

- 1) Download the (incomplete) source code for Figure 5.17. Save it as *charCount1.bin*.
 - Enter **x3000** for the program's load-address as the first line of the program.
 - Enter **x3100** for the starting address of the file in the empty line (address **x3012**)
 - Include a Program Id Paragraph: <http://users.cis.fiu.edu/~pestaina/asmpip.txt>
 - Use the LC3Edit **B** button to translate your program into *charCount1.obj*.
- 2) Download test data files *verse.asm* and *rhyme.asm* from the class page,
 - Use the LC3Edit **asm** button to assemble into *verse.obj* and *rhyme.obj*.
- 3) **[50 points]** In the LC3 simulator:
 - Open *verse.obj* and *charCount1.obj* into memory (at **x3100** and **x3000** respect.)
 - Set a breakpoint at the **Halt** instruction; run the program to count the number of 'i' characters. The count should be 8.
 - Set a breakpoint at the **Increment R2** instruction and run the program again. Complete the table to show the (hex) content of **R2** and **R3** at each breakpoint:

<u>R2</u>	<u>R3</u>
x0000	x3101
x0001	x3108
x0002	x3114
x0003	x311D
x0004	x312A
x0005	x3134
x0006	x313B
x0007	x3148
x0008	x3167

- 4) **[25 points]** Extend the *charCount1.bin* machine language program to build a list of the addresses where the character matches occur. Start the list at memory location **x3500**. Save the modified program as *charCount2.bin*. Test it on *verse.obj*.
- 5) **[25 points]** The program output is correct only when the count is a single digit 0... 9. Extend *charCount2.bin* to work for any 2-digit count, 0... 99. You must split the final count into two digits by dividing by 10, and then print both digits. Save the modified program as *charCount3.bin*. Test it on both *verse.obj* and *rhyme.obj*.
- 6) **Your Name:** _____ Edward R. Gonzalez _____ **Student #:** 4999406

Zip this completed work-sheet and your three (.bin) source files. Upload the zipped file in SCIS-Moodle: <https://moodle.cis.fiu.edu/>. **No late submissions accepted.**