

A mining company extracts terbium, a rare metal used for constructing lightweight magnets, from river sand. They mine the Long River at N mining points, each of them identified by its distance from the river source. At each mining point, a relatively small but highly valued heap of mineral ore is extracted from the river.

To collect the mineral ore, the company regroups the N produced heaps into a smaller number of K heaps, each located at one of the initial mining points. The newly formed heaps are then collected by trucks.

To regroup the N heaps, they use a barge, which in practice can carry any amount of mineral ore because it is very large. The barge starts at the river source and can only travel downriver, so the heap produced at a mining point X can be taken to a mining point Y only if $Y > X$. Each heap is moved completely to another mining point, or not moved at all. The cost of moving a heap of weight W from a mining point X to a mining point Y is $W \times (Y - X)$. The total cost of the regrouping is the sum of the costs for each heap movement. Notice that a heap which is not moved has no influence on the total cost.

Given the values for N and K , the N mining points, and the weight of the heap each mining point produced, write a program that calculates the minimum total cost to regroup the N initial heaps into K heaps.

Input

Each test case is described using several lines. The first line contains two integers N and K denoting respectively the number of initial heaps and the desired number of heaps after regrouping ($1 \leq K < N \leq 1000$). Each of the next N lines describes one of the initial heaps with two integers X and W indicating that the mining point X produced a heap of weight W ($1 \leq X, W \leq 10^6$). Within each test case the heaps are given in strictly ascending order considering their mining points.

Sample Output

For each test case output a line with an integer representing the minimum total cost to regroup the N initial heaps into K heaps.

Sample Input

```
3 1
20 1
30 1
40 1
3 1
11 3
12 2
13 1
6 2
10 15
12 17
16 18
18 13
30 10
32 1
6 3
10 15
12 17
16 18
18 13
30 10
32 1
```

Sample Output

```
30
8
278
86
```

G. Distinctification

time limit per test: 6 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

Suppose you are given a sequence S of k pairs of integers $(a_1, b_1), (a_2, b_2), \dots, (a_k, b_k)$.

You can perform the following operations on it:

1. Choose some position i and **increase** a_i by 1. That can be performed only if there exists at least one such position j that $i \neq j$ and $a_i = a_j$. The cost of this operation is b_i ;
2. Choose some position i and **decrease** a_i by 1. That can be performed only if there exists at least one such position j that $a_i = a_j + 1$. The cost of this operation is $-b_i$.

Each operation can be performed arbitrary number of times (possibly zero).

Let $f(S)$ be minimum possible x such that there exists a sequence of operations with total cost x , after which all a_i from S are pairwise distinct.

Now for the task itself ...

You are given a sequence P consisting of n pairs of integers $(a_1, b_1), (a_2, b_2), \dots, (a_n, b_n)$. All b_i are pairwise distinct. Let P_i be the sequence consisting of the first i pairs of P . Your task is to calculate the values of $f(P_1), f(P_2), \dots, f(P_n)$.

Input

The first line contains a single integer n ($1 \leq n \leq 2 \cdot 10^5$) — the number of pairs in sequence P .

Next n lines contain the elements of P : i -th of the next n lines contains two integers a_i and b_i ($1 \leq a_i \leq 2 \cdot 10^5, 1 \leq b_i \leq n$). It is guaranteed that all values of b_i are pairwise distinct.

Output

Print n integers — the i -th number should be equal to $f(P_i)$.

Examples

input Copy
5 1 1 3 3 5 5 4 2 2 4
output Copy
0 0 0 -5 -16
input Copy
4 2 4 2 3 2 2 1 1

Educational Codeforces Round 51 (Rated for Div. 2)

Finished

Practice



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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++14 6.4.0 v

Choose file: No file selected.

→ Last submissions

Submission	Time	Verdict
43151972	Sep/20/2018 20:50	Wrong answer on test 9
43148084	Sep/20/2018 19:43	Wrong answer on test 9
43147943	Sep/20/2018 19:43	Compilation error

→ Contest materials

- Announcement x
- Tutorial x

↑ **output** Copy

```
0
3
7
1
```

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D. Green and Black Tea

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Innokentiy likes tea very much and today he wants to drink exactly n cups of tea. He would be happy to drink more but he had exactly n tea bags, a of them are green and b are black.

