# Problem F. Following are Equivalent

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|---|---|
| Input file: | *standard input* |
| Output file: | *standard output* |
| Time limit: | 2 seconds |
| Memory limit: | 256 mebibytes |

Rabbit loves to study mathematics. She often sees theorems and their proofs like this:

> **Theorem.** The following are equivalent: (i) ...... (ii) ...... (iii) ...... (iv) ......
> **Proof.** We will prove (i) ⇒ (ii), (ii) ⇒ (i), (ii) ⇒ (iii), (iii) ⇒ (iv) and (iv) ⇒ (ii). ......

More generally and more formally, the theorem claims that $N$ propositions $P_1, \ldots, P_N$ are equivalent, and in order to prove it, they show some implications $P_{a_1} \Rightarrow P_{b_1}$, ..., $P_{a_k} \Rightarrow P_{b_k}$, so that for any $x$ and $y$ ($1 \leq x \leq N$, $1 \leq y \leq N$), $P_x \Rightarrow P_y$ can be deduced from these implications.

Rabbit sometimes feels that a proof has no waste but is long, and she wants to know how many such proof schemes there are, for a given $N$. A *proof scheme* is a set of implications $\{P_{a_i} \Rightarrow P_{b_i} \mid 1 \leq i \leq k\}$ which proves the theorem. Here we do not distinguish the order of proving. For example, $\{P_1 \Rightarrow P_2, P_2 \Rightarrow P_3, P_3 \Rightarrow P_1\}$ and $\{P_3 \Rightarrow P_1, P_2 \Rightarrow P_3, P_1 \Rightarrow P_2\}$ are considered to be the same. A proof scheme is called *good* if, when we omit any one of the implications, the remaining implications do not prove the theorem. A proof scheme is called *long* if the number of implications is more than or equal to $2N - 3$. Write a program that finds the number of good and long proof schemes, modulo 1 000 000 007.

## Input

The input is given in the following format:

$N$

The first line contains an integer $N$ ($2 \leq N \leq 100$).

## Output

Your program should output an integer: the number of good and long proof schemes, modulo 1 000 000 007.

## Examples

| standard input | standard output |
|---|---|
| 3 | 5 |
| 4 | 52 |