Course Name: Computer Architecture Lab

Course Number and Section:
14:332:333:03

Experiment: Lab 5: RISC-V Functions and Pointers

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Exercise 1: Debugging megalistmanips.s

Fixed code in the file megalistmanips.s, uploaded in the folder

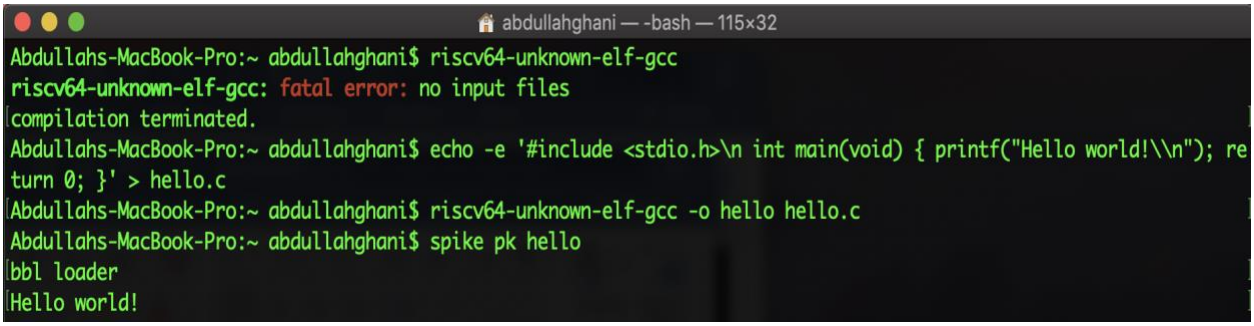
Exercise 2: Write a function without branches

Please see the submitted code file “discrete_fn.s” for my implementation of the function.

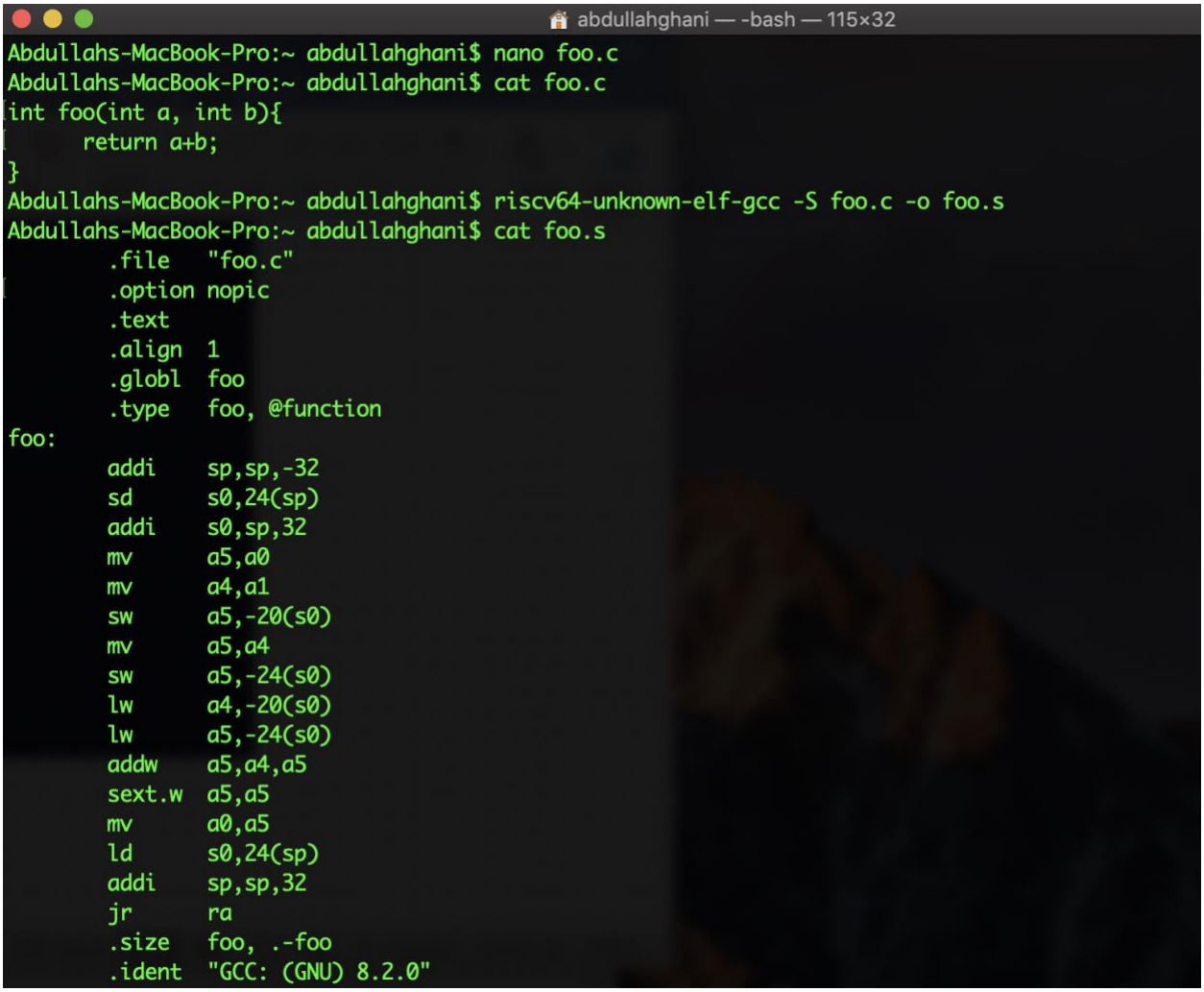
Exercise 3: RISC-V C Compiler and Spike

I have attached screenshots of the terminal for each section of this exercise.

