Grand Integer Lottery

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The Integer lottery company is conducting a very special lottery event for the lottery enthusiasts. The scheme for this special lottery is little different from normal lotteries. In particular, there is a sequence of integers called " *lottery sequence* " ranging between S and E which will be generated according to the following rule:

- At first the lottery company decides on a number N representing the total amount of positive integers that a player chooses [i.e. n1, n2, …. nN]. Then the player choose these N positive integers.
- Based on the above user-picked integers, the lottery company generates the *lottery sequence* as follows: For any given integer M in the range [S, E] (inclusive of S and E), M will be in the lottery sequence if at least one user-picked integer when considered as string occurs as a contiguous block in M. In the *lottery sequence* those picked integer Ms are in the sorted order.

For an example: S=1, E=35, N=2, n1=3 and n2=11, then the generated *lottery sequence* would be as follows:
[3, 11, 13, 23, 30, 31, 32, 33, 34, 35] Comprised of all the integers in the range [1, 35] that contain the strings 3 or 11 or both.

After the *lottery sequence* has been generated, the lottery picks the *winning number* using the given *winning index* of the sequence. First integer of the sequence has index 1. For the example above, if the lottery company picked the 5th index as the *winning index* , then *winning number* would be 30 (i.e. the 5th integer of the lottery sequence).

Task

The task in this problem is to find and print the *winning number* of the lottery for the given set of inputs.

Input

The format of the input is as follows:
S E P N
n1
n2
...
nN

The first line of the input consists of 4 space separated positive integers which represent:
S The minimum value from which the *lottery sequence* will be generated
E The maximum value from which the *lottery sequence* will be generated (1 <= S <= E <= 10^6)
P The *winning index* (1 <= P <= 10^6)

N The amount of positive integers that a player picks (1 <= N <= 18)

Then, N lines follow, each one ending with a newline character, representing the N positive integers that were selected by the player. Each of the user-picked integers will consist up to 18 digits (i.e. 1 <= The number of digits in any user-picked integer <=18). Also, for each number it holds true that it begins with a nonzero digit.

Output

Your program should print the *winning number* to the standard output. If no such number exists, then the output should be:
DOES NOT EXIST
Otherwise, the program should print the *winning number* e.g.:
163
Note: There is a newline character at the end of the last line of the output.

Sample Input 1

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1 10000 4 2
62
63

Sample Output 1

163

Explanation of Sample 1

In this example the user selects 2 positive integers n1=62 and n2=63. Based on this selection, the *lottery sequence* would look like [62, 63, 162, 163, 262, 263, ...]. Since the lottery has picked the *winning index* P=4, the program should output 163 as the *winning number* .

Sample Input 2

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1 10000 999999 2
62
63

Sample Output 2

DOES NOT EXIST