# C Crossing River

Time limit: 1s



Panda is a boatman who operates a boat on a river. The boat can carry at most one passenger at a time.

One day, there are $n$ people who want to cross from the left bank of the river to the right bank. Their arrival times at the left riverbank are $a_1, a_2, \ldots, a_n$. There are also $m$ people who want to cross from the right bank to the left bank. Their arrival times at the right riverbank are $b_1, b_2, \ldots, b_m$. A passenger can only board the boat at or after their arrival time.

The boat takes exactly $k$ units of time to cross the river, whether it has a passenger or not. Panda can choose the boat's starting position (left or right bank). The goal is to find a crossing schedule that minimizes the time when the very last of the $n+m$ people reaches the opposite bank destination. You should also help Panda determine the complete crossing schedule.

## Input

The first line contains three integers $n, m, k$ ($1 \le n, m \le 10^5$, $1 \le k \le 10^9$), denoting the number of people starting on the left, the number of people starting on the right, and the time for a single crossing.

The second line contains $n$ integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$), which are the arrival times for the people on the left bank.

The third line contains $m$ integers $b_1, b_2, \ldots, b_m$ ($1 \le b_i \le 10^9$), which are the arrival times for the people on the right bank.

## Output

The first line should contain one integer $T$, representing the minimum possible time the last passenger reaches their destination.

The following $n+m$ lines should describe the crossing schedule **in chronological order**. The $i$-th line contains three integers $t_i, tp_i, id_i$ ($0 \le t_i \le T$, $tp_i \in \{0, 1\}$), indicating that at time $t_i$, the passenger with index $id_i$ from the left bank ($tp_i = 0$) or the right bank ($tp_i = 1$) gets on the boat. When $tp_i = 0$, you must ensure that $1 \le id_i \le n$ and $t_i \ge a_{id_i}$; when $tp_i = 1$, you must ensure that $1 \le id_i \le m$ and $t_i \ge b_{id_i}$. Moreover, you must ensure that $t_1 < t_2 < \cdots < t_{n+m}$ and $T = \max_i(t_i + k)$.

For a valid schedule, every one of the $n+m$ people must successfully board the boat and reach the opposite bank. The time between two consecutive boarding times must be at least $k$, that is, $t_i - t_{i-1} \ge k$ for all $1 < i \le n+m$. If two consecutive people board from the same bank ($tp_i = tp_{i-1}$), the time between their boarding must be at least $2k$, that is, $t_i - t_{i-1} \ge 2k$.

| Sample Input 1 | Sample Output 1 |
|---|---|
| 5 5 2<br>2 1 13 19 11<br>12 18 19 7 8 | 25<br>5 0 2<br>7 1 4<br>9 0 1<br>11 1 5<br>13 0 5<br>15 1 1<br>17 0 3<br>19 1 2<br>21 0 4<br>23 1 3 |

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