Task Hop

♩ Jeremiah was a bullfrog
Was a good friend of mine ♩

There are n water lilies, numbered 1 through n, in a line. On the i-th lily there is a positive integer x_i, and the sequence $(x_i)_{1\leq i\leq n}$ is strictly increasing.

Enter three frogs.

Every pair of water lilies (a, b), where $a < b$, must belong to frog 1, frog 2, or frog 3.

A frog can *hop* from water lily i to water lily $j > i$ if the pair (i, j) belongs to it, and x_i **divides** x_j.

Distribute the pairs among the frogs such that no frog can make more than 3 consecutive hops.

Input

The first line contains a positive integer n $(1 \leq n \leq 1000)$, the number of water lilies.

The second line contains n positive integers x_i $(1 \leq x_i \leq 10^{18})$, the numbers on the water lilies.

Output

Output $n - 1$ lines. In the i-th line, output i numbers, where the j-th number is the label of the frog to which $(j, i + 1)$ belongs.

Scoring

Subtask	Points	Constraints
1	10	$n \leq 30$
2	100	No additional constraints.

If in your solution some frog can make k consecutive hops, where $k > 3$, but no frog can make $k + 1$ consecutive hops, your score for that test case is $f(k) \cdot x$ points, where

$$f(k) = \frac{1}{10} \cdot \begin{cases} 11 - k & \text{if } 4 \leq k \leq 5, \\ 8 - \lfloor k/2 \rfloor & \text{if } 6 \leq k \leq 11, \\ 1 & \text{if } 12 \leq k \leq 19, \\ 0 & \text{if } k \geq 20, \end{cases}$$

and x is the number of points for that subtask.

The score for some subtask equals the minimum score which your solution gets over all test cases in that subtask.

Examples

input

```
8
3 4 6 9 12 18 36 72
```

output

```
1
2 3
1 2 3
1 2 3 1
2 3 1 2 3
1 2 3 1 2 3
1 2 3 1 2 3 1
```

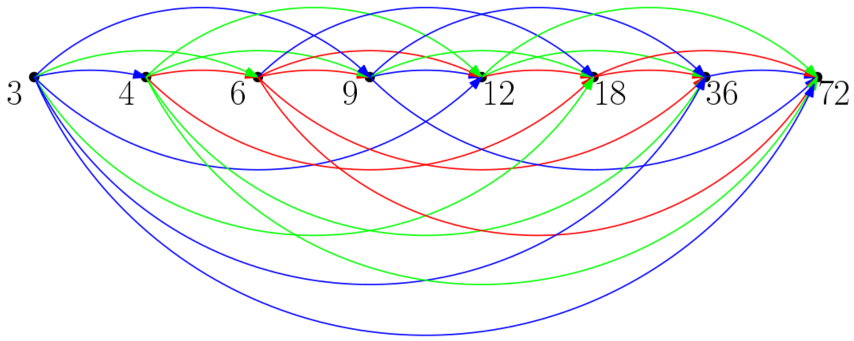
input

```
2
10 101
```

output

```
1
```

Clarification of the first example:



The frogs are marked blue (1), green (2), and red (3).

The blue frog can hop from water lily $x_1 = 3$ to water lily $x_4 = 9$, then to water lily $x_7 = 36$, and then to $x_8 = 72$. These are the only three consecutive hops any frog can make.

The green frog can hop from water lily $x_2 = 4$ to water lily $x_5 = 12$, and then to $x_7 = 36$, because 4 divides 12, and 12 divides 36. Those are two consecutive hops.

The red frog cannot hop from water lily $x_2 = 4$ to water lily $x_3 = 6$ because 6 is not divisible by 4.

No frog can make more than three consecutive hops.