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/*
 * USART3_echo_usb.c
 *
 * Created: 3/25/2021 7:56:05 PM
 * Author : Judah Ben-Eliezer
 */

#define BAUD_RATE 9600UL
#define F_CPU 4000000UL

#include <avr/io.h>
#include <util/delay.h>
#include <avr/interrupt.h>

char c;

int main(void)
{
    PORTB.DIRSET = PIN0_bm; // enable output on PB0.
    PORTB.DIRCLR = PIN1_bm; // enable input on PB1.

    USART3.BAUD = BAUD_RATE; // set baud rate.
    USART3.CTRLA = USART_CMODE_ASYNCHRONOUS_gc | USART_PMODE_DISABLED_gc |
        USART_SBMODE_1BIT_gc | USART_CHSIZE_8BIT_gc; // Asynchronous mode, no parity
        bits, single stop bit, 8 bits data.
    USART3.CTRLB = USART_TXEN_bm | USART_RXEN_bm; // enable transmission, enable receiving.
    USART3.CTRLA = USART_RXCIE_bm; // enable RX complete interrupt.

    sei();

    while (1)
    {
    }
}

ISR (USART3_RXC_vect) {
    if ((USART3.STATUS & USART_RXCIF_bm) == USART_RXCIF_bm) {
        if (USART3.RXDATAH != 0x00) return;
        c = USART3.RXDATAL;

        while ((USART3.STATUS & USART_DREIF_bm) != USART_DREIF_bm){}
        USART3.TXDATAL = c + 20;

        // echo character.
    }
}
```