

# Computer Organization, Spring 2020

## Lab 1: RISC-V Programming

**Due: 2020/04/02**

### 1. Goal

In Lab 1, students will learn how to write RISC-V assembly code, and know the difference between assembly and high-level languages. In order to test the correctness of the program, students should use RISC-V simulator – Ripes to simulate the programs.

### 2. Attached Files

- (1) “factorial.c”: C code for “factorial”.
- (2) “factorial.s”: RISC-V assembly code for “factorial.c”.
- (3) “bubble\_sort.c”: C code for “bubble sort”.
- (4) “gcd.c”: C code for “greatest common divisor”.
- (5) “fibonacci.c”: C code for “fibonacci sequence”.

### 3. Lab Description

This lab can be divided into three parts.

A simple RISC-V assembly code - “factorial.s” is given as an example for the corresponding C code “factorial.c”.

C output:

```
Factorial value of 7 is 5040
-----
Process exited after 0.03513 seconds with return value 0
Press any key to continue . . .
```

Ripes output:

```
Application output
Factorial value of 7 is 5040
```

You have to write the corresponding RISC-V assembly codes for “bubble\_sort.c”, “gcd.c”, and “fibonacci.c” and get the same output result.

Ripes Link: [\(Please Download the 1.0.4 version\)](#)

Ripes Introduction: <https://github.com/mortbopet/Ripes/wiki/Ripes-Introduction>

Ripes v.1.0.4 Download: <https://github.com/mortbopet/Ripes/releases/tag/v.1.0.4>

### 4. Grade

- (1) Bubble sort(30%)
- (2) Greatest Common Divisor(30%)
- (3) Fibonacci Sequence(30%)
- (4) Report (10%)
- (5) Late submission: 10 percent penalty per day
- (6) No plagiarism, or you will get 0 point.

### 5. Hand in

- (1) Zip your folder and name it as “ID.zip” (e.g. 0816001.zip) before uploading to neue3. Other filenames and formats such as \*.rar and \*.7z are NOT accepted! Multiple submissions are accepted, and the version with the latest time stamp will be graded.
- (2) Please include ONLY Assembly source codes (\*.s) and your report (\*.docx or \*.pdf) in the zipped folder.

## 6. Q&A

For any questions regarding Lab 1, please contact

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