acmASCIS Contest#3

A. Qualification Round

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

"Contestant who earns a score equal to or greater than the k^{th} place finisher's score will advance to the next round, as long as the contestant earns a positive score..." — an excerpt from contest rules.

A total of n participants took part in the contest ($n \geq k$), and you already know their scores. Calculate how many participants will advance to the next round.

Input

The first line of the input contains two integers n and k ($1 \leq k \leq n \leq 50$) separated by a single space.

The second line contains n space-separated integers $a_1, a_2, ..., a_n$ ($0 \leq a_i \leq 100$), where a_i is the score earned by the participant who got the i^{th} place. The given sequence is non-increasing (that is, for all i from 1 to $n - 1$ the following condition is fulfilled: $a_i \geq a_i + 1$).

Output

Output the number of participants who advance to the next round.

Sample test(s)

input

```
8 5
10 9 8 7 7 7 5 5
```

output

```
6
```

B. Even Odds

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

Being a nonconformist, Volodya is displeased with the current state of things, particularly with the order of natural numbers (natural number is positive integer number). He is determined to rearrange them. But there are too many natural numbers, so Volodya decided to start with the first n. He writes down the following sequence of numbers: firstly all odd integers from 1 to n (in ascending order), then all even integers from 1 to n (also in ascending order). Help our hero to find out which number will stand at the position number k.

Input

The only line of input contains integers n and k ($1 \le k \le n \le 10^{12}$).

Output

Print the number that will stand at the position number k after Volodya's manipulations.

Sample test(s)

input
10 3
output
5

input
7 1
output
1

Note

In the first sample Volodya's sequence will look like this: {1, 3, 5, 7, 9, 2, 4, 6, 8, 10}. The third place in the sequence is therefore occupied by the number 5.

C. Queue at the School

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

During the break the schoolchildren, boys and girls, formed a queue of n people in the canteen. Initially the children stood in the order they entered the canteen. However, after a while the boys started feeling awkward for standing in front of the girls in the queue and they started letting the girls move forward each second.

Let's describe the process more precisely. Let's say that the positions in the queue are sequentially numbered by integers from 1 to n, at that the person in the position number 1 is served first. Then, if at time x a boy stands on the i^{th} position and a girl stands on the $(i+1)^{th}$ position, then at time $x+1$ the i^{th} position will have a girl and the $(i+1)^{th}$ position will have a boy. The time is given in seconds.

You've got the initial position of the children, at the initial moment of time. Determine the way the queue is going to look after t seconds.

Input

The first line contains two integers n and t ($1 \le n, t \le 50$), which represent the number of children in the queue and the time after which the queue will transform into the arrangement you need to find.

The next line contains string s, which represents the schoolchildren's initial arrangement. If the i^{th} position in the queue contains a boy, then the i^{th} character of string s equals "B", otherwise the i^{th} character equals "G".

Output

Print string a, which describes the arrangement after t seconds. If the i^{th} position has a boy after the needed time, then the i^{th} character must equal "B", otherwise it must equal "G".

Sample test(s)

input

```
5 1
BGGBG
```

output

```
GBGGB
```

input

```
5 2
BGGBG
```

output

```
GGBGB
```

D. Theatre Square

time limit per test: 2 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

Theatre Square in the capital city of Berland has a rectangular shape with the size $n \times m$ meters. On the occasion of the city's anniversary, a decision was taken to pave the Square with square granite flagstones. Each flagstone is of the size $a \times a$.

What is the least number of flagstones needed to pave the Square? It's allowed to cover the surface larger than the Theatre Square, but the Square has to be covered. It's not allowed to break the flagstones. The sides of flagstones should be parallel to the sides of the Square.

Input

The input contains three positive integer numbers in the first line: n, m and a ($1 \le n, m, a \le 10^9$).

Output

Write the needed number of flagstones.

