ordinary 8-bit fixed-length code.