Problem - 1283D - Codeforces 7/21/20, 10:48 PM





HOME CONTESTS GYM **PROBLEMSET GROUPS** RATING EDU API CALENDAR HELP 10 YEARS! ##

PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

### D. Christmas Trees

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

There are *n* Christmas trees on an infinite number line. The i-th tree grows at the position  $x_i$ . All  $x_i$  are guaranteed to be distinct.

Each integer point can be either occupied by the Christmas tree, by the human or not occupied at all. Non-integer points cannot be occupied by anything.

There are m people who want to celebrate Christmas. Let  $y_1, y_2, \ldots, y_m$  be the positions of people (note that all values  $x_1, x_2, \dots, x_n, y_1, y_2, \dots, y_m$  should be **distinct** and all  $y_j$ should be integer). You want to find such an arrangement of people that the value  $\sum \min_{i} |x_i - y_j|$  is the minimum possible (in other words, the sum of distances to the nearest Christmas tree for all people should be minimized).

In other words, let  $d_j$  be the distance from the j-th human to the nearest Christmas tree (  $d_j = \min_{i=1}^n |y_j - x_i|$ ). Then you need to choose such positions  $y_1, y_2, \dots, y_m$  that  $\sum_{i=1}^m d_j$  is the minimum possible.

#### Input

The first line of the input contains two integers n and m  $(1 \le n, m \le 2 \cdot 10^5)$  — the number of Christmas trees and the number of people.

The second line of the input contains *n* integers  $x_1, x_2, \ldots, x_n$  ( $-10^9 \le x_i \le 10^9$ ), where  $x_i$  is the position of the *i*-th Christmas tree. It is guaranteed that all  $x_i$  are distinct.

## Output

In the first line print one integer res — the minimum possible value of  $\sum_{j=1}^m \min_{i=1}^n |x_i - y_j|$  (in other words, the sum of distances to the nearest Christmas tree for all people).

In the second line print *m* integers  $y_1, y_2, \dots, y_m$   $(-2 \cdot 10^9 \le y_i \le 2 \cdot 10^9)$ , where  $y_i$  is the position of the j-th human. All  $y_i$  should be distinct and all values  $x_1, x_2, \ldots, x_n, y_1, y_2, \ldots, y_m$  should be **distinct**.

If there are multiple answers, print any of them.

#### **Examples**

input	Сору
2 6 1 5	
output	Сору

#### Codeforces Round #611 (Div. 3)

### **Finished**

# → Virtual participation

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Start virtual contest

### $\rightarrow$ Problem tags

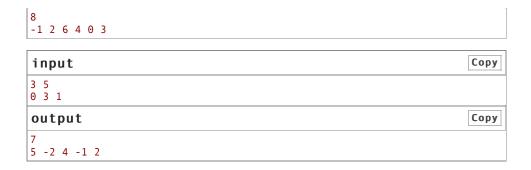
shortest paths \*1800 graphs greedy No tag edit access

### → Contest materials

- Announcement (en)
- Tutorial

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