

Yosupo's Algorithm

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 1024 megabytes

Can you replicate my master thesis in 5 hours?

You are given N red points and N blue points on a two dimensional plane. The i -th red point's coordinate is (r_i^x, r_i^y) , and its weight is r_i^w . The i -th blue point's coordinate is (b_i^x, b_i^y) , and its weight is b_i^w .

Process Q queries. In the i -th query, you are given two integers L_i and R_i , and choose a red point j and a blue point k with following conditions:

- $r_j^y < b_k^y$
- $(r_j^x < L_i \text{ and } R_i < b_k^x)$ or $(L_i < r_j^x \text{ and } b_k^x < R_i)$

Your task is to maximize the sum of weights of the two points or report that it is impossible to select two points.

Input

Input is given from Standard Input in the following format:

```
N
r_1^x r_1^y r_1^w
⋮
r_N^x r_N^y r_N^w
b_1^x b_1^y b_1^w
⋮
b_N^x b_N^y b_N^w
Q
L_1 R_1
⋮
L_Q R_Q
```

Constraints:

- $1 \leq N \leq 100,000$
- $1 \leq Q \leq 500,000$
- $-1,000,000,000 \leq r_i^x, L_i \leq -1$
- $1 \leq b_i^x, R_i \leq 1,000,000,000$
- $1 \leq r_i^y, b_i^y \leq 1,000,000,000$
- $1 \leq r_i^w, b_i^w \leq 1,000,000,000$
- $r_1^x, \dots, r_N^x, b_1^x, \dots, b_N^x, L_1, \dots, L_Q, R_1, \dots, R_Q$ are all distinct
- $r_1^y, \dots, r_N^y, b_1^y, \dots, b_N^y$ are all distinct

- All values in input are integers.

Output

For each query, in a line, print the maximum sum of weights of the selected points, or -1 if it is impossible to choose two points.

Examples

standard input	standard output
2 -3 1 1 -6 3 10 3 4 100 5 2 1000 5 -5 4 -2 6 -4 1 -10 10 -1 2	101 -1 110 1001 1001
10 -389 786 414303478 -159 301 976196121 -268 599 754785437 -605 652 597104844 -199 841 214521748 -192 8 581825989 -515 898 509582353 -297 36 854072992 -489 616 41481895 -665 876 378086770 869 583 376652629 509 222 380009514 354 693 428231281 519 738 608396032 100 811 220629740 960 708 928349711 324 89 710139852 716 897 771429659 647 203 72269757 368 699 540753047 10 -350 499 -956 639 -287 504 -915 742 -777 135 -176 487 -150 987 -133 10 -852 147 -476 106	1564212844 1584592153 1782422703 1747625780 1196825861 1782422703 -1 1904545832 1196825861 1525454555