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ⅠⅠⅠ **CODEFORCES**
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HOME   TOP   CATALOG   CONTESTS   GYM   PROBLEMSET   GROUPS   RATING   EDU   API   CALENDAR   HELP

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D. Gellyfish and Camellia Japonica

time limit per test: 2 seconds

memory limit per test: 512 megabytes

Gellyfish has an array of n integers $c_1, c_2, \ldots, c_n$. In the beginning, $c = [a_1, a_2, \ldots, a_n]$.

Gellyfish will make q modifications to c.

For $i = 1, 2, \ldots, q$, Gellyfish is given three integers x_i, y_i, and z_i between 1 and n. Then Gellyfish will set $c_{z_i} := \min(c_{x_i}, c_{y_i})$.

After the q modifications, $c = [b_1, b_2, \ldots, b_n]$.

Now Flower knows the value of b and the value of the integers x_i, y_i, and z_i for all $1 \leq i \leq q$, but she doesn't know the value of a.

Flower wants to find any possible value of the array a or report that no such a exists.

If there are multiple possible values of the array a, you may output any of them.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains two integers n and q ($1 \leq n, q \leq 3 \cdot 10^5$) — the size of the array and the number of modifications.

The second line of each test case contains n integers $b_1, b_2, \ldots, b_n$ ($1 \leq b_i \leq 10^9$) — the value of the array c after the q modifications.

The following q lines each contain three integers x_i, y_i, and z_i ($1 \leq x_i, y_i, z_i \leq n$) — describing the i-th modification.

It is guaranteed that the sum of n and the sum of q over all test cases does not exceed $3 \cdot 10^5$.

Output

For each test case, if a exists, output n integers $a_1, a_2, \ldots, a_n$ ($0 \leq a_i \leq 10^9$) in a single line. Otherwise, output "-1" in a single line.

If there are multiple solutions, print any of them.

Example

```
input                                                    Copy
3
2 1
1 2
2 1 2
3 2
1 2 3
2 3 2
1 2 1
6 4
1 2 2 3 4 5
5 6 6
4 5 5
3 4 4
2 3 3
```

```
output                                                   Copy
-1
1 2 3
1 2 3 4 5 5
```

Note

In the first test case, based on the given sequence of modifications, we know that $b_1 = a_1$ and $b_2 = \min(a_1, a_2)$. Therefore, it is necessary that $b_2 \leq b_1$. However, for the given b, we have

$b_1 < b_2$. Therefore, there is no solution.

In the second test case, we can see that the given c becomes b from a after the given modifications, and c is not changed at each modification.