Problem C. Contemporary Artist

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	1024 mebibytes

Given a tree with N vertices. The famous artist Kalevich wants to make art object from it and paint its vertices. Kalevich plans to use K colors and every vertex should be painted in one color. Moreover, the Kalevich plans paint tree in a way that the distance between 2 nearest vertices with same color is maximal possible.

You should find this maximal distance and the number of such paintings modulo 998 244 353. Two paintings are considered different if there exist at least one vertex which has different colors.

Input

First line of the input contains 2 integers N ($2 \le N \le 2000$) and K ($1 \le K < N$). Each of the next $N - 1$ lines contains 2 integers a_i, b_i, which means that vertices a_i and b_i are connected by an edge ($1 \le a_i, b_i \le N$).

Output

Print 2 integers – maximal distance between nearest vertices with same color and number of such paintings modulo 998 244 353.

Example

standard input	standard output
4 2 1 2 1 3 1 4	2 2