Ho Chi Minh City University of Technology
Faculty of Computer Science and Engineering

Computer Architecture

Practical session - Week 6 Autumn Semester 2018

Notes:

- The main purpose of this week is to continually practice the conditional branch and unconditional jump instructions.
- **To reduce work load for all students, this week exercises will be considered as your assignment. Therefore, please read these notes carefully and follow the rules. There will be no any exception for the assignment.**
- Students are requested to submit the MIPS programs to the elearning no later than 23-Dec-2018.
- One report (in pdf) also needs to be submitted through the elearning system to answer the sub-questions that do not require programming.
- You need to compress all files into one zip file before you submit your assignment to the system.
- **Similarity less than 20% in MIPS code is allowed. In other words, you will get 0 if your answers are similar to an another student more than 20%.**

Question 1. Given the following MIPS declaration in the data section of a MIPS program

```
.data
 nums .word <an integer number>
 elems .word <array elements>
```

Where `<an integer number>` will store the number of elements in the array `elems`. `elems` is an array that stores integer elements whose size is equal to value `<an integer number>`. You are required to choose those values when developing and testing your program.

1. Write a MIPS program that sort the the array `elems` in **descending order** using the **buble sort** algorithm. (*4 points*)
2. Calculate the execution time of your program if one instruction requires 1 ns for processing. (*1 point*)

Question 2. Given the following MIPS declaration in the data section of a MIPS program

```
.data
 nums .word <an integer number>
 elems .word <array elements>
```

Where `<an integer number>` will store the number of elements in the array `elems`. `elems` is an array that stores integer elements whose size is equal to value `<an integer number>`. You are required to choose those values when developing and testing your program.

1. Write a MIPS program that sort the the array `elems` in **ascending order** using the **quick sort** algorithm. (*5 points*)
2. Calculate the execution time of your program if one instruction requires 1 ns for processing. (*bonus 1 point*)

——————the end——————