DMOPC '16 Contest 4 P5 - Migrant Mascot

Time limit: 1.0s **Memory limit:** 64M

After indulging in one of her guilty pleasures for some time, Molly tears herself away from the booth. She begins moving along with the large crowds of the carnival and hopes this will lead to one of the fabled carnival attractions. After some time, Molly notices a busy intersection in front of her. There were no traces of the carnival to be seen...

The city in which Molly lives consists of M **undirected** (relevant) roads and N tourist ~~traps~~ attractions numbered from 1 to N, with 1 being the carnival.

Molly exhibits a preference for certain types of roads over others and thus assigned each road with a *preference value* p_i. The higher this value is, the better the road will be for Molly to traverse. With many paths leading away from the carnival to choose from, Molly will only remember a path by the lowest *preference value* of the roads which comprise it.

Molly would like to know the best possible value of any path leading from the carnival to a specific tourist attraction.

Since Molly cannot decide which of the tourist attractions in her city to visit next, she has enlisted your help.

Write a program to determine the desired value for each of the tourist attractions to help Molly!

Note: A path is a series of roads joining any two (different) attractions.

Input Specification

Line 1: Two space separated integers N and M, denoting the number of tourist attractions and relevant roads respectively.
Line $2 \ldots M+1$: Three space separated integers a_i, b_i, p_i, denoting an edge between tourist attractions a_i and b_i $(1 \le i \le M)$ with a weight of p_i.

Output Specification

Your program should output N lines, the i^{th} of which represents the best possible value of the i^{th} path leading from the carnival to the i^{th} attraction.

Constraints

For all subtasks:

$a_i \neq b_i$

$1 \le a_i, b_i \le N$

$1 \le p_i \le 10^9$

$1 \le M \le \min\left(\frac{N(N-1)}{2}, 2 \cdot 10^5\right)$

It is possible to reach every attraction from every other attraction.

Subtask 1 [20%]

$2 \leq N \leq 15$

Subtask 2 [30%]

$2 \leq N \leq 350$

Subtask 3 [50%]

$2 \leq N \leq 2 \cdot 10^5$

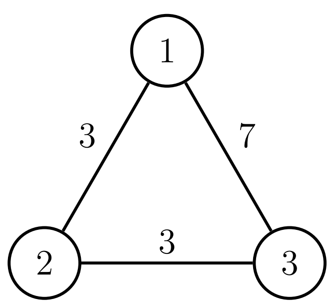
Sample Input

```
3 3
1 2 3
2 3 3
1 3 7
```

Sample Output

```
0
3
7
```

Explanation



Because Molly was just at the Carnival, she is no longer interested in spending time there. As a result, the value for #1 is (always) 0.

The lowest *preference value* of either path leading to attraction #2 is 3.

There are two paths leading from the carnival (#1) to attraction #3: $1 \to 3$ and $1 \to 2 \to 3$, with respective values (as Molly recalls) of 7 (the only *preference value* of the path) and $\min(1 \to 2, 2 \to 3) = \min(3, 3) = 3$.