G - Range Knapsack Query

Editorial (/contests/abc426/tasks/abc426_g/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 575 points

Problem Statement

There are N items numbered from 1 to N. The **weight** of item i is W_i and the **value** is V_i.

You are given Q queries, so process them in order. The j-th query is as follows:

- Integers L_j, R_j, C_j $(1 \leq L_j \leq R_j \leq N)$ are given. When choosing some (possibly zero) items from items $L_j, L_j + 1, \ldots, R_j$ such that the total weight does not exceed C_j, find the maximum possible total value of the chosen items.

Constraints

- $1 \leq N \leq 2 \times 10^4$
- $1 \leq Q \leq 2 \times 10^5$
- $1 \leq W_i \leq 500$
- $1 \leq V_i \leq 10^9$
- $1 \leq L_j \leq R_j \leq N$
- $1 \leq C_j \leq 500$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&W_1 \quad V_1 \\
&W_2 \quad V_2 \\
&\vdots \\
&W_N \quad V_N \\
&Q \\
&L_1 \quad R_1 \quad C_1 \\
&L_2 \quad R_2 \quad C_2 \\
&\vdots \\
&L_Q \quad R_Q \quad C_Q
\end{aligned}
$$

Output

Output Q lines. The i-th line $(1 \leq i \leq Q)$ should contain the answer for the i-th query.

Sample Input 1 Copy

Copy

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

Sample Output 1 Copy

Copy

```
11
13
0
```

For the first query, among items $1, 2, 3, 4$, if you choose items $2, 4$, the total weight is $5 + 2 = 7$, which does not exceed $C_1 = 7$, and the total value is $8 + 3 = 11$. This is the maximum.

For the second query, even if you choose all items $2, 3, 4$, the total weight is $5 + 1 + 2 = 8$, which does not exceed $C_2 = 10$, and you can achieve a total value of $8 + 2 + 3 = 13$.

For the third query, both items $1, 2$ have weights exceeding $C_3 = 2$, so you cannot choose any item, and the maximum total value is 0.

Sample Input 2 Copy

```
8
167 430302156
22 623690081
197 476190629
176 24979445
22 877914575
247 211047202
232 822804784
25 628894325
8
6 8 176
3 5 80
1 7 310
4 8 368
4 5 218
3 4 431
4 6 228
1 1 239
```

Sample Output 2 Copy

```
628894325
877914575
2324409440
2329613684
902894020
501170074
902894020
430302156
```

'#telegram)

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