

EECS2021

LAB C

Lab Objectives

In this lab you will learn how to implement some simple control flow examples and loops at the assembly level:

1. Implement simple if-then-else statements in assembly
2. Implement multiple if-then-else statements
3. Implement a compound if statement (if (A &&B)).

Note: Before starting the part 1 below, please read the “RVS Input/Output System Calls Manual” under the “Documentation” section in the supporting materials website (http://www.eecs.yorku.ca/course_archive/2018-19/F/2021SUP/)

Part 1

Implement a simple RISC-V assembly code to do the following

```
if (A > B) x=0;
else x=1
```

Assume that x is in register x5 (i.e. for x=0 you have x5=0). Your program loads A in register x1 by using add immediate, and reads B from the input. The value of A is hardwired in your code, B is an input from user.

Part 2

In this part, you will implement a more complicated if-then-else statement

```
if (A > B) {
    Y=1;
    Z=2;
} else if (A < B) {
    Y=5;
    Z=5;
} else {
    Y=0;
    Z=0;
}
```

Similar to Part 1, your program loads A in register x1 by using add immediate, and reads B from the input (The value of A is hardwired in your code, B is an input from user). Y and Z are memory locations, you need to allocate the memory using DD and initialize it with a negative number.

Part 3

Implement the following code

```
if ( (A > B) && (C == 5) ) {  
    Y=1;  
    Z=2;  
} else {  
    Y=0;  
    Z=0;  
}
```

Read A, B, and C from the input panel. Assume that Y and Z are in registers x1 and x2, respectively.

Note: After completing the lab, you need to show the TA that your code is working (This should be done for all labs).

Lab Report:

Your lab report should be submitted in pdf format (You can use LibreOffice; type libreoffice in the terminal). Name your report file **LabCReport.pdf**

Your report should include:

1. cover page with your name and student ID
2. The assembly code for part 2 and part 3 programs.
3. For each program, put a screen shot showing the simulator (all windows, including memory, registers, etc.) after the compile (before the run) and after the run.
4. Any further explanation you might want to add

Submit it as: **submit 2021 labC LabCReport.pdf**