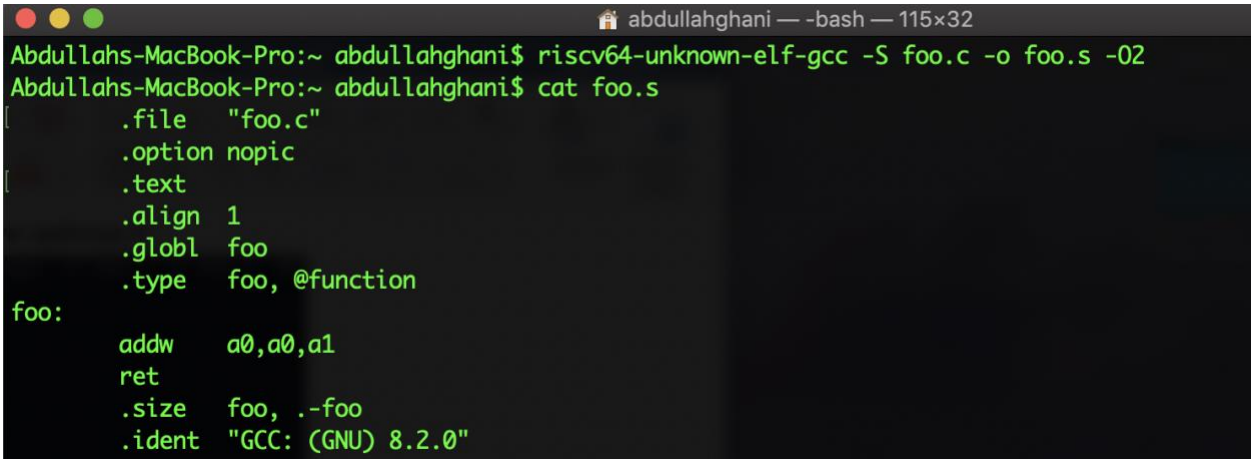
Test the compiler:



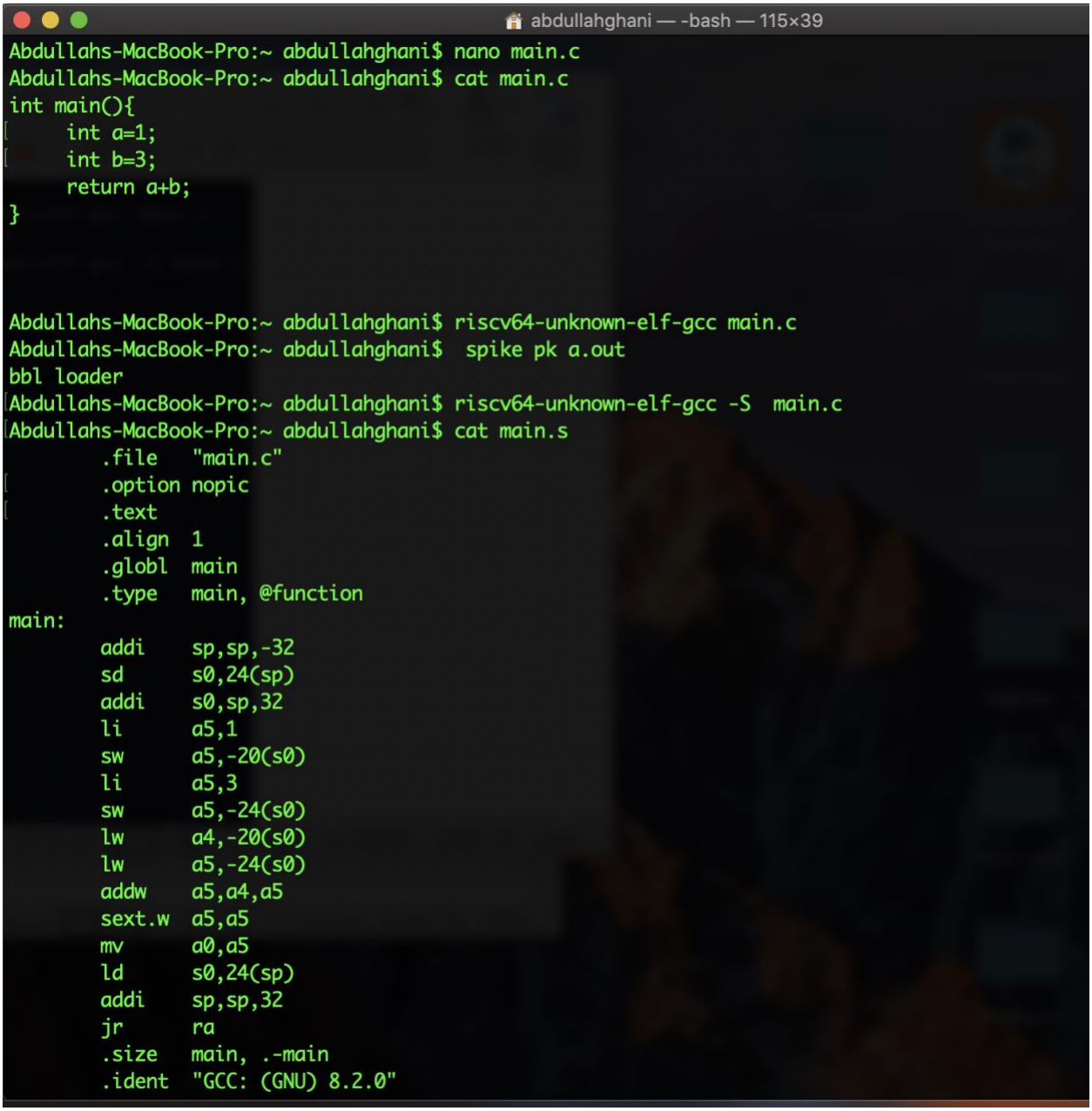
Exploring Compiled C Code:



