

## Big Range Queries and Updates

There is an array of  $N$  integers. Initially, all elements have value zero. We will perform range queries and updates in this array.

You want to support the following updates:

- **Add**  $v_i$  to all elements of the array between  $l_i$  and  $r_i$  inclusive.
- **Set** all elements of the array between  $l_i$  and  $r_i$  inclusive to the value  $v_i$ .

You want to support the following queries:

- What is the **Total** sum of a range? That is what is the sum of  $A[l_i \dots r_i]$  ?
- What is the **Max** value of a range  $A[l_i \dots r_i]$  ?

### Input

The first line contains two integers,  $N$  and  $Q$ . Then  $Q$  lines follow, each of one of the following forms:

- **A**  $l_i$   $r_i$   $v_i$
- **S**  $l_i$   $l_i$   $r_i$   $v_i$
- **T**  $l_i$   $r_i$
- **M**  $l_i$   $r_i$

These correspond to the 2 updates followed by the 2 queries in the above described order. You are guaranteed there is at least one query, and that is there is at least one line starting with **T** or **M**.

### Output

One line for each **T** or **M** query. For **T** queries, the sum of the current values of  $A$  between  $[l_i, r_i]$ . For **M** queries, the max of the current values of  $A$  between  $[l_i, r_i]$ .

### Constraints

You are guaranteed that:

- $1 \leq N \leq 10^9$  .
- $1 \leq Q \leq 10^5$  .
- $0 \leq v_i \leq 10^4$  .
- $0 \leq l_i \leq r_i \leq N - 1$ , for each query.

**Sample Input**

```
3 8
A 0 1 3
T 0 2
S 1 2 4
T 0 2
M 0 0
M 0 1
A 1 1 1
T 0 2
```

**Sample Output**

```
6
11
3
4
12
```