Task: BAG
Bagaż podręczny (Carry-on luggage)

XXXIII OI, Stage I (school round). Source file `bag.*` **Available memory: 64 MB.** *21.11.2025*

Note: In this task, you will learn the score of your submission ***only after the competition has ended.***

Bajtazar is going on a long trip to another International Olympiad in Informatics. Getting there requires taking many flights on n different airlines. Each of these airlines has its own requirements regarding the maximum size of carry-on luggage allowed on board. More precisely, the i-th airline allows carry-on luggage that fits in a rectangular box with dimensions $A_i \times B_i \times C_i$.

Bajtazar would like to buy a suitcase, which is also a rectangular box with dimensions $X \times Y \times Z$. He wants its volume — that is, the product $X \cdot Y \cdot Z$ — to be as large as possible, while still allowing the suitcase to be taken on board with each of the n airlines. Before every flight, Bajtazar may rotate the suitcase: for each of the three axes independently, he can rotate the suitcase by any multiple of 90 degree.

Help Bajtazar and determine the maximum possible volume of the suitcase.

Input

The first line of input contains a single integer n ($1 \le n \le 10^5$). Each of the next n lines contains a description of the luggage allowed on board by the corresponding airline. In the i-th line there are three integers A_i, B_i, C_i ($1 \le A_i, B_i, C_i \le 10^6$) representing the maximum dimensions of the carry-on luggage permitted by the i-th airline.

Output

The first and only line of output should contain a single integer denoting the largest possible volume of a suitcase that can be carried on board all n airlines.

Example

For the input:

```
2
2 5 3
1 4 4
```

the correct output is:

```
12
```

Explanation: It is possible to buy a suitcase with dimensions $1 \times 3 \times 4$, its volume is 12.

For the input:

```
6
55 40 23
40 23 55
55 35 25
23 56 35
55 40 23
55 20 40
```

the correct output is:

```
38500
```

Explanation: These are the actual dimensions in centimetres for some airlines. A suitcase with dimensions $55 \times 35 \times 20$ can be taken on board each of them.

Sample tests: Tests `0a` i `0b` are the tests from the example above. Further:

`0c:` $n = 10^4, A_i = 33i, B_i = 1, C_i = 1$; the answer is 33.

`0d:` $n = 10^5, A_i = i, B_i = n + 1 - i, C_i = 10^6$; the answer is 50 001 000 000.

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Grading

The test cases are divided into the following subtasks. The tests for each subtask consist of one or more separate groups of test cases.

Subtask	**Constraints**	**Points**
1	$n \leq 10$ and $A_i, B_i, C_i \leq 10$	12
2	$B_i = 1, C_i = 1$	9
3	$C_i = 1$	33
4	no additional constraints	46