

Problem C. Shortest Routes I

Time limit 1000 ms

Mem limit 524288 kB

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 $1, 2, \dots, n$, 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 $1, 2, \dots, n$.

Constraints

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

Sample

Input	Output
3 4 1 2 6 1 3 2 3 2 3 1 3 4	0 5 2