

Contest Duration: 2025-11-01(Sat) 23:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251101T2100&p1=248>) - 2025-11-02(Sun) 00:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251101T2240&p1=248>) (local time) (100 minutes)

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## G - Range Set Modifying Query

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Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 625 points

### Problem Statement

There are  $N$  sets  $S_1, \dots, S_N$ . Initially, all sets are empty.

You are given  $Q$  queries in the following formats. Process them in order.

- Type 1: Given as 1 L R x. For each  $S_i$  satisfying  $L \leq i \leq R$ , add  $x$ .
- Type 2: Given as 2 L R x. For each  $S_i$  satisfying  $L \leq i \leq R$ , remove  $x$ .
- Type 3: Given as 3 L R. Find the maximum number of elements among  $S_i$  satisfying  $L \leq i \leq R$ , and the number of sets that achieve this maximum.

### Constraints

- $1 \leq N \leq 3 \times 10^5$
- $1 \leq Q \leq 3 \times 10^5$
- For each query,  $1 \leq L \leq R \leq N$ .
- For type 1, 2 queries,  $1 \leq x \leq 60$ .
- All input values are integers.

## Input

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

```
N Q  
query1  
:  
queryQ
```

Here,  $\text{query}_i$  represents the  $i$ -th query, and each is given in one of the following formats as shown in the problem statement:

```
1 L R x
```

```
2 L R x
```

```
3 L R
```

## Output

Let  $q$  be the number of type 3 queries, and print  $q$  lines.

The  $i$ -th line should contain  $x, y$  separated by a space, where  $x$  is the maximum number of elements and  $y$  is the number of sets that achieve this maximum for the  $i$ -th type 3 query.

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### Sample Input 1

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```
4 7  
1 1 2 10  
1 2 4 20  
3 1 3  
2 1 2 20  
1 2 3 10  
3 1 2  
3 1 4
```

Copy

### Sample Output 1

Copy

```
2 1  
1 2  
2 1
```

Copy

- Initially  $(S_1, S_2, S_3, S_4) = (\{\}, \{\}, \{\}, \{\})$ .

- The 1-st query adds 10 to  $S_1, S_2$ , resulting in  $(S_1, S_2, S_3, S_4) = (\{10\}, \{10\}, \{\}, \{\})$ .
- The 2-nd query adds 20 to  $S_2, S_3, S_4$ , resulting in  $(S_1, S_2, S_3, S_4) = (\{10\}, \{10, 20\}, \{20\}, \{20\})$ .
- For the 3-rd query, the maximum number of elements among  $S_1, S_2, S_3$  is 2 achieved by  $S_2$ , so print 2 1.
- The 4-th query removes 20 from  $S_1, S_2$ , resulting in  $(S_1, S_2, S_3, S_4) = (\{10\}, \{10\}, \{20\}, \{20\})$ .
- The 5-th query adds 10 to  $S_2, S_3$ , resulting in  $(S_1, S_2, S_3, S_4) = (\{10\}, \{10\}, \{10, 20\}, \{20\})$ .
- For the 6-th query, the maximum number of elements among  $S_1, S_2$  is 1 achieved by  $S_1, S_2$ , so print 1 2.
- For the 7-th query, the maximum number of elements among  $S_1, S_2, S_3, S_4$  is 2 achieved by  $S_3$ , so print 2 1.

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'#telegram)

url=https%3A%2F%2Fatcoder.jp%2Fcontests%2Fabc430%2Ftasks%2Fabc430\_g%3Flang%3Den&title=G%20-20Query)

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