Introduction to Computer Programming **Name:** _____
Lab 6: NumLang **Due Date: 12 / 14 / 2016**

The objectives of this laboratory are to use pseudo-code and flow charts to plan a program, use a procedural language in which you must pay attention to variables, location, order of operations and statements, and comment programs.

Pre-Laboratory Requirements:
Pseudo-code (or Flow Charts) of programs including variables' plan, order of statements, user prompts, etc
Keep in mind efficiency of code and variable usage

Post-Laboratory Requirements:
Electronically submit both a program and a commented program via email

B-Level:

1. Average of Five (5) Integers
   Input: five integers

2. Slope
   Input: four integers (x_1, y_1) then (x_2, y_2)

3. $\sigma^2 = \dfrac{\sum_{i=1}^{n}\left(\bar{x} - x_i\right)^2}{n-1}$ for $n = 5$
   Input: five integers $\{x_1, x_2, x_3, x_4, x_5\}$

A-Level:

4. Average of Fifteen (15) Integers
   Input: fifteen integers

5. Slope, *x*-intercept, and *y*-intercept for a Line
   Input: four integers (x_1, y_1) then (x_2, y_2)

6. $\sigma \approx \sqrt{\dfrac{\sum_{i=1}^{n}\left(\bar{x} - x_i\right)^2}{n-1}}$ for $n = 8$
   Input: eight integers $\{x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8\}$

7. Area of Any Triangle
   Input: six integers (x_1, y_1) then (x_2, y_2) then (x_3, y_3)

NumLang Syntax

All statements are four digits

All programs must begin with 0000 (“Begin”) and end with 3333 (“End”)

Operation statements must be repeated and followed by an “Equals” statement
i.e. 2298 “add constant 8”
2245 “add variable 5”
2143 “equals variable 3

0000 Begin
3333 End

Input / Output:
11xx Input Variable
12xx Output Variable
13xx Output String Prompts

Operations:
21xx Equals Variable
22xx Add
23xx Subtract
24xx Multiply
25xx Divide

41, 42, 43, … 49 Variables (*note* there are only nine memory locations using only integers)
91, 92, 93, … 99 Constants (*note* the constants are from 1 to 9)

Preset String Prompts:

50	“ ”	60	“enter ”	70	“product ”
51	“\n”	61	“one ”	71	“quotient ”
52	“:”	62	“two ”	72	“area ”
53	“-”	63	“three ”	73	“average ”
54	“a ”	64	“x ”	74	“base ”
55	“an ”	65	“y ”	75	“height ”
56	“the ”	66	“value ”	76	“integer ”
57	“is ”	67	“intercept ”	77	“sigma ”
58	“equals ”	68	“sum ”	78	“slope ”
59	“approximately ”	69	“difference ”	79	“squared ”