Computer Architecture

Practical session - Week 2, Semester 2020

Notes:

- The main purpose of this session is to get familiar with MARS MIPS simulator tool only
- To download the MARS MIPS simulator, the link from developers (https://goo.gl/497FVV) can be used. Besides, the additional download link (https://goo.gl/ECR2k6) can be used as an alternative.
- The MARS MIPS simulator requires JDK which is downloadable from Oracle website to execute.
- To get a simple MARS MIPS tutorial, please check out this link (https://goo.gl/CUzFTi) and this link (https://goo.gl/8m6Tzi).
- Please note that the register \$zero can be described as \$0.

Question 1. Write a simple MIPS program that can execute these steps:

- 1. Print a sentence to terminal to request an integer number from user;
- 2. Collect the number and increase it by 1;
- 3. Print the result to terminal.

Question 2. Write a small program that is able collect two integer numbers from users and print out the sum of the two numbers.

Question 3. Write a small program that allows users to input values for variables a, b, c, and d. The program then calculates the following expressions and prints the results to terminal.

$$f = (a+b) - (c-d-2); (1)$$

$$g = (a+b) * 3 - (c+d) * 2; (2)$$

Question 4. Write a small program that allows users to input 5 different integer numbers. The program then prints those numbers in reverse. For example, users input 1, 2, 3, 4, 5; the program should print 5, 4, 3, 2, 1.

Question 5. Write a MIPS program that calculates and prints the result of the following equation to the terminal with the number of instructions as small as possible.

Question 6. Write a MIPS program that receives values for a, b, c, d, and x variables from users and prints result of following equation:

$$f = a \times x^{3} + b \times x^{2} + c \times x + d$$
the end———— (4)