

GCD is a Joke

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 256 megabytes

In mathematics, Eisenstein integers (named after Gotthold Eisenstein), also known as Eulerian integers (after Leonhard Euler), are complex numbers of the form $z = a + b\omega$, where both a and b are integers.

The product of $a_1 + b_1\omega$ and $a_2 + b_2\omega$ is $(a_1a_2 - b_1b_2) + (a_1b_2 + a_2b_1 - b_1b_2)\omega$. For example, $(5 + 7\omega) \times (6 + 9\omega) = -33 + 24\omega$, $(1 + 0\omega) \times (9 - 14\omega) = 9 - 14\omega$ and $(-1 + 0\omega) \times (0 - 1\omega) = 0 + 1\omega$.

If U , V and W are Eisenstein integers such that $U \times V = W$, then U (or V) is a divisor of W .

It's always true that we can find some divisors of each Eisenstein integer. Because the Eisenstein integer $1 + 0\omega$ is a divisor of any Eisenstein integer. Moreover, each Eisenstein integer is a divisor of $0 + 0\omega$. Because we can find that $(1 + 0\omega) \times (a + b\omega) = a + b\omega$ and $(0 + 0\omega) \times (a + b\omega) = 0 + 0\omega$.

If an Eisenstein integer G is a divisor of P and also a divisor of Q , we can call G is a common divisor of P and Q .

In Eisenstein integers, a greatest common divisor of P and Q is a common divisor G_g of P and Q such that each common divisor of P and Q is also a divisor of G_g . There may be one or more greatest common divisors of two Eisenstein integers.

Your task is to get an greatest common divisor of a given pair of Eisenstein integers.

Input

The first line of the input contains an integer T denoting the number of test cases. Each test case consists of one line which contains four integers, a_1 , b_1 , a_2 and b_2 , representing a pair of Eisenstein integers $a_1 + b_1\omega$ and $a_2 + b_2\omega$. ($T \leq 50000$, $-10^7 \leq a_1, b_1, a_2, b_2 \leq 10^7$)

Output

For each test case, output one line containing two integers a and b , indicating the greatest common divisor $a + b\omega$. If there are multiple greatest common divisors, choose the Eisenstein integer with the largest $a^2 + b^2$, if there are still multiple options, choose the one with the largest a , if there are still multiple options, then choose the one with the largest b .

Examples

standard input	standard output
3	3 2
-4 2 2 -1	1 1
1 1 1 1	1 1
1 2 3 4	