Intelligent machines are on the rise and they have surpassed humans in many aspects. Little Nas has heard about those and he wants to build his own intelligent robot too.

The robot has a hammer and a V-shaped shovel. Nas has a container and he wants to load some soil on it using the robot. The container has N cells. The hammer and shovel of the robot can have variable size according to the command given to it. If the shovel size is of **W** then it has **(2*W-1)** number of cells and the cell capacities are **1, 2, 3, ... W, ..., 3, 2, 1** units of soil. Every soil unit is a square of length 1 and Initially the container is empty e.g. all the cells contains 0 units of soil.

The robot has **four** types of operations.

1. The shovel operation. **W** sized shovel points at **Cth** cell of the container and dumps the soil on **C-W+1** to **C+W-1th** cells. So, at **Cth** cell of the container **W** unit soil is added. **C-1** and **C+1th** cell gets **W-1** units and so on.
2. The hammer operation. **W** sized hammer points at **Cth** cell of the container and smashes **C-W+1** to **C+W-1th** cells. The soil in the cells that are in the range of the hammer gets distributed equally. Meaning if the cells have $\mathbf{u_1, u_2, \ldots, u_M}$ soil units then they all become $\mathbf{\lfloor (u_1 + u_2 + ... + u_M) / M \rfloor}$ units each (the fraction part is sautered hence ignored).
3. Calculates total soil units in **L** to **Hth** cells.
4. The effective area calculation operation. The robot calculates the maximum rectangular area after all the operations so far in the container. For example, if the cells in the container have **3, 2, 2, 4, 1** units of soil, the max rectangular area is **8** (as every soil unit is a square).

Nas has already created the robot, but he figures out that he need some computer program to make the robot intelligent and operational. He heard about this programming contest event. So he came and demanded to make him the program for his robot. The specifications he provided are as follows.

Input:
The input starts with two integers **N** (**1** to **10^5**), width of the container and **O** (**1** to **10^5**) number of operations for the robot.
Next **O** lines are one of the three operations.
S **C W**, Shovel operation at **C** location and of **W** shovel size.
H **C W**, Hammer operation at **C** location and of **W** hammer size.
A **L H**, Calculate total soil units in the range **L** to **H** inclusive.
C, **W, L, H** in the above operations are in **1** to **N** and **L ≤ H**

Output:
In a line for each **A** operation (robot's third operation) print the number of soil unit. At the end print a line **"effective area : X"** (without the ""), where **X** is the output of the 4th operation of the robot.

Sample input:

5 3
S 3 3
A 1 5
H 3 2

Sample output:

9
effective area : 6

Explanation:

Container size is 5 and 3 operations. All the cells have 0 units of soil initially. After the first operation soil units of the container cells are 1, 2, 3, 2, 1. Second operation given was A 1 5 which calculates the total soil area in 1 to 5^{th} cell which is 9. Third operation is a hammer operation which make the container as 1, 2, 2, 2, 1. So, the effective area will be 6.