

Design Assignment 4A

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Primary Github address: https://github.com/mendos1/submission_da

Directory: DA4A

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

For this assignment I used the following components:

- Atmega328p Xplained MINI
- Multi-Function Shilde for Arduino
- MD08A Motor Driver
- Breadboard
- 10 wires
- Potentiometer
- External power supply (+5V)
- USB cable for Atmega328p
- Atