



0_送分題 - Hello World

(30分)

前言

比賽開始了！

趕快驗證一下，

網路是否設定正確？

上傳競賽程式是否順利？

程式解答是否用 STDOUT 輸出？

都沒問題，30分就到手了！繼續 ... 衝！衝！衝！

題目敘述

請寫一個程式輸出Hello World!

輸入格式

本題無需輸入值

輸出格式

[A~Z][a~z]、空格，以及常用英文符號。

資料範圍

[A~Z][a~z]、空格，以及驚嘆號“!”

測試範例

輸入範例 1

(無輸入值)

輸出範例 1

```
Hello world!
```

0_Hello World

(30 points)

Introduction

YTP Contest has started!

Let's verify everything first.

Is the internet setting correct?

Is the source code submission working well?

Do you use STDOUT output for program solutions?

Everything is ready! Go get 30 points now!! Go! Go! Go!

Statement

Please write a program to output Hello World!

Input Format

This problem requires no input.

Output Format

[A~Z][a~z], space, and common English punctuation.

Constraints

[A~Z][a~z], space, and exclamation mark "!".

Test Cases

Input 1

(no input)

Output 1

```
Hello world!
```

Illustrations

Input 1 has no input, simply output Hello World!

1_撲克之王安妮亞 (Poker King Anya)

(10分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

小女孩安妮亞去年在學習撲克牌的規則，她不只是聰明，還學得很快速。因此她發明了一個簡單的遊戲：從撲克牌的牌庫堆抽五張牌，然後把這些牌對應到的點數加總。

今年她決定考考你，給你五張牌的點數總和，請輸出她抽到的五張牌的點數。

輸入格式

輸入只有一行，包含一個正整數 x ，表示五張牌的點數總和。

輸出格式

輸出一行，包含五個正整數 a_1, a_2, a_3, a_4, a_5 ，兩個整數間以一個空白隔開，表示可能抽到的五張牌的點數。

輸出的數字應滿足 $1 \leq a_i \leq 13$ 且 $a_1 + a_2 + a_3 + a_4 + a_5 = x$ 。如果有多種可能的解，請輸出任意一種。

你可以使用同一種點數的牌任意多次。

資料範圍

- $5 \leq x \leq 65$ 。

範例

輸入範例 1

```
25
```

輸出範例 1

```
5 5 5 5 5
```

輸入範例 2

```
64
```

輸出範例 2

```
13 13 13 13 12
```

範例說明

在範例 1 中，五張牌的總和為 25。輸出 3 4 5 6 7、13 6 3 2 1、5 5 5 5 5 等，都會被視為正確。

在範例 2 中，五張牌的總和為 64。

1_Poker King Anya

(10 Points)

Time Limit: 1 second

Memory Limit: 256MB

Description

Little girl Anya was learning the rule of pokers last year. She was very smart and learning very fast. Thus she invented a simple game: draw 5 cards from the deck and then find the sum of the 5 cards' corresponding values.

This year, she decided to ask you, given the sum of 5 cards, can you help her find out what the cards' values are?

Input Format

The input contains only one positive integer x -- the sum of 5 cards.

Output Format

The output should contain five positive integers a_1, a_2, a_3, a_4, a_5 -- the values on each card.

The numbers a_i must satisfy $1 \leq a_i \leq 13$ and $a_1 + a_2 + a_3 + a_4 + a_5 = x$. If there is more than one answer, you can output any of them.

You can use the same card as many times as you want.

Constraints

- $5 \leq x \leq 65$.

Test Cases

Input 1

```
25
```

Output 1

```
5 5 5 5 5
```

Input 2

```
64
```

Output 2

```
13 13 13 13 12
```

Illustrations

In example 1, the sum of the five cards is 25. Outputs such as `3 4 5 6 7`, `5 5 5 5 5`, `13 6 3 2 1`, etc., are seen to be correct.

In example 2, the sum of the five cards is 64.

