Problem 8: Monkey Election

Time limit: 2 seconds

The Monkey House has n enclosures, numbered with integers from 1 to n. Enclosure i is home to b_i monkeys and g_i gorillas. Some enclosures are connected by walkways. Two enclosures are said to be adjacent if there is a walkway between them. A simple path from enclosure x to y is a sequence $s_0,\ldots,s_p$ of distinct enclosures, where p is a non-negative integer, $s_0=x$, $s_p=y$, and each pair s_{i-1} and s_i is adjacent for all $i=1,\ldots,p$. Because the walkways are set up in such a way that for any two enclosures x and y, there is exactly one simple path from x to y, it is guaranteed that the network of enclosures forms a tree.

A section is a non-empty set S of enclosures such that for any two x and y in S, there is a simple path from x to y that passes only through the enclosures in S. A collection of sections P is called a partition if each of the n enclosures is part of exactly one section in P. This means no two sections in P share any enclosures, and together they account for all n enclosures.

The Monkey House holds its annual **Mister Jungle** competition. This year's contestants are **Grumpy Gorilla** and **Playful Monkey**. The winner of the competition is determined by a voting system, which we will now explain. Suppose P is a partition of the enclosures into m sections $S_1,\ldots,S_m$. Each village holds its own election. The monkeys vote for their favorite contestant (Playful Monkey), and the gorillas vote for theirs (Grumpy Gorilla). No one abstains from voting.

Mayor Gorang and his assistant, Zangorang, want **Grumpy Gorilla** to win. They can choose how to partition the Monkey House into exactly m sections. If they make the partition optimally, we want to know the maximum number of villages in which **Grumpy Gorilla** can win.

Input

The first line of input contains a single integer t $(1 \le t \le 100)$ representing the number of test cases. Each test case is described as follows:

- The first line contains two space-separated integers n and m $(1 \le m \le n \le 3000)$.
- The second line contains n space-separated integers $b_1, b_2,\ldots, b_n$ $(0 \le b_i \le 109)$, where bi represents the number of monkeys in enclosure i.
- The third line contains n space-separated integers $g_1, g_2,\ldots, g_n$ $(0 \le g_i \le 109)$, where g_i represents the number of gorillas in enclosure i.
- The next $n-1$ lines describe the pairs of adjacent enclosures. Each of these lines contains two space-separated integers x_i and y_i $(1 \le x_i, y_i \le n, x_i \ne y_i)$, indicating that enclosures x_i and y_i are adjacent.

It is guaranteed that these pairs form a tree. It is also guaranteed that the total number of enclosures across all test cases does not exceed 105.

Output

For each test case, output a single line containing a single integer: the maximum number of villages in which Grumpy Gorilla wins, among all possible ways to partition the Monkey House into m villages.

Sample input & output

The following is an example of a sample input and corresponding correct outputs.

Sample input	Sample Output
2 4 3 10 160 70 50 70 111 111 0 1 2 2 3 3 4 2 1 143 420 214 349 2 1	2 0