

Solution to all the problems

People have been coming to the wise man, complaining about the same problems every time.

One day he told them a joke and everyone roared in laughter.

After a couple of minutes, he told them the same joke and only a few of them smiled.

When he told the same joke for the third time no one laughed.

The wise man smiled and said:

"You can't laugh at the same joke over and over. So why are you always crying about the same problem?"

He has also created a very simple game to cheer the people up. The game is as follows:

You are given a sequence A of N integers.

The task is to answer Q queries on the given sequence. For each query, you will be given four space-separated integers L, R, P, K.

Print the index of Kth occurrence of P in L to R(inclusive). If no such index exists, print -1.

Input

The first line contains two space-separated integers N and Q.

The second line contains N space-separated integers. (1-based indexing)

Following Q lines contain,

Four integers L, R, P, K.

Output

For each query, print a single line containing one integer between 1 to N i.e. index of the Kth occurrence of P in L to R.

Print -1 if no such index exists.

Constraints

$$2 \leq N, Q \leq 10^5$$

$$1 \leq A_i \leq 10^6$$

$$1 \leq L < R \leq N$$

$$1 \leq P \leq 10^6$$

$$1 \leq K \leq N$$

Example

Input:

10 3

1 1 2 1 2 3 1 2 3 4

1 10 2 3

1 5 2 3

5 9 3 2

Output:

8

-1

9