CPE301 – SPRING 2019

Design Assignment X

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Primary Github address: https://github.com/sotoi2/submission\_da

Directory: ESD301/DA3A

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

Atmel Studio 7

List of Components used

Block diagram with pins used in the Atmega328P

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

// \* DA3AC.c

//; Replace with your application code

#define *F\_CPU* 16000000UL

#define UBRR\_9600 103

#define BAUDRATE 9600

#define BAUD\_PRESCALAR (((*F\_CPU*/(BAUDRATE\*16UL))) -1)

#include <avr/io.h>

#include <util/delay.h>

#include <stdio.h>

void USART\_init(unsigned int ubrr);

void USART\_tx\_string( char \*data);

char word[] = "HelloWorld";

char space[] = " ";

float flnumb = 1.23456789;

int number;

char outs[20];

int main(void)

{

while(1)

{

number = *rand*();

USART\_tx\_string(word); // This prints HelloWorld

USART\_tx\_string(space); // This will print a space

*snprintf*(outs, sizeof(outs), "%3d\r\n", number);// This will make a rand number

USART\_tx\_string(outs); // Here is the random number

USART\_tx\_string(space);

*sprintf*(outs, "%g", flnumb);

USART\_tx\_string(outs);// the floating point number

USART\_tx\_string(space);// A space;

}

}

/\*INIT USART (RS-232) \*/

void USART\_init( unsigned int ubrr){

UBRR0H = (unsigned char)(ubrr>>8);

UBRR0L = (unsigned char)ubrr;

UCSR0B = (1 << TXEN0);//Enable receiver, transmitter & RX interrupt

UCSR0C = (1 << UCSZ01) | (1 << UCSZ00); //asynchronous 8 N 1

}

/\* SEND A STRING TO THE RS-232 \*/

void USART\_tx\_string(char \*data){

while((\*data != '/0')){

while (!(UCSR0A & (1<<UDRE0)));

UDR0 = \*data;

data++;

}

}

1. **DEVELOPED MODIFIED CODE OF TASK 2/A from TASK 1/A**

One task only

1. **SCHEMATICS**

Use fritzing.org

1. **SCREENSHOTS OF EACH TASK OUTPUT (ATMEL STUDIO OUTPUT)**
2. **SCREENSHOT OF EACH DEMO (BOARD SETUP)**
3. **VIDEO LINKS OF EACH DEMO**
4. **GITHUB LINK OF THIS DA**

**Student Academic Misconduct Policy**

<http://studentconduct.unlv.edu/misconduct/policy.html>

“This assignment submission is my own, original work”.

Ivan Soto