Computer Organization, Spring 2022

Lab01: RISC-V Programming Due: 2022/03/17/23:59

1. **Goal**

   In Lab0, students will 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. **Feel free to generate assembly code in any way!**

2. **Attached Files**

   - factorial.c: C code
   - factorial.s: RISC-V assembly code for factorial.c
   - bubble_sort.c: C code
   - gcd.c: C code
   - fibonacci.c: C code

3. **Lab Description**

   We provide "factorial.c" and "factorial.s" for example. You should generate the assembly codes for "bubble_sort.c", "gcd.c", "fibonacci.c" correspond to "bubble_sort.s", "gcd.s", "fibonacci.s".
   With our giving data in C program, you have to answer the questions below, and please describe the answers in your report.

   - How many instructions are actually executed? You have to explain clearly how you calculate your instructions. There is no specific answer. (Hint: loop need to be counted every single time.)
   - What is the maximum number of variable be pushed into the stack at the same time when your code execute? There is only one correct answer.

4. **Grade**

   - Assembly Code: 20%.

   - `Report (80%): You should include`
     - The answer of the question for three program. Every question you got 10%, totally 60%. For example, you answer question 1 and question 2 for "bubble_sort.s" in your report you got 20%.
     - Experience: 20%

5. **Hand in**

   - Zip your folder and name it as "ID.zip" (e.g. 0816001.zip) before uploading to newe3. 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.
   - Please include **ONLY** Assembly source code(*.s) and your report(*.pdf) in the zipped folder.

6. **Reference Link**

   - [Ripes Introduction](#)
   - [Ripes Download](#) (Please download v.1.0.4)

7. Q&A

   - Feel free to ask any question if you need.
   - We will not debug for you.

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