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## DSA Lab 10 Set 2 | Internet

Input file:            standard input  
Output file:           standard output  
Time limit:            2 seconds  
Memory limit:          64 megabytes

Consider a collection of  $k$  webpages, numbered  $1, 2, \dots, k$ . Each web page belongs to a domain of topics. The domain of a web page could be sports, electronic products or online security etc.

We maintain a set of integer pairs (denoting two web-page IDs) indicating links between two web pages belonging to the same domain. A link is said to be formed if **either** of the two web pages contains a hyperlink to the other.

The web pages that are reachable from each other (either directly or indirectly) are said to belong to the same domain.

So every web page belonging to a domain of topics will have a way to reach to other pages in the same domain.

Given a set of link pairs your program should identify the number of domains, and the number of web pages in each domain. (Refer to the sample for clarity)

### Input

The first line contains two single space separated integers,  $N$  and  $D$ , where  $N$  is the number of web pages and  $D$  is the number of links in web pages altogether.

Next  $D$  lines contain two single space separated integers  $x$  and  $y$  in each line where  $x$  and  $y$  are web page IDs and  $x$  has a link to  $y$ .

#### Constraints:

$$1 \leq D \leq \frac{N(N-1)}{2}$$

$$1 \leq x, y \leq N, x \neq y$$

$$\text{Easy: } 1 \leq N \leq 10$$

$$\text{Advanced: } 1 \leq N \leq 500$$

Please note that if a link  $(x, y)$  is in the list, there will not be a link  $(y, x)$  in the list as this link is implied.

### Output

Print the integer  $N$  denoting the number of domains represented in the network. Next line should contain  $N$  space separated integers denoting the number of web pages in each domain in non-decreasing order.

### Examples

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

### Note

Sample 1: Domains are  $\{1, 2, 3\}$  and  $\{4, 5\}$

Sample 2: Domains are  $\{1\}$ ,  $\{4\}$  and  $\{2, 3, 5, 6\}$