The Enigma of the Dungeon Cave (dungeon)

Everybody knows that Giorgio is a great fan of pen-and-paper role-playing games, and is in fact the game master for a heroic decade-long campaign. For the next game session, he has to prepare an enigma protecting the entrance of the final cave of his dungeon.

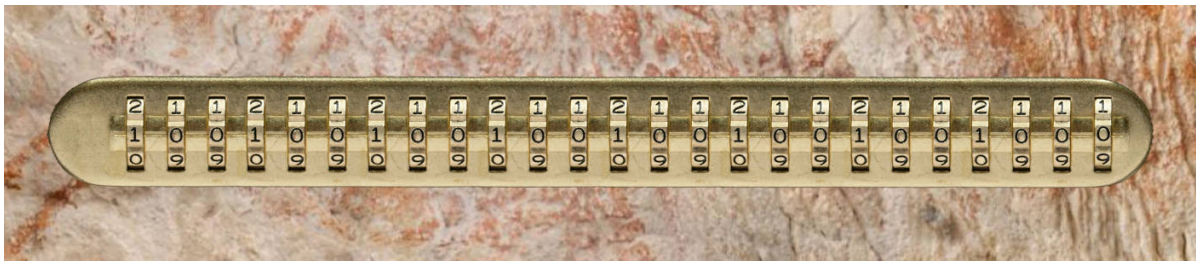

Figure 1: What could be the correct numeric code?

In particular, the entrance will be locked by a numeric code of N digits, with a rhymed poetry hinting at the fact that the sum of its digits is equal to the product of them. However, Giorgio is not sure if N is the right length for the numeric code, in order to give exactly the right amount of challenge to his players. Help him compute how many N-digit codes exist with the same sum and product of their digits!

☞ Among the attachments of this task you may find a template file `dungeon.*` with a sample incomplete implementation.

Input

The first and only line contains the only integer N.

Output

You need to write a single line with an integer: the number of N-digit codes with the same sum and product of their digits, **modulo** $10^9 + 7$.

✍ The *modulo* operation (a mod m) can be written in C/C++/Python as `(a % m)` and in Pascal as `(a mod m)`. To avoid the *integer overflow* error, remember to reduce all partial results through the modulus, and not just the final result!
Notice that if $x < 10^9 + 7$*, then* $2x$ *fits into a* C/C++ `int` *and* Pascal `longint`.

Constraints

- $1 \leq N \leq 100\,000$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.


– **Subtask 2** (10 points) $N \leq 6$.


– **Subtask 3** (30 points) $N \leq 1000$.


– **Subtask 4** (60 points) No additional limitations.


Examples

input	output
1	10
2	1

Explanation

In the **first sample case**, there are 10 codes: every 1-digit integer is equal to both the sum and product of its only digit.

In the **second sample case**, there is only one code: number 22.