Problem E. Construct The Integer

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

For any positive integer y we define $A(y)$ as the set of all positive integers that are anagrams of y. Formally, we consider the sequence of all digits of y in decimal representation without leading zeroes, then we apply all possible permutations to this sequence. For any permutation we throw away leading zeroes and assemble digits back to an integer. All integers that can be obtained that way belong to $A(y)$. For example, for 2021 set $A(2021)$ consists of integers 122, 212, 221, 1220, 2120, 2210, 1202, 2102, 2201, 1022, 2012 and 2021. Note, that set $A(y)$ always contains y, thus it is never empty.

For any positive integer x we define $S(x)$ as the set of all positive integers z such that greatest common divisor of all integers in $A(z)$ equals x.

You are given the integer n, find the **minimum** integer z in $S(x)$, or determine that $S(x)$ is empty.

Input

The first line of the input contains one integer t ($1 \le t \le 50$) — the number of the test cases.

Each test case data consists of one integer n ($1 \le n \le 10^{18}$).

Output

For each test case, print one integer on a separate line. If the corresponding set $S(n)$ is empty, print `-1`. Otherwise, print minimum element of $S(n)$.

Example

standard input	standard output
2 12 2021	48 -1