Lab Worksheet

**Lab Number (circle this week’s lab)**

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

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**Lab Section**: 1

**Lab Partner Name**: Ruyiu Son

This lab worksheet is the final deliverable for a lab. You will usually have three deliverables for a lab:

1. **Prelab assignment BEFORE LAB**: Posted with the lab manual, typically involves a system sketch, submitted in Canvas before the start of your lab section, may be worked on and used by lab partners in class on Tuesday during lab planning
2. **Demonstrations IN LAB**: Demonstrated/discussed with a TA in lab and recorded using a demo evaluation sheet to be printed and signed in lab (functional demo of a lab milestone, debug demo using debugging tools to explain something about the internal workings of your system, Q&A demo showing ability to formulate and respond to questions)
3. **Postlab assignment AFTER LAB**: Submitted in Canvas before the start of your next lab section, may be reviewed by lab partners in class on Tuesday during lab retrospective, consists of three items (prelab planning boards, lab notes, and lab retrospective)

Deliverable #1 has its own Canvas assignment submission. (10 points)

Deliverable #2 has an evaluation sheet that is printed in lab, used as a checklist, and submitted to your TA. The TA will enter points in Canvas based on the demo evaluation sheet. (40 points)

Deliverable #3 has its own Canvas assignment submission. (30 points)

This worksheet will help you develop the items needed for deliverable #3.

1. **PRELAB PLANNING BOARDS**
2. Question Board: What are the three priority questions from your lab planning work?
   1. How does the Flag work with the Data register?
   2. How can we incorporate software to work with the flag and data register?
   3. How the functions in C will work together in communication with the puTTy and Lcd Screen?
3. Task Board: What are several tasks you identified in your planning (for you and lab partner)?
   1. Understand how to notice when the data register is empty and should be taking in data
   2. How to correctly set the baud rate and IBRD
   3. How to set the given character to the data register based on the functions parameters
   4. Logically work through how to print to the LCD screen once data is being sent to the registers and when to stop
4. **LAB NOTES**

During lab, keep notes about the following so that you can submit information with this deliverable.

1. Results related to the three priority questions (might be answers, might be more questions, write brief summaries, don’t include code files)
   1. We looked over our prelab again and inside of the Bai book to understand what value the flag should have if it is empty. Based on that we changed the mask opposite of empty and set it as a while loop parameter, so the function did nothing if the data register was full. We incorporated software with the flag and data register by using a mask for the flag and then based off the while loop we took the character argument for the function and set it equal to the (UART1\_DR\_R = data;). We didn’t get to this part of the lab really but we read through the design parameters to know that we should use lcd\_printf() to help print to the lcd screen and then made conditional statements so it continues to print unless 20 characters have been entered or ‘/r’ was enter by the user.
2. Any additions, refinements, or corrections to the prelab system sketch based on what you learned (include an updated sketch, or briefly describe at least one update you made)
   1. I did not make any corrections to my prelab.
3. Description of your debug demo (what did you demo and why, what did you find, a paragraph is fine, may want to include a screenshot)
   1. We went through printing to the lcd screen as our demo showing how things were being printed to the lcd screen and then how we fixed not adding an enter key when it is pressed. At first we just had a conditional if(letter != ‘\r’) then add characters to our array upon stepping through we realized we needed an else with a break statement so it wouldn’t continue to loop through until 20 characters were met.
4. **LAB RETROSPECTIVE**

Take 10-15 minutes and answer these questions as you think about your lab experience. You don’t need to describe everything, try to pick something notable.

1. What did we set out to do?

* We set out to complete the lab will understanding how the flag and data registers work. We also wanted to effectively write C functions to send and receive data with the putty using the correct baud rate which in turn would get printed on the lcd screen.

1. What actually happened?

* My lab partner and I worked through the utilization of the UART, got the correct baud rate set and IBRD. We then worked though the first two functions for sending and receiving data with the putty which we were able to finish by using the right mask to understand when UART1\_DR\_R was full.

1. Why did it happen?

* I don’t think we used our time effectively because we went back and forth on different ideas of how to notice how if the register was full as well as how to write the functions. This caused us to be slow in our endeavors which didn’t allow us to get to the functional demo during lab time.

1. What are we going to do next time (to improve)?

* Time management skills as well as working through the prelab together or at least sharing ideas, so that we aren’t butting heads on too many ideas.