

Project Euler #162: Hexadecimal numbers

This problem is a programming version of [Problem 162](#) from [projecteuler.net](#)

In the hexadecimal number system numbers are represented using **16** different digits:

$0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F$

The hexadecimal number AF when written in the decimal number system equals $10 \times 16 + 15 = 175$.

In the **3** – *digit* hexadecimal numbers **10A**, **1A0**, **A10**, and **A01** the digits **0**, **1** and **A** are all present.

Like numbers written in base ten we write hexadecimal numbers without leading zeroes.

How many hexadecimal numbers containing at most n hexadecimal digits exist with all of the digits **0**, **1**, and **A** present at least once?

Give your answer modulo $(10^9 + 7)$.

Input Format

The first line contains an integer, n .

Constraints

- $3 \leq n \leq 100$

Output Format

Print the answer modulo $1000000007 = 10^9 + 7$.

Sample Input

3

Sample Output

4