Problem L. Restricted Arrays

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	256 mebibytes

Let n be a positive integer. Find the number of integers $1 \leq M \leq n$ for which there exists an array of integers $a[1..n]$ that satisfies the following conditions:

$$a[x_i] + 1 \equiv a[y_i] \pmod{M}, \quad 1 \leq i \leq q.$$

Input

The first line contains two integers, n and q: the array size and the number of conditions ($1 \leq n, q \leq 10^6$).

Each of the next q lines contains two integers, x_i and y_i: the indices describing the corresponding condition ($1 \leq x_i, y_i \leq n$).

Output

On the first line, print an integer t: the number of possible values of M. On the second line, print the t possible values of M in increasing order.

Examples

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