Green Edge

Description

In mathematics and computer science, a directed acyclic graph (DAG), is a finite directed graph with no directed cycles. That is, it consists of finitely many vertices and edges, with each edge directed from one vertex to another, such that there is no way to start at any vertex v and follow a consistently-directed sequence of edges that eventually loops back to v again.

DAGs may be used to model many different kinds of information. Here's an easy problem you may seen before. Given a DAG with N vertices. What's the shortest path from vertex 1 to vertex N? If you think we will ask you such problem, you're so innocent.

As you know, there may be lots of shortest paths in the DAG. An edge is a green edge if and only if it's belongs to some shortest paths form vertex 1 to vertext N.

Eddy selects an edge and does some magic on it. He used x unit magic, then the edge reduces the weight by x unit. Eddy will use minimal unit magic to make the edge be green edge.

Now, Eddy wants to select one edge, but he doesn't know which edge he should select. Can you tell him the unit of magic he should use for each edge?

Input

The first line contains an integer T indicating the total number of test cases. Each test case contains one line with two integers n, m, denoting the number of nodes and the number of edges in the DAG. Then m lines, each contains 3 integers a_i, b_i, c_i, denoting an edge from a_i to b_i in the graph with distance c_i.

- $1 \leq T \leq 514$
- $2 \leq n, m \leq 10^5$
- $1 \leq a_i < n$
- $2 \leq b_i \leq n$
- $1 \leq c_i \leq 10^4$
- There are at most 5 test cases with $\max(n, m) > 100$

Output

For each test case, Output m integers in a line, where the i-th integer indicates the unit of magic Eddy should use on the i-th edge. If an edge cannot be a green edge, then output "-1" for it.

Sample Input

```
2
5 6
1 2 10
1 3 11
2 4 5
3 5 6
2 5 8
1 5 20
3 3
1 2 1
2 3 10
1 3 9
```

Sample Output

```
1 0 -1 0 1 3
2 2 0
```