Problem 1922: Count Good Numbers

Problem Information

Difficulty: Medium
Acceptance Rate: 57.17%
Paid Only: No
Tags: Math, Recursion

Problem Description

A digit string is **good** if the digits **(0-indexed)** at **even** indices are **even** and the digits at **odd** indices are **prime** (`2`, `3`, `5`, or `7`).

* For example, `"2582"` is good because the digits (`2` and `8`) at even positions are even and the digits (`5` and `2`) at odd positions are prime. However, `"3245"` is **not** good because `3` is at an even index but is not even.

Given an integer `n`, return _the**total** number of good digit strings of length _`n`. Since the answer may be large, **return it modulo**`109 + 7`.

A **digit string** is a string consisting of digits `0` through `9` that may contain leading zeros.

Example 1:

Input: n = 1 **Output:** 5 **Explanation:** The good numbers of length 1 are "0", "2", "4", "6", "8".

Example 2:

Input: n = 4 **Output:** 400

Example 3:

Input: n = 50 **Output:** 564908303

Constraints:

* `1 <= n <= 1015`

Code Snippets

C++:

```
class Solution {
public:
int countGoodNumbers(long long n) {

}
};
```

Java:

```
class Solution {
public int countGoodNumbers(long n) {

}
}
```

Python3:

```
class Solution:
def countGoodNumbers(self, n: int) -> int:
```