Idola-Tree

Input file:	`standard input`
Output file:	`standard output`
Time limit:	9 seconds
Memory limit:	256 megabytes

The idol group Oshikoshi requests that you help design mathematical art for their new album cover.

The album cover is to be a **tree**—it will showcase the n idols, with $n-1$ curves that each bidirectionally connect a different pair of idols. A simple path is a sequence of two or more distinct idols, such that there exists a curve directly connecting any two adjacent idols in the sequence; as it is a tree, there exists a path between any two idols u and v in the tree, and we can show that such a path is unique. Thus, you can verify that any tree with n idols will have $n(n-1)/2$ distinct simple paths (if we count the path from u to v to be "the same as" the path from v to u).

Oshikoshi gives you some more definitions!

- Each curve's length is some positive integer.
- The "ink cost" of the entire tree is equal to the sum of the lengths of all of its $n-1$ curves.
- The length of a simple path is equal to the sum of the lengths of all curves along that path.
- The squared length of a path is the value you get by taking the length of a path and then squaring it
  - Note that the sum of the lengths of the curves along a path is squared, **not** the individual lengths (e.g. in a path with curves of length 3 and 4, what we want is $(3+4)^2$ and **not** 3^2+4^2).
- The "drama" of a tree is equal to the sum of the squared lengths of all $n(n-1)/2$ distinct simple paths in the tree.

Now, the "shape" of the tree has already been decided (i.e. which idols are connected by the $n-1$ curves), but the length to make each curve has not yet been set in stone.

Here was your original job: Given an integer c, consider all the different ways to assign a positive integer length to each curve in the tree, such that the ink cost is exactly equal to c. Among all such ways, find one which minimizes the drama of the tree; let this minimum drama value be denoted by $m(c)$.

But Oshikoshi wants to mess with you, so they ask you the following question instead: Given an integer C, what is the sum of $(m(c))^3$ across all integers c from $n-1$ to C (inclusive)? Find this number modulo 998244353.

Input

The first line of input contains t, the number of test cases. The descriptions of t test cases follow.

The first line of each test case contains two space-separated integers n and C. Then $n-1$ lines follow, each containing two space-separated integers between 1 and n denoting a pair of idols directly connected by a curve. We number the idols 1 to n.

- $1 \le t \le 4$
- $2 \le n \le 3 \cdot 10^5$
- $n-1 \le C \le 5 \cdot 10^7$

Output

For each test case, output a single line containing a single integer denoting the answer for that test case.

Example

standard input	standard output
2 4 3 1 4 1 3 2 1 4 4 1 4 1 3 2 1	3375 25327

Note

Both sample test cases feature the same tree.

- For $c = 3$, there is only one way to assign positive integer lengths to all 3 curves such that the ink cost is exactly 3, and that is to assign 1 to each of them.
  - The drama is then $m(3) = 1^2 + 1^2 + 1^2 + 2^2 + 2^2 + 2^2 = 15$.
- For $c = 4$, one way to achieve the minimum drama is to assign a length of 2 to the curve connecting idols 1 and 3, and assign a length of 1 to the remaining two curves.
  - The drama is then $m(4) = 1^2 + 2^2 + 1^2 + 3^2 + 2^2 + 3^2 = 28$.

Thus,

- the answer to the first sample case is $153 \bmod 998244353 = 3375$; and
- the answer to the second sample case is $(153 + 283) \bmod 998244353 = 25327$.