Problem H. Health check

Ballon:	
Time limit:	1 seconds
Memory limit:	512 megabytes

Chi is a busy person. But because of working too much, he is suffered from some diseases that needed to be examined and the doctor required many tests to be able to judge **Chi**'s health.

After receiving the request, **Chi** looked at the calendar and saw that he had n, $(1 < n < 10^5)$ upcoming free days and **Chi** listed them on paper $a_1, a_2, \ldots, a_n$, $(1 \le a_i < 10^9)$ is the distance from today to the next free day. For example, tomorrow is free, then a_1 is 1.

The doctor asked **Chi** to go to the hospital and do m, $(m \le 10^3)$ tests. He is can only go to the hospital on free days, but can do many different tests on the same day. For each test, **Chi** will need z, $(z < 10^9)$ sets of documents to be able to conclude the disease.

A document is a chart that compares body indicators between any two days to monitor health conditions. A valid document requires that the gap between two test dates must be between x and y days $(1 < x \le y < 10^9)$ and the hospital only needs enough documents before concluding the disease. without prohibiting the time of any two sets of documents to overlap for a period of time. That means you can use data from a past medical examination day to create multiple sets of documents for the same test.

Input

The first line contains one integer n, m.

The second line contains n increasing non-negative natural numbers represent the upcoming free days of **Chi**.

The next m lines, each line includes 3 numbers: x, y, z. With x, y, z is the requirement that **Chi** must complete z sets of documents, with the condition of each set being the gap between 2 days in the range of $x - y$ days.

Output

Print the earliest date that **Chi** will complete all tests. If that date is not available, return -1.

Examples

standard input	standard output
5 1 1 2 4 5 7 2 3 2	4
8 2 1 4 6 8 12 16 18 20 2 3 4 4 5 4	18

Note

In the first example: **Chi** will make 2 sets of documents. 1 set is to compare day 4 compared to day 1. 1 set is to compare day 4 compared to day 2. Complete at the earliest on day 4.

In the second example: Test 1 will be completed on day 18 at the earliest. Test 2 will be completed on the day 16 at the earliest. Print out 18.