CPE301 – FALL 2019

Design Assignment 3A

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Primary Github address: <https://github.com/kirkster96/submission_da>

Directory: <https://github.com/kirkster96/submission_da/tree/master/DesignAssignment/DA3_>a

1. **COMPONENTS LIST AND CONNECTION BLOCK DIAGRAM w/ PINS**

Atmega328PB

No pins were used for this solution

1. **AVR C DEVELOPED CODE OF TASK 1**

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\* \DA3\_a Cameron Kirk

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\* \This is a AVR C program that will display a string, random integer, and random float to the serial terminal every 1 sec

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#define *F\_CPU* 16000000UL

#define BAUD\_RATE 9600

#include <avr/io.h>

#include <util/delay.h>

#include <stdlib.h>

#include <string.h>

void usart\_init ();

void usart\_send (unsigned char ch);

void usart\_print (char\* str);

int main (void)

{

//initialize the usart

usart\_init ();

//allocate char arrays

char \* textString ="Hello";

char \* textInt = "0";

char \* textFloat = "0";

while (1){

//generate random numbers to display on serial terminal

int a = *rand*();

double b = ((double)*rand*())/((double)*rand*());

//display string and line feed

usart\_print(textString);

usart\_send('\r');

//display integer and line feed

*itoa*(a,textInt,10);

usart\_print(textInt);

usart\_send('\r');

//display float and linefeed

*dtostrf*(b,3,3,textFloat);

usart\_print(textInt);

usart\_send('\r');

*\_delay\_ms*(1000);

}

return 0;

}

void usart\_init(void){

UCSR0B = (1<<TXEN0);

UCSR0C = (1<<UCSZ01)|(1<<UCSZ00);

UBRR0L = *F\_CPU*/16/BAUD\_RATE-1;

}

void usart\_send( unsigned char ch){

while(! (UCSR0A & (1<<UDRE0))); //wait until UDR0 is empty

UDR0 = ch; //transmit ch

}

void usart\_print(char\* str){

int i = 0;

while(str[i] != 0){

usart\_send(str[i]);

i++;

}

}

1. **VIDEO LINKS OF EACH DEMO**

AVR C Task 1 Demo

<https://drive.google.com/open?id=19ywDqCDODDDQQRZQyTxDxnukVQnw_Wfr>

1. **GITHUB LINK OF THIS DA**

<https://github.com/kirkster96/submission_da/tree/master/DesignAssignment/DA3_>a

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

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

Cameron Kirk