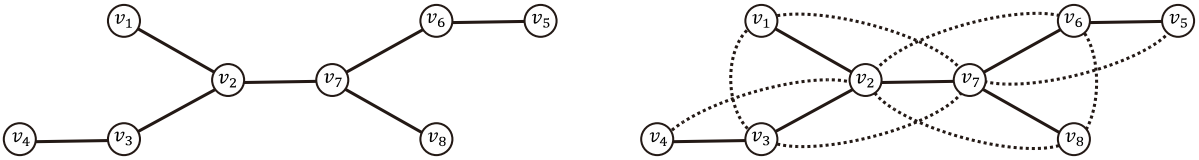
Problem I
Square Root
Time Limit: 3 Seconds

The *square* T^2 of a tree T is defined as a simple undirected graph with the same vertex set as T and the edge set that is augmented in such a way that two vertices of T^2 are adjacent if and only if there exists a path of length at most two in T joining them. That is, its vertex set is equal to that of T and its edge set is equal to $\{(u, v) : d_T(u, v) \leq 2\}$, where $d_T(u, v)$ denotes the distance between u and v in T. Figure X.1 shows a tree and its square.



(a) a tree T (b) its square T^2

Figure I.1: A tree T and its square T^2. An edge of T^2 that joins vertices u and v with $d_T(u, v) = 2$ is shown by a dotted curve.

If a graph G is the square of some tree T, i.e. $G = T^2$, then T is said to be a *square root* of G. For a given tree T, computing the square T^2 is trivial; for a given graph G, however, deciding if there exists a tree T such that $T^2 = G$ is not trivial. Your job is to write an efficient running program for deciding whether or not there exists a tree that is a square root of an input graph G.

Input
Your program is to read from standard input. The first line contains two positive integers n and m, respectively, representing the numbers of vertices and edges of the input graph G, where $2 \leq n \leq 100{,}000$ and $m \leq 1{,}000{,}000$. It is followed by m lines, each contains two positive integers u and v representing an edge between the vertices u and v of G. It is assumed that G is a simple undirected graph whose vertices are indexed from 1 to n.

Output
Your program is to write to standard output. The first line must contain an integer indicating whether there exists a tree that is a square root of the input graph. If yes, the integer must be `1`; otherwise `-1`. When and only when the first line is `1`, it must be followed by the description of an arbitrary tree that is a square root of the input graph. A tree is described by a single line containing an integer n, representing the number of vertices, followed by $n - 1$ lines, each contains two positive integers u and v representing an edge between the vertices u and v of the tree.

The following shows sample input and output for four test cases.

Sample Input 1

```
8 15
1 2
1 3
1 7
2 3
2 4
2 6
2 7
2 8
3 4
3 7
5 6
5 7
6 7
6 8
7 8
```

Output for the Sample Input 1

```
1
8
1 2
2 3
3 4
7 2
5 6
6 7
7 8
```

Sample Input 2

```
8 14
1 2
1 3
1 7
2 3
2 4
2 6
2 7
2 8
3 4
3 7
5 6
5 7
6 7
6 8
```

Output for the Sample Input 2

```
-1
```

Sample Input 3

```
5 7
1 2
2 3
3 4
4 5
5 3
4 2
3 1
```

Output for the Sample Input 3

```
1
5
1 2
2 3
3 4
4 5
```

Sample Input 4

```
4 6
1 2
2 3
3 4
4 1
4 2
3 1
```

Output for the Sample Input 4

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