After Optimization:



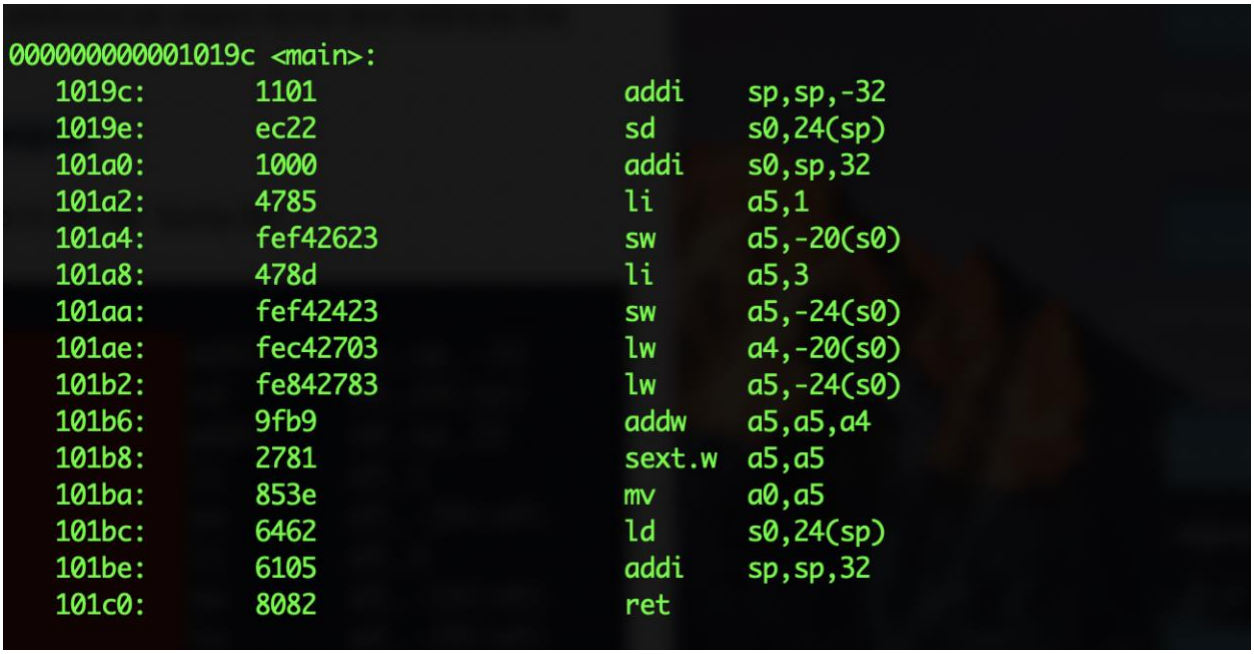
Compiling to an executable:



Then we execute the following command, which performs an object dump and redirects the output into a text file named “dump.txt”:

$ riscv64-unknown-elf-objdump -d a.out > dump.txt

Below is a screenshot of the **main** function found in the file “dump.txt”:


000000000001019c <main>:
1019c: 1101 addi sp,sp,-32
1019e: ec22 sd s0,24(sp)
101a0: 1000 addi s0,sp,32
101a2: 4785 li a5,1
101a4: fef42623 sw a5,-20(s0)
101a8: 478d li a5,3
101aa: fef42423 sw a5,-24(s0)
101ae: fec42703 lw a4,-20(s0)
101b2: fe842783 lw a5,-24(s0)
101b6: 9fb9 addw a5,a5,a4
101b8: 2781 sext.w a5,a5
101ba: 853e mv a0,a5
101bc: 6462 ld s0,24(sp)
101be: 6105 addi sp,sp,32
101c0: 8082 ret