CS 2110 Timed Lab 4

Due Date and Time

Day: Monday, March 14th, 2016

Time: Before the end of you lab section

Policy

Submission

TURN IN THIS ASSIGNMENT ELECTRONICALLY USING CANVAS. SUBMISSIONS WHICH ARE LATE WILL NOT BE ACCEPTED. EMAIL SUBMISSIONS WILL NOT BE ACCEPTED UNDER ANY CIRCUMSTANCES! IN ADDITION IF YOU FORGET TO HIT THE SUBMIT BUTTON YOU WILL GET A ZERO.

Questions

If you are unsure of what questions mean, the TA's will clarify them to the best of their ability. We will not be able to answer any questions about how to reach a solution to the timed lab questions. You should know how by now!

What's Allowed

- The assignment files
- Your previous homework and lab submissions
- The ISA appendix in Complx
- Your mind
- Blank paper for scratch work

What's Not Allowed

- The Internet (except the Canvas Assignment page to submit)
    - Any resource on Canvas that is not given in the assignment.
    - Textbook or notes on paper or saved on your computer.
    - Dropbox (If your harddrive crashes we will let you retake it).
    - Email/IM
    - Contact in any form with any other person besides TAs

- If you have any questions on what you may not use then assume you can't use it and ask a TA.

Other Restrictions

- You may not leave the classroom until we have verified that you have submitted the lab. If you leave the classroom without submitting you will receive a zero.

1. **YOU MUST SUBMIT BY THE END OF YOUR LAB PERIOD**. Bear in mind that the clock on your computer may be a few minutes slow. You are supposed to have a full class period to work, and we are letting you use the 10 minutes between classes to make sure you have submitted your work. **WE WILL NOT ACCEPT LATE SUBMISSIONS**, be they 1 second or 1 hour late.
2. The timed lab has been configured to accept one submission. If you accidentally submit or submit the wrong version flag one of the TAs and we will reopen submission for you.

Violations

Failure to follow these rules will be in violation of the Georgia Tech Honor Code. **AND YOU WILL RECIEVE A ZERO** and you will be reported to Bill and the Office of Student Integrity.

We take cheating and using of unauthorized resources **VERY SERIOUSLY** and you will be in serious trouble if you are caught.

Remember

1. We allow you to use your homework assignment.
2. Please don’t get stressed out during a timed lab. You have plenty of time; however, use your time effectively
3. Again, remember: Don’t get stressed. Partial credit will be given for things you have done correctly. Do the best you can!
4. If you don’t know something at least **TRY.** Do not just walk out of the lab or submit an empty file. Partial credit!
5. Remember what you can and can’t use. If you don’t know, then don’t use it and ask a TA if you can use it. If we catch you with unauthorized resources we will give you a zero, so better to be safe than sorry.

The Assignment

OBJECTIVE:

Your assignment today is to implement a recursive function in LC3 assembly. For a given input N, you must sum all the even numbers less than or equal to N and greater than 0.

For example, if N=6, the return value is 12, because 6 + 4 + 2 equals 12. If N = 10, the return value is 30, because 10 + 8 + 6 + 4 + 2 equals 22.

You must follow the pseudocode below. Non-recursive solutions will receive a zero.

PSEUDO-CODE:

```
int even_sum(int N) {
        int sum;
        if (N <= 0)
                return 0;

        sum = even_sum(N - 1);

        if (N & 1 == 1)
                return sum;
        else
                return sum + N;
}
```

HOW TO TEST:
We have provided a test file that will test your code. To use the tester, place even_sum.asm and even_sum_test.xml in the same folder and run the following command:

lc3test even_sum_test.xml even_sum.asm

The tester randomizes the memory and then loads even_sum.asm on top of the randomized memory. This means that if your solution is incorrect, you could get more or less points each time you run the tester. When we grade your assignment we will run the tester multiple times and take the lowest grade, so run the tester several times yourself to be sure your grade is consistently a 100.

RESTRICTIONS:
You may only use old labs, homework and the ISA reference sheet when completing this assignment. Please note that this means you may not use Appendix A from the textbook.

Deliverables

1) even_sum.asm