Innokentiy doesn't like to drink the same tea (green or black) more than k times in a row. Your task is to determine the order of brewing tea bags so that Innokentiy will be able to drink n cups of tea, without drinking the same tea more than k times in a row, or to inform that it is impossible. Each tea bag has to be used exactly once.

Input

The first line contains four integers n, k, a and b ($1 \leq k \leq n \leq 10^5, 0 \leq a, b \leq n$) — the number of cups of tea Innokentiy wants to drink, the maximum number of cups of same tea he can drink in a row, the number of tea bags of green and black tea. It is guaranteed that $a + b = n$.

Output

If it is impossible to drink n cups of tea, print "NO" (without quotes).

Otherwise, print the string of the length n , which consists of characters 'G' and 'B'. If some character equals 'G', then the corresponding cup of tea should be green. If some character equals 'B', then the corresponding cup of tea should be black.

If there are multiple answers, print any of them.

Examples

input	Copy
5 1 3 2	
output	Copy
GBGBG	
input	Copy
7 2 2 5	
output	Copy
BBGBGBB	
input	Copy
4 3 4 0	
output	Copy
NO	

Codeforces Round #386 (Div. 2)

Finished

Practice



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Start virtual contest

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Clone Contest

→ Submit?

Language: GNU G++14 6.4.0

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Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Contest materials

- Announcement [×](#)
- Tutorial [×](#)



E. Tournament

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

Recently a tournament in k kinds of sports has begun in Berland. Vasya wants to make money on the bets.

The scheme of the tournament is very mysterious and not fully disclosed. Competitions are held back to back, each of them involves two sportsmen who have not left the tournament yet. Each match can be held in any of the k kinds of sport. Loser leaves the tournament. The last remaining sportsman becomes the winner. Apart of this, the scheme can be arbitrary, it is not disclosed in advance.

Vasya knows powers of sportsmen in each kind of sport. He believes that the sportsmen with higher power always wins.

The tournament is held every year, and each year one new participant joins it. In the first tournament, only one sportsman has participated, in the second there were two sportsmen, and so on. Vasya has been watching the tournament for the last n years. Help him to find the number of possible winners for each of the n tournaments.

Input

The first line contains two integers n and k ($1 \leq n \leq 5 \cdot 10^4$, $1 \leq k \leq 10$) — the number of tournaments and the number of kinds of sport, respectively.

Each of the next n lines contains k integers $s_{i1}, s_{i2}, \dots, s_{ik}$ ($1 \leq s_{ij} \leq 10^9$), where s_{ij} is the power of the i -th sportsman in the j -th kind of sport. The sportsman with higher powers always wins. It's guaranteed that for any kind of sport all of these powers are distinct.

Output

For each of the n tournaments output the number of contenders who can win.

Examples

input	Copy
3 2 1 5 5 1 10 10	
output	Copy
1 2 1	
input	Copy
3 2 2 2 3 3 1 10	
output	Copy
1 1 3	
input	Copy
3 2 2 3 1 1 3 2	

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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?



Language: GNU G++14 6.4.0

Choose file: [Browse...](#) No file selected.

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Submit

→ Contest materials

- Announcement 
- Tutorial 

↑ **output** Copy

```
1
1
2
```

Note

In the first sample:

In the first tournament there is only one sportsman, and he is the winner.

In the second tournament, there are two sportsmen, and everyone can defeat another, depending on kind of sports.

In the third tournament, the third sportsman is the strongest in both kinds of sports, so he is the winner regardless of the scheme.

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Status (/status/TREAP/) Ranking (/ranks/TREAP/)

TREAP - Yet another range difference query!

no tags

Given an empty set S , you have to apply Q operations on this set while keeping the set sorted in increasing order and elements have indices $0 \leq i < \text{size}(S)$

The operations are insert, delete, find min difference in a given range, find max difference in a given range.

Input

I k : Insert k into S , if k is not in S

D k : Delete k from S , if k is in S

N i j : Print $\min\{\text{abs}(S[x] - S[y]) \mid i \leq x, y \leq j\}$ or -1 if the range has 1 element

X i j : Print $\max\{\text{abs}(S[x] - S[y]) \mid i \leq x, y \leq j\}$ or -1 if the range has 1 element

limits: $0 < Q \leq 200000$, $0 \leq k \leq 10^9$, $0 \leq i, j < \text{size}(S)$


Output

For each N and X operations, print an integer per line as described above.

