

Pihara tribe has a counting system of only a few words: "one", "two" and "many".



A time traveler returns to the past and teaches the tribe graph theory. The time traveler gives them a simple undirected graph, and requires them to color every vertex on the graph, such that **the colors of two endpoints are different for every edge**. Since the tribe's counting system can only count to two (the larger number will be considered "many" for them), they want to know if **the graph can be colored within two colors**.

Please decide whether it is possible to color the graph. If so, color the graph for the tribe.

Input

The first line contains two integers  $n, m$  — the number of vertices in the graph and the number of edges in the graph. The vertices are labeled  $1, 2, \dots, n$ .

The following  $m$  lines contains two integers  $u_i$  and  $v_i$ , being an edge in the graph.

Constraints

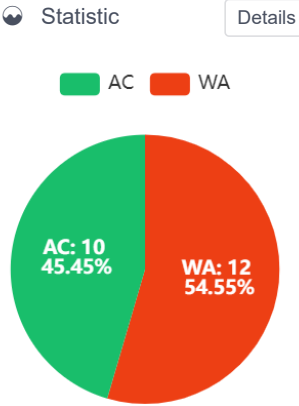
- $2 \leq n \leq 10^5$
- $1 \leq m \leq 2 \times 10^5$
- $1 \leq u_i, v_i \leq n; u_i \neq v_i$

Output

If the graph can be colored within two colors, print the coloring of the graph. For each vertex from  $1$  to  $n$ , print "1" or "2", denoting the color type.

Otherwise, print "MANY".

ID	bipartite
Time Limit	1000MS
Memory Limit	256MB
IO Mode	Standard IO
Created By	ta_david
Level	Hidden
Score	100
Tags	Show



Sample Input 1

```
5 3
```

Sample Output 1

```
1 2 2 1 2
```

Sample Input 2

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

Sample Output 2

```
MANY
```

Hint

For test ID 1, 2, 3, 4 (40% of total points):

- $1 \leq n \leq 10$
- $1 \leq m \leq 20$

For test ID 5, 6, 7, 8, 9, 10 (60% of total points):

- $1 \leq n \leq 10^5$
- $1 \leq m \leq 2 \times 10^5$

Language: C

Theme: Solarized Light



```
1
```

Submit for Sample Test

Submit

Sample Test Input

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

Sample Test Output



