Problem A. Cactus Revisited

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	512 megabytes

«Contest should be comparable with regional competitions» - they say. Well, with this problem, this one should feel really NEERC.

A b**-fold coloring** of a graph G is an assignment of sets of colors of size b to vertices of G such that adjacent vertices are assigned with disjoint sets. An a**:**b**-coloring** is a b-fold coloring such that all assigned sets of colors are subsets of a universal set of size a.

A **cactus** is a connected graph in which every edge belongs to at most one simple cycle.

You are given a cactus. Find its a:b-coloring that minimizes the ratio $\frac{a}{b}$ among colorings with $1 \le b \le 1000$. If there are multiple suitable a:b-colorings with the smallest possible ratio, output any of them.

Input

The first line contains two integers n and m ($2 \le n \le 1000, 1 \le m \le 1500$), the number of vertices and the number of edges in the graph respectively.

Each of the next m lines contains two integers u and v ($1 \le u, v \le n$) describing an edge between vertices u and v.

It is guaranteed that the given graph is a cactus without loops and multiple edges.

Output

In the first line print two integers a and b ($1 \le a \le 10^6, 1 \le b \le 1000$). It can be proven, that in an optimal answer a will never exceed 10^6 under given limitations.

Each of the next n lines should contain b distinct numbers in the range from 1 to a. i-th of the lines should describe the set of colors assigned to the vertex i in an arbitrary order.

Examples

standard input	standard output
2 1 1 2	2 1 1 2
3 3 1 2 2 3 1 3	6 2 2 5 1 6 3 4
5 6 1 2 2 3 1 3 3 5 3 4 4 5	3 1 3 1 2 1 3
4 3 1 2 1 3 1 4	4 2 1 3 2 4 2 4 2 4