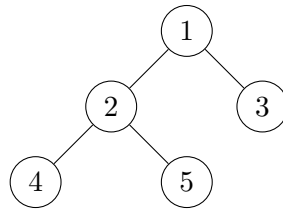


- P1) You are given a tree T where every node i has weight $w_i \geq 0$. Design a polynomial time algorithm to find the weight of the largest weight independent set in T . For example, suppose in the following picture $w_1 = 3, w_2 = 1, w_3 = 4, w_4 = 3, w_5 = 6$. the maximum independent set has nodes 3, 4, 5 with weight $4 + 3 + 6 = 13$.



- P2) A country has $2n$ cities; n of them are on a line north of the river with x-coordinates a_1, \dots, a_n and n of them are on a line south of the river with x-coordinates b_1, \dots, b_n . You can assume no two cities in the north have the same coordinates and no two in the south have the same coordinates. We want to make maximum number of bridges between north and south. A bridge is a direct line connecting the i -th city in the north to the i -th city in the south, i.e., a_i to b_i . Design a polynomial time algorithm that outputs the maximum number of bridges we can build such that no two bridges cross each other. For example if $a_1 = 5, a_2 = 2, a_3 = 4$ and $b_1 = 1, b_2 = 4, b_3 = 2$ then, the maximum number of bridges is 1.

