Task: GRR
Garden Road Routine

AACPP SuSe 2025 Round 5 Memory: 512MiB 2025.06.17 – 2025.06.24

Dexter the Cat has discovered a large overgrown garden in one of the neighbor yards. There's tons of unkempt plants, so the only way to get around is to follow one of the narrow paths that other cats have made. Of course, the paths often intersect, creating a purrplexing network of n crossroads and m paths between them. Since some of the cats tend to get agressive trying to cross a path in the opposite direction of a different cat, the neighborhood cat Meowfia set up some concrete rules to oversee the garden. Namely, cats can only cross the paths in a certain direction; on odd days the cats can only walk in one predetermined direction, and on even days only in the reversed, opposite direction.

The crossroads tend to be more open to let the cats move around each other or rest. Thus, Dexter the Cat is looking for a crossroads in a well-connected location to catnap at. He is interested in such a place, that every other crossroads can be reached from it **in one day** - this may be an even day for some target crossroads and an odd day for the rest. The way back can be ignored, since Dexter can curl up and snooze at the crossroads overnight or meow loud enough for someone to come and pick him up.

Given the garden layout, help Dexter find all the crossroads that meet his wishes.

Input

The first line of input contains two integers n and m, which specify the number of crossroads and of the paths between them, respectively. The crossroads are numbered from 1 to n. Then m lines follow, describing the paths. The i-th of these lines contains two integers a_i and b_i, which indicate the path connecting spots numbered a_i and b_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$). This indicates a one-way path originally oriented from the crossroads no. a_i to the crossroads no. b_i (e.g., on odd days the path can be cat-cruised from a_i to b_i, and on even days from b_i to a_i). There is at most one ordered pair (a_i, b_i).

Output

In the first line of output, print a single integer k, the number of crossroads that meet Dexter's wishes. In the second line, print k integers, the order numbers of the crossroads in increasing sequence of length k.

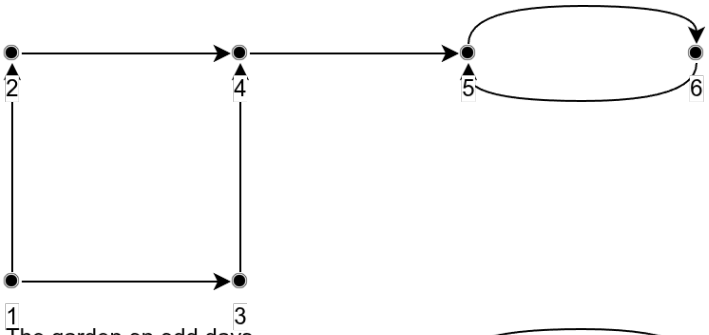
Example

For the input:

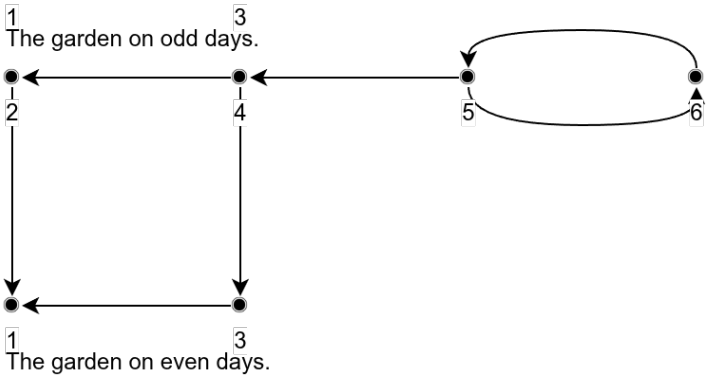
```
6 7
1 2
1 3
2 4
3 4
4 5
5 6
6 5
```

the correct output is:

```
4
1 4 5 6
```



The garden on odd days.



The garden on even days.

From the crossroads no. 1, all other crossroads can be reached on odd days. From each of the crossroads no. 5 and 6, all other crossroads can be reached on even days. From the crossroads no. 4, the crossroads no. 5 and 6 can be reached on odd days, and the crossroads no. 1, 2, and 3 on even days.

Additional examples

The following initial tests are also available:

- `0b` – $n = 10$, $m = 9$, an alternating route whose paths are oriented left or right depending on their parity. No crossroads meet Dexter's wishes;
- `0c` – $n = 4\,321$, $m = 5\,000$, normal garden where some crossroads meet Dexter's wishes;
- `0d` – $n = 100\,000$, $m = 100\,000$, on odd days, every crossroads can be reached directly from crossroads no. 1; also, on odd days, the crossroads no. 1 can be reached directly from the crossroads no. n; The crossroads no. 1 and n are the only ones that meet Dexter's wishes;
- `0e` – $n = 300\,000$, $m = 366\,526$, normal garden where some crossroads meet Dexter's wishes;
- `0f` – $n = 500\,000$, $m = 499\,999$, a "chain", so each crossroads no. i for $1 \leq i < n$ is connected to crossroads no. $i + 1$, all crossroads satisfy Dexter's wishes;

Limits

Your solution will be evaluated on a number of hidden test cases divided into groups. Points for a group are awarded if and only if the submission returns the correct answer for each of the tests in the group within the allotted time limit. These groups are organised into subtasks with the following limits and points awarded.

Subtask	Limits	Points
1.	$2 \leq n \leq 5\,000$, $1 \leq m \leq 5\,000$, $1 \leq a_i, b_i \leq n, a_i \neq b_i$	2
2.	$2 \leq n \leq 300\,000$, $1 \leq m \leq 1\,000\,000$, $1 \leq a_i, b_i \leq n, a_i \neq b_i$, from each crossroads satisfying Dexter's wishes, all other crossroads can be reached on odd days	3
3.	$2 \leq n \leq 500\,000$, $1 \leq m \leq 1\,000\,000$, $1 \leq a_i, b_i \leq n, a_i \neq b_i$	5