Problem H. Handsome multisets

Input file:	`standard input`
Output file:	`standard output`
Time limit:	15 seconds
Memory limit:	256 megabytes

Call a multiset of positive integers $A = \{a_1, a_2, \ldots, a_k\}$ *n-handsome* if the sum of its elements is equal to n, and each integer from 1 to n can be uniquely represented as a sum of its elements up to their order. For example, $\{1, 2, 4\}$ is 7-beautiful, $\{1, 1, 3\}$ is 5-beautiful. Given an integer n, find the following sum:

$$\left(\sum_{A \text{ is } n\text{-beautiful}} |A| \right) \bmod p.$$

You can choose $p = 10^9 + 7$ or $p = 10^9 + 9$ by yourself for each n you are computing the answer.

Input

The first line contains an integer t ($1 \le t \le 5$) – the number of test cases in the input file.

Each of the next t lines contain one integer n_i ($1 \le n_i \le 10^{16}$), for which you need to output the answer. It is guaranteed that all n_i in one file are different.

Output

Output t lines. The i-th of them should contain the answer for the number n_i. Each answer has to be correct either with $p = 10^9 + 7$ or $p = 10^9 + 9$, and p can be chosen independently for each test case. Note that you should not output the chosen p, only the remainder of the answer.

Examples

standard input	standard output
5 1 2 3 4 5	1 2 5 4 11
5 6 7 8 9 10	6 18 12 19 10
5 99 17 14 24 38	572 64 26 32 66