ES 112.02/04 Homework #1
Fall 2003-2004

The Euclidean Algorithm

Finding the greatest common divisor (GCD) of two numbers is an interesting problem. There is an algorithm, called the *Euclidean Algorithm*. Assuming we want to find the greatest common divisor of two numbers a and b, the algorithm is as follows:

1. Divide the larger number by the smaller number, and find the remainder.
2. If the remainder is zero, the smaller number is the greatest common divisor of the two original numbers. Stop.
3. Replace the greater of the two numbers with the remainder. Go back to step 1.

This surely looks almost magical. Let us see this at work. Let us use the numbers 108 and 30. Here is how the calculation goes:

Divide 108 by 30. The remainder is 18. It is not zero, so we continue and replace 108 with 18.

Divide 30 by 18. Remainder is 12. Again nonzero, so we replace 30 by 12 and continiue.

Divide 18 by 12. The remainder is 6. Replace 18 by 6 and continue.

Divide 12 by 6. The remainder *is* zero. So the smaller of the two numbers, 6, is the greatest common divisor of 108 and 30 is 6. You can check that this is true by direct factorization of the two numbers.

The Problem

Your task is to write a C program that finds the greatest common divisor of two numbers. The program should satisfy the following requirements:

1. The user should be prompted to enter two integers.
2. After the two integers are entered, their GCD should be calculated and displayed.
3. Your program should *not* crash if the user enters zero for a number.

You will be graded on program function, as well as proper formatting. Proper formatting includes blank lines, brace use and placement, good choice of variable names, and easy-to-read code.