

Monodigital Representations

Let K be a decimal digit different from 0. We say that an arithmetic expression is a **K-representation of the integer X** if a value of this expression is X and if it contains only numbers composed of a digit K. (All the numbers are of course decimal). The following arithmetical operations are allowed in the expression: addition, subtraction, multiplication and division. Round brackets are allowed too. Division may appear only when a dividend is a multiple of a divisor.

Example

Each of the following expressions is the 5-representation of the number 12:

- $5+5+(5:5)+(5:5)$
- $(5+(5))+5:5+5:5$
- $55:5+5:5$
- $(55+5):5$

The **length** of the K -representation is the number of occurrences of digit K in the expression. In the example above the first two representations have the length 6, the third - 5, and the fourth - 4.

Task

Write a program which:

- reads the digit K and the series of numbers from the standard input,
- verifies for each number from the series, whether it has a K -representation of length at most 8, and if it does, then the program finds the minimal length of this representation,
- writes results to the standard output.

Input

The number of test cases t is in the first line of input, then t test cases follow separated by an empty line. The first line of each test case contains digit K , K is an element of $\{1, \dots, 9\}$. The second line contains number n , $1 \leq n \leq 10$. In the following n lines there is the series of natural numbers a_1, \dots, a_n , $1 \leq a_i \leq 32000$ (for $i=1, \dots, n$), one number in each line.

Output

The output for each test case composes of n lines. The i -th line should contain:

- exactly one number which is the minimal length of K -representation of a_i , assuming that such a representation of length not greater than 8 exists,
- one word NO, if the minimal length of the K -representation of the number a_i is greater than 8.

Example

Sample input:

1

5
2
12
31168

Sample output

4
NO