Diana and Numbers (div3)

Diana got a package for her birthday and she was very happy because when she opened the box, she found N positive integers in it. However, she likes numbers that are divisible by 3 the most. For each number, she wants to remove some (0 or more) of its digits, so that the number becomes divisible by 3 and still stays positive. If there are multiple ways to achieve this, she wants to get the biggest possible number as the result.

Diana's present.

The numbers are too big for Diana to handle. Can you help her? For each given number, your program has to determine the greatest positive integer that is divisible by 3, and is obtainable from the given number by deleting 0 or more of its digits. If there is no such number, print -1.

Input

The first line contains a single integer N. Each of the following N lines contain a single positive integer V_i with at most $100\,000$ digits that was in Diana's birthday package.

Output

You need to print N integers, each of them on a separate line. The i-th line should contain the greatest positive multiple of 3 that is obtainable from V_i by deleting digits, or -1 if there is no such number. The result must not have leading zeros.

Constraints

- $1 \le N \le 100$.
- $1 \le V_i < 10^{100000}$.
- The total number of digits of all V_i does not exceed $1\,000\,000$.

Scoring

– **Subtask 1** (0 points)   Examples.

– **Subtask 2** (9 points) $V_i < 10^6$ for all $1 \le i \le N$.

– **Subtask 3** (12 points) $V_i < 10^{100}$ for all $1 \le i \le N$.

– **Subtask 4** (27 points)   Every digit of V_i is 1 or 2 for all $1 \le i \le N$.

– **Subtask 5** (52 points)   No additional limitations.

Examples

input	output
5 76 31415926 22000000000 100666 42	6 3415926 -1 666 42