Maximum Mex

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

Mr. Nežmah has a tree with n nodes. On each edge (u_i, v_i), there is a number a_i. Nežmah noticed an interesting property: every value of a_i appears on **at most six edges**.

For every pair of nodes u and v, let's define their *goodness* as the smallest non-negative integer that doesn't appear on any edges on the path from u to v. Find the maximum value of goodness across all pairs of nodes.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains a single integer n ($3 \le n \le 10^5$).

The following $n - 1$ lines of each test case contain u_i, v_i, and a_i ($1 \le u_i, v_i \le n, u_i \ne v_i, 0 \le a_i < n$).

It's guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case, in a single line, output the maximum value of goodness across all pairs of nodes.

Example

standard input	standard output
3 4 2 1 0 1 3 1 1 4 2 5 1 2 0 1 3 1 2 4 0 2 5 2 10 2 3 0 6 10 1 3 7 2 10 9 0 8 2 0 1 9 2 5 2 1 9 3 2 4 10 3	2 3 4