ECE 344L Lab 0

*Development Environment Familiarization*

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# Abstract

# The purpose of this laboratory was to familiarize students with the assembler/linker/loader system and its debugging capabilities. This lab used the provided math.S routine, which was then assembled and executed on the MX4 development platform.

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Figure 1: Math.S Routine

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# Procedure

### Part 1: math.S Routine

Following the procedures given in the “How to use MPLab”, we created a new Project in MPLab version 8.92 using the Project Wizard. From there, we designed the software to run on PIC32MX460F512L hardware, compiled with the C32 C compiler, and added the provided math.S routine. With the routine built, we attached and programmed the chipKit Pro MX4 board, and ran the instructions. Initially, the program performed the mathematical functions and went into an infinite loop (see Figure 1).

A screenshot of a computer

Description automatically generated

Figure 1: Math.S Routine

### Part 2: math.S Routine with Breakpoints

By either double-clicking on the side of the math.S routine or right-clicking and selecting *Add Breakpoint*, we were able to create breaks in the code which we could then analyze and determine the code behavior. We were tasked with creating breakpoints at specific portions of the code and to examine the General Purpose Register before the execution of the loop and after the execution of the arithmetic loop (see Figure 2).

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Figure 2: Math.S Routine with Breakpoints

As extra practice, I used the fast forward button to animate the program and execute one instruction at a time. This allowed me to observe the values of the registers and memory after each step (see Figure 3).