2_波奇與芒果假面 (Bocchi and Mango Masks)

(10分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

波奇要迎來在 STARRY 的第二場演奏了！因為她還是不敢看著觀眾，團結 Band 的其他團員幫她準備了 n 個紙箱，讓她能夠進入紙箱（？並表演。

已知第 i 個紙箱的長、寬、高分別為 l_i, w_i, h_i ，而且可以用一個長、寬、高分別為 L, W, H 的長方體來表示波奇。一個紙箱可以作為波奇的「芒果假面」若將紙箱旋轉或翻轉後，它能夠裝的下波奇。更具體來說，假設經過一些旋轉或翻轉後紙箱的長、寬、高為 a, b, c ，則若 $L \leq a, W \leq b, H \leq c$ ，它能夠裝的下波奇。

現在波奇想要知道這些紙箱有幾個可以作為她的「芒果假面」？請幫助她求出答案。

輸入格式

輸入第一行有一個正整數 n ，代表有幾個紙箱。

接下來 n 行，每行有三個正整數 l_i, w_i, h_i ，意義與題目敘述相同。

接下來一行有三個正整數 L, W, H ，意義與題目敘述相同。

輸出格式

請輸出一行，包含一個數字，代表可以作為波奇的「芒果假面」的紙箱數量。

資料範圍

- $1 \leq n \leq 1000$
- $1 \leq l_i, w_i, h_i, L, W, H \leq 10^6$

測試範例

輸入範例 1

```
3
3 5 2
100 100 1
10 10 10
2 4 3
```


輸出範例 1

```
2
```

輸入範例 2

```
6
7 2 4
1 6 5
5 6 5
3 2 5
5 4 7
2 6 6
1 3 1
```

輸出範例 2

```
6
```

範例說明

在範例測資一中，第一個紙箱和第三個紙箱可以作為「芒果假面」。

在範例測資二中，所有紙箱都可以作為「芒果假面」。

2_Bocchi and Mango Masks

(10 points)

Time Limit: 1 second

Memory Limit: 256MB

Statement

Bocchi is about to have her second performance in STARRY! Since she still can't look at the audience, the other members of Kessoku Band have prepared n cardboard boxes for her to enter(?) and perform.

It is known that the dimensions of the i -th cardboard box are given by l_i, w_i, h_i . And Bocchi can be represented by a rectangular prism with dimensions L, W, H . A cardboard box can serve as Bocchi's "Mango Mask" if, after rotating or flipping the box, it can contain Bocchi. More specifically, let's assume that after some rotation or flipping, the dimensions of the box become a, b, c . If $L \leq a, W \leq b, H \leq c$, then it can contain Bocchi.

Now Bocchi wants to know how many of these cardboard boxes can serve as her "Mango Mask." Please help her find the answer.

Input Format

The first line of input contains a positive integer n , representing the number of cardboard boxes.

The next n lines each contain three positive integers l_i, w_i, h_i , representing the dimensions of the cardboard boxes, as described in the problem statement.

The next line contains three positive integers L, W, H , representing the dimensions of Bocchi, as described in the problem statement.

Output Format

The output should consist of a single line containing a number representing the count of cardboard boxes that can serve as "Mango Masks" for Bocchi.

Constraints

- $1 \leq n \leq 1000$
- $1 \leq l_i, w_i, h_i, L, W, H \leq 10^6$

Test Cases

Input 1

```
3
3 5 2
100 100 1
10 10 10
2 4 3
```

Output 1

```
2
```

Input 2

```
6
7 2 4
1 6 5
5 6 5
3 2 5
5 4 7
2 6 6
1 3 1
```

Output 2

```
6
```

Illustrations

In Sample Test Case 1, the first cardboard box and the third cardboard box can serve as a "Mango Masks."

In Sample Test Case 2, all the cardboard boxes can serve as "Mango Masks."

3_你太矮了我看不到 (Too Short to Be Seen)

(10分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

有 N 個人在排隊，這些人的身高互不相同，且它們被依照身高由小到大編號為 $1, 2, \dots, N$ （也就是說編號 1 的人最矮、編號 N 的人最高）。李老闆叫他的記錄員記錄隊伍中第一個人到最後一個人的編號依序為何。

記錄員站在第 1 個人前面，因為他懶得移動，所以如果某一個人前面有人身高比他高，記錄員就會看不到這個人。記錄員很懶惰，所以他會把所有他看不見的人的編號，記錄為前一個他看得見的人（也就是前面最高的人）的編號。記錄員可以知道每一個他看得到的人是排在第幾個，所以他不會漏記錄任何一個人。正式地說，假設隊伍中第 i 個人的編號是 a_i ，那麼記錄員記錄的第 i 個人的編號是 $b_i = \max_{1 \leq k \leq i} \{a_k\}$ 。

