1680. Concatenation of Consecutive Binary Numbers

Description

Given an integer `n`, return *the* ***decimal value*** *of the binary string formed by concatenating the binary representations of* `1` *to* `n` *in order,* ***modulo*** `10^9 + 7`.

Example 1:

```
Input: n = 1
Output: 1
Explanation: "1" in binary corresponds to the decimal value 1.
```

Example 2:

```
Input: n = 3
Output: 27
Explanation: In binary, 1, 2, and 3 corresponds to "1", "10", and "11".
After concatenating them, we have "11011", which corresponds to the decimal value 27.
```

Example 3:

```
Input: n = 12
Output: 505379714
Explanation: The concatenation results in "110111001011101111000100110101010111100".
The decimal value of that is 118505380540.
After modulo 10^9 + 7, the result is 505379714.
```

Constraints:

- `1 <= n <= 10^5`