3196 Gaussian Prime Factors

Let a, b, c, d be integers. The complex number $a + bj$, where $j^2 = -1$, is a factor of $c + dj$, if there exist integers e and f such that

$$c + dj = (a + bj)(e + fj)$$

A complex number $a + bj$ where a and b are integers is a Gaussian prime if the factors are 1, -1, $-a - bj$ and $a + bj$ only.

The following are Gaussian primes: $1 + j$, $1 - j$, $1 + 2j$, $1 - 2j$, 3 and 7.

The Gaussian prime factors of 5 are:

$$1 + 2j \text{ and } 1 - 2j, \text{ or}$$
$$2 + j \text{ and } 2 - j, \text{ or}$$
$$-1 - 2j \text{ and } -1 + 2j, \text{ or}$$
$$-2 - j \text{ and } -2 + j.$$

Write a program that finds all the Gaussian prime factors of a positive integer.

Input

One line of input per case. The line represents a positive integer n.

Output

One line of output per test case. The line represents the Gaussian prime factors of n. If $a + bj$ is a Gaussian prime factor of n, then $a > 0$, $|b| > a$, if $b \neq 0$. If $b = 0$, the output must be a.

Sample Input

```
2
5
6
700
```

Sample Output

```
Case #1:  1+j, 1-j
Case #2:  1+2j, 1-2j
Case #3:  1+j, 1-j, 3
Case #4:  1+j, 1-j, 1+2j, 1-2j, 7
```