CODEFORCES
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HOME   TOP   CATALOG   CONTESTS   GYM   PROBLEMSET   GROUPS   RATING   EDU   API   CALENDAR   HELP

PROBLEMS   SUBMIT CODE   MY SUBMISSIONS   STATUS   HACKS   ROOM   STANDINGS   CUSTOM INVOCATION

C. Have Your Cake and Eat It Too

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

Alice, Bob and Charlie want to share a rectangular cake cut into n pieces. Each person considers every piece to be worth a different value. The i-th piece is considered to be of value a_i by Alice, b_i by Bob and c_i by Charlie.

The sum over all a_i, all b_i and all c_i individually is the same, equal to tot.

Given the values of each piece of the cake for each person, you need to give each person a contiguous slice of cake. In other words, the indices at the left and right ends of these subarrays (the slices given to each person) can be represented as (l_a, r_a), (l_b, r_b) and (l_c, r_c) respectively for Alice, Bob and Charlie. The division needs to satisfy the following constraints:

- No piece is assigned to more than one person, i.e., no two subarrays among $[l_a, \ldots, r_a]$, $[l_b, \ldots, r_b]$ and $[l_c, \ldots, r_c]$ intersect.
- $\sum_{i=l_a}^{r_a} a_i, \sum_{i=l_b}^{r_b} b_i, \sum_{i=l_c}^{r_c} c_i \geq \lceil \frac{tot}{3} \rceil$.

Here, the notation $\lceil \frac{a}{b} \rceil$ represents ceiling division. It is defined as the smallest integer greater than or equal to the exact division of a by b. In other words, it rounds up the division result to the nearest integer. For instance $\lceil \frac{10}{3} \rceil = 4$ and $\lceil \frac{15}{3} \rceil = 5$.

Input

The first line contains an integer t, the number of testcases, $(1 \leq t \leq 10^4)$

For each testcase:

The first line contains the integer n $(3 \leq n \leq 2 \cdot 10^5)$.

The following three lines contain n integers each:

One line with n integers $a_1, a_2, \ldots, a_n$ represents the values for Alice $(1 \leq a_i \leq 10^6)$.

The next line with n integers $b_1, b_2, \ldots, b_n$ represents the values for Bob $(1 \leq b_i \leq 10^6)$.

The next line with n integers $c_1, c_2, \ldots, c_n$ represents the values for Charlie $(1 \leq c_i \leq 10^6)$.

It is guaranteed that $\sum_{i=1}^{n} a_i = \sum_{i=1}^{n} b_i = \sum_{i=1}^{n} c_i$.

The sum of n over all testcases does not exceed $2 \cdot 10^5$.

Output

For each testcase, output -1 if the required condition is impossible.

Otherwise, output six numbers $- l_a, r_a, l_b, r_b, l_c, r_c$, the respective starting and ending indices (1-indexed) of the subarrays for Alice, Bob and Charlie, respectively.

Example

```
input                                              Copy
10
5
5 1 1 1 1
1 1 5 1 1
1 1 1 1 5
6
1 2 3 4 5 6
5 6 1 2 3 4
3 4 5 6 1 2
4
4 4 4 4
4 4 4 4
4 4 4 4
```

Codeforces Round #956 (Div. 2) and ByteRace 2024
Finished
Practice
⭐

→ Last submissions

Submission	Time	Verdict
269446999	Jul/08/2024 19:24	Accepted

→ Problem tags

binary search   brute force   greedy
implementation   *1400
No tag edit access

→ Contest materials

- Announcement (en)   ✕
- Editorial (en)   ✕

```
5
5 10 5 2 10
9 6 9 7 1
10 7 10 2 3
3
4 5 2
6 1 4
1 8 2
3
10 4 10
8 7 9
10 4 10
7
57113 65383 19795 53580 74452 3879 23255
12917 16782 89147 93107 27365 15044 43095
33518 63581 33565 34112 46774 44151 41756
6
6 3 1 8 7 1
10 2 6 2 2 4
10 9 2 1 2 2
5
5 5 4 5 5
1 6 3 8 6
2 4 1 9 8
10
1 1 1 1 1001 1 1 1001 1 1
1 1 1 1 1 1 2001 1 1 1
1 1 1 1 1 1001 1 1 1 1001
```

output   Copy

```
1 1 2 3 4 5
5 6 1 2 3 4
-1
-1
1 1 3 3 2 2
-1
1 2 3 4 5 7
3 6 1 1 2 2
1 2 3 4 5 5
1 5 6 7 8 10
```

Note

In the first testcase, the sum of either of the three arrays is 9. Each person needs a cake slice corresponding to a subarray with a total value of at least $\lceil \frac{9}{3} \rceil = 3$.

If we assign the subarray $(1,1)$ to Alice, its total value to her is 5, which is ≥ 3; the subarray $(2,3)$ to Bob, its total value to him is $1 + 5 = 6$, which is ≥ 3; and the subarray $(4,5)$ to Charlie, its total value to him $1 + 5 = 6$, which is also ≥ 3. Each person gets their own separate pieces of the cake, and no piece is common to two or more people.

It can be shown that for the third test case, it is not possible to give slices of the cake in a way that satisfies the given constraints.