CPE301 – SPRING 2019

Design Assignment 3A

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Directory: /Design Assignments/

Submit the following for all Labs:

1. In the document, for each task submit the modified or included code (only) with highlights and justifications of the modifications. Also, include the comments.
2. Use the previously create a Github repository with a random name (no CPE/301, Lastname, Firstname). Place all labs under the root folder ESD301/DA, sub-folder named LABXX, with one document and one video link file for each lab, place modified asm/c files named as LabXX-TYY.asm/c.
3. If multiple asm/c files or other libraries are used, create a folder LabXX-TYY and place these files inside the folder.
4. The folder should have a) Word document (see template), b) source code file(s) and other include files, c) text file with youtube video links (see template).

1. COMPONENTS LIST AND CONNECTION BLOCK DIAGRAM w/ PINS

Atmega328P Xplained Mini Microcontroller
Arduino Multi-function Shield

2. INITIAL/MODIFIED/DEVELOPED CODE OF TASK 1/A

Insert initial code here

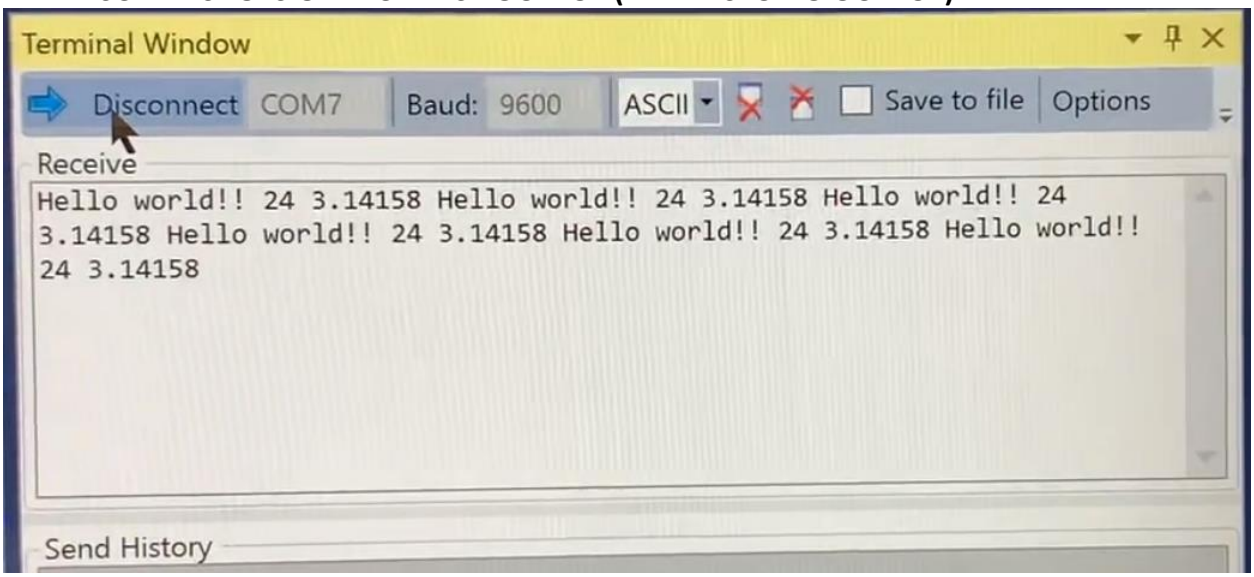
```
/*
 * DA3a.c
 *
 * Created: 3/26/2019 11:39:09 AM
 * Author : regis
 */

#define F_CPU 16000000UL
#include <avr/io.h>
#include <util/delay.h>

#define BAUDRATE 9600
#define BAUD_PRESCALLER (((F_CPU / (BAUDRATE * 16UL))) - 1)

//Declaration of our functions
void USART_init(void);
unsigned char USART_receive(void);
void USART_send( unsigned char data);
void USART_putstring(char* StringPtr);

char String[] = "Hello world!! ";  //String[] is in fact an array but wh

int main(void) {
    USART_init();        //Call the USART initialization code
    char intNum[] = "24 ";
    char floatNum[] = "3.14158 ";
```

```
    while (1) {      //Infinite loop
        USART_putstring(String);    //Pass the string to the USART_putstring fur
        USART_putstring(intNum);
        USART_putstring(floatNum);
        _delay_ms(1000);        //Delay for 2 seconds so it will re-send the str
    }

    return 0;
}

void USART_init(void) {

    UBRR0H = (uint8_t)(BAUD_PRESCALLER >> 8);
    UBRR0L = (uint8_t)(BAUD_PRESCALLER);
    UCSR0B = (1 << RXEN0) | (1 << TXEN0);
    UCSR0C = (3 << UCSZ00);
}

unsigned char USART_receive(void) {

    while (!(UCSR0A & (1 << RXC0)));
    return UDR0;

}




void USART_send( unsigned char data) {

    while (!(UCSR0A & (1 << UDRE0)));
    UDR0 = data;

}

void USART_putstring(char* StringPtr) {

    while (*StringPtr != 0x00) {
        USART_send(*StringPtr);
        StringPtr++;
    }

}
```

