

B. You Are Given a Decimal String...

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Suppose you have a special x - y -counter. This counter can store some value as a decimal number; at first, the counter has value 0.

The counter performs the following algorithm: it prints its lowest digit and, after that, adds either x or y to its value. So all sequences this counter generates are starting from 0. For example, a 4-2-counter can act as follows:

- it prints 0, and adds 4 to its value, so the current value is 4, and the output is 0;
- it prints 4, and adds 4 to its value, so the current value is 8, and the output is 04;
- it prints 8, and adds 4 to its value, so the current value is 12, and the output is 048;
- it prints 2, and adds 2 to its value, so the current value is 14, and the output is 0482;
- it prints 4, and adds 4 to its value, so the current value is 18, and the output is 04824.

This is only one of the possible outputs; for example, the same counter could generate 0246802468024 as the output, if we chose to add 2 during each step.

You wrote down a printed sequence from one of such x - y -counters. But the sequence was corrupted and several elements from the sequence could be erased.

Now you'd like to recover data you've lost, but you don't even know the type of the counter you used. You have a decimal string s — the remaining data of the sequence.

For all $0 \leq x, y < 10$, calculate the minimum number of digits you have to insert in the string s to make it a possible output of the x - y -counter. Note that you can't change the order of digits in string s or erase any of them; only insertions are allowed.

Input

The first line contains a single string s ($1 \leq |s| \leq 2 \cdot 10^6$, $s_i \in \{0 - 9\}$) — the remaining data you have. It's guaranteed that $s_1 = 0$.

Output

Print a 10×10 matrix, where the j -th integer (0-indexed) on the i -th line (0-indexed too) is equal to the minimum number of digits you have to insert in the string s to make it a possible output of the i - j -counter, or -1 if there is no way to do so.

Example

input	Copy
0840	
output	Copy
<div>-1 17 7 7 7 -1 2 17 2 7 17 17 7 5 5 5 2 7 2 7 7 7 7 4 3 7 1 7 2 5 7 5 4 7 3 3 2 5 2 3 7 5 3 3 7 7 1 7 2 7 -1 5 7 3 7 -1 2 9 2 7 2 2 1 2 1 2 2 2 0 1 17 7 7 5 7 9 2 17 2 3 2 2 2 2 2 2 0 2 2 2 7 7 5 3 7 7 1 3 2 7</div>	

Note

Let's take, for example, 4-3-counter. One of the possible outcomes the counter could print is 0(4)8(1)4(7)0 (lost elements are in the brackets).

One of the possible outcomes a 2-3-counter could print is 0(35)8(1)4(7)0.

The 6-8-counter could print exactly the string 0840.

Educational Codeforces Round 70

(Rated for Div. 2)

Finished

Practice

Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

Submit?

Language: GNU G++11 5.1.0

Choose file:

选择文件

 未选择任何文件

Submit

Problem tags

brute force

dp

shortest paths

*1700

No tag edit access

Contest materials

Announcement #1 (en)

Announcement #2 (ru)

Tutorial (en)