

Programming Embedded Systems 2017 / JB

Exercise 5 /28.2/1.3.2017 / Deadline for submitting report 10.3.2017

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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 = UCAR0XBUF;
}
```