Problem G. MST with Metropolis

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	1024 mebibytes

In this problem, we will consider weighted undirected graphs where all edges have positive weights.

We are given a weighted undirected graph G which consists of n vertices numbered from 1 to n. Among the spanning trees of G, the MST (Minimum Spanning Tree) with **metropolis vertex** i is the one that contains every possible edge with the metropolis (the vertex i) and minimizes the sum of edge weights in it. Let this edge weight sum be S_i. Your task is to calculate S_i for every vertex i.

Input

The first line contains two integers n and m: the number of vertices and edge in the graph, respectively ($1 \le n \le 10^5$, $n - 1 \le m \le 3 \times 10^5$).

Each of the following m lines describes a single edge and contains three integers, x, y, and c which mean that there is an edge between vertices x and y of weight c ($1 \le x < y \le n$, $1 \le c \le 10^9$).

It is guaranteed that the given graph is connected, and there is at most one edge between every possible pair of vertices.

Output

Print n lines. The i-th line must contain an integer S_i: the weight of the MST with metropolis vertex i.

Example

standard input	standard output
4 4 1 2 1 2 3 2 3 4 3 1 4 4	7 6 6 8