Lab Assignment 9

Due No Due Date   **Points** 105   **Submitting** a file upload   **File Types** asm and s

Purpose: Translate a main program and a 4 parameter function it calls from the high level language C to MIPS assembly language.

Program

The following main program and 4 parameter function are written in the high level language C:

```
int f(int a, int b, int c, int d) {
    if (a < b) {
        return (a);
    }
    if (a == b) {
        return (b);
    }
    if (a > b) {
        return (c + d);
    }
}  // end f

int main() {
        int result = 0;

        result = f(12,7,20,21);

        return (result);
} // end main
```

The main function is used in C to hold the programming logic that is performed when the program runs. The main function can call other functions as a part of its programming logic. In this program, the main function is calling the f function.

Translate this C program into a MIPS assembly program.   In your translation, you are to use the following rules:

1. All parameter passed to a function must have their values placed in the parameter registers $a0, $a1, $a2, and $a3 **before** the function is called.
2. All integer values are 32 bits long.
3. All values returned from a function must be stored in the $v0 register.

You will earn full credit for this assignment if:

- the assembly language translation you write follows the rules above, and has **all** the equivalent programming logic as the C program. All of the programming logic for both the C program's main function and the C program's function f **must** be in your translation
- the assembly language translation you write executes without any errors
- the assembly language translation you write provides the same value for $v0 in the last instruction of the program as the value of result in the C program's main function
- the assembly language translation contains program comments that state your name, the programming logic, and any details you feel you'd like to explain that state about how you are using the assembly language instructions

Use The MIPS Technical Document To See The MIPS Assembly Language instructions ↓ **(https://ccsf.instructure.com/courses/47907/files/7405493/download?download_frd=1) . You may wish to download the document and refer to it as you are writing the program.**

This program is to be saved in its own file, with a .asm or a .s file extension. You may only use a .asm or .s file extension (MIPS assembly language programs are named using these files extensions). Once your program is working correctly, submit the program file to this assignment to receive a grade for your program.

You may wish to reread the module that explains High Level Language to Assembly Language translation when performing work on this assignment. Select This Text To Go To Module 13: High Level Language To Low Level Language Translation