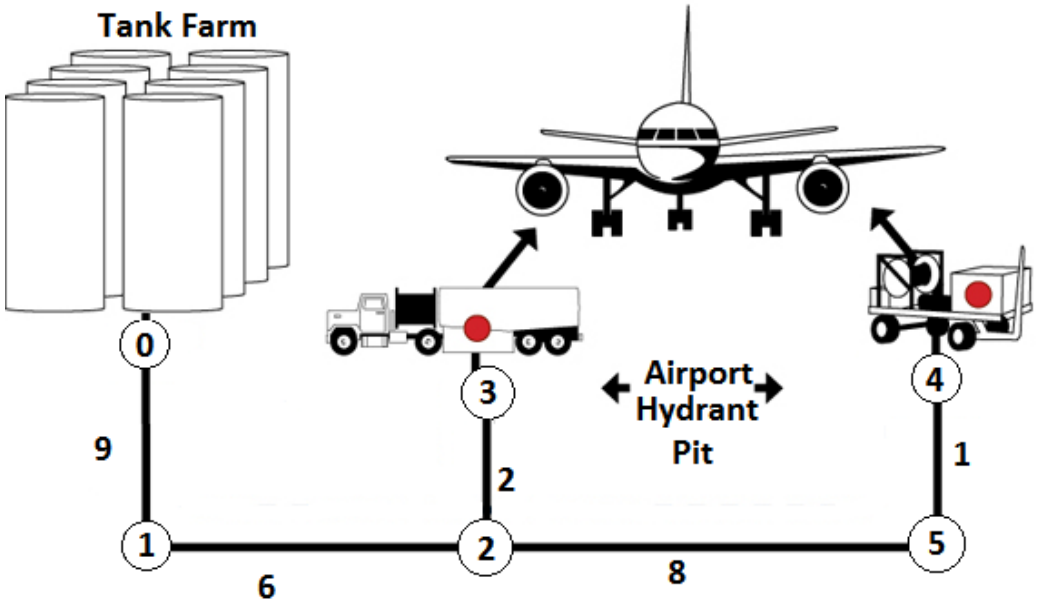
Problem A. Pipelines

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

Most modern airports depend on miles of direct buried fuel piping loops to distribute millions of gallons of fuel to airliners daily from the terminal aprons. An undetected fuel leak along the hydrant fuel system can be devastating to airport operations and the surrounding environment.

There are actually $N-1$ pipelines used to transport oil from the tank farm to the airport hydrant pits, there are also N connectors connecting two or more pipelines. The whole network can be seen as a tree rooted at the connector of the tank farm, where edges are pipelines and leaves are connectors to the hydrant pits.



The monitoring system alerted a leakage at each one of the N connectors. The maintenance team is ready to intervene, they can fix at most k connectors at the same time **if none of those connectors is linked directly to more than two others from this set of k connectors under maintenance**.

As a lead computer scientist you decided to write a program that calculates the maximum number of connectors that can be repaired at the same time, you also want to minimize the distance that separates those (maximum) connectors so that the maintenance intervention could be as fast as possible. This distance equals the sum of lengths of all the pipelines connected **ONLY** by those k connectors.

Input

The first line of the input file contains the number of test cases.

Each test case starts with two integers N the number of connectors and k the maximum number of connectors that can be repaired at the same time ($1 \leq N, K \leq 5 \times 10^4$).

Then follows $N-1$ lines, each one containing two integers u_i, v_i. Meaning that pipeline $i (1 \leq i \leq N)$ is attached to connectors u_i and v_i ($1 \leq u, v \leq N$).
The last line contains $N-1$ integers l_i ($1 \leq l_i \leq 10^6$) denoting the length of pipeline i.

The connector number Zero is **always** linked to the tank farm.

Output

For each line output two integers S and L : S is the maximum number of connectors that can be repaired

at the same time and L is the minimum sum of lengths of all the pipelines connected **ONLY** by those connectors.

Example

standard input	standard output
6 4 0 1 1 2 2 3 2 5 5 4 9 6 2 8 1	4 11