

Contest Duration: 2025-04-05(Sat) 23:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250405T2100&p1=248>) - 2025-04-06(Sun) 00:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250405T2240&p1=248>) (local time) (100 minutes)

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E - Ringo's Favorite Numbers 3

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

A positive integer N is a **400 number** if and only if it satisfies both of the following two conditions:

- N has exactly 2 distinct prime factors.
- For each prime factor p of N , p divides N an even number of times. More formally, the maximum non-negative integer k such that p^k divides N is even.

Process Q queries. Each query gives you an integer A , so find the largest 400 number not exceeding A . Under the constraints of this problem, a 400 number not exceeding A always exists.

Constraints

- $1 \leq Q \leq 2 \times 10^5$
- For each query, $36 \leq A \leq 10^{12}$.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
Q
query1
query2
⋮
queryQ
```

Here, query_{*i*} is the *i*-th query, given in the following format:

```
A
```

Output

Print *Q* lines. The *i*-th line should contain the answer to the *i*-th query.

Sample Input 1

Copy

```
5
404
36
60
1000000000000
123456789
```

Copy

Sample Output 1

Copy

```
400
36
36
1000000000000
123454321
```

Copy

Let us explain the first query.

There are exactly 2 prime factors of 400: 2 and 5. Also, 2 divides 400 four times and 5 divides it twice, so 400 is a 400 number. None of 401, 402, 403, and 404 is a 400 number, so the answer is 400.

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