VIRGINIA COMMONWEALTH UNIVERSITY
SCHOOL OF ENGINEERING

EGRE 364 – Microcomputer Systems (4 Credits)

Fall 2019 – Lab 6 –Serial Communication

Due Date: Demo due in lab, report due Nov 8th

Goals

1. Create an assembly project for STM32L4 discovery kit and program the kit.
2. Learn basics of GPIO conformation for keypad input and serial communication.
3. Learn how to program the microcontroller for USART communication
4. Learn how to perform virtual serial port on STM32L4 Discovery kit.

Grading Rubrics (Total = 100 points)

1. Pre-lab assignment (10 points)
2. Documentation and Maintainability (25 points)
3. Functionality and Correctness (25 points)
4. Lab Demonstration (30 points)
5. Post-lab assignment (10 points)

Pre-lab assignment

1. Read Textbook **Chapter 22.1 Universal Asynchronous Receiver and Transmitter.**
2. Read Textbook **Chapter 14 GPIO.**
3. Read Reference Manual about USART registers
4. Download and install PuTTy on the host computer.
5. Complete the assembly coding and pin configuration for USART.

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11/7/19
TA:

Lab assignment

- Design a circuit and program the microcontroller to correctly parse the inputs from a keypad through serial port to your computer. You will use 10K resistors and 12/16 button keypad in your circuit.
- Use virtual serial port to perform the communication between the host computer and the microcontroller. You might need to download and install PuTTy on the host computer.
- When pressing any button in the keypad, it shows up correctly on your host computer.
- Your program will be able to deal with debouncing and pressing one key.
- Use the assembly language and proper coding techniques.

GPIO Configuration for USART

To perform USART communication, TX and RX pins need to be configured as AF mode. The detailed configuration is as follows.

Pin	Mode	Output Type	Pull Up/Down	Clock
TX	AF	Push-pull	No Pull-up/down	40MHz
RX	AF	Open-drain	No Pull-up/down	40MHz

For example, we have the following C code to configure USART2 (PD5 as TX, PD6 as RX)