Q1 Multi-capacity classroom booking

Description

The school has two departments, the Computer Science Department and the Art Center, which need to arrange suitable classrooms for different types of courses. The **Computer Science Department** offers **theory and lab classes**, each with **specific capacity** requirements. The **Art Center**, on the other hand, arranges **only art classes**. Each department provides its list of courses and corresponding capacity requirements. To ensure quality teaching, each course should be held in a classroom that matches its category and has sufficient capacity. The goal is to schedule appropriate classrooms for all departmental courses. **Output "No" if it is not possible to arrange a suitable classroom for each course, or "Yes" if a classroom has been arranged for every class in every department.**

Assumed Conditions:

- Classes are **scheduled in one time slot only**, without regard to a full day schedule.
- The classroom type must **match** the course type.
- The classroom capacity is **not less than** the course capacity requirement.
- The number of classrooms of the same type may **vary** or **same**.

Due to a bug in the system, the data storage has been **messed up**, and **the classroom information and course information have been mixed together**, but the good thing is that for the classroom information, there is an R as the identifier, and for the course information, there is a C as the identifier, and you are now required to **differentiate and organize the data first.**

Input

In each case, The first line contains an number ${\bf n}$ ($1 \le n \le 100$), represent ${\bf n}$ line mixed up data.

The next n rows, each represents a course or room information split by ,.

- The first element marks whether it is course information or classroom information.
- The second element represents the course or classroom type, this element does not contain spaces.
- The third element represents the maximum classroom capacity or course capacity ($1 \leq num \leq 200$).

Output

No if it is not possible to arrange a suitable classroom for each course.

Yes if a classroom has been arranged for every class in every department.

Samples

Input1

```
7
R,theory,100
R,lab,50
C,theory,100
R,lab,60
C,lab,60
R,art,70
C,art,60
```

Output1

```
Yes
```

Input2

```
10
R,theory,150
R,lab,50
C,theory,100
R,lab,60
C,lab,50
R,art,30
C,art,40
C,art,30
R,theory,80
C,lab,60
```

Output2

```
No
```

Explanation

In this case, there are 1 theory room with capacity 150 and 1 theory class with 100 course capacity requirement. So the classroom capacity satisfies the course capacity requirement. However, there is only 1 art room with capacity 30 and 1 art class with 40 course capacity requirement. For this class, there are no appropriate room. So the answer is No.

Q2 String Addition

Description

Given a string composed of digits and a number k, divide the string into multiple parts each with a length of k, as well as a remaining part smaller than k. Reverse these parts and calculate the sum of these reversed parts.

For example, string is 12345678 and k is 3. The string will be divided into 123, 456, 78. Reverse them, we get 321, 654, 87. Plus 321+654+87, the answer is 1062.

Input

One line a string s composed of digits and integer k, separated by space. For all test cases, 1 <= s.length <= 100, 2 <= k <= 15.

Output

Print the sum.

Samples

Input1

1234567 2

Output1

136

Explanation

1234567 => 12, 34, 56, 7 => 21, 43, 65, 7 => 21+43+65+7 => 136

Input2

123345 3

Output2

864

Explanation

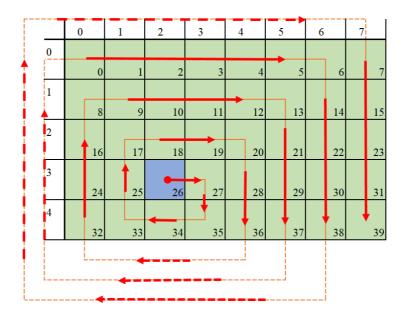
123345 => 123, 345 => 321, 543 => 321+543 => 864

Q3 Cyclone

Description

In a rectangle island where cyclones frequently occur, the island's king has divided the island into many grids, assigning each one a **distinct** number. Every cyclone always follow a fixed rotational path. Now, we need to tell the king the number of the kth grid that the cyclone will pass through.

As shown in the figure below, the green area represents the island, while the white areas represent non-island regions. And the cyclone is set to travel along the red arrow path starting from a given grid, potentially passing through both island and non-island regions. In this figure, grid with number 26 is the 0 th grid, and grid with number 32 is the 12 th grid. Only the green grids are counted towards the total number of grids passed through by the cyclone.



Input

The input consists of several lines.

The first line contains two integers, m and n (where $1 \le m, n \le 100$), representing the size of the island. m indicates the number of rows and n represents the number of columns.

Next there are m lines of input data, each consisting of n integers separated by spaces. These integers denote the numbers of the girds at corresponding positions in that row.

Finally, there are two more integers: Start and k ($0 \le k < m \times n$), which respectively denote the number of the starting grid for the cyclone and the value of k as mentioned in the problem statement.

We guarantee that the number represented by start appears somewhere within the islands.

Output

Please output the number in the kth grid that the cyclone passes through.

Samples

Input

```
5 8
0 1 2 3 4 5 6 7
8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31
32 33 34 35 36 37 38 39
26 5
```

output

```
25
```

Input

```
3 4
6 9 3 5
12 15 19 23
3 7 16 18
19 10
```

output

12