當記錄員將 b_1, b_2, \dots, b_N 這個序列交給李老闆後，李老闆很生氣地威脅要把他開除。為了避免增加失業人口，請你給記錄員任意一個可能的序列 a_1, a_2, \dots, a_N 。

輸入格式

第一行有一個整數 N ，表示隊伍中的人數。

第二行有 N 個整數 b_1, b_2, \dots, b_N ，表示記錄員記錄下來的序列。

輸出格式

輸出一行，包含 N 個整數 a_1, a_2, \dots, a_N ，表示一個可能的排隊順序。

你的答案會被視為正確若且唯若以下條件全部滿足：

- $1 \leq a_i \leq N$
- $\forall i \neq j, a_i \neq a_j$
- $b_i = \max_{1 \leq k \leq i} \{a_k\}$

資料範圍

- $1 \leq N \leq 10^5$
- $1 \leq b_i \leq N$
- 保證記錄員沒有記錯，所以一定存在符合條件的答案，也就是說：
 - $\forall 1 \leq i < N, b_i \leq b_{i+1}$
 - $b_i \geq i$

測試範例

輸入範例 1

```
5
2 2 4 5 5
```

輸出範例 1

```
2 1 4 5 3
```

輸入範例 2

```
4
1 2 3 4
```

輸出範例 2

```
1 2 3 4
```

輸入範例 3

```
5
5 5 5 5 5
```

輸出範例 3

```
5 2 3 4 1
```

範例說明

在範例輸出 1 的序列 2, 1, 4, 5, 3 中，對於每一個人：

- 2：他前面沒有任何人比他更高，所以記錄員記錄下來的編號是 2。
- 1：他前面最高的人是 2，且比他更高，所以記錄員記錄下來的編號是 2。
- 4：他前面沒有任何人比他更高，所以記錄員記錄下來的編號是 4。
- 5：他前面沒有任何人比他更高，所以記錄員記錄下來的編號是 5。
- 3：他前面最高的人是 5，且比他更高，所以記錄員記錄下來的編號是 5。

因此這是一個合法的答案。

在範例輸入 3 中，5, 4, 3, 2, 1、5, 1, 2, 3, 4 等等都是合法的答案。

3_Too Short to Be Seen

(10 points)

Time Limit: 1 second

Memory Limit: 256 MB

Statement

There are N people in a queue, and their heights are pairwise distinct. They are numbered in $1, 2, \dots, N$ according to their heights in ascending order (i.e. person 1 is the shortest and person N is the tallest). Mr. Lee, the boss, asked his recorder to record the sequence of the numbers from the first person to the last person in the queue.

The recorder stands in front of the first person. Because he is lazy to move, if there is someone taller in front of a person, the recorder cannot see that person. The recorder is very lazy, so he will record the number of all the people he cannot see as the number of the last person he can see (i.e. the tallest person) in front of them. The recorder knows the position of each person he can see, so he won't miss anyone. Formally, assume that the number of the i -th person in the queue is a_i . Then the number recorded by the recorder for the i -th person is $b_i = \max_{1 \leq k \leq i} \{a_k\}$.

When the recorder gives the sequence b_1, b_2, \dots, b_N to Mr. Lee, he threatens to fire him angrily. To avoid increasing the unemployment rate, please provide the recorder with any possible sequence a_1, a_2, \dots, a_N .

Input Format

The first line of input contains an integer N , representing the number of people in the queue.

The second line of input contains N integers b_1, b_2, \dots, b_N , representing the recorded sequence.

Output Format

The output should consist of a single line containing N integers a_1, a_2, \dots, a_N , representing a possible sequence a_1, a_2, \dots, a_N .

Your answer is considered correct if and only if all conditions below are satisfied:

- $1 \leq a_i \leq N$
- $\forall i \neq j, a_i \neq a_j$
- $b_i = \max_{1 \leq k \leq i} \{a_k\}$

Constraints

- $1 \leq N \leq 10^5$
- $1 \leq b_i \leq N$
- It is guaranteed that the recorded sequence is correct, so there is an answer satisfying the conditions. In other words:
 - $\forall 1 \leq i < N, b_i \leq b_{i+1}$

- $b_i \geq i$

Test Cases

Input 1

```
5
2 2 4 5 5
```

Output 1

```
2 1 4 5 3
```

Input 2

```
4
1 2 3 4
```

Output 2

```
1 2 3 4
```

Input 3

```
5
5 5 5 5 5
```

Output 3

```
5 2 3 4 1
```

Illustrations

In the output of Example 1, for each person in the sequence 2, 1, 4, 5, 3:

- 2: There is no person in front of him who is higher than him, so the recorder records 2 as his number.
- 1: The highest person in front of him is 2 and is higher than him, so the recorder records 2 as his number.
- 4: There is no person in front of him who is higher than him, so the recorder records 4 as his number.
- 5: There is no person in front of him who is higher than him, so the recorder records 5 as his number.
- 3: The highest person in front of him is 5 and is higher than him, so the recorder records 5 as his number.

