Problem H. Graph Operation

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

You are given two undirected graphs G and H. Both G and H have exactly n vertices and m edges, and the vertices are labeled from 1 to n. Now, you need to change graph G to graph H. You can perform the following operation any number of times:

- First select four distinct vertices a, b, c, and d. You should ensure that $a \sim b$, $c \sim d$ while $a \not\sim c$, $b \not\sim d$.
- Delete the edge between a and b, and the one between c and d. Add an edge between a and c and one between b and d.

Here $a \sim b$ means that there exists an edge between a and b, and $a \not\sim b$ means that there doesn't exist an edge between a and b.

Note that you can select a different set of a, b, c, d each time. Please determine whether you can change graph G to graph H. If yes you also need to provide the detailed steps.

Input

The first line of the input contains two integers n and m ($4 \le n \le 1000$, $0 \le m \le \binom{n}{2}$) indicating the number of vertices and edges in graph G and H.

For the following m lines, the i-th line contains two integers u and v where $1 \le u \ne v \le n$, indicating that there exists an edge between u and v in graph G.

For the following m lines, the i-th line contains two integers u and v where $1 \le u \ne v \le n$, indicating that there exists an edge between u and v in graph H.

Neither graph G nor H has multi-edges or self-loops.

Output

If you cannot change G to H output "-1" (without quotes).

Otherwise first output an integer r ($0 \le r \le 3 \times 10^6$) in one line indicating the number of operations you need.

For the following r lines, output four integers a_i, b_i, c_i and d_i in the i-th line separated by a space, indicating that for the i-th operation you choose vertices a_i, b_i, c_i and d_i. Note that a_i, b_i, c_i, d_i must be distinct.

Example

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