COE 301/ ICS 233, Term 172

Computer Architecture & Assembly Language

Programming Assignment# 1
Due date: Sunday, Feb. 25, 2018

Q.1. Write a MIPS assembly program to implement the **BubbleSort** algorithm to sort an array of integers (i.e. 32-bit signed numbers) in an **ascending** order.

The pseudocode for the **BubbleSort** algorithm is given below:

```
BubbleSort ()
        Status = Unsorted
        #comprisons = ArraySize-1
        while (#comparisons<>0 AND status = Unsorted)
                status = Sorted
                for (i= 0 to #comparisons)
                        if (Array[i] > Array[i+1])
                                swap ith and (i+1)th elements of the array
                                status = Unsorted
                        end if
                end for
        #comparisons = #comparisons – 1
        end while
end BubbleSort
```

Store the array to be sorted in variable Array as defined below.

```
Array: .word 10, 2, 0, 15, 25, 30, 7, 22
```

Your program should display the following:
Array before sorting is: 10 2 0 15 25 30 7 22
Array after sorting is: 0 2 7 10 15 22 25 30

Clearly indicate in your assembly code where each pseudocode statement is translated. Also clearly indicate what registers are used to store the variables.

This assignment can be solved based on a group of two students. The solution should be well organized and your program should be well documented. Submit a soft copy of your

solution in a zip file. Your solution should be submitted in a ***word file*** *that contains the following items:*

i. *Your name and ID*

ii. *Assignment number*

iii. *Problem statement*

iv. *Your solution along with the code*

v. *Discussion of what worked and what did not work in your program. Include snapshots that demonstrate the working parts of your program. If things did not work and you attempted to solve them, mention that and write about the difficulty that you have faced.*