

# ECSE 324

## Laboratory No. 1 Report

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## Introduction

This is the report for Lab 1. The lab assignment given was to program some tasks in assembly.

### Part 1: Largest integer program, part1.s

#### **Description**

This part was about finding the largest number in the sample.

#### **Approach Taken**

We just copied the code from the assignment document.

#### **Challenge Faced**

None, frankly.

### Part 2: Standard deviation program, stddev.s

#### **Description**

This part was about finding the standard deviation, using the range rule.

#### **Approach Taken**

The main steps were to get the largest number, smallest number and divide their subtraction by 4, which is the range rule. We reused the code from part1 to find the largest number. A small modification was made into the code to find the smallest number.

#### **Challenge Faced**

Understanding that dividing by 4 was performing a logical shift right by 4.

### Part 3: Centering program, center.s

#### **Description**

Centering an audio signal to remove DC components before sending the signal to the speaker, by calculating the average value of the signal and subtracting the average from every sample of the signal.

#### **Approach Taken**

The tasks were divided into finding the total, finding the average and then subtracting the average from the signal array. The step to finding the total was straightforward. Finding the average was hard as we had to perform Arithmetic shift, not Logical shift to not affect the sign

bit, and for that as we had to express the dividend in terms of the number of shifts we have to perform because we were performing division of binary numbers, with the sample size in the order of the multiple of two. Because the sample size was in the order of the multiple of two, the method used was sufficient. Subtracting the average from the sample signal was done in a very straight forward manner as well.

### **Challenge Faced**

Finding the dividend. Because there was no way to perform a division directly. So, we had to express our dividend in terms of the number of Arithmetic Shift.

## Part 4: Sorting program, sort.s

### **Description**

This part was about sorting an array in ascending order.

### **Approach Taken**

The program consisted of two loops, nested, copying two data from the array and then comparing and storing them back in ascending order.

### **Challenge Faced**

Implementing a dynamic bubble sort algorithm to perform the sort with the least amount of comparison.

### **Improvements made**

Created a separate branch to perform the repeated task.

## Conclusion

The lab requirements were very straight forward and that allowed us to perform the tasks without much ambiguity. Till next time.