

Assignment 9

Design & Analysis of Algorithms Lab

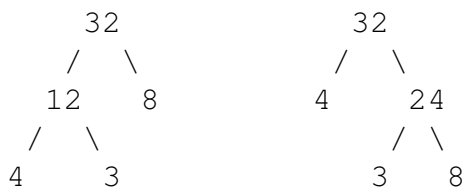
March 22, 2022

Strict Binary Tree Problem A *strict binary tree* is a binary tree with nodes having either 0 child (leaf) or two children. Given the inorder traversal of a binary tree in an array A of n positive integers (may not be distinct), write a C/C++ program that computes the minimum cost strict binary tree among all possible trees. The value of each non-leaf node is equal to the product of the largest leaf value in its left subtree and the largest leaf value in its right subtree. Among all possible strict binary trees considered, print the minimum sum of the values of each non-leaf node.

Example 1:

Input: $n = 3$ $A[] = \{4, 3, 8\}$ **Output:** 44

Explanation: There are two possible trees. The first has non-leaf node sum 44, and the second has non-leaf node sum 56.



Weighted Interval Scheduling Problem Given n weighted intervals $\langle start, end, weight \rangle$, write a C/C++ program that selects a subset of intervals of the maximum total weight such that no two intervals in the subset overlap with each other. Note that if you select an interval that ends at t , you will be able to pick another interval that starts at t .

Example 1:

Input: $n = 4$ $I = \{\{1, 3, 50\}, \{2, 4, 10\}, \{3, 5, 40\}, \{3, 6, 70\}\}$ **Output:** 120

Explanation: The subset chosen is the first and fourth interval with a total profit of $50 + 70 = 120$.

Example 2:

Input: $n = 5$ $I = \{\{1, 3, 20\}, \{2, 5, 20\}, \{3, 10, 100\}, \{4, 6, 70\}, \{6, 9, 60\}\}$ **Output:** 150

Explanation: The subset chosen is the first, fourth and fifth interval with a total profit of $20 + 70 + 60 = 150$.

Submission Instruction:

File Name: A7_RollNo.c/cpp

Email to: pds2016autumn@gmail.com with **subject line:** A7_RollNo