CPE301 – SPRING 2019

Design Assignment 4A

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Primary Github address: https://github.com/regis-shaquille/submissions-SR
Directory: https://github.com/regis-shaquille/submissions-SR/tree/master/Design%20Assignments

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

List of Components used
Block diagram with pins used in the Atmega328P
1K Potentiometer
Pushbutton
TB6612FNG Chip
5V DC Motor
ATMega328P Explained Mini

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

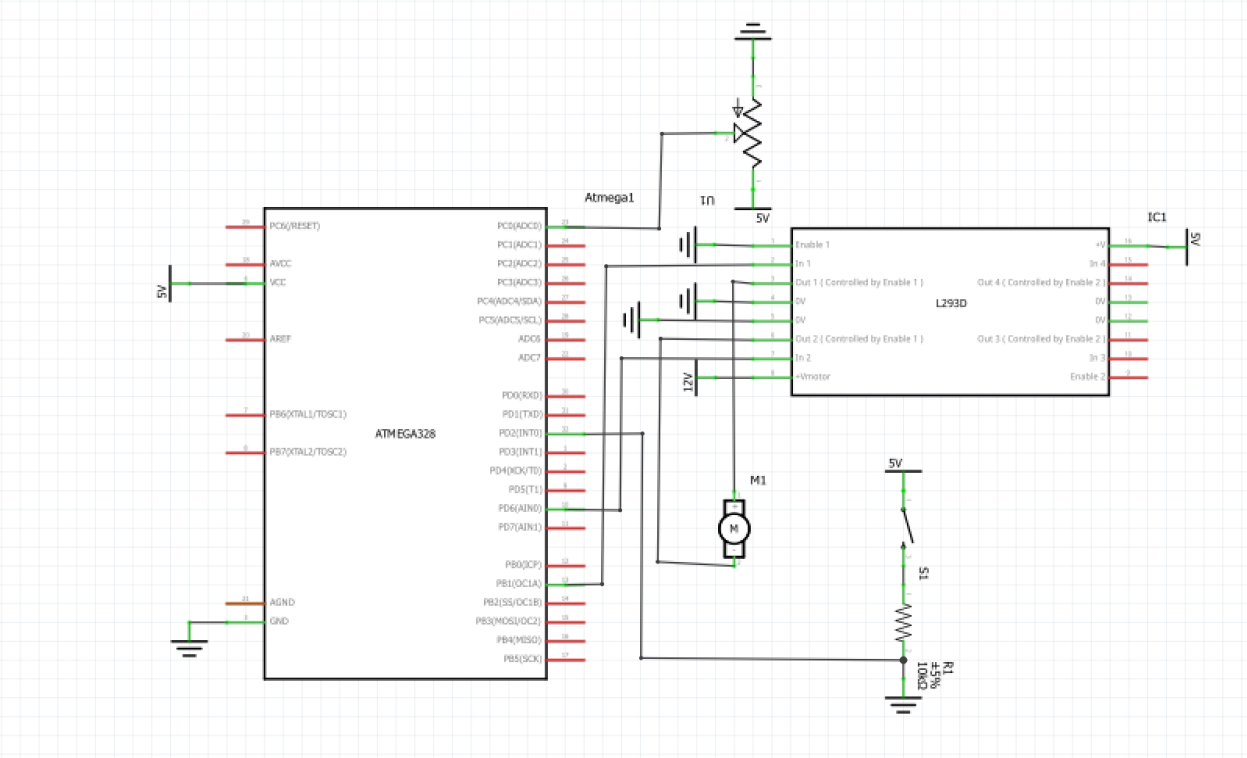
Insert initial code here

```
/*
 * DA4a.c
 *
 * Created: 4/11/2019 10:34:54 AM
 * Author : regis
 */

#define F_CPU 8000000UL
#include <avr/io.h>
#include <util/delay.h>
#include <avr/interrupt.h>
int check = 0; //bool

int main(void)
{

    DDRD = 0xFF;         //set PORTD as output
    DDRB = 0xFF;         //set PORTB as output
    TCCR1B=0b00000001;   //sets no Prescaler
    TCCR1A=0x83;         //sets COM0 and Fast PWM
    EIMSK = 0x01;        //enable INT0
    EIFR = 0x01;         //enable INTF0
    EICRA = 0x03;        //enable ISC01 and ISC00
    sei();               //interrupt
    ADMUX = 0x60;        //set PC0 as ADC pin
    ADCSRA = 0xE6;
```