Example

```
Input :
11
I 1
I 12
I 4
I 8
N 0 3
X 0 3
N 1 3
X 0 2
D 4
N 0 1
X 1 2

Output :
3
11
4
7
7
4
```

 **Submit solution!** (/submit/TREAP/)

hide comments





jusbut1943 (/users/jusbut1943): 2018-08-31 11:16:01
Why my solution is black, and shows OK, Result: 0.



fz0718 (/users/fz0718): 2017-07-22 23:10:28
Another fun BBST problem, that you also need lazy propagation for:
<https://csacademy.com/contest/archive/task/strings/>



mahmud2690 (/users/mahmud2690): 2016-05-25 13:30:54
Why my solution is black, and shows OK, Result: 0.

-  timonknigge (/users/timonknigge): 2015-08-31 15:20:40
It might be worth pointing out that for the N query, we also require that $x \neq y$.
-  bicsi (/users/bicsi): 2015-07-02 23:38:35
This was probably the most resourceful problem I have ever coded! However, it was worth it in the end! :D

[Submit solution! \(/submit/TREAP/\)](/submit/TREAP/)



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UTM_CAMPAIGN=TRAILBLAZER
UTM_CONTENT=CARBON

Added by: ahmed.abdrabo (/users/ahmedabdrabo)
Date: 2013-04-22
Time limit: 5s
Source limit: 50000B
Memory limit: 1536MB
Cluster: Cube (Intel G860) (/clusters/)
Languages: All except: ASM64
Resource: modified zeap from infoarena.ro

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L. Two Heads Are Better

time limit per test: 2.0 s
memory limit per test: 256 MB
input: standard input
output: standard output

World famous scientist Innokentiy has started studying computability theory and invented a new abstract executor that represents a tape of n cells, each of which contains a lowercase Latin letter. Two heads can move along the tape, each pointing at some cell. This device can execute the following instructions: to move the specified head to the left or to the right by one cell, to reverse the part of the tape between two heads, including the cells the heads point at, and to answer the request which symbol the specified head points at. Innokentiy asked you to help him to emulate the work of this device since the program he has written works too slow.

Input

The first line contains three integers separated by spaces: n , l and r ($1 \leq n \leq 10^5$, $1 \leq l < r \leq n$) — the number of cells in the tape and the initial positions of the left and the right head, correspondingly.

The second line contains n lowercase Latin letters, written in the cells.

The third line contains a single integer m ($1 \leq m \leq 3 \cdot 10^5$) — the number of queries.

In the next m lines there are the queries in the following form.

- S X Y — to move the head X in direction Y, where X can be L for the left head and R for the right one, and Y can be L for moving left or R for moving right.
- R — to reverse the part of the tape between the heads, including the cells the heads point at.
- Q X — to ask which character the head X points at, where X can be L for the left head and R for the right one.

It is guaranteed that the left head always remains to the left of the right head and that the heads don't move out of the tape.

Output

Output one string, containing all the answers for the queries of the last type. The k -th character of this string must be the answer to the k -th query of the type «Q X».

Examples

```

input
11 2 6
abracadabra
12
Q L
Q R
R
Q L
Q R
S L R
S R R
Q L
Q R
R
Q L
Q R

output
baabcddc

```

2014, Samara SAU ACM ICPC Quarterfinal Qualification Contest

Finished

Practice

★

→ **Clone Contest to Mashup**

You can clone this contest to a mashup.

Clone Contest

→ **Submit?**

Language: GNU G++14 6.4.0

Choose file: Browse... No file selected.

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A. Compote

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Nikolay has a lemons, b apples and c pears. He decided to cook a compote. According to the recipe the fruits should be in the ratio 1: 2: 4. It means that for each lemon in the compote should be exactly 2 apples and exactly 4 pears. You can't crumble up, break up or cut these fruits into pieces. These fruits — lemons, apples and pears — should be put in the compote as whole fruits.

Your task is to determine the maximum total number of lemons, apples and pears from which Nikolay can cook the compote. It is possible that Nikolay can't use any fruits, in this case print 0.

Input

The first line contains the positive integer a ($1 \leq a \leq 1000$) — the number of lemons Nikolay has.

