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Codeforces Round 916 (Div. 3)

Finished

→ Virtual participation

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Start virtual contest

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brute force dp greedy implementation sortings *1200

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D. Three Activities

time limit per test

2 seconds

memory limit per test

256 megabytes

input

standard input

output

standard output

Winter holidays are coming up. They are going to last for nn days.

During the holidays, Monocarp wants to try all of these activities exactly once with his friends:

- go skiing;
- watch a movie in a cinema;
- play board games.

Monocarp knows that, on the i -th day, exactly a_i friends will join him for skiing, b_i friends will join him for a movie and c_i friends will join him for board games.

Monocarp also knows that he can't try more than one activity in a single day.

Thus, he asks you to help him choose three distinct days x, y, z in such a way that the total number of friends to join him for the activities $(a_x + b_y + c_z)$ is maximized.

Input

The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of testcases.

The first line of each testcase contains a single integer n ($3 \leq n \leq 10^5$) — the duration of the winter holidays in days.

The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 10^8$) — the number of friends that will join Monocarp for skiing on the i -th day.

The third line contains n integers b_1, b_2, \dots, b_n ($1 \leq b_i \leq 10^8$) — the number of friends that will join Monocarp for a movie on the i -th day.

The fourth line contains n integers c_1, c_2, \dots, c_n ($1 \leq c_i \leq 10^8$) — the number of friends that will join Monocarp for board games on the i -th day.

The sum of n over all testcases doesn't exceed 10^5 .

Output

For each testcase, print a single integer — the maximum total number of friends that can join Monocarp for the activities on three distinct days.

Example

Input

Copy

```
4
3
1 10 1
10 1 1
1 1 10
4
30 20 10 1
30 5 15 20
30 25 10 10
10
5 19 12 3 18 18 6 17 10 13
15 17 19 11 16 3 11 17 17 17
1 17 18 10 15 8 17 3 13 12
10
17 5 4 18 12 4 11 2 16 16
8 4 14 19 3 12 6 7 5 16
3 4 8 11 10 8 10 2 20 3
```

Output

Copy

```
30
75
55
56
```

Note

In the first testcase, Monocarp can choose day 22 for skiing, day 11 for a movie and day 33 for board games. This way, $a_{22} = 10$, $b_{11} = 10$, $c_{33} = 10$ friends will join him for skiing, 10 friends will join him for a movie and 10 friends will join him for board games.

for board games. The total number of friends is 3030.

In the second testcase, Monocarp can choose day 11 for skiing, day 44 for a movie and day 22 for board games.
 $30 + 20 + 25 = 75$ $30 + 20 + 25 = 75$ friends in total. Note that Monocarp can't choose day 11 for all activities, because he can't try more than one activity in a single day.

In the third testcase, Monocarp can choose day 22 for skiing, day 33 for a movie and day 77 for board games.
 $19 + 19 + 17 = 55$ $19 + 19 + 17 = 55$ friends in total.

In the fourth testcase, Monocarp can choose day 11 for skiing, day 44 for a movie and day 99 for board games.
 $17 + 19 + 20 = 56$ $17 + 19 + 20 = 56$ friends in total.

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The only programming contests Web 2.0 platform

Server time: Feb/23/2025 20:43:44^{UTC+6} (i2).

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Processing math: 100%