Thus, this is a legal solution.

In Example 3, 5, 4, 3, 2, 1, and 5, 1, 2, 3, 4, etc., are also legal solutions.

4_角色分配 (Role Assignment)

(3分/12分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

MOBA 遊戲在年輕人中十分歡迎，相信大家也不陌生。它是一款 5 vs. 5 的遊戲，玩家們需要團隊合作取得勝利。每個角色都有不同的任務，比如 AD 主要負責輸出和拆塔，JG 主要負責帶領團隊經濟優勢等。該遊戲不僅僅是肉搏，而是智取。

由於每個人擅長的位置不太一樣，所以當五個好友一起遊戲時，會不知道怎麼去做角色分配。現在每次給你五個人分別擅長的位置，請你幫助我們回答共有多少種分配，可以使得每個人各司其職。

輸入格式

第一行有一個正整數 t ，代表接下來有多少筆測資。

接下來有 $5t$ 行，每 5 行代表一組資料。每行第一個數 k ，代表這位玩家擅長 k 個位置，同一行接著 k 個字串 S_1, S_2, \dots, S_k ，代表該玩家擅長的位置。

輸出格式

對每筆測資請輸出一個整數，代表有多少種角色分配。

資料範圍

- $1 \leq t \leq 1000$ 。
- $1 \leq k \leq 5$ 。
- $S_i \in \{\text{JG, MID, TOP, SUP, AD}\}$ ($1 \leq i \leq k$)。
- $S_i \neq S_j$ ($1 \leq i < j \leq k$)。

子任務

- 子任務 1, $k = 1$ 。
- 子任務 2, 無額外限制。

範例

輸入範例 1

```

2
1 JG
1 MID
1 TOP
1 SUP
1 AD
1 TOP
1 TOP
1 TOP
1 TOP
1 TOP

```

輸出範例 1

```

1
0

```

輸入範例 2

```

1
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD

```

輸出範例 2

```

120

```

範例說明

輸入範例 1 的兩筆測資中，第一筆有一組可行的分配 (JG, MID, TOP, SUP, AD)，第二筆沒有任何一組分配可以使每個位置都有人負責，因此答案為 0。

輸入範例 2 的測資中，由於五個玩家都擅長五個位置，所以可行的分配有 (JG, MID, TOP, SUP, AD)、(JG, MID, TOP, AD, SUP)、(JG, MID, SUP, TOP, AD) 等等，共有 120 種，也就是全排列 $5! = 5 \times 4 \times 3 \times 2 \times 1$ 的數量。

4_Role Assignment

(3 Points /12 Points)

Time Limit: 1 second

Memory Limit: 256MB

Description

MOBA games are highly popular among young people, and I believe most of you are familiar with them. It is a 5 vs. 5 game where players need to collaborate as a team to achieve victory.

Each character has different roles, such as AD (Attack Damage) responsible for dealing damage and destroying towers, and JG (Jungler) primarily responsible for leading the team's economy.

The game is not just about combat but also about strategy.

Since each person excels in different positions, when a group of five friends play together, they may not know how to allocate roles.

Now, you will be given the preferred positions of five individuals, and your task is to calculate how many possible role assignment can ensure that each person plays their respective roles.

Input Format

The first line contains a positive integer t , representing the number of testcases.

The next $5t$ lines contain the data for each testcase.

Each group of five lines represents a testcase.

Each line starts with an integer k , indicating the number of positions the player excels in.

Following k strings S_1, S_2, \dots, S_k on the same line, representing the player's preferred positions.

Output Format

For each testcase, output a single integer denoting the number of possible role assignment.

Constraints

- $1 \leq t \leq 1000$.
- $1 \leq k \leq 5$.
- $S_i \in \{\text{JG, MID, TOP, SUP, AD}\}$ ($1 \leq i \leq k$).
- $S_i \neq S_j$ ($1 \leq i < j \leq k$).

