A. Diverse Team

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

There are n students in a school class, the rating of the i-th student on Codehorses is a_i. You have to form a team consisting of k students ($1 \le k \le n$) such that the ratings of all team members **are distinct**.

If it is impossible to form a suitable team, print "NO" (without quotes). Otherwise print "YES", and then print k distinct numbers which should be the indices of students in the team you form. If there are multiple answers, print any of them.

Input

The first line contains two integers n and k ($1 \le k \le n \le 100$) — the number of students and the size of the team you have to form.

The second line contains n integers $a_1, a_2, \dots, a_n$ ($1 \le a_i \le 100$), where a_i is the rating of i-th student.

Output

If it is impossible to form a suitable team, print "NO" (without quotes). Otherwise print "YES", and then print k distinct integers from 1 to n which should be the indices of students in the team you form. All the ratings of the students in the team should be distinct. You may print the indices in any order. If there are multiple answers, print any of them.

Assume that the students are numbered from 1 to n.

Examples

input Copy

```
5 3
15 13 15 15 12
```

output Copy

```
YES
1 2 5
```

input Copy

```
5 4
15 13 15 15 12
```

output Copy

```
NO
```

input Copy

```
4 4
20 10 40 30
```

output Copy

```
YES
1 2 3 4
```

Note

All possible answers for the first example:

- {1 2 5}
- {2 3 5}
- {2 4 5}

Note that the order does not matter.

B. Bear and Game

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

Bear Limak likes watching sports on TV. He is going to watch a game today. The game lasts 90 minutes and there are no breaks.

Each minute can be either interesting or boring. If 15 consecutive minutes are boring then Limak immediately turns TV off.

You know that there will be n interesting minutes $t_1, t_2, ..., t_n$. Your task is to calculate for how many minutes Limak will watch the game.

Input

The first line of the input contains one integer n $(1 \le n \le 90)$ — the number of interesting minutes.

The second line contains n integers $t_1, t_2, ..., t_n$ $(1 \le t_1 < t_2 < ... t_n \le 90)$, given in the increasing order.

Output

Print the number of minutes Limak will watch the game.

Examples

input

```
3
7 20 88
```

output

```
35
```

input

```
9
16 20 30 40 50 60 70 80 90
```

output

```
15
```

input

```
9
15 20 30 40 50 60 70 80 90
```

output

```
90
```

Note

In the first sample, minutes $21, 22, ..., 35$ are all boring and thus Limak will turn TV off immediately after the 35-th minute. So, he would watch the game for 35 minutes.

In the second sample, the first 15 minutes are boring.

In the third sample, there are no consecutive 15 boring minutes. So, Limak will watch the whole game.

C. Adding Two Integers

time limit per test: 1.0 s

memory limit per test: 256 MB

input: standard input

output: standard output

Given two integers (a and b), get their sum:

$$a + b$$

Input

There will be one line with two integers given, a and b, separated by spaces.

Output

You should return the integer sum of a and b, sum.

Examples

input Copy

```
5 9
```

output Copy

```
14
```

input Copy

```
50 -26
```

output Copy

```
24
```

Note

Constraints:

$-1,000,000,000 \leq a \leq 1,000,000,000$

$-1,000,000,000 \leq b \leq 1,000,000,000$

$-2,000,000,000 \leq sum \leq 2,000,000,000$

D. Racetrack

time limit per test: 1.0 s

memory limit per test: 64 MB

input: standard input

output: standard output

Alice and Bob play different games. When Alice plays, she always wins exactly a points. When Bob plays, he always wins exactly b points.

Today, after they finished playing, they noticed they had the same number of points. What is the smallest number this could be?

Input

The first line contains two integers, a and b, separated by spaces, where a is the number of points Alice wins in one game and b is the number of points Bob wins in one game.

Output

You should return the smallest possible number of points that Alice and Bob have, which should be an integer c.

Examples

input Copy

```
2 3
```

output Copy

```
6
```

input Copy

```
4 6
```

output Copy

```
12
```

Note

Constraints:

$$1 \leq a \leq 10,000$$

$$1 \leq b \leq 10,000$$

$$1 \leq c \leq 100,000,000$$

E. Elephant

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

An elephant decided to visit his friend. It turned out that the elephant's house is located at point 0 and his friend's house is located at point $x (x > 0)$ of the coordinate line. In one step the elephant can move 1, 2, 3, 4 or 5 positions forward. Determine, what is the minimum number of steps he need to make in order to get to his friend's house.

Input

The first line of the input contains an integer x $(1 \le x \le 1\ 000\ 000)$ — The coordinate of the friend's house.

Output

Print the minimum number of steps that elephant needs to make to get from point 0 to point x.

Examples

input

```
5
```

output

```
1
```

input

```
12
```

output

```
3
```

Note

In the first sample the elephant needs to make one step of length 5 to reach the point x.

In the second sample the elephant can get to point x if he moves by 3, 5 and 4. There are other ways to get the optimal answer but the elephant cannot reach x in less than three moves.