Sample test(s)

input
6 6 4
output
4

E. Almost Prime

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

A number is called almost prime if it has exactly two distinct prime divisors. For example, numbers 6, 18, 24 are almost prime, while 4, 8, 9, 42 are not. Find the amount of almost prime numbers which are between 1 and n, inclusive.

Input

Input contains one integer number n ($1 \le n \le 3000$).

Output

Output the amount of almost prime numbers between 1 and n, inclusive.

Sample test(s)

input

```
10
```

output

```
2
```

input

```
40
```

output

```
19
```

F. Puzzles

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

The end of the school year is near and Ms. Manana, the teacher, will soon have to say goodbye to a yet another class. She decided to prepare a goodbye present for her n students and give each of them a jigsaw puzzle (which, as wikipedia states, is a tiling puzzle that requires the assembly of numerous small, often oddly shaped, interlocking and tessellating pieces).

The shop assistant told the teacher that there are m puzzles in the shop, but they might differ in difficulty and size. Specifically, the first jigsaw puzzle consists of f_1 pieces, the second one consists of f_2 pieces and so on.

Ms. Manana doesn't want to upset the children, so she decided that the difference between the numbers of pieces in her presents must be as small as possible. Let A be the number of pieces in the largest puzzle that the teacher buys and B be the number of pieces in the smallest such puzzle. She wants to choose such n puzzles that $A - B$ is as small as possible. Help the teacher and find the least possible value of $A - B$.

Input

The first line contains space-separated integers n and m ($2 \le n \le m \le 50$). The second line contains m space-separated integers $f_1, f_2, ..., f_m$ ($4 \le f_i \le 1000$) — the quantities of pieces in the puzzles sold in the shop.

Output

Print a single integer — the least possible difference the teacher can obtain.

Sample test(s)

input

```
4 6
10 12 10 7 5 22
```

output

```
5
```

G. Nuts

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

You have a nuts and lots of boxes. The boxes have a wonderful feature: if you put x ($x \geq 0$) divisors (the spacial bars that can divide a box) to it, you get a box, divided into $x + 1$ sections.

You are minimalist. Therefore, on the one hand, you are against dividing some box into more than k sections. On the other hand, you are against putting more than v nuts into some section of the box. What is the minimum number of boxes you have to use if you want to put all the nuts in boxes, and you have b divisors?

Please note that you need to minimize the number of used boxes, not sections. You do not have to minimize the number of used divisors.

Input

The first line contains four space-separated integers k, a, b, v ($2 \leq k \leq 1000$; $1 \leq a, b, v \leq 1000$) — the maximum number of sections in the box, the number of nuts, the number of divisors and the capacity of each section of the box.

Output

Print a single integer — the answer to the problem.

Sample test(s)

input

```
3 10 3 3
```

output

```
2
```

input

```
3 10 1 3
```

output

```
3
```

Note

In the first sample you can act like this:

Put two divisors to the first box. Now the first box has three sections and we can put three nuts into each section. Overall, the first box will have nine nuts. Do not put any divisors into the second box. Thus, the second box has one section for the last nut. In the end we've put all the ten nuts into boxes.

H. Flag

time limit per test: 1 second
memory limit per test: 64 megabytes
input: standard input
output: standard output

According to a new ISO standard, a flag of every country should have a chequered field $n \times m$, each square should be of one of 10 colours, and the flag should be «striped»: each horizontal row of the flag should contain squares of the same colour, and the colours of adjacent horizontal rows should be different. Berland's government asked you to find out whether their flag meets the new ISO standard.

Input

The first line of the input contains numbers n and m ($1 \le n, m \le 100$), n — the amount of rows, m — the amount of columns on the flag of Berland. Then there follows the description of the flag: each of the following n lines contain m characters. Each character is a digit between 0 and 9, and stands for the colour of the corresponding square.

Output

Output "YES", if the flag meets the new ISO standard, and "NO" otherwise.

Sample test(s)

input

```
3 3
000
111
222
```

output

```
YES
```

input

```
3 3
000
000
111
```

output

```
NO
```