

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:

$N \ M$

$u_1 \ v_1$

$u_2 \ v_2$

\vdots

$u_M \ v_M$

Output

Output the answers in the following format:

$\text{ans}_1 \ \text{ans}_2 \ \dots \ \text{ans}_{N-1}$

ans_i is the number of simple paths from vertex 1 to vertex N that contain exactly i edges.

Sample Input 1

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

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Sample Output 1

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```
0 1 2 1
```

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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

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```
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

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```
0 0 0 0 1 5 10 10 5 1
```

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Sample Input 3

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```
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

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```
1 3 11 29 50 42
```

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2026-01-02 (Fri)

05:28:52 +11:00

'#telegram)

url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc419%2Ftasks%2Fabc419_g%3Flang%3Den&title=G%20-02)

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