Subtasks

- Subtask 1, $k = 1$.
- Subtask 2, No additional constraints.

Test Cases

Input 1

```
2
1 JG
1 MID
1 TOP
1 SUP
1 AD
1 TOP
1 TOP
1 TOP
1 TOP
1 TOP
```

Output 1

```
1
0
```

Input 2

```
1
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
5 JG MID TOP SUP AD
```

Output 2

```
120
```

Illustrations

In the Input 1, there is one feasible allocation (**JG**, **MID**, **TOP**, **SUP**, **AD**) in the first testcase. While in the second testcase, there is no allocation that makes each position to be filled by a player. Therefore, the answer is 0.

In the Input 2, since all five players are skilled in all five positions, feasible allocations include (**JG**, **MID**, **TOP**, **SUP**, **AD**), (**JG**, **MID**, **TOP**, **AD**, **SUP**), (**JG**, **MID**, **SUP**, **TOP**, **AD**), and so on, for a total of 120 possibilities, which is the factorial of 5, denoted as $5! = 5 \times 4 \times 3 \times 2 \times 1$.

5_效益評估 (Benefit Evaluation)

(15分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

小明身為一位探險家，他非常享受在探險中還能收穫寶藏的過程。今天他來到了一大片富含寶藏的土地，這片土地可以看成一個 $10^4 \times 10^4$ 的表格，透過他的專業夥伴小義的分析，這塊土地上有 N 片可疑的區域，每片可疑的區域會形成一個長方形，對於一片可疑的區域，小明只要有辦法將其從頭到尾整個搜尋一遍，他就可以獲得價值為 C 的寶藏。

但很不巧的，小明是一個很單純的人，給他 N 片區域請他每片分別搜尋一遍對他來說實在是太複雜了，因此，小義決定指定恰好一個長方形區域，並讓小明只要專心搜尋這個長方形區域就好。但讓小明搜尋太大片的區域又會害他過份勞碌，所以小義也希望不要選定太大片的區域。

因此小義委託了擅長演算法的你，是否能為他評估一個最好的長方形區域，使得他定義出來的效益值，「被完整包含在選定的長方形內的可疑區域數量 $\times C$ 」減去「選定的長方形區域面積」，盡量大？注意到不選擇任何長方形也可以是一種選項，這時候的效益值為 0。

輸入格式

第一行包含兩個正整數 N, C ，總共有 N 片可疑的區域，以及小明完整搜尋完一片區域後可以得到的價值。

接下來 N 行，每行包含四個正整數 d_i, l_i, u_i, r_i ，代表第 i 片可疑區域形成一個左下角在 (d_i, l_i) 、右上角在 (u_i, r_i) 的長方形。

輸出格式

請輸出在最佳的評估下，效益值的最大值。

資料範圍

- $1 \leq N \leq 100$
- $1 \leq C \leq 10^7$
- $1 \leq d_i \leq u_i \leq 10^4$
- $1 \leq l_i \leq r_i \leq 10^4$

測試範例

輸入範例 1

```
3 7
1 2 3 3
4 1 5 3
1 4 3 5
```

輸出範例 1

```
2
```

輸入範例 2

```
5 16  
6 1 8 2  
2 5 3 6  
6 3 10 8  
3 6 5 7  
1 3 1 6
```

輸出範例 2

```
23
```

範例說明

在範例 1 中，我們可以選擇左下角在 $(1, 2)$ 、右上角在 $(3, 5)$ 的長方形讓小明探索，如此就能完整的搜尋完可疑區域 1 和 3，因為長方形的面積是 12，效益值即為 $2 \times 7 - 12 = 2$ 。

在範例 2 中，我們可以選擇左下角在 $(1, 3)$ 、右上角在 $(5, 7)$ 的長方形讓小明探索，如此就能完整的搜尋完可疑區域 2、4 和 5，因為長方形的面積是 25，效益值即為 $3 \times 16 - 25 = 23$ 。

5_Benefit Evaluation

(15 points)

Time Limit: 1 second

Memory Limit: 256 MB

Statement

As an adventurer, Xiao Ming enjoys the process of exploration and the rewards he can gain from it. Today, he arrives at a vast land filled with treasures. This land can be viewed as a $10^4 \times 10^4$ grid. Through the analysis by his partner Xiao Yi, there are N suspicious regions on this land. Each suspicious region forms a rectangle. For each suspicious region, if Xiao Ming can search through it from start to finish, he will obtain treasures worth C .