F. Vasya and Book

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

Vasya is reading a e-book. The file of the book consists of n pages, numbered from 1 to n. The screen is currently displaying the contents of page x, and Vasya wants to read the page y. There are two buttons on the book which allow Vasya to scroll d pages forwards or backwards (but he cannot scroll outside the book). For example, if the book consists of 10 pages, and $d = 3$, then from the first page Vasya can scroll to the first or to the fourth page by pressing one of the buttons; from the second page — to the first or to the fifth; from the sixth page — to the third or to the ninth; from the eighth — to the fifth or to the tenth.

Help Vasya to calculate the minimum number of times he needs to press a button to move to page y.

Input

The first line contains one integer t ($1 \leq t \leq 10^3$) — the number of testcases.

Each testcase is denoted by a line containing four integers n, x, y, d ($1 \leq n, d \leq 10^9$, $1 \leq x, y \leq n$) — the number of pages, the starting page, the desired page, and the number of pages scrolled by pressing one button, respectively.

Output

Print one line for each test.

If Vasya can move from page x to page y, print the minimum number of times he needs to press a button to do it. Otherwise print -1.

Example

input

```
3
10 4 5 2
5 1 3 4
20 4 19 3
```

output

```
4
-1
5
```

Note

In the first test case the optimal sequence is: $4 \to 2 \to 1 \to 3 \to 5$.

In the second test case it is possible to get to pages 1 and 5.

In the third test case the optimal sequence is: $4 \to 7 \to 10 \to 13 \to 16 \to 19$.

G. Vova and Trophies

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

Vova has won n trophies in different competitions. Each trophy is either golden or silver. The trophies are arranged in a row.

The *beauty* of the arrangement is the length of the longest subsegment consisting of golden trophies. Vova wants to swap two trophies (not necessarily adjacent ones) to make the arrangement as beautiful as possible — that means, to maximize the length of the longest such subsegment.

Help Vova! Tell him the maximum possible beauty of the arrangement if he is allowed to do at most one swap.

Input

The first line contains one integer n ($2 \le n \le 10^5$) — the number of trophies.

The second line contains n characters, each of them is either G or S. If the i-th character is G, then the i-th trophy is a golden one, otherwise it's a silver trophy.

Output

Print the maximum possible length of a subsegment of golden trophies, if Vova is allowed to do at most one swap.

Examples

input Copy

```
10
GGGSGGGSGG
```

output Copy

```
7
```

input Copy

```
4
GGGG
```

output Copy

```
4
```

input Copy

```
3
SSS
```

output Copy

```
0
```

Note

In the first example Vova has to swap trophies with indices 4 and 10. Thus he will obtain the sequence "`GGGGGGGSGS`", the length of the longest subsegment of golden trophies is 7.

In the second example Vova can make no swaps at all. The length of the longest subsegment of golden trophies in the sequence is 4.

In the third example Vova cannot do anything to make the length of the longest subsegment of golden trophies in the sequence greater than 0.

H. Multi-Subject Competition

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

A multi-subject competition is coming! The competition has m different subjects participants can choose from. That's why Alex (the coach) should form a competition delegation among his students.

He has n candidates. For the i-th person he knows subject s_i the candidate specializes in and r_i — a skill level in his specialization (this level can be negative!).

The rules of the competition require each delegation to choose some subset of subjects they will participate in. The only restriction is that the **number of students from the team** participating in each of the **chosen** subjects should be the **same**.

Alex decided that each candidate would participate only in the subject he specializes in. Now Alex wonders whom he has to choose to maximize the total sum of skill levels of all delegates, or just skip the competition this year if every valid non-empty delegation has negative sum.

(Of course, Alex doesn't have any spare money so each delegate he chooses must participate in the competition).

Input

The first line contains two integers n and m ($1 \le n \le 10^5$, $1 \le m \le 10^5$) — the number of candidates and the number of subjects.

The next n lines contains two integers per line: s_i and r_i ($1 \le s_i \le m$, $-10^4 \le r_i \le 10^4$) — the subject of specialization and the skill level of the i-th candidate.

Output

Print the single integer — the maximum total sum of skills of delegates who form a valid delegation (according to rules above) or 0 if every valid non-empty delegation has negative sum.

Examples

input Copy

```
6 3
2 6
3 6
2 5
3 5
1 9
3 1
```

output Copy

```
22
```

input Copy

```
5 3
2 6
```

```
3 6
2 5
3 5
1 11
```

output

```
23
```

input

```
5 2
1 -1
1 -5
2 -1
2 -1
1 -10
```

output

```
0
```

Note

In the first example it's optimal to choose candidates 1, 2, 3, 4, so two of them specialize in the 2-nd subject and other two in the 3-rd. The total sum is $6 + 6 + 5 + 5 = 22$.

In the second example it's optimal to choose candidates 1, 2 and 5. One person in each subject and the total sum is $6 + 6 + 11 = 23$.

In the third example it's impossible to obtain a non-negative sum.