Sell Statistics Query System

Julia is actively buying and selling products on OLX. Now, after being an active user of OLX for more than six years, she decided to build a system to store information about sold products. The system should also be able to query the total number of products sold based on some criteria.

- The information of a sell is given in the following format:

  S d p_id[.c_id] s_id[.r_id]

  Here:

  - **d** describes the day of the sell. The value of *day* is in the range 1 to 100 inclusive.
  - **p_id** and **c_id** describe the *product_id* and *category_id* respectively. The value of *product_id* is in the range 1 to 10 inclusive, and the value of *category_id* is in the range 1 to 4 inclusive. The *category_id* is optional so it could be missing.
  - **s_id** and **r_id** describe the *state_id* and *region_id* of the person who purchased the product respectively. The value of *state_id* is in the range 1 to 7 inclusive, and the value of *region_id* is in the range 1 to 25 inclusive. The *region_id* is optional so it could be missing.

- The query for the total number of products sold is given in the following format:

  Q d_start[.d_end] p_id[.c_id] s_id[.r_id]

  Here:

  - **d_start** and **d_end** describe the day range for the query. The value of **d_start** and **d_end** is in the range 1 to 100 inclusive. The value of *d_end* is optional so it could be missing.
  - **p_id** and **c_id** describe the *product_id* and *category_id* respectively. The value of *product_id* is in the range 1 to 10 inclusive, and the value of *category_id* is in the range 1 to 4 inclusive. The *category_id* is optional so it could be missing. The value of *product_id* could also be -1 which means all the products, also in this case no *category_id* is provided.
  - **s_id** and **r_id** describe the *state_id* and *region_id* respectively. The value of *state_id* is in the range 1 to 7 inclusive, and the value of *region_id* is in the range 1 to 25 inclusive. The *region_id* is optional so it could be missing. The value of *state_id* could also be -1 which means all the states, also in this case no *region_id* is provided.

The response for the query should be the total number of products sold between the days **d_start** and **d_end** and satisfying the constraints over *product_id*, *category_id*, *state_id*, and *region_id* given by **p_id**, **c_id**, **s_id**, and **r_id** respectively. If the value of **d_end** is missing then the response should be the total number of products sold on **d_start** only. Note that, to answer any query, the sell information provided before the query are considered only.

Input Format

The first line contains an integer T. Each of the next T lines describes either the sell information or products count query.

Constraints

- $1 \leq T \leq 10^5$
- $1 \leq d \leq 100$
- $1 \leq d\_start \leq d\_end \leq 100$
- $p\_id = -1$ or $1 \leq p\_id \leq 10$
- $1 \leq c\_id \leq 4$

- $s\_id = -1$ or $1 \leq s\_id \leq 7$
- $1 \leq r\_id \leq 25$

Output Format

For each of the products count queries, output the total number of products on a new line.

Sample Input 0

```
15
Q 1 1.2 2.5
S 1 1.3 2.5
S 1 1.2 2.6
Q 1 1.2 2.6
Q 1 1.2 2
S 2 2 3.5
Q 2 2.3 3.5
S 1 1.2 3.4
Q 1 1 -1
S 3 2.3 6.7
S 3 2.4 6.8
S 2 2 7.8
Q 3 2 6.7
Q 3 2 6
Q 1.3 2 -1
```

Sample Output 0

```
0
1
1
0
3
1
2
4
```

Explanation 0

- `Q 1 1.2 2.5`
  The query is to find the products count sold on day 1, *product_id* $= 1$, *category_id* $= 2$, *state_id* $= 2$, and *region_id* $= 5$. We do not have enough sell information, to answer this query.
- `Q 1 1.2 2.6`
  The query is to find the products count sold on day 1, *product_id* $= 1$, *category_id* $= 2$, *state_id* $= 2$, and *region_id* $= 6$. There is *one* such product: `(S 1 1.2 2.6)`.
- `Q 1 1.2 2`
  The query is to find the products count sold on day 1, *product_id* $= 1$, *category_id* $= 2$, *state_id* $= 2$, and *region_id* could have any value. There is *one* such product: `(S 1 1.2 2.6)`.
- `Q 2 2.3 3.5`
  The query is to find the products count sold on day 2, *product_id* $= 2$, *category_id* $= 3$, *state_id* $= 3$, and *region_id* $= 5$. There are *no* such products.
- `Q 1 1 -1`
  The query is to find the products count sold on day 1, *product_id* $= 1$, *category_id* could have any value, *state_id* $= -1$ i.e., all the states are considered valid. There are *three* such products: `(S 1 1.3 2.5)`, `(S 1 1.2 2.6)`, and `(S 1 1.2 3.4)`.
- `Q 3 2 6.7`
  The query is to find the products count sold on day 3, *product_id* $= 2$, *category_id* could have any value, *state_id* $= 6$, and *region_id* $= 7$. There is *one* such product: `(S 3 2.3 6.7)`.
- `Q 3 2 6`
  The query is to find the products count sold on day 3, *product_id* $= 2$, *category_id* could have any value, *state_id* $= 6$, and *region_id* could have any value. There are *two* such products: `(S 3 2.3 6.7)` and `(S 3 2.4 6.8)`.

- `Q 1.3 2 -1`
  The query is to find the products count sold on days $[1-3]$ inclusive, *product_id* $= 2$, *category_id* could have any value, *state_id* $= -1$ i.e., all the states are considered valid. There are *four* such products: `(S 2 2 3.5)`, `(S 3 2.3 6.7)`, `(S 3 2.4 6.8)`, and `(S 2 2 7.8)`.

Sample Input 1

```
11
S 1 1 2
S 2 1.1 2
S 2 2.3 1
S 1 2.2 1
Q 1 1 2
Q 1 2 1
Q 2 1 2
Q 2 2 1
Q 1.2 1 -1
Q 1.2 -1 2
Q 1.2 -1 -1
```

Sample Output 1

```
1
1
1
1
2
2
4
```