Midterm 1: UART Interface Due Date: See Website

Q: Write, simulate, and demonstrate using Microchip Studio 7 a C code for the AVR ATMEGA328pb microcontroller that performs the following functions:

Program the UART Module to interact with the ATmega328pb:

1. On transmitting the following keys from the host terminal, the following actions will be performed:
    1. On-reboot or 'h' key – help screen (list all keys and functionalities)
    2. 'o' - turns ON LED at PB5, 'O' turns OFF the LED at PB5.
    3. 'p' - Blink (on-off) the LED PB3. Choose your own period. Only use timer mode. 'P' turns off the LED PB3/stops this operation.
    4. 'f' - fade the intensity of LED PB1. Choose your own frequency and step resolution. 'F' turns off the LED PB1/stops this operation.
    5. 'b' – reads the status of the switch at PC1. Display the status in terminal. Exit this function when there is change of switch status.
    6. Use UART RX interrupt for all of the above operations.

Submission:
The following are required for successful completion of the design assignment:

a. AVR C code that has been compiled and working submitted to the github repository.
b. A word/pdf document that contains the C/assembly code well documented along with the kiCAD schematics with components used connected to the ATmega328P/PB.
c. In the word/pdf provide the screenshots of 1) successful compilation, 2) snapshot of the demo circuit, 3) screenshot of demo outputs, and 4) video links for each task.
d. Provide a text file in your github with links to youtube for all tasks.

Evaluation Rubrics:
See class website for the DA evaluation rubrics.