

## D. Fewer Batteries

time limit per test: 3 seconds

memory limit per test: 256 megabytes

In 2077, when robots took over the world, they decided to compete in the following game.

There are  $n$  checkpoints, and the  $i$ -th checkpoint contains  $b_i$  batteries. Initially, the Robot starts at the 1-st checkpoint with no batteries and must reach the  $n$ -th checkpoint.

There are a total of  $m$  one-way passages between the checkpoints. The  $i$ -th passage allows movement from point  $s_i$  to point  $t_i$  ( $s_i < t_i$ ), but not the other way. Additionally, the  $i$ -th passage can only be used if the robot has at least  $w_i$  charged batteries; otherwise, it will run out of power on the way.

When the robot arrives at point  $v$ , it can additionally take any number of batteries from 0 to  $b_v$ , inclusive. Moreover, it always carries all previously collected batteries, and at each checkpoint, it recharges all previously collected batteries.

Find the minimum number of batteries that the robot can have at the end of the journey, or report that it is impossible to reach from the first checkpoint to the last.

### 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  $n, m$  ( $2 \leq n \leq 2 \cdot 10^5, 0 \leq m \leq 3 \cdot 10^5$ ) — the number of checkpoints and the number of passages, respectively.

The second line contains  $n$  numbers  $b_i$  ( $0 \leq b_i \leq 10^9$ ) — the number of batteries at the  $i$ -th checkpoint.

The next  $m$  lines contain three integers  $s_i, t_i, w_i$  ( $1 \leq s_i < t_i \leq n, 1 \leq w_i \leq 10^9$ ) — the endpoints of the passage and the minimum number of batteries required to pass through it.

It is guaranteed that the sum of  $n$  does not exceed  $2 \cdot 10^5$ .

It is guaranteed that the sum of  $m$  does not exceed  $3 \cdot 10^5$ .

### Output

For each test case, output the minimum number of batteries that you can have at the end of the journey, or  $-1$  if it is impossible to reach point  $n$ .

### Example

input
4
3 3
2 0 0
1 2 1
2 3 1
1 3 2
5 6
2 2 5 0 1
1 2 2
1 3 1
1 4 3
3 5 5
2 4 4
4 5 3
2 0
1 1
4 4
3 10 0 0
1 2 1
1 3 3
2 3 10

3 4 5Copy

outputCopy

1  
4  
-1  
10

**Note**  
In the first test case, you need to take 1 battery at the starting point, then move to point 2, and then to point 3.

In the second test case, you need to take 2 batteries at the starting point, then move to point 2, take another 2 batteries, move to point 4, and then to point 5.

In the third test case, there is no path from point 1 to point  $n$ .

In the fourth test case, you need to take 1 battery at the starting point, then move to point 2, take another 9 batteries, move to point 3, and then to point 4.

Codeforces Round 1026 (Div. 2)

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
<a href="#">322398230</a>	Jun/01/2025 16:09	Accepted
<a href="#">321139367</a>	May/24/2025 19:27	Wrong answer on pretest 2
<a href="#">321104452</a>	May/24/2025 18:28	Wrong answer on pretest 2
<a href="#">321100428</a>	May/24/2025 18:22	Wrong answer on pretest 2
<a href="#">321094114</a>	May/24/2025 18:14	Wrong answer on pretest 2

→ Problem tags

binary search dfs and similar dp graphs greedy hashing \*1700

No tag edit access

→ Contest materials

- Announcement
- Tutorial

