INTERESTING INTEGERS

Undoubtedly you know of the Fibonacci numbers. Starting with $F_1 = 1$ and $F_2 = 1$, every next number is the sum of the two previous ones. This results in the sequence $1, 1, 2, 3, 5, 8, 13, \ldots$.

Now let us consider more generally sequences that obey the same recursion relation

$$G_i = G_{i-1} + G_{i-2} \text{ for } i > 2$$

but start with two numbers $G_1 \le G_2$ of our own choice. We shall call these Gabonacci sequences. For example, if one uses $G_1 = 1$ and $G_2 = 3$, one gets what are known as the Lucas numbers: $1, 3, 4, 7, 11, 18, 29, \ldots$. These numbers are – apart from 1 and 3 – different from the Fibonacci numbers.

By choosing the first two numbers appropriately, you can get any number you like to appear in the Gabonacci sequence. For example, the number n appears in the sequence that starts with 1 and $n - 1$, but that is a bit lame. It would be more fun to start with numbers that are as small as possible, would you not agree?

Input

On the first line one positive number: the number of test cases, at most 100. After that per test case:

- one line with a single integer n ($2 \le n \le 10^9$): the number to appear in the sequence.

Output

Per test case:

- one line with two integers a and b ($0 < a \le b$), such that, for $G_1 = a$ and $G_2 = b$, $G_k = n$ for some k. These numbers should be the smallest possible, i.e., there should be no numbers a^t and b^t with the same property, for which $b^t < b$, or for which $b^t = b$ and $a^t < a$.

Examples

№	stdin	stdout
1	5 89 123 1000 1573655 842831057	1 1 1 3 2 10 985 1971 2 7