

Contest Duration: 2025-08-16(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250816T2100&p1=248>) - 2025-08-16(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250816T2240&p1=248>) (local time) (100 minutes)

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## G - Count Simple Paths 2

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Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 600 points

### Problem Statement

You are given a simple connected undirected graph with  $N$  vertices numbered 1 to  $N$  and  $M$  edges. The  $i$ -th edge connects vertices  $u_i$  and  $v_i$ .

For each  $k = 1, 2, \dots, N - 1$ , find the number of simple paths from vertex 1 to vertex  $N$  that contain exactly  $k$  edges.

### Constraints

- $2 \leq N \leq 2 \times 10^5$
- $N - 1 \leq M \leq N + 20$
- $1 \leq u_i < v_i \leq N$
- The given graph is a simple connected undirected graph.
- All input values are integers.

### Input

The input is given from Standard Input in the following format:

2026-01-02 (Fri)  
05:28:52 +11:00

```
 $N \quad M$   
 $u_1 \quad v_1$   
 $u_2 \quad v_2$   
 $\vdots$   
 $u_M \quad v_M$ 
```

## Output

Output the answers in the following format:

```
ans1  ans2  ...  ansN-1
```

ans<sub>*i*</sub> is the number of simple paths from vertex 1 to vertex *N* that contain exactly *i* edges.

## Sample Input 1

Copy

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

Copy

## Sample Output 1

Copy

```
0 1 2 1
```

Copy

For each  $k = 1, 2, 3, 4$ , the simple paths from vertex 1 to vertex 5 that contain exactly  $k$  edges are as follows.

- $k = 1$  : None
- $k = 2$  :  $1 \rightarrow 3 \rightarrow 5$
- $k = 3$  :  $1 \rightarrow 2 \rightarrow 4 \rightarrow 5$  and  $1 \rightarrow 3 \rightarrow 4 \rightarrow 5$
- $k = 4$  :  $1 \rightarrow 2 \rightarrow 4 \rightarrow 3 \rightarrow 5$

## Sample Input 2

Copy

Copy

11 15  
1 2  
1 3  
2 3  
3 4  
3 5  
4 5  
5 6  
5 7  
6 7  
7 8  
7 9  
8 9  
9 10  
9 11  
10 11

Sample Output 2

Copy

0 0 0 0 1 5 10 10 5 1

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Sample Input 3

Copy

7 18  
6 7  
4 5  
1 7  
2 7  
1 4  
2 5  
4 6  
2 3  
5 6  
5 7  
1 5  
2 4  
2 6  
1 2  
1 3  
3 4  
1 6  
3 5

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Sample Output 3

Copy

1 3 11 29 50 42

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#telegram)

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