CS2610 : Computer Organization Architecture Lab

Lab 4 : Introduction to RISC-V Toolchain and Assembly

10th March 2025

In this lab you will be introduced to interactions between C and assembly programs.

Question 1:

- Write an assembly code (in a file named lab4q1.s) that interacts with C functions (in a file named lab4q1.c).
- Call a C Function: From the assembly code, call a C function named *getCourse* that returns the given course as a string.
- Declare a global variable named course_name and initialize it with a default value.
- Define a function named displayStudentProfile that takes five arguments: first_name, last_name and course_name. This function should print the following format:
  First Name: <first_name>, Last Name: <last_name>, Course: <course_name>
- Initialise the “course_name” variable (in C) from assembly and call the “print” function by passing the necessary arguments to display the above output.

Question 2:

- Write a C code (in file lab4q2.c) that calls a function in assembly code (in file lab4q2.s).
- Write a function named “reverse” in the assembly that reverses the given string and stores it in the data section, it should also return the length of the string.
- The C code should invoke this function by passing one argument (input_string) and print the reversed string by accessing it from the assembly code data section. (Ever heard of the “extern” keyword in C?)
- Example output:
  input_string: Hello

- reverse_string: olleH, length = 5

Submission:

1. The assignment should be done individually.
2. The following artifacts need to submitted:
    a. Screenshots of the output as mentioned for each question
    b. Code files per question
    c. Report: Explain the commands you used.
3. Zip all the contents and submit on Moodle.