

Problem D. Degree Of Number's Eccentricity

Input file: done.in
Output file: done.out
Time limit: 2 seconds
Memory limit: 256 megabytes

Do you think that being eccentric is easy? This is not the case when you're a number.

The *degree of eccentricity* of a $2N$ -digit integer X (possibly with leading zeroes) is defined as the smallest possible value of $|a + b - 10^N|$ for some N -digit integers a and b (again, possibly with leading zeroes) such that $S_d(X) = S_d(a) + S_d(b)$ holds for every digit d , where $S_d(P)$ ($0 \leq d \leq 9$) is the number of occurrences of digit d in the decimal representation of P . For example, the degree of eccentricity of *amusing* numbers (see problem *Counting Amusing Numbers*) is equal to 0, while the degree of eccentricity of 192747 is equal to 7 ($|274 + 719 - 1000| = 7$).

You are given a bunch of numbers of even lengths. Find the degree of eccentricity of each of them.

Input

The first line of the input file contains the number of test cases T ($1 \leq T \leq 1000$). Each of the next T lines contains an integer number of an even length (possibly with leading zeroes). The total length of all numbers in the input file (except T) doesn't exceed 10^6 .

Output

For each test case, output one line containing the degree of eccentricity of the corresponding number in the input file.

Examples

done.in	done.out
3	0
9820	7
192747	900
000001	