Minimum Product Sub Interval

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Problem Statement

Given an array of integers (1-indexed), you have to perform two types of queries on the array.

1. $1\ i\ j$ - find the minimum product sub interval between i and j inclusive
2. $2\ i\ v$ - change the value of the i^{th} indexed element of the array to v.

Definition of Minimum Product Sub-interval

The product of an interval is the result after multiplying all the elements of that interval. Let's say you have an array A = *{4, 5, 6}* and $A[i, j]$ denotes the subarray or sub-interval of array A ranging from i to j. Then the product of $A[2, 3]$ will be $A[2] \times A[3] = 5 \times 6 = 30$. Minimum Product Sub-interval for a given interval is that sub-interval which have the minimum product value among all the sub-intervals of the given interval. For clear explanation, check the explanation section.

Input Format

The first line of each case contains two integers, N and Q. The next line contains N space-separated integers denoting the elements of the array.

The next Q lines will each contain a query of the form:

```
1 i j
2 i v
```

Constraints

$1 \leq i \leq j \leq N$
$1 \leq i \leq N$
$1 \leq N \leq 10^5$
$1 \leq Q \leq 10^5$
$0 \leq v \leq 10^5$

The integers in the original array are between 0 and 10^5 inclusive.

Output Format

For each query of the form $1\ i\ j$, print three integers $V\ L\ R$, which denote the product value, start index, and end index of the minimum product sub interval between thr i^{th} index and j^{th} indices, respectively. **If there is more than one such possible interval with the same minimum product, you need to print the longest one; if there is still a tie, you need to print the sub-interval which has the lowest start index.**

Sample Input

```
5 5
2 22 10 12 2
1 2 4
1 2 5
1 1 5
2 2 3
1 2 4
```

Sample Output

```
10 3 3
2 5 5
2 1 1
3 2 2
```

Explanation

For the 1^{st} query 1 2 4, these sub-intervals are possible:

```
[2,2] = 22
[2,3] = 22 * 10 = 220
[2,4] = 22 * 10 * 12 = 2640
[3,3] = 10
[3,4] = 10 * 12 = 120
[4,4] = 12
```

Among all of these sub-intervals, [3,3] interval has the minimum multiplication value.

For the 3^{rd} query, 1 2 5, interval [1,1] and [5,5] both give the minimum product but we need to print the sub-interval [1,1] because it starts earlier.

Because of the 4^{th} query, the original array changes to A = {2, 3, 10, 12, 2}

Suggest Edits


```
1  import java.io.*;
2  import java.util.*;
3  import java.text.*;
4  import java.math.*;
5  import java.util.regex.*;
6
7  public class Solution {
8
9      public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named
   Solution. */
11     }
12 }
```

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