

C. Mirror Box

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Mirror Box is a name of a popular game in the Iranian National Amusement Park (INAP). There is a wooden box, 10^5 cm long and 100 cm high in this game. Some parts of the box's ceiling and floor are covered by mirrors. There are two negligibly small holes in the opposite sides of the box at heights h_l and h_r centimeters above the floor. The picture below shows what the box looks like.

In the game, you will be given a laser gun to shoot once. The laser beam must enter from one hole and exit from the other one. Each mirror has a preset number v_i , which shows the number of points players gain if their laser beam hits that mirror. Also — to make things even funnier — the beam must **not** hit any mirror more than once.

Given the information about the box, your task is to find the maximum score a player may gain. Please note that the reflection obeys the law "the angle of incidence equals the angle of reflection".

Input

The first line of the input contains three space-separated integers h_l, h_r, n ($0 < h_l, h_r < 100$, $0 \leq n \leq 100$) — the heights of the holes and the number of the mirrors.

Next n lines contain the descriptions of the mirrors. The i -th line contains space-separated v_i, c_i, a_i, b_i ; the integer v_i ($1 \leq v_i \leq 1000$) is the score for the i -th mirror; the character c_i denotes i -th mirror's position — the mirror is on the ceiling if c_i equals "T" and on the floor if c_i equals "F"; integers a_i and b_i ($0 \leq a_i < b_i \leq 10^5$) represent the x -coordinates of the beginning and the end of the mirror.

No two mirrors will share a common point. Consider that the x coordinate increases in the direction from left to right, so the border with the hole at height h_l has the x coordinate equal to 0 and the border with the hole at height h_r has the x coordinate equal to 10^5 .

Output

The only line of output should contain a single integer — the maximum possible score a player could gain.

Examples

input
50 50 7 10 F 1 80000 20 T 1 80000 30 T 81000 82000 40 T 83000 84000 50 T 85000 86000 60 T 87000 88000 70 F 81000 89000
output
100

input
80 72 9 15 T 8210 15679 10 F 11940 22399 50 T 30600 44789 50 F 32090 36579 5 F 45520 48519 120 F 49250 55229 8 F 59700 80609

35 T 61940 64939 2 T 92540 97769
output
120

Note

The second sample is depicted above. The red beam gets $10 + 50 + 5 + 35 + 8 + 2 = 110$ points and the blue one gets 120.

The red beam on the picture given in the statement shows how the laser beam can go approximately, this is just illustration how the laser beam can gain score. So for the second sample there is no such beam that gain score 110.