1 Where are the Exit Doors?

A king's palace has special rooms that form a 2D grid. Every room is labelled with different values. There are some rooms that you cannot enter, labelled as -1. Rooms filled with gold are labelled as 500 and rooms that have exit points to outside the palace are lablled as 0.

Write a program to read the grid of various types of rooms and replace the rooms filled with gold with the distance to the nearest exit point. If an exit point cannot be reached from a gold room, do not change it value.

Input/Output

Input	Output	Comments
4 4 500 -1 0 500 500 500 500 -1 500 -1 500 -1 0 -1 500 500	3 -1 0 1 2 2 1 -1 1 -1 2 -1 0 -1 3 4	• First line 4 represents total number of rows • First line 4 represents total number of cols • Next four lines represents the grid (G). • Values in each separated by a space Explanation: • There are Exit Points at G(1,3) and G(4,1) • For the gold room at G(1,1), it takes 4 steps to reach Exit Point (1, 3) due to wall at (1,2) while it takes 3 steps to reach Exit Point (4,1). Hence, G(1,1) is replaced with 3 in the output. • For the gold room at G(4,4), it takes 7 steps to reach G(4,1) due to walls in its path. It takes 4 steps to reach G(1,3). Hence, G(4,4) is replaced with 4 in the output.
3 3 -1 0 500 500 -1 0 0 500 -1	-1 0 1 1 -1 0 0 1 -1	
3 3 -1 -1 500 500 -1 -1 0 500 -1	-1 -1 500 1 -1 -1 0 1 -1	

2 Mike and Dad

Mike and his Dad Mike is a math whizz-kid. He and his father like to play with numbers. One day Mike's father took Mike on a walk and they started playing a new number game. In this one, Mike gives his father 2 numbers, P and Q. Mike's father gives Mike numbers from K_1 to K_P.

Mike is now to assign unique numbers from 1 to Q(R_1 to R_Q) to the numbers his father gave, let us say R_i be the integer assigned to K_i. He should assign them in such a way that maximum number of K_i are divisible by their R_i. And he is also to find the maximum number of K_i that could be divisible by Ri, in optimal assignment. Help Mike in finding this.

Input: First line of input consists of integer P and Q. Next P lines consist of P integers with i^{th} line containing integer A_i

Output:
Output maximum number of Ai that can be made divisible by C_i in optimal assignment.

Input/Output

Input	Output	Comments
5 5 6 4 5 15 18	**5**	1. As Q is 5, the numbers that can be assigned to the 5 integers are 1,2,3,4 and 5 (R_1 to R_5) 2. We should try and pair/assign the integers in such a way that K_i % R_i will be zero 3. So, for numbers from 6,4,5,15 and 18 in the input (K_1 to $K_{5)}$, [1,4,5,3,2] is the best possibility as 6%1 =0 , 4%4 =0 , 5%5=0, 15%3, 18%2 = 0 . 4. Thus the output is 5 (as we are able to assign number to all 5 numbers in the input) Note: Number(R_i) cannot be repeated or reassigned.
8 16 4 12 21 18 42 53 72 88	**8**	
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3 Leela's task to her Students

Leela is an award-winning Math teacher and on the occasion of Teacher's day she gave a task to her students. She has given N digits to the Students (1 < N < 10). She then gave one magic number (M) to the students.

The task for the students is to find the smallest possible number that can be formed with the digits given to them. And to find the number of times this number is of the given number (M). If no such number is possible then output should be -1.

Input Format:
The first line contains N, the number of digits.
The second line contains the N digits separated by blank space.
The third line is M, the given magical number.

Output Format:
Output contains the smallest number containing all digits atleast once and is a multiple of M and how many times the smallest number is of the given number M separated by space, if possible, otherwise return -1.

Input/Output

Input	Output	Comments
5 **5 3 0 4 2** **10**	**23450** **2345**	• Given 5 digits are 2 3 0 4 5 • The least number that contains the digits, at least once and is a multiple of 10 is 23450 and is 2345 times of 10.
4 **6 4 2 8** **5**	**-1**	• Given 4 digits are 2 4 6 8 • The least number that contains the digits, at least once is 2468, but it is not a multiple of 5. So print -1.