

## **Experiment 2**

### **Learning how to program using LabView – Part II**

#### **Objective**

In this experiment the student will learn how to use loops, do basic math inside loops, and graph numerical information.

#### **Material Required**

Computer with LabView installed.

#### **Prelab**

The following must be completed before the Lab session:

Go to the website <http://www.ni.com/white-paper/7466/en> Do the Tutorial and exercises under “Loops” and “Timing and Storing Data”, “Arrays, Clusters and Text Base Nodes”.

#### **Lab**

##### **Part I**

It is well known that  $1 + x + x^2 + x^3 + \dots = \frac{1}{1-x}$  when  $|x| < 1$

Write a LabView program that takes as an input a value for x, and a number of iterations. The program will use a loop to calculate the sum of the geometric series for the specified number of operations. It will also calculate the closed form expression for the series. The program will display these two results, and will also display the absolute error of the difference.

Demo your program with x=0.5 and 3, 10 and 200 iterations.

##### **Part II**

Write a LabView program that generates a 50% Duty Cycle square wave signal between 0- $x_{\max}$  volts (input) ( $x_{\max} < 10V$ ) with a nonzero variable frequency (input). Display the waveform on a waveform chart (output). In this part you are not allowed to use the LabView provided function generation blocks.

Demo this program for amplitudes of 1, 5 and 10V and for 1Hz and 5Hz.