Easy Fibonacci

Problem Code: **FIBEASY**

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The **Fibonacci sequence** $F_0, F_1, \ldots$ is a special infinite sequence of non-negative integers, where $F_0 = 0$, $F_1 = 1$ and for each integer $n \geq 2$, $F_n = F_{n-1} + F_{n-2}$.

Consider the sequence D of the last decimal digits of the first N Fibonacci numbers, i.e. $D = (F_0 \% 10, F_1 \% 10, \ldots, F_{N-1} \% 10)$. Now, you should perform the following process:

- Let $D = (D_1, D_2, \ldots, D_l)$.
- If $l = 1$, the process ends.
- Create a new sequence $E = (D_2, D_4, \ldots, D_{2\lfloor l/2 \rfloor})$. In other words, E is the sequence created by removing all odd-indexed elements from D.
- Change D to E.

When this process terminates, the sequence D contains only one number. You have to find this number.

Input

- The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows.
- The first and only line of each test case contains a single integer N.

Output

For each test case, print a single line containing one integer — the last remaining number.

Constraints

- $1 \leq T \leq 10^5$

- $1 \leq N \leq 10^{18}$

Subtasks

Subtask #1 (20 points):

- $1 \leq T \leq 10^5$
- $1 \leq N \leq 10^7$

Subtask #2 (80 points): original constraints

Example Input

```
1
9
```

Example Output

```
3
```

Explanation

Example case 1: The first N Fibonacci numbers are $(0, 1, 1, 2, 3, 5, 8, 13, 21)$. The sequence D is $(0, 1, 1, 2, 3, 5, 8, 3, 1) \rightarrow (1, 2, 5, 3) \rightarrow (2, 3) \rightarrow (3)$.

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Source Limit:	50000 Bytes
Languages:	C, CPP14, JAVA, PYTH, PYTH 3.6, PYPY, CS2, PAS fpc, PAS gpc, RUBY, PHP, GO, NODEJS, HASK, rust, SCALA, swift, D, PERL, FORT, WSPC, ADA, CAML, ICK, BF, ASM, CLPS, PRLG, ICON, SCM qobi, PIKE, ST, NICE, LUA, BASH, NEM, LISP sbcl, LISP clisp, SCM guile, JS, ERL, TCL, kotlin, PERL6, TEXT, SCM chicken, PYP3, CLOJ, R, COB, FS

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