Problem J
Lowest Non-Zero Hexadecimal Digit

Time limit: 1 second
Memory limit: 256 megabytes

Problem Description

For any non-negative integer n, $n!$ is defined as follows.

- $0! = 1$.
- $n! = n \times (n-1)! = n \times (n-1) \times \cdots \times 1$.

Hexadeciaml is the numeral system of base 16. A hexadecimal digit has 16 different symbols. `0~9` represent zero to nine, and `A~F` represent ten to fifteen. For example, $10! = 3628800 = 3 \times 16^5 + 7 \times 16^4 + 5 \times 16^3 + 15 \times 16^2$ is `375F00` in hexadecimal representation. Its lowest hexidecimal digit is `0`, and its lowest non-zero hexadecimal digit is `F`.

Write a program to compute the lowest non-zero hexadecimal digit of $n!$.

Input Format

The first line of the input contains an integer t ($t \leq 10^4$) indicating the number of test cases. Each test case is a line containing an integer n. n is given in decimal representation (base 10), and $0 \leq n < 2^{64}$.

Output Format

For each test case, output the lowest non-zero hexadecimal digit of $n!$.

Sample Input

```
5
10
23456
789012
34567890
123456789012345
```

Sample Output

```
F
A
C
9
C
```