Programming Embedded Systems 2018 / JB

Exercise 5

Return report electronically on address: https://abacus.abo.fi/ro.nsf. If you do not have an ÅA account, please email jerker.bjorkqvist@abo.fi. Deadline for report 5.11.2018.

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Equipment and tools

Equipment used:

a) Texas Instruments LaunchPad **MSP430G2** development card
b) Cables
c) Own laptop

Task

Implement a multiprocessor system by connecting two MSP430G2, using a shared clock eOS. Connect the devices in the following way using jump wires:

```
MASTER          SLAVE
======          =====
TX P1_2  ---  RX P1_1
RX P1_1  ---  TX P1_2
GND      ---  GND
```

Implement the state machine of traffic lights in the mater so that when one MSP shows green, the other shows red and vice versa.

a) One MSP430G2 is the master, and sends tick messages to the other, where the tick messages contains the state of the systems
b) The other MSP430G2 is the slave, and send back acknowledge messages, or error messages

Select yourself the messages to send.

In order to use UART on MSP430:

Set up serial port

```
UCA0CTL1 |= UCSWRST; // **Initialize USCI state machine**
 UCA0CTL1 |= UCSSEL_2; // SMCLK
UCA0BR0 = 0x68; // 1MHz 9600
UCA0BR1 = 0x00; // 1MHz 9600

P1SEL |= RXD + TXD ; // P1.1 = RXD, P1.2=TXD
P1SEL2 |= RXD + TXD ; // P1.1 = RXD, P1.2=TXD

UCA0CTL1 &= ~UCSWRST; // **Take UART out of reset **

UC0IE |= UCA0RXIE; // Enable USCI_A0 RX interrupt
```

To send on port

```
UCA0TXBUF = byte;
```

Interrupt for receiving

```
__attribute__((interrupt(USCIAB0RX_VECTOR)))void USCI0RX_ISR(void)
{
  byte = UCAORXBUF;
}
```

This is implemented in the file

users.abo.fi/jbjorkqv/muart.c