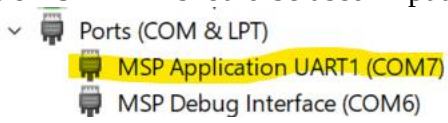
CPE 325: Embedded Systems Laboratory
Laboratory Assignment #9

Assignment [100 pts]

You have been given a demo code for SPI Master and Slave that can establish the SPI communication between two MSP430F5529LP Experimenter Boards using UCB0. The SIMO, SOMI and SCLK are multiplexed with P3.0, P3.1 and P3.2 respectively. We also need a handshaking signal as Slave Ready and we are using P1.2 for that purpose.
The two experimenter boards should be physically connected to each other with the mentioned ports using cables and then the master program should be loaded first and then run. The program would wait for the slave to get ready. Then the slave board should be programmed and run. The slave sends the handshaking signal using slave ready pin P1.2.
If the connection is established correctly, then master will send data to slave and slave will send back the data. LED1 will be on at the slave and LED2 works as heartbeat, meaning it will blink when it receives the data from master and sends it back. The LED1 at the master will be on if the data received matched the data sent one cycle before or otherwise only LED2 blinks indicating data being sent at with a delay of 1 sec. Thus, the master and slave LED2 blinks at a rate of 0.5Hz.

Problem: Your aim should be to develop a master program such that the master communicates using UART UCA1 block with user. The user can enter the frequency between 1-10 Hz and the number of cycles for data transfer and the master-slave duo should use this parameters and blink their LED2 at the same frequency for the same number of cycles.

Note: Use UCA1 UART setup from demo UART_noSerialCable.c. You don't have to use the serial cable when using this, the USB interface is enough to establish the connection. The port associated with "MSP Application UART1" should be used in putty or Mobaxterm.



Putty Interface:

```
You Can Set the Frequency of LED-2 from 1 - 10 Hz by entering the value.
What is your intended frequency?
1
What is your intended cycle?
30
You Can Set the Frequency of LED-2 from 1 - 10 Hz by entering the value.
What is your intended frequency?
2
What is your intended cycle?
50
```

Topics for Theory

1. SPI vs UART

2. Serial Communication Types

Deliverables

1. Report in DOC/PDF format that contains the following:
    a. Screenshots of terminal output
    b. Source code (written in C)