However, Xiao Ming is a simple person, and asking him to search each suspicious region separately is too complex. Therefore, Xiao Yi decides to assign a **single rectangle region** for Xiao Ming to focus on. However, if the selected region is too large, it will cause Xiao Ming to work excessively. Thus, Xiao Yi hopes to select a region that is not too large.

Therefore, Xiao Yi seeks the help of an algorithm expert like you. Can you evaluate the best rectangle region for him? The evaluation is based on the following formula: "The number of suspicious regions completely contained within the selected rectangle multiplied by C ", minus "the area of the selected rectangle." The goal is to maximize this evaluation value. Note that not selecting any rectangle is also an option, resulting in an evaluation value of 0.

Input Format

The first line contains two positive integers N and C , representing the total number of suspicious regions and the value Xiao Ming obtains after fully searching a region, respectively.

Next, there are N lines, each containing four positive integers d_i, l_i, u_i, r_i . These integers represent the bottom-left coordinates (d_i, l_i) and top-right coordinates (u_i, r_i) of the i -th suspicious region forming a rectangle.

Output Format

Output the maximum evaluation value under the best selection.

Constraints

- $1 \leq N \leq 100$
- $1 \leq C \leq 10^7$
- $1 \leq d_i \leq u_i \leq 10^4$
- $1 \leq l_i \leq r_i \leq 10^4$

Test Cases

Input 1

```
3 7
1 2 3 3
4 1 5 3
1 4 3 5
```

Output 1

```
2
```

Input 2

```
5 16
6 1 8 2
6 3 10 8
3 6 5 7
2 5 3 6
1 3 1 6
```

Output 2

```
23
```

Illustrations

In Example 1, we can select a rectangle with the bottom-left corner at $(1, 2)$ and the top-right corner at $(3, 5)$ for Xiao Ming to search. This will allow him to fully search suspicious regions 1 and 3. The area of the rectangle is 12, and the evaluation value is $2 \times 7 - 12 = 2$.

In Example 2, we can select a rectangle with the bottom-left corner at $(1, 3)$ and the top-right corner at $(5, 7)$ for Xiao Ming to search. This will allow him to fully search suspicious regions 2, 4, and 5. The area of the rectangle is 25, and the evaluation value is $3 \times 16 - 25 = 23$.

6_涼與雜草 (Ryo and Weed)

(20分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述



波奇的院子有 N 根雜草排成一列，雜草的高度由左到右為 a_1, a_2, \dots, a_N 。

涼最近因為買了太多貝斯所以沒錢了，之後的幾天只好餐餐吃草，而她特別喜歡波奇家院子裡的雜草。

涼在接下來的這幾天會依序進行 Q 個操作，操作分成以下三種：

- $f\ l\ r\ x$ ：涼跑到波奇的院子吃了一些雜草，對於所有 $l \leq i \leq r$ ， a_i 會變成 $\lfloor \frac{a_i}{x} \rfloor$ 。
- $c\ l\ r\ x$ ：涼跑到波奇的院子吃了一些雜草，對於所有 $l \leq i \leq r$ ， a_i 會變成 $\lceil \frac{a_i}{x} \rceil$ 。
- $?\ k$ ：涼想知道波奇院子裡從左數來第 k 根雜草的高度，換句話說，她想知道 a_k 此時是多少。

因為波奇這幾天社恐症又双叢發作了，所以她請你在涼希望知道院子裡某個雜草的高度時，代替自己告訴涼。

註： $\lfloor x \rfloor$ 代表不超過 x 的最大整數， $\lceil x \rceil$ 代表不低於 x 的最小整數。

輸入格式

第一行輸入兩個正整數 N, Q 。

第二行輸入 N 個正整數 a_1, a_2, \dots, a_N 。

接下輸入 Q 行，其中第 i 行輸入第 i 個動作 op ， op 有以下三種：

- $f\ l\ r\ x$ ，其中 l, r, x 為正整數
- $c\ l\ r\ x$ ，其中 l, r, x 為正整數
- $?\ k$ ，其中 k 為正整數

