# Homework 3

BE/EE/MedE 189a: Design and Construction of Biodevices

Fall 2017

Due October 17, 2017

1. Construct a VI with one numeric input n that builds an array containing n Fibonacci numbers, beginning with F_1. Display the array in a waveform graph. Fibonacci numbers are the sequence of numbers, denoted by F_n, defined by the relation: $F_n = F_{n-2} + F_{n-1}$ with $F_1 = 1$ and $F_2 = 1$.

2. Create a VI that computes all prime numbers less than n, where n is a user input. Display the result in an array and in an x-y graph where you put a dot at $(x, 0)$ if x is prime. For example, if $n = 10$, then the VI should compute and display 1, 2, 3, 5, and 7. *Hint*: Check out the Sieve of Eratosthenes for an easy-to-implement algorithm.

3. Design a VI to simulate an oscilloscope using a waveform chart. Generate a sine waveform that varies from 0 to 5V to serve as input. An example of a virtual oscilloscope looks like this:
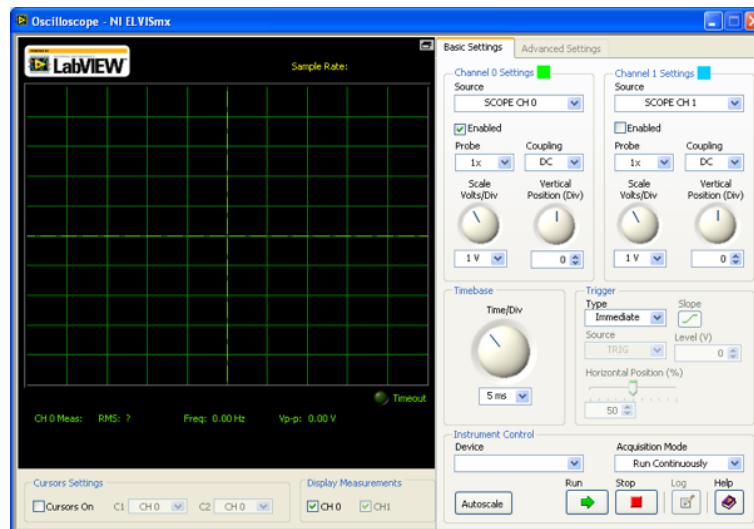
You don't need to write every feature and use the same user interface as shown in the figure. You only need to implement the following features: (1) one channel input; (2) the y scale (Volt/Div) can be tuned; (3) the time base (Time/Div) can be tuned; (4) the offset can be tuned. Design the user interface and use any controls or indicators that you think are suitable.