CS 221

Homework Assignment 0

Below are two small programming problems. Choose only <u>one</u> of the two, and design a program to solve the problem that is described. This assignment is intended to allow you to demonstrate the programming skills you have learned during your first year(s).

Please email **only** your source code file (.cpp) to mdb0013@cs.uah.edu.

Problem 1: Numbers of the Fibonacci sequence are known as Fibonacci numbers. The first several numbers in the sequence are 0, 1, 1, 2, 3, 5, 8, and so on. Excluding the first two terms in the sequence, every term is the sum of the two previous terms. For example, 1 + 1 = 2 (sum of 1 and 1), 3 + 5 = 8 (sum of 3 and 5), etc. This sequence is commonly used in mathematics and computer science, and also appears in nature.

Your assignment: Write a C++ program to calculate all Fibonacci numbers less than 100,000.

- OR -

Problem 2: The greatest common factor (GCF) and the least common multiple (LCM) are two valuable pieces of information for a computer scientist or mathematician, as they provide a quick description of how two numbers relate to one another. You'll remember that the GCF is the greatest factor that divides two numbers, and the LCM is the smallest number that is a multiple of two numbers. For example, consider 12 and 27 - the GCF of these numbers is 3, and the LCM is 108.

Your assignment: Write a C++ program to calculate the GCF and LCM of two numbers read from user input. (If you cannot remember how to perform Console I/O, then you may declare two variables and hard code the two numbers whose GCF and LCM will be calculated. Don't spend the whole time figuring out Console I/O - that is not the point of this problem.)