The second line contains the positive integer b ($1 \leq b \leq 1000$) — the number of apples Nikolay has.

The third line contains the positive integer c ($1 \leq c \leq 1000$) — the number of pears Nikolay has.

Output

Print the maximum total number of lemons, apples and pears from which Nikolay can cook the compote.

Examples

input	Copy
2 5 7	
output	Copy
7	
input	Copy
4 7 13	
output	Copy
21	
input	Copy
2 3 2	
output	Copy
0	

Note

In the first example Nikolay can use 1 lemon, 2 apples and 4 pears, so the answer is $1 + 2 + 4 = 7$.

In the second example Nikolay can use 3 lemons, 6 apples and 12 pears, so the answer is $3 + 6 + 12 = 21$.

Codeforces Round #386 (Div. 2)

Finished

Practice



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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++14 6.4.0

Choose file: No file selected.

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

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In the third example Nikolay don't have enough pears to cook any compote, so the answer is 0.

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ADACROP - Ada and Harvest

[#datastructures \(/problems/tag/datastructures\)](/problems/tag/datastructures)

As you might already know, Ada the Ladybug is a farmer. She has a very long furrow with many kinds of vegetables (represented by integer numbers). Whenever she wants to harvest a single vegetable, she always replace it with another vegetable (possibly same kind).

After each replacement, she wants to know the number of vegetables of the same kind (at the new vegetable) which are before it (have lower position in furrow).

Input

The first line of input contains $1 \leq N, Q \leq 2 \cdot 10^5$, the length of furrow and number of harvests.

The next line contains N numbers $0 \leq A_i \leq 10^9$ the kind of vegetable which is currently on i^{th} spot in furrow (indexed from 0).

The next Q lines contains two numbers $0 \leq i < N$ (the index of harvested plant) and $0 \leq a \leq 10^9$ (the kind of newly planted vegetable)

Output

For each harvest, print the number of vegetables of the same kind before the newly planted vegetable.

Example Input

```
5 5
1 2 1 2 1
2 2
4 2
2 3
3 3
4 3
```

Example Output

```
1
3
0
1
2
```

Example Input 2

```
10 10
2 3 5 3 9 3 5 2 9 9
7 2
0 5
0 2
1 2
9 2
4 3
8 2
4 2
2 5
3 5
```

Example Output 2


```

1
0
0
1
3
1
3
2
0
1

```

[Submit solution! \(/submit/ADACROP/\)](/submit/ADACROP/)

hide comments

 anirudnits (/users/anirudnits): 2018-08-28 13:33:16
 using BIT but still getting TLE, any suggestions?

[Submit solution! \(/submit/ADACROP/\)](/submit/ADACROP/)



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Added by: Morass (/users/morass)
 Date: 2017-09-11
 Time limit: 1s
 Source limit: 50000B
 Memory limit: 1536MB
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B. Wilbur and Array

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

Wilbur the pig is tinkering with arrays again. He has the array a_1, a_2, \dots, a_n initially consisting of n zeros. At one step, he can choose any index i and either add 1 to all elements a_i, a_{i+1}, \dots, a_n or subtract 1 from all elements a_i, a_{i+1}, \dots, a_n . His goal is to end up with the array b_1, b_2, \dots, b_n .

Of course, Wilbur wants to achieve this goal in the minimum number of steps and asks you to compute this value.

Input

The first line of the input contains a single integer n ($1 \leq n \leq 200\,000$) — the length of the array a_i . Initially $a_i = 0$ for every position i , so this array is not given in the input.

The second line of the input contains n integers b_1, b_2, \dots, b_n ($-10^9 \leq b_i \leq 10^9$).

Output

Print the minimum number of steps that Wilbur needs to make in order to achieve $a_i = b_i$ for all i .

Examples

input	Copy
5 1 2 3 4 5	
output	Copy
5	
input	Copy
4 1 2 2 1	
output	Copy
3	

Note

In the first sample, Wilbur may successively choose indices 1, 2, 3, 4, and 5, and add 1 to corresponding suffixes.

In the second sample, Wilbur first chooses indices 1 and 2 and adds 1 to corresponding suffixes, then he chooses index 4 and subtract 1.

Codeforces Round #331 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++14 6.4.0

Choose file: No file selected.

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Contest materials

- Announcement
- Tutorial

