

Problem I. Embedding Trees

Input file: standard input
 Output file: standard output
 Time limit: 12 seconds
 Memory limit: 1024 megabytes

Note the unusual definition of subtree and diameter in this problem.

Here are some definitions:

- The size of a tree T is the number of vertices in it, that is, $|V(T)|$.
- The degree of a vertex i in tree T is the number of edges connected to it, denoted by deg_i .
- A tree T' is a subtree of tree T if and only if:
 - For all vertices $v \in V(T')$, $v \in V(T)$.
 - For all edges $e \in E(T')$, $e \in E(T)$.
- Let S_T be the set of subtrees of T .
- The diameter of a tree T is the size of the largest subtree of T such that $\max(deg_i) \leq 2$ in the subtree.
- Let R_x be the set of the largest trees such that:
 - $\max(deg_i) \leq 3$.
 - The diameter of the tree is $2x$.
- For a tree T , let $f(T)$ be the largest k such that $S_T \cap R_k \neq \emptyset$. If there's no such k , $f(T) = 0$.

You are given a tree T with n nodes. Count sum of $f(T')$ for all subtrees T' of T modulo 998244353. Two subtrees are different if and only if they have different vertex set or edge set.

Input

Each test contains multiple test cases. The first line contains one integer t ($1 \leq t \leq 5 \times 10^4$), indicating the number of test cases. The description of the test cases follows.

The first line contains one integer n ($1 \leq n \leq 10^5$, $\sum n \leq 10^6$), indicating the number of vertices in the tree T .

Each of the following $n - 1$ lines contains two integers u, v ($1 \leq u \neq v \leq n$), indicating an edge on the tree T .

Output

For each test case, print one integer, indicating the sum of $f(T')$, modulo 998244353.

Examples

standard input	standard output
2	12
5	94
1 2	
1 3	
2 4	
2 5	
8	
1 2	
8 7	
1 3	
8 6	
1 4	
8 5	
1 8	

Note

For the first test case, there are 17 different subtrees. 5 of the subtrees contain only one vertex and thus $f(T') = 0$. All the other subtrees satisfy $f(T') = 1$. Thus, the answer is 12.