動作的意義如題敘所述。

輸出格式

對於每個形如 $? k$ 的動作輸出一行，在這行輸出當下 a_k 的值。

資料範圍

- $1 \leq N \leq 2 \cdot 10^5$
- $1 \leq Q \leq 2 \cdot 10^5$
- $1 \leq a_i \leq 10^9$
- 對於所有 **f** 和 **c** 操作， $1 \leq l \leq r \leq N$
- 對於所有 **f** 和 **c** 操作， $1 \leq x \leq 10^9$
- 對於所有 **?** 操作， $1 \leq k \leq N$

測試範例

輸入範例 1

```
5 9
4 5 5 10 49
f 2 4 2
? 2
? 4
c 3 5 4
? 3
? 4
? 5
f 1 5 45510
? 1
```

輸出範例 1

```
2
5
1
2
13
0
```

範例說明

每次動作後，雜草的高度變化或輸出如下：

1. $[4, 5, 5, 10, 49] \rightarrow [4, 2, 2, 5, 49]$

2. 輸出 $a_2 = 2$
3. 輸出 $a_4 = 5$
4. $[4, 2, 2, 5, 49] \rightarrow [4, 2, 1, 2, 13]$
5. 輸出 $a_3 = 1$
6. 輸出 $a_4 = 2$
7. 輸出 $a_5 = 13$
8. $[4, 2, 1, 2, 13] \rightarrow [0, 0, 0, 0, 0]$
9. 輸出 $a_1 = 0$

6_Ryo and Weed

(20 points)

Time Limit: 1 second

Memory Limit: 256MB

Statement



Bocchi's backyard has N weeds. The heights of weeds from left to right are a_1, a_2, \dots, a_N .

Ryo ran out of money after buying too much bass, so she has to eat each grass from now on. She especially likes the weeds in Bocchi's backyard.

Ryo will perform Q operations for the next few days. There are three types of operations:

- $f\ l\ r\ x$: Ryo goes to Bocchi's backyard to eat some grass. For all $l \leq i \leq r$, a_i becomes $\lfloor \frac{a_i}{x} \rfloor$.
- $c\ l\ r\ x$: Ryo goes to Bocchi's backyard to eat some grass. For all $l \leq i \leq r$, a_i becomes $\lceil \frac{a_i}{x} \rceil$.
- $?\ k$: Ryo wants to know the height of the k -th weed from the left. In other words, she wants to know the current value of a_k .

Because Bocchi's social anxiety is giving her a panic attack for the 8-th time, so she asks you to help her tell Ryo the heights of weeds in her backyard whenever Ryo needs them.

Note: $\lfloor x \rfloor$ is the largest integer that is not larger than x . $\lceil x \rceil$ is the smallest integer that is not smaller than x .

Input Format

The first line of input contains two positive integers N, Q .

The second line of input contains N positive integers a_1, a_2, \dots, a_N .

Then there are Q lines, in the i -th line, input the i -th operation op . Each op is one of the following types:

- $f\ l\ r\ x$, where l, r, x are positive integers.
- $c\ l\ r\ x$, where l, r, x are positive integers.
- $?\ k$, where k is a positive integer.

The meanings of each operation is defined in the statement.

Output Format

For each $?\ k$ operation, output one line containing one integer, representing the value a_k at that moment.

Constraints

- $1 \leq N \leq 2 \cdot 10^5$
- $1 \leq Q \leq 2 \cdot 10^5$
- $1 \leq a_i \leq 10^9$
- For all f and c operations, $1 \leq l \leq r \leq N$
- For all f and c operations, $1 \leq x \leq 10^9$
- For all $?$ operations, $1 \leq k \leq N$

Test Cases

Input 1

```
5 9
4 5 5 10 49
f 2 4 2
? 2
? 4
c 3 5 4
? 3
? 4
? 5
f 1 5 45510
? 1
```

Output 1

```
2
5
1
2
13
0
```

Illustrations

Here are the heights of weeds and/or the output after each operation:

1. $[4, 5, 5, 10, 49] \rightarrow [4, 2, 2, 5, 49]$
2. Output $a_2 = 2$
3. Output $a_4 = 5$
4. $[4, 2, 2, 5, 49] \rightarrow [4, 2, 1, 2, 13]$
5. Output $a_3 = 1$
6. Output $a_4 = 2$
7. Output $a_5 = 13$
8. $[4, 2, 1, 2, 13] \rightarrow [0, 0, 0, 0, 0]$
9. Output $a_1 = 0$