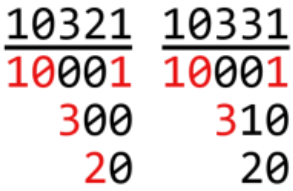
E. Sum Queries?

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Let's define a *balanced* multiset the following way. Write down the sum of all elements of the multiset in its decimal representation. For each position of that number check if the multiset includes at least one element such that the digit of the element and the digit of the sum at that position are the same. If that holds for every position, then the multiset is *balanced*. Otherwise it's *unbalanced*.

For example, multiset $\{20, 300, 10001\}$ is *balanced* and multiset $\{20, 310, 10001\}$ is *unbalanced*:



The red digits mark the elements and the positions for which these elements have the same digit as the sum. The sum of the first multiset is 10321, every position has the digit required. The sum of the second multiset is 10331 and the second-to-last digit doesn't appear in any number, thus making the multiset *unbalanced*.

You are given an array $a_1, a_2, \ldots, a_n$, consisting of n integers.

You are asked to perform some queries on it. The queries can be of two types:

- $1\ i\ x$ — replace a_i with the value x;
- $2\ l\ r$ — find the ***unbalanced*** subset of the multiset of the numbers $a_l, a_{l+1}, \ldots, a_r$ with the minimum sum, or report that no *unbalanced* subset exists.

Note that the empty multiset is *balanced*.

For each query of the second type print the lowest sum of the *unbalanced* subset. Print `-1` if no *unbalanced* subset exists.

Input

The first line contains two integers n and m ($1 \le n, m \le 2 \cdot 10^5$) — the number of elements in the array and the number of queries, respectively.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i < 10^9$).

Each of the following m lines contains a query of one of two types:

- $1\ i\ x$ ($1 \le i \le n$, $1 \le x < 10^9$) — replace a_i with the value x;
- $2\ l\ r$ ($1 \le l \le r \le n$) — find the ***unbalanced*** subset of the multiset of the numbers $a_l, a_{l+1}, \ldots, a_r$ with the lowest sum, or report that no *unbalanced* subset exists.

It is guaranteed that there is at least one query of the second type.

Output

For each query of the second type print the lowest sum of the *unbalanced* subset. Print `-1` if no *unbalanced* subset exists.

Example

input Copy

```
4 5
300 10001 20 20
2 1 3
1 1 310
```

```
2 1 3
2 3 3
2 3 4
```

output Copy

```
-1
330
-1
40
```

Note

All the subsets of multiset $\{20, 300, 10001\}$ are *balanced*, thus the answer is `-1`.

The possible *unbalanced* subsets in the third query are $\{20, 310\}$ and $\{20, 310, 10001\}$. The lowest sum one is $\{20, 310\}$. Note that you are asked to choose a subset, not a subsegment, thus the chosen elements might not be adjancent in the array.

The fourth query includes only the empty subset and subset $\{20\}$. Both of them are *balanced*.

The last query includes the empty subset and the subsets $\{20\}$, $\{20\}$ and $\{20, 20\}$. Only $\{20, 20\}$ is *unbalanced*, its sum is 40. Note that you are asked to choose a multiset, thus it might include equal elements.