Matching Bins

There is a large number of empty bins in a factory depot. The bins are arranged in a single row. The manager of the depot wants to put some bins into other bins to make some free space in the left end of the depot. Bins can be moved by a robot, which can take a bin, carry it to the right, and put it into a larger bin. This three-operation sequence is the only allowed way to move bins.

Because of safety regulations, any bin can contain at most one other bin, which must be empty. The manager also wants to keep the double bins in the left end of the resulting row, to make it easier to keep track of them.

You are to write a program that computes the largest possible K such that the K leftmost bins can be put into the immediately following K bins in some order.

Input. The first line of the text file `bins.in` contains two integers, separated by a space: M ($1 \leq M \leq 1000$), the size of the largest bin, and N ($1 \leq N \leq 20{,}000$), the number of bins. The second line contains N integers A_i ($1 \leq A_i \leq M$), separated by spaces: the sizes of the bins, listed from left to right.

Output. The first and only line of the text file `bins.out` should contain a single integer, the largest number K such that the robot can put the K leftmost bins into the next K bins.

Sample.

`bins.in`
```
5 10
2 2 1 4 3 2 5 4 2 3
```

`bins.out`
```
4
```

Candies

Kristian works as a shopkeeper and sells candies. There are N packages in his shop and each of them may contain a different number of candies. When a customer comes and asks for K candies, Kristian has to bring some packages, such that the total number of candies in those packages is equal to K. If he is unable to do this, for example if someone asks for 4 candies and there are only 5 packages with 3 candies in each of them, often the customer gets upset and leaves.

Because of that, Kristian wanted to know how many different options he could provide to the next customer with the packages he currently has. He managed to solve this problem and now he is wondering what to do to improve the result. He wants to open one package and change the number of candies in it so that the total number of distinct options he can offer to the customer will increase as much as possible.

Input. The first line of the text file `candies.in` contains one integer N ($2 \leq N \leq 100$). The second line contains a sequence of N integers B_i ($1 \leq B_i \leq 7\,000$) separated by single spaces and describing the numbers of candies in each package.

Output. The first and only line of the text file `candies.out` should contain two integers P and Q separated by a single space. They mean that Kristian should take a package with P candies and change the number of candies in it to Q. P has to be equal to one of B_i. Since there can be many optimal results, output the one with P as small as possible. Among all results with the minimal P, choose the smallest possible Q. You can assume that Kristian can increase the total number of distinct orders he can serve by altering a single package.

Sample.

candies.in	candies.out
4 1 3 4 4	4 9

Remark. With the packages described in the first sample input file, Kristian can serve orders of 9 different sizes, namely 1, 3, 4, 5, 7, 8, 9, 11 and 12. After changing a package with 4 candies to 9 candies, he could serve orders of size 1, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 16 and 17, which makes 13 distinct options in total.

Sample.

candies.in	candies.out
5 3 3 3 3 3	3 1

Mines (Open Input Task)

Heino drew an $H \times W$ grid. Each cell was either empty or contained a mine. Indrek, a good friend of Heino, drew another $H \times W$ grid. In each cell of his grid, he wrote the total number of mines in the corresponding cell of Heino's grid and all its adjacent cells (two cells are adjacent if they share a common point). Indrek then erased Heino's grid. Given Indrek's grid, your task is to help Heino restore his original grid.

You may assume that at least one solution always exists.

Input. The first line of the input file contains two integers: H ($1 \leq H \leq 600$), the height of the grid, and W ($1 \leq W \leq 600$), the width of the grid. The following H lines each containing W digits describe Indrek's grid.

Output. The output file should contain H lines. Each of these lines should contain W characters: '`X`' for a mine and '`.`' for an empty cell.

If there are several correct solutions, submit any one of them.

Sample.

mines.in	mines.out
3 5	.XXX.
24531	.XX..
46631	XX...
34310	

Grading. In this task you're given 10 input files named `mines.01.in`...`mines.10.in` and as a solution you need to submit corresponding output files. You should not submit a program.