**Austin Sypolt**

**ECE 362**

**Pre-Lab #3**

**Introduction:**

The purpose of this lab is to implement arithmetic instructions onto our HC(S)12, correctly scale numerical operations for an accurate computation, understand the difference between signed and unsigned computations and how they affect the Condition Code Register, and finally create a program that will continuously run on the I/O board.

**Lab 3.1.1:**

Objective/Purpose:

The purpose of this section is to generate an integer result that solves the straight line equation (y=mx+b).

Expected Results:

This code should take the given values to the straight line equation, and dependent on the x value will output a correct y.

Val = 0 - 12

Val = 10 – 18.8

Val = 75 – 63

Val = 200 – 148

Val = 255 – 185.4

Code:

XDEF Entry

XREF \_\_SEG\_END\_SSTACK

Variables: Section

var1: ds.b 1

var2: ds.b 1

var3: ds.w 1

Constants: Section

cons1: dc.b 1, 1, 2

cons2: dc.w 68

cons3: dc.b 12

cons4: dc.b 100

Code: Section

Entry:

LDS #\_\_SEG\_END\_SSTACK ;You should comment your code

LDAA #1 ;Make sure the formatting is correct

LDAB

STAA var1

nop

**Lab 3.1.2:**

Objective/Purpose:

The purpose of this section is to write and test an assembly language program that solves the equation y = mx^2 + b.

Expected Results:

We expect to generate the proper values for val=? by setting m=0.68 and b=12.

Val = 0 – 12

Val = 10 – 80

Val = 75 – 3837

Val = 200 – 27212

Val = 225 – 44229

Code:

XDEF Entry

XREF \_\_SEG\_END\_SSTACK

**Lab 3.2:**

Objective/Purpose:

The purpose of this section is to show the state changes on the Condition Code Register (CCR), and see the changes to all the state flags (C,V,N,Z).

Expected Results:

A = Find the value in accumulator A with the current code

Carry Flag (C): 1 if a carry occurs during execution, 0 otherwise

Overflow Flag (V): 1 if an overflow occurs during execution, 0 otherwise

Negative Flag (N): 1 if it is a negative value, 0 otherwise

Zero Flag (Z): 1 if the value is 0, 0 otherwise

Expected results are based on the changing of values from various sections of 3.2.x.

Code:

XDEF Entry

XREF \_\_SEG\_END\_SSTACK

**Lab 3.3:**

Objective/Purpose:

The purpose of this section is to write a program that reads the switches then writes the following values to the LEDs.

Expected Results:

Expecting for the switch inputs to send the proper values to the LEDs.

Code:

XDEF Entry

XREF \_\_SEG\_END\_SSTACK