

CSci 1113: Introduction to C/C++
Programming for Scientists and Engineers
Homework 3
Spring 2018

Due Date: Thursday, Feb. 22, 2018 before 11:55pm.

Instructions: This is an individual homework assignment. There are two problems worth 20 points each. Solve the problem below by yourself (unlike the labs, where you work collaboratively), and submit the solution as a C++ source code file. Here are a few more important details:

1. Unlike the computer lab exercises, this is not a collaborative assignment.
2. Because all homework assignments are submitted and tested electronically, the following are important:
 - You follow any naming conventions mentioned in the homework instructions.
 - You submit the correct file(s) through Moodle by the due deadline.
 - You follow the example input and output formats exactly given in each problem description.
 - **Regardless of how or where you develop your solutions, your programs compile and execute on cselabs computers running the Linux operating system.**
3. You should test your program on other test cases (that you make up) as well. Making up good test cases is a valuable programming skill, and is part of ensuring your code solution is correct.

Problem A: Funny numbers (20 points)

Let some “funny numbers” be defined as:

$$F_i = \begin{cases} F_{i-1} + F_{i-2}, & \text{if } i \text{ is even} \\ F_{i-1} + 7, & \text{otherwise} \end{cases}$$

Assume $F_0=0$ and $F_1=1$.

Write a program that receives a number as input and will tell whether this number input is a “funny number”.

Example 1, **fixed** (user input is underlined):

Enter a number:

57

Yes, that is a funny number

Example 2 (user input is underlined):

Enter a number:

94

No, that is not a funny number

When you are done, name the source code file `<username>_3A.cpp`. Here you replace `<username>` with your U of M email address; for example, if your email address is `smithx1234@umn.edu`, your file should be named `smithx1234_3A.cpp`. Then submit your program using the HW 3 Problem A submission link in Moodle.

Problem B: Fibonacci and primes (20 points)

Make a program that takes a number as an input. Then find the amount of numbers between 2 and this input that are both prime and a Fibonacci number. This range is inclusive, so you should include both 2 and the input number in the count.

Example 1 (user input is underlined):

Enter a number:

20

The number of **Fibonacci** primes between 2 and 20 are:

4

Example 2 (user input is underlined):

Enter a number:

1234

The number of **Fibonacci** primes between 2 and 1234 are:

6

When you are done, name the source code file <username>_3B.cpp. Here you replace <username> with your U of M email address; for example, if your email address is smithx1234@umn.edu, your file should be named smithx1234_3B.cpp. Then submit your program using the HW 3 Problem B submission link in Moodle.