

1.6 Problems

1.6.1 The $3n + 1$ Problem

PC/UVa IDs: 110101/100, **Popularity:** A, **Success rate:** low **Level:** 1

Consider the following algorithm to generate a sequence of numbers. Start with an integer n . If n is even, divide by 2. If n is odd, multiply by 3 and add 1. Repeat this process with the new value of n , terminating when $n = 1$. For example, the following sequence of numbers will be generated for $n = 22$:

22 11 34 17 52 26 13 40 20 10 5 16 8 4 2 1

It is *conjectured* (but not yet proven) that this algorithm will terminate at $n = 1$ for every integer n . Still, the conjecture holds for all integers up to at least 1,000,000.

For an input n , the *cycle-length* of n is the number of numbers generated up to and *including* the 1. In the example above, the cycle length of 22 is 16. Given any two numbers i and j , you are to determine the maximum cycle length over all numbers between i and j , *including* both endpoints.

Input

The input will consist of a series of pairs of integers i and j , one pair of integers per line. All integers will be less than 1,000,000 and greater than 0.

Output

For each pair of input integers i and j , output i , j in the same order in which they appeared in the input and then the maximum cycle length for integers between and including i and j . These three numbers should be separated by one space, with all three numbers on one line and with one line of output for each line of input.

Sample Input

1 10
100 200
201 210
900 1000

Sample Output

1 10 20
100 200 125
201 210 89
900 1000 174