A. Cookies

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

Olga came to visit the twins Anna and Maria and saw that they have many cookies. The cookies are distributed into bags. As there are many cookies, Olga decided that it's no big deal if she steals a bag. However, she doesn't want the sisters to quarrel because of nothing when they divide the cookies. That's why Olga wants to steal a bag with cookies so that the number of cookies in the remaining bags was even, that is, so that Anna and Maria could evenly divide it into two (even 0 remaining cookies will do, just as any other even number). How many ways there are to steal exactly one cookie bag so that the total number of cookies in the remaining bags was even?

Input

The first line contains the only integer n $(1 \le n \le 100)$ — the number of cookie bags Anna and Maria have. The second line contains n integers a_i $(1 \le a_i \le 100)$ — the number of cookies in the i-th bag.

Output

Print in the only line the only number — the sought number of ways. If there are no such ways print 0.

Sample test(s)

input

```
1
1
```

output

```
1
```

input

```
10
1 2 2 3 4 4 4 2 2 2
```

output

```
8
```

input

```
11
2 2 2 2 2 2 2 2 2 2 99
```

output

```
1
```

Note

In the first sample Olga should take the only bag so that the twins ended up with the even number of cookies.

In the second sample Olga can take any of five bags with two cookies or any of three bags with four cookies — $5 + 3 = 8$ ways in total.

In the third sample, no matter which bag with two cookies Olga chooses, the twins are left with $2 * 9 + 99 = 117$ cookies. Thus, Olga has only one option: to take the bag with 99 cookies.

B. Students and Shoelaces

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

Anna and Maria are in charge of the math club for junior students. When the club gathers together, the students behave badly. They've brought lots of shoe laces to the club and got tied with each other. Specifically, each string ties together two students. Besides, if two students are tied, then the lace connects the first student with the second one as well as the second student with the first one.

To restore order, Anna and Maria do the following. First, for each student Anna finds out what other students he is tied to. If a student is tied to exactly one other student, Anna reprimands him. Then Maria gathers in a single group **all** the students who have been just reprimanded. She kicks them out from the club. This group of students immediately leaves the club. These students takes with them the laces that used to tie them. Then again for every student Anna finds out how many other students he is tied to and so on. And they do so until Anna can reprimand at least one student.

Determine how many groups of students will be kicked out of the club.

Input

The first line contains two integers n and m — the initial number of students and laces ($1 \le n \le 100, 0 \le m \le \frac{n(n-1)}{2}$). The students are numbered from 1 to n, and the laces are numbered from 1 to m. Next m lines each contain two integers a and b — the numbers of students tied by the i-th lace ($1 \le a, b \le n, a \ne b$). It is guaranteed that no two students are tied with more than one lace. No lace ties a student to himself.

Output

Print the single number — the number of groups of students that will be kicked out from the club.

Sample test(s)

input

```
3 3
1 2
2 3
3 1
```

output

```
0
```

input

```
6 3
1 2
2 3
3 4
```

output

```
2
```

input

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

output

```
1
```

Note

In the first sample Anna and Maria won't kick out any group of students — in the initial position every student is tied to two other students and Anna won't be able to reprimand anyone.

In the second sample four students are tied in a chain and two more are running by themselves. First Anna and Maria kick out the two students from both ends of the chain (1 and 4), then — two other students from the chain (2 and 3). At that the students who are running by themselves will stay in the club.

In the third sample Anna and Maria will momentarily kick out all students except for the fourth one and the process stops at that point. The correct answer is one.

C. Statues

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

In this task Anna and Maria play a game with a very unpleasant rival. Anna and Maria are in the opposite squares of a chessboard (8×8): Anna is in the upper right corner, and Maria is in the lower left one. Apart from them, the board has several statues. Each statue occupies exactly one square. A square that contains a statue cannot have anything or anyone — neither any other statues, nor Anna, nor Maria.

Anna is present on the board as a figurant (she stands still and never moves), and Maria has been actively involved in the game. Her goal is — to come to Anna's square. Maria and statues move in turn, Maria moves first. During one move Maria can go to any adjacent on the side or diagonal cell in which there is no statue, or she can stay in the cell where she is. The statues during their move must go one square down simultaneously, and those statues that were in the bottom row fall from the board and are no longer appeared.

