

# School of Engineering, Computer and Mathematical Sciences

Assignment Part 2/3: Assembly language

COMP502 Foundations of IT Infrastructure Semester 1, 2017

Semester 1, 2014

**Contribution to final mark: 15%**

**Due: 23:59 pm, Sun. 7 May 2017 (end of AUT calendar week 8).**

Late penalty: Late submissions will be penalised at 5% of the actual assignment mark for every calendar day. E.g. assignments submitted 5 minutes late are penalised as one day late. Late work of 5 or more days will not be marked.

**Miscellaneous requirements:**

* Assignment will not be marked if:
  + It contains any form of malware (e.g. computer virus)
  + Submitted in non-requested compression format (e.g. 7zip, rar, …)
  + Not submitted incorrect file format (see section: REPORT SUBMISSION INSTRUCTION)
* Keep a backup copy of your assignments to be:
  + uploaded to *“TurinItIn”* anti-plagiarism service – **if requested**.
  + submitted as a hard copy – **if requested**.

ASSIGNMENT AIM

This assignment will help you progress in the understanding of Assembly programming language. Think carefully about any problems you come across, and try to solve them on your own. Remember to properly document your code to make it readable and understandable by the markers.

**Your code must be able to run using the LC-3 simulator on Windows machine in the lab. Make sure you can run it before submitting it.**

INSTRUCTION

You are asked to design and implement a simple Sorting program to be used in a fruit grading, sorting and packing machine. It needs to be fast and efficient, thus, requires you to implement the system in Assembly language.

Your task is to implement a simpler version of such program which asks the user to enter a list of random positive numbers (between 1 and 9). Assume that totally there are less than ten numbers and all they are all one digit numbers, the user **only** types the correct inputs. Your program should read user’s input, perform a number of simple comparisons and processes to print out the following outputs:

*FirstName LastName, ID number: 12345678 (line 1 – 20 marks)  
Please enter a list of numbers from 1-9 separated by spaces: 3 2 5 1 3 9 5 7 (line 2 – 20 marks)  
Your have entered: 3 2 5 1 3 9 5 7 (line 3 – 20 marks)  
There are 8 numbers in the list (line 4 – 10 marks)  
The smallest number is: 1 (line 5 – 10 marks)  
The largest number is: 9 (line 6 – 10 marks)  
The sorted list is: 1 2 3 5 5 7 9 (line 7 – 10 marks)*

**There are seven output lines as shown above:**

* If line 1 is correctly shown, **20 marks** are rewarded.
  + Your student name and ID must be printed out correctly.
* If line 2 and 3 are printed correctly and allow users to enter numbers, each number is separated by a space, finished by pressing “enter” key, and reprinted what was typed;   
  **20 marks** are rewarded each.
  + Allows the user to enter up to 9 numbers.
  + Assume that user enters correctly.
  + Correctly reprint what was typed.
* If line 4, 5, 6, and 7 are correctly shown, **10 marks** each are rewarded.
  + Line 7 is difficult and it is targeting A+ students.

SUBMISSION INSTRUCTION

The assignment has to be submitted on AUT ONLINE / BlackBoard in soft copy and submit it at: **Assessments > Current Assessments > Assignment Part 2/3: LC-3 Assembly language**.

1. Name your programs to: **sort.asm**.
2. Submit it online via Blackboard (blackboard.aut.ac.nz).

Note that RAR, 7zip or virus-contaminated files will not be marked (automatic failure)