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/*
 * USART3_echo_usb.c
 *
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 * Author : jason
 */

#include <avr/io.h>
#define F_CPU 4000000
#include <util/delay.h>

#define USART3_BAUD_RATE(BAUD_RATE) ((float)(F_CPU * 64 / (16 *(float)BAUD_RATE)) + 0.5) //Calculation of baud rate from data sheet

char receivedCharacter;

//All the header functions
uint8_t USART_sw_read();
void USART_sw_write(char);

int main(void)
{
    PORTB.DIR |= PIN0_bm; //Set PB0 as output (TX pin) and PB1 in input pin (RX pin)
    USART3.BAUD = (uint16_t)USART3_BAUD_RATE(9600); //Taken from data sheet to calculate baud rate
    USART3.CTRLB |= USART_TXEN_bm | USART_RXEN_bm; //Enable USART transmitter and receiver

    while (1)
    {
        receivedCharacter = (char)USART_sw_read();
        USART_sw_write(receivedCharacter);
    }
}

uint8_t USART_sw_read(){
    //Poll to wait for the character to be received from TeraTerm
    while(!(USART3_STATUS & USART_RXCIF_bm)){

    }

    return USART3_RXDATA0;
}

void USART_sw_write(char c){
    //Poll until there is data available to be transmitted or echoed after data is moved to the transmit shift register
    while(!(USART3_STATUS & USART_DREIF_bm)){

    }

    USART3_TXDATA0 = c; //Write the character to be echoed which will output to the TXD pin
}
```