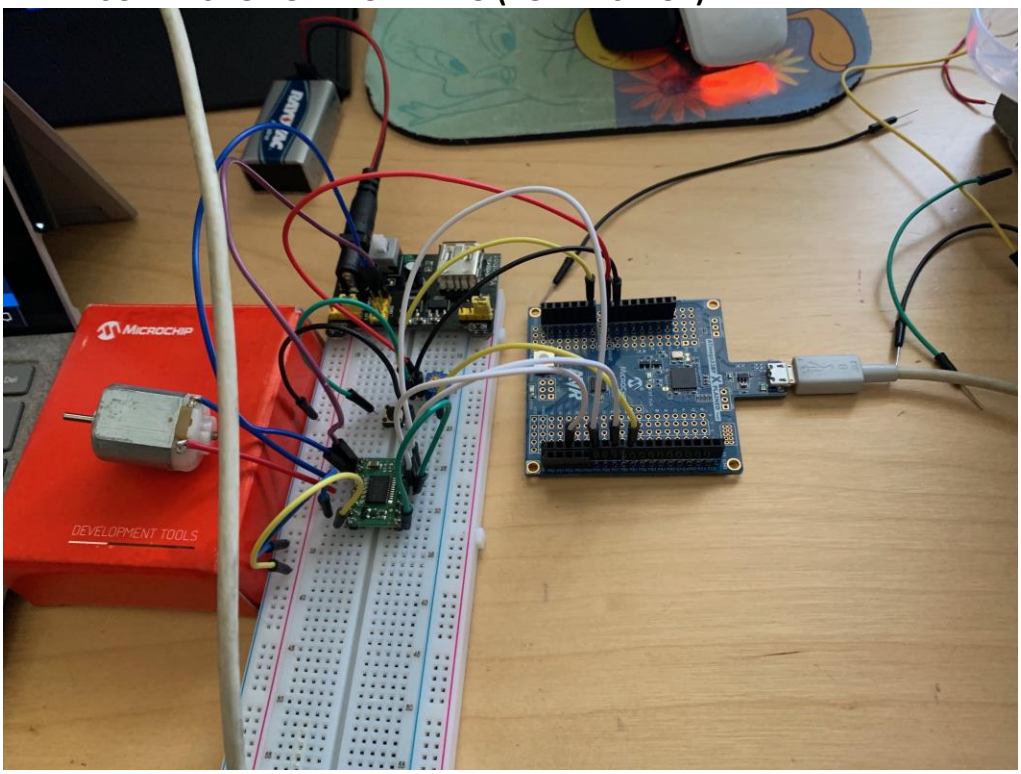
```
    while (1){

        while(!(ADCSRA & (1<<ADIF)));    //poll
        ADCSRA |=0b00010000;             //set ADIF 1
        //read conversion from ADCH register
        OCR1A = ADCH;                    //read ADC value from pot
    }
    return 0;
}
ISR(INT0_vect) //external interrupt
{
    if(check == 0)
    {
        PORTB |= 1 << PORTB1;
        _delay_ms(1000);
    }
    else
    {

        PORTB &= ~(1<<PORTB1);
        _delay_ms(1000);
    }
    check ^= 1; //toggle DC Motor when external interrupt is pressed

}
```

3. SCHEMATICS

Use fritzing.org



4. SCREENSHOT OF EACH DEMO (BOARD SETUP)



5. VIDEO LINKS OF EACH DEMO

6. GITHUB LINK OF THIS DA

https://github.com/regis-shaquille/submissions-SR/tree/master/Design%20Assignments/DA4a

Student Academic Misconduct Policy

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

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