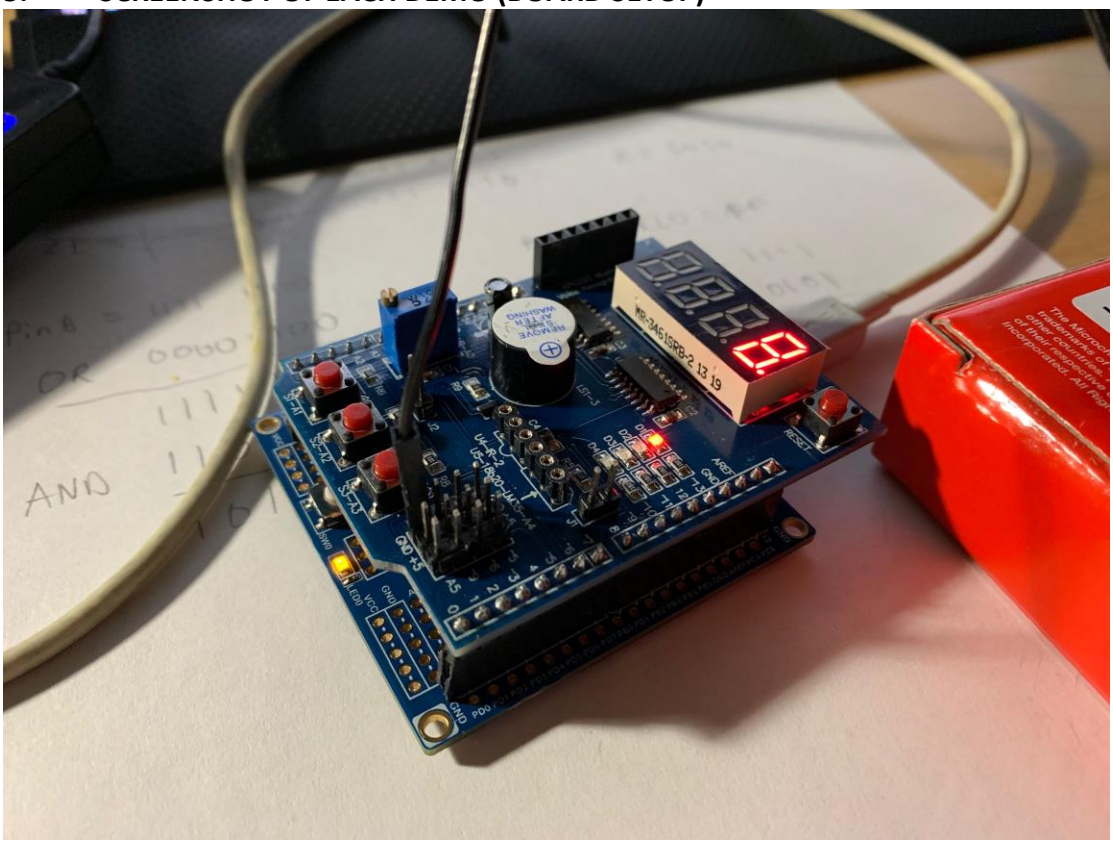
3. SCHEMATICS

Use fritzing.org

4. SCREENSHOTS OF EACH TASK OUTPUT (ATMEL STUDIO OUTPUT)



5. SCREENSHOT OF EACH DEMO (BOARD SETUP)



6. VIDEO LINKS OF EACH DEMO

https://www.youtube.com/watch?v=w6fnT-MOh-0

7. GITHUB LINK OF THIS DA

Student Academic Misconduct Policy
http://studentconduct.unlv.edu/misconduct/policy.html

"*This assignment submission is my own, original work*".
Shaquille Regis