EGRE 426

Computer Design and Architecture

Lab1:

*Lab conducted on:* September 8th, 2022

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On my honor, I have neither given nor received unauthorized aid on   
this assignment”



**Introduction:**

For this lab, we got more familiar with the MIPS assembly language. Using the MARS Integrated Development Environment, we gain a familiarity with MIPS instructions and syscalls. We did gained familiarity with these through three different challenges. This overall helped us get a better understanding of registers and memory manipulation through MIPS assembly.

**Lab content:**

This lab had three distinct challenges to it. The first challenge was to allow the user to input a number, N, then sum 1, N and all the whole numbers in between. For this we used a loop and summed all the numbers in between (Figure 1). To achieve this loop, we need to save the users input to a register. We then used another register to iterate through integer until got to the user’s input. We then proceeded to sum each iteration into another register. From there we output the sum from 1 to N. The second challenge of this lab still required us to do the same challenge as the first but use a loop. Instead, we used the summing equation (Equation 1). Using registers as the appropriate variables we were able to get the sum of the sequence (Figure 2). For the final challenge of this lab was to be able to input and reverse and an array. To do this we first needed to allocate memory for the appropriate size of the array. We then needed to allow the user to input the values in each array’s iterations. We did this with loops and syscalls to both input and reverse the array values (Figure 3).

Figure 1

Text

Description automatically generatedText

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Equation 1

Figure 2

Graphical user interface, text, application

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Figure 3

Graphical user interface, text, application

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**Problems:**

The only major problem, I faced during this lab was allocating space for the user to input a dynamic array. To solve this problem, with used syscall 9 to allocate space on the heap and store the input from the user.

**Conclusion:**

Overall, this lab was good experience for getting us to learn MIPs assembly and understanding syscalls. It also helped me understand the purpose of different instructions and how they affected memory and registers.