MATHEMATICAL GRAMMAR SCHOOL CUP
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https://arena.petlja.org/en-US/competition/mgcup2020

TASK1 MG table (English)

You are given a square table **n**x**n**. In the first instance, each element at the **i**-th row and **j**-th column of this table contains the value **i + j** ($1 \le i, j \le n$).

e.g. for n=3

2 3 4
3 4 5
4 5 6

There are two types of queries that can be applied on the table:

R x (sum up all values in row x, print the sum and set all values in row x to zero)
C y (sum up all values in column y, print the sum and set all values in column y to zero).

Write a program TABLE and print the results of the queries.

The first line of the standard input contains two integers: **n** (size of the table) and **q** (number of queries) ($1 \le n \le 10^6$, $1 \le q \le 10^5$).

Each of the next **q** lines contains the description of the query.

Each query is either

R x (uppercase letter R, blank space punctuation character, $1 \le x \le n$) or
C y (uppercase letter C, blank space punctuation character, $1 \le y \le n$).

The standard output will contain **q** lines. The **i**-th line will contain one integer (the result of the **i**-th query).

Example

Input
5 6
R 2
C 3
R 2
R 1
C 2
C 1

Output
20
34
18
0
15
24

TASK 2 MG POWER (English)

Let us build a defense barrier in a popular Craft building game suite using the same template.
The length of the barrier is **n** meters.
Each one-meter chunk of the barrier is labeled by a non-negative integer from **1** to **n** along its length and may have a different height.
The height template is based on a given integer **r** ($1 \le r < n$) and three hard-set sequences **a**, **b**, and **c** (each sequence contains n elements) such that $a[i] < b[i] < c[i]$ for all $1 \le i \le n$.
These sequences and **r** are the same for any barrier that is built in the game.

The selection of the specific barrier design is established by two special integers **x** and **y** ($1 \le x < y \le n - r + 1$) in the following way. Let us consider two segments of integers:
$[x, x + r - 1]$ and $[y, y + r - 1]$ (both ends included).
Then the height of the barrier at the one-meter chunk **i** for all $1 \le i \le n$ is equal to:

a[i], if **i** does not belong to any of the selected segments
b[i] if **i** belongs to exactly one selected segment
c[i] if **i** belongs to both selected segments

The power of a barrier is defined as the sum of all heights of its **n** one meter chunks.

The sequences **a**, **b**, **c**, and an integer **r** are the same for any barrier built in the game, so the gamers are provided with a list with all the possible barrier designs, sorted in non-decreasing order of their power.
You choose the **k-th** barrier design from the list and Your task is to write a program POWER and find the power of the selected barrier.

The first line of the standard input contains three integers **n**, **r** and **k** ($2 \le n \le 30000$, $1 \le r < n$, $1 \le k \le (n - r)(n - r + 1)/2$, the length of the barrier, the length of the segments, and the position of the barrier in the sorted list.

The second line of the standard input contains the elements of the sequence **a** ($1 \le a[i] \le 10$^6).

The third line of the standard input contains the elements of the sequence **b** ($a[i] < b[i] \le 10$^6).

The fourth line of the standard input contains the elements of the sequence **c** ($b[i] < c[i] \le 10$^6).

Print on the standard output the power of the **k**-th barrier from the list (sorted in non-decreasing order according to the power).

Example 1

Input
4 2 2
1 2 3 4
3 3 5 5
7 7 7 7

Output
16

Clarification:
In the first example, because n=4, n-r+1=3, the selected pair of (x,y) could be (1,2) or (1,3) or (2,3). That's why, it is possible to create three different barriers:

The selection of x = 1 and $y = 2$ produce heights ``3 7 5 4" with the power equal to 3+7+5+4=19;
because: i=1 belongs to [1,2] and the cooresponding height is equal to b[1]=3
i=2 belongs to [1,2] and [2,3], so the cooresponding height is equal to c[2]=7
i=3 belongs to [2,3] and the cooresponding height is equal to b[3]=5
i=4 belongs to [] and the cooresponding height is equal to a[4]=4
The selection of x = 1 and y = 3 produce heights ``3 3 5 5" with the power equal to 3+3+5+5=16;
The selection of x = 2 and y = 3 produce heights ``1 3 7 5" with the power equal to 1+3+7+5=16.

Example 2

Input
2 1 1
388838 280678
485358 886588
781228 988458

Output
1371946