C – Cactus cutting

Time limit: 15 s *Memory limit: 256 MiB*

Mr Malnar has given up on his tree obsession and found something even more interesting, cacti! Formally, a cactus is a connected graph where each edge is contained in at most one cycle. A cycle is defined as a sequence of more than one distinct edge in which every two consecutive edges share a common endpoint, and the first and last edge share a common endpoint as well.

Unfortunately, the cactus that Mr Malnar bought is rather big, so he would like to cut it up into disjoint sticks. One stick is defined as a pair of edges that share a common endpoint. Mr Malnar is a pedantic individual, so he wants to know the exact number of ways he can cut up his cactus into sticks.

Input data

The first line contains the number of vertices N and the number of edges M. This is followed by M lines, each containing two distinct integers A_i and B_i denoting an edge between vertices A_i and B_i. Each edge will be listed exactly once.

Input limits

- $1 \leq N, M \leq 100\,000$
- $1 \leq A_i, B_i \leq N$

Output data

Compute the number of distinct ways Mr Malnar can cut his cactus up into sticks. Since this number can get quite large, output the result modulo $10^6 + 3$.

Example

Input	Output
10 12 1 6 2 5 7 2 8 9 8 1 2 6 4 3 4 10 3 10 3 9 1 3 5 7	8