**Problem 1: Xth Digit ( Please don't use string operation )**

Description: You are given a infinite sequence : **0123456789101112131415**...

The zero digit of this sequence is 0, the first digit of this sequence is 1, the 2nd digit of this sequence is 2 and so on. You will be given some queries.Each query we will ask you **xth** digit of this sequence.

Input:

The first line of the input contains a single integer T denoting the number of test cases. Then T test cases follow. Each test case consist of one line which contains a positive integer x, which asks you to print the xth digit in the sequence given.

Output:

Corresponding to each test case, in a new line, print the digit at that position.

Constraints:

1 ≤ T ≤ 2000

1 ≤ Query Value ≤ 100000

**Input Format:**

3

7

20

30

**Output Format:**

7

1

2

**Problem 2: An Easy Problem**

Description: Probably you are a very serious mathematician and you like to solve expression problems. This is for you.You are given two expressions string. your task is simple, compare them and check if they are similiar. Expressions consist of lowercase alphabets, '+', '-' and '( )'.

Input:

The first line of input contains an integer T denoting the number of test cases. Then T test cases follow. Each test case contains two lines. And each line contains an expression.

Output

For each test case, print in a new line "YES" if the expressions are similar else print "NO".

Constraints:

1<=T<=100

3<=|Expression length|<=100

**Input Format:**

2

-(a+b+c)

-a-b-c

a-b-(c-d)

a-b-c-d

**Output Format:**

YES

NO

Problem F: Mirror! Mirror! Mirror Clock

Description: Little Lilly has learnt to read wall clock. Very often he loudly announces the time. He has a big clock in his room. There is also a mirror in the opposite side of the clock. Few days ago his mother noticed that sometimes Lilly is announcing wrong time. She became worried and after some investigation she found, Lilly has no problem in reading time from the clock, the thing is sometimes he reads from the clock in the mirror. So she told him “Lilly, you shouldn’t read time from the clock in the mirror.” “But why mother?” curious Lilly asked. “Because it gives wrong time” mother replied. Now Lilly looked at the two clocks and realized his mother was telling the truth. Two clocks were not matching. He thought for some time and shouted, “But mother, we can calculate the real time from the clock in the mirror, can’t we?” Can we? Now this challenge is for you to help little Lilly.



Input consist a given line t which denotes the mirror time. Calculate the actual time from the mirror.

**Input Format:**

7:00

11:00

**Output Format**:

05.00

01.00

Problem G: Spiral Form

Description: You have to give a 2D array which denotes NXM array. Print the Spiral form in 2D array.(NXM array elements should be natural number)

Example: if N = 4, M = 4 then we construct the array 4X4 such as,

1 2 3 4

5 6 7 8

9 10 11 12

13 14 15 16

output should be 1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10

Input consists a line of 2 integers N and M. print the spiral form of this 2D array.

**Input Format:** 4 4

**Output Format:** 1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10

Problem H: Number Generator

Description: Little Lilly wants to play a number game. She start with N=0 and she want to make N=a given integer S. Only three types of operation are allowed:

1. INC : increment N by 1, i.e. N ← N + 1

2. DEC : decrement N by 1, i.e. N ← N − 1

3. DBL : double N, i.e. N ← 2N

Of course we want to make N = S with the minimum number of operations. Consider an example: Let S = 7. Then only 5 steps are required, for instance:

1. INC : N = 0 + 1 = 1

2. INC : N = 1 + 1 = 2

3. DBL : N = 2 × 2 = 4

4. DBL : N = 2 × 4 = 8

5. DEC : N = 8 − 1 = 7 ← DONE!!

Can you help her to play the game ?

Input contains no more than 200 lines. Each line contains one integer S (0 ≤ S ≤ 2^31). Input is terminated by EOF.

For each S, output the minimum number of operations required to make N = S. You may assume that N is of infinite precision, so NO overflow will ever occur.

**Input Format:** 7

**Output Format:** 5

Problem I: Equal Graph

Given the two undirected graph. You have to print "Yes" if the two graph is equal, otherwise "No". Assume that, you have the change the orientation of graph node and edge .



The two undirected graph is equal.

Input: Two Undirected graph

Output: Yes or No

Problem J: Justify TEXT

Given an Word Jar of words and a length *L*, format the text such that each line has exactly *L* characters and is fully (left and right) justified. Pad extra spaces(' ') when necessary so that each line has exactly *L* characters. Extra spaces between words should be distributed as evenly as possible. If the number of spaces on a line do not divide evenly between words, the empty slots on the left will be assigned more spaces than the slots on the right. For the last line of text, it should be left justified and no extra space is inserted between words.

Input consist of 2 lines. The first line contain a word jar of words. The second line contain length L.

**Input Format:**

["This", "is" ,"an", "example", "of", "Text", "Justification"]

16

**Output Format:**

"This is an",

"example of text",

"justification. "