

Quiz3 ECE2560 Autumn 2021

Due date: Sunday, Oct. 24, 11:59pm

Collaboration with other students is not allowed

Given array a in RAM (not in FRAM):

```
a: .byte 10, 7, -5, 6, 9, -12, 5, 21, -4, -1
```

Write pseudo-code, draw the flowchart and write assembly code to re-arrange the elements of array a so that it ends up being in descending order, i.e.,

$a[0] \geq a[1] \geq a[2] \geq \dots \geq a[9]$

Use alternate implementations of for-loops (page 15, lesson 11) and if-structures (page 9, lesson 11). Note that your program will change the array, a, so that it will end up being in descending order.

Place the array and your temporary variables in RAM (not in FRAM or core registers). Use core registers for array indices (do not use core registers R0, R1, R2 or R3). Here is pseudo code in words to follow: You will have two for-loops, one inside the other. The inner loop will contain an if-structure. In the outer loop the index i will go from 0 to 8. In the inner loop the index j will go from i+1 to 9. In the inner loop check if a[j] is greater than a[i], if it is then interchange a[i] with a[j].

Instructions: Use the word template and instructions contained on our web site to submit your screenshots to Carmen. Do not email directly to your TA or me. Files emailed to the TA or me will not be accepted. Include the following in your submission:

- i) Pseudo code and the flow chart
- ii) Assembly language source code
- iii) Screenshot of the "General" tab of the properties screen of your project. Note: In CCS, right click on your project folder in "project browser" and choose "properties" to get to the properties screen.
- iv) In the debugger execute your program (green play button) and pause (suspend) it. While the program is paused (suspended) take a screenshot of the memory browser showing the array, a (use 8 bit Signed Int to display the data as decimal numbers).

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