Road Maintenance

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Problem Submissions Leaderboard Discussions Editorial

Byteland has N cities (numbered from 1 to N) and $N-1$ bidirectional roads. A *path* is comprised of 1 or more connected roads. It is guaranteed that there is a path from any city to any other city.

Steven is a road maintenance worker in Byteland. He is required to maintain *exactly* M paths on any given workday. He *cannot* work on the same road twice in one day (so no 2 paths can contain the same 2 roads). Steven can start his workday in any city and, once he has finished maintaining a path, teleport to his next starting city.

Given M, help Steven determine how many different possible M–path sets will allow him to perform his maintenance duties. Then print the answer modulo 10^9+7.

Input Format

The first line contains 2 space-separated integers, N (the number of cities) and M (the number of roads to maintain).
Each line i of the $N-1$ subsequent lines contains 2 space-separated integers, A_i B_i, describing a bidirectional road between cities A_i and B_i.

Constraints

- $1 \leq N \leq 10^5$
- $1 \leq M \leq 5$
- $A_i \neq B_i$
- $1 \leq A_i, B_i \leq N$

Output Format

Find the number of different M–path sets that will allow Steven to complete M orders, and print the answer $\%\ (10^9+7)$.

Sample Input

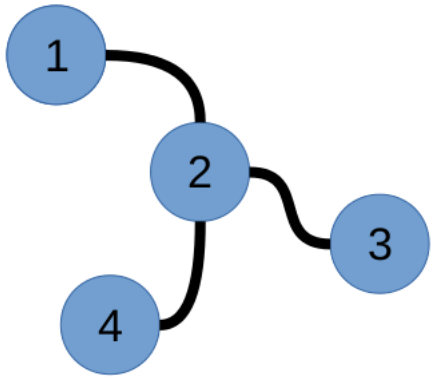
```
4 2
1 2
2 3
2 4
```

Sample Output

```
6
```

Explanation

For the following Byteland map:



Steven can maintain $M = 2$ roads using any of the following 6 routes:

1. $[1, 2]$ and $[2, 3]$
2. $[1, 2]$ and $[2, 4]$
3. $[1, 2]$ and $[3, 4]$
4. $[1, 3]$ and $[2, 4]$
5. $[1, 4]$ and $[2, 3]$
6. $[2, 3]$ and $[2, 4]$

Thus, we print the result of $6 \% (10^9 + 7)$ on a new line, which is 6.

Submissions:117

Max Score:100

Difficulty: Hard

Rate This Challenge:

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Current Buffer (saved locally, editable) Java 7

```
import java.io.*;
import java.util.*;
import java.text.*;
import java.math.*;
import java.util.regex.*;

public class Solution {

    public static void main(String[] args) {
        /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
    }
}
```

Line: 1 Col: 1

Upload Code as File Test against custom input Run Code Submit Code