

525.446

DSP Hardware Laboratory

Electronic Submission Due October 1st @ 11:59PM

Demonstrate In Class October 7th

Assignment #4

Assembly Introduction

Introduction

This assignment is a short introduction to assembly programming. While we will write assembly functions in later lab assignments to be used in our real-time processing, for this assignment we will write a simple assembly function and a test function in C.

DSP Implementation

For this assignment, we will implement the function `DSPF_dp_maxval()` ourselves, but for 32-bit integers (therefore don't name your function `DSPF_dp_maxval()`, since that implies double-precision!). Implement this function in C (almost the entire C implementation is given in the DSPLIB) and assembly and time the difference. Test your function against the test cases specified on the grade sheet.

Note that an easier way to do time the execution time than using an LED/oscilloscope is to put the function call in a for loop, so that it is called many times. Place a call to turn on an LED before the loop, and turn it off afterwards. Time the execution in seconds manually. Then divide the number of seconds by the number of iterations in the for loop – this will give you a fairly accurate estimation of the time it takes to execute the function once.

Reading

Reference Chapter 3 (Architecture and Instruction Set of the C6x Processor) and Chapter 4 (Finite Impulse Response Filters) of Chassaing will both be useful for this assignment.

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Assignment #4, Grade Sheet

Total : (____/50)

(____/20) Implemented the assembly function

(____/5) Passed test case [1 2 3 4 5 6 7 8 9 10]

(____/5) Passed test case [-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0]

(____/5) Passed test case [1 2 3 4 5 100 6 7 8 9 10]

(____/5) Passed test case [1 2 3 4 5 6 6 6 6 6]

(____/5) Timed and reported the difference between C and assembly

(____/5) Well documented code