Problem A. Connected Components

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

No legend. Just pure mathematics =)

Given an undirected graph $G = (V, E)$. $|V| = N, |E| = M$.

$V = \{0, 1, ..., N - 1\}$

Find all connected components of this graph.

Input

First line contains two integer numbers divided by space character: $0 < N \leq 100000$, $0 < M \leq 100000$ — number of vertices and edges respectively.

Each of next M lines contains two integer numbers v_i, u_i — vertices connected by i-th edge: $0 \leq v_i, u_i < N$. (Actually, it is just an edge list, described in the lecture).

Output

On first line print only integer number — number of connected components in the graph.

Then, for each connected component print two lines:

1. Number of vertices in the component.

2. Numbers of vertices which construct this component divided by space character.

You are free to print components and vertices inside components in any order.

Examples

standard input	standard output
3 2 0 1 1 2	1 3 0 1 2
3 0	3 1 0 1 1 1 2
3 3 0 1 1 2 2 1	1 3 0 1 2
3 1 0 1	2 2 0 1 1 2
6 4 2 0 0 1 4 3 1 2	3 3 0 1 2 2 3 4 1 5

Problem B. Park

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You're in a hurry, because webinar on Algorithms and Data structures is about to start. On your way home there is a park and you decided to go this park through. And you want to find the shortest way from the enter (your current position) to the exit.

Fortunately, you've found a map of the park. This may help.

Map of the park is square array of the following characters:

. – empty space (you can go through it)

– barrier, e.g. a tree (you can't go through it)

E – your current position (Enter)

X – your destination (eXit)

From position (i, j) you can move to one of the $(i-1, j), (i, j-1), (i+1, j)$ or $(i, j+1)$ only if there's no barrier in target position.

Input

The first line contains two integer numbers: $0 < N \leq 500, 0 < M \leq 500$ — number of rows and columns in the map respectively.

Each of the next N lines contains M characters each (terminated with line break character) and denote a map of the park.

It is guaranteed that there are exactly one E and exactly one X characters in the map.

Output

Print one integer number — minimum number of steps you need to get from the current position to the exit. If it is impossible, print -1.

Examples

standard input	standard output
2 2 E. .X	2
4 5 E.... .###. .#... ...#X	7
3 5 E.... ##### X	-1