At that moment, when one of the statues is in the cell in which the Maria is, the statues are declared winners. At the moment when Maria comes into the cell where Anna has been waiting, Maria is declared the winner.

Obviously, nothing depends on the statues, so it all depends on Maria. Determine who will win, if Maria does not make a strategic error.

Input

You are given the 8 strings whose length equals 8, describing the initial position on the board. The first line represents the top row of the board, the next one — for the second from the top, and so on, the last line represents the bottom row. Each character string matches a single cell board in the appropriate row, and the characters are in the same manner as that of the corresponding cell. If the cell is empty, the corresponding character is "`.`". If a cell has Maria, then it is represented by character "`M`". If a cell has Anna, it is represented by the character "`A`". If a cell has a statue, then the cell is represented by character "`S`".

It is guaranteed that the last character of the first row is always "`A`", the first character of the last line is always "`M`". The remaining characters are "`.`" or "`S`".

Output

If Maria wins, print string "`WIN`". If the statues win, print string "`LOSE`".

Sample test(s)

input

```
.......A
........
........
........
........
........
........
M.......
```

output

```
WIN
```

input

```
.......A
........
........
........
........
........
SS......
M.......
```

output

```
LOSE
```

input

```
.......A
........
........
........
........
.S......
S.......
MS......
```

output

```
LOSE
```

D. String

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

One day in the IT lesson Anna and Maria learned about the lexicographic order.

String x is lexicographically less than string y, if either x is a prefix of y (and $x \neq y$), or there exists such i ($1 \leq i \leq min(|x|, |y|)$), that $x_i < y_i$, and for any j ($1 \leq j < i$) $x_j = y_j$. Here $|a|$ denotes the length of the string a. The lexicographic comparison of strings is implemented by operator < in modern programming languages .

The teacher gave Anna and Maria homework. She gave them a string of length n. They should write out all substrings of the given string, including the whole initial string, and the equal substrings (for example, one should write out the following substrings from the string "aab": "a", "a", "aa", "ab", "aab", "b"). The resulting strings should be sorted in the lexicographical order. The cunning teacher doesn't want to check all these strings. That's why she said to find only the k-th string from the list. Help Anna and Maria do the homework.

Input

The first line contains a non-empty string that only consists of small Latin letters ("a"-"z"), whose length does not exceed 10^5. The second line contains the only integer k ($1 \leq k \leq 10^5$).

Output

Print the string Anna and Maria need — the k-th (in the lexicographical order) substring of the given string. If the total number of substrings is less than k, print a string saying "No such line." (without the quotes).

Sample test(s)

input

```
aa
2
```

output

```
a
```

input

```
abc
5
```

output

```
bc
```

input

```
abab
7
```

output

```
b
```

Note

In the second sample before string "bc" follow strings "a", "ab", "abc", "b".

E. Games with Rectangle

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

In this task Anna and Maria play the following game. Initially they have a checkered piece of paper with a painted $n \times m$ rectangle (only the border, no filling). Anna and Maria move in turns and Anna starts. During each move one should paint inside the last-painted rectangle a new lesser rectangle (along the grid lines). The new rectangle should have no common points with the previous one. Note that when we paint a rectangle, we always paint only the border, the rectangles aren't filled.

Nobody wins the game — Anna and Maria simply play until they have done k moves in total. Count the number of different ways to play this game.

Input

The first and only line contains three integers: n, m, k ($1 \le n, m, k \le 1000$).

Output

Print the single number — the number of the ways to play the game. As this number can be very big, print the value modulo 1000000007 ($10^9 + 7$).

Sample test(s)

input
```
3 3 1
```
output
```
1
```

input
```
4 4 1
```
output
```
9
```

input
```
6 7 2
```
output
```
75
```

Note

Two ways to play the game are considered different if the final pictures are different. In other words, if one way contains a rectangle that is not contained in the other way.

In the first sample Anna, who performs her first and only move, has only one possible action plan — insert a 1×1 square inside the given 3×3 square.

In the second sample Anna has as much as 9 variants: 4 ways to paint a 1×1 square, 2 ways to insert a 1×2 rectangle vertically, 2 more ways to insert it horizontally and one more way is to insert a 2×2 square.