There are n cities and m flight connections between them. Your task is to determine the length of the shortest route from Syrjälä to every city.

Input

The first input line has two integers n and m: the number of cities and flight connections. The cities are numbered $1, 2, \ldots, n$, and city 1 is Syrjälä.

After that, there are m lines describing the flight connections. Each line has three integers a, b and c: a flight begins at city a, ends at city b, and its length is c. Each flight is a one-way flight.

You can assume that it is possible to travel from Syrjälä to all other cities.

Output

Print n integers: the shortest route lengths from Syrjälä to cities $1, 2, \ldots, n$.

Constraints

- $1 \le n \le 10^5$
- $1 \le m \le 2 \cdot 10^5$
- $1 \le a, b \le n$
- $1 \le c \le 10^9$

Example

Input:
```
3 4
1 2 6
1 3 2
3 2 3
1 3 4
```

Output:
```
0 5 2
```