

J. Kaprekar's Constant

The number 6174 is known as Kaprekar's constant. It is ultimate convergence point of the Kaprekar's routine, an algorithm thought up by Indian mathematician D.R. Kaprekar in 1949.

The routine is as follows:

1. Take any four-digit number (at least two different digits must be used, zeroes allowed).
2. Arrange the digits in descending and then in ascending order to get two four-digit numbers.
3. Subtract the smaller number from the larger and get the result.
4. Repeat steps 2-4 with the new number.

After a few iterations, the algorithm converges to a fixed point and starts to result in the same number (6174) the so-called Kaprekar's constant.

For Example

For the input of 6324, the solution is as below:

$$(1) 6432 - 2346 = 4086$$

$$(2) 8640 - 0468 = 8172$$

$$(3) 8721 - 1278 = 7443$$

$$(4) 7443 - 3447 = 3996$$

$$(5) 9963 - 3699 = 6264$$

$$(6) 6642 - 2466 = 4176$$

$$(7) 7641 - 1467 = 6174$$

$$(8) 7641 - 1467 = 6174$$

The number of iteration for the second Kaprekar's constant is 8.

Input

The first input should be the number of cases (n), followed by 4 distinct digits of number for each n line. The input should be in between $1111 \leq x \leq 9999$

Output

The output should be the number of iteration for the second Kaprekar's constant.

Sample Input / Output

Input	Output
3	
2619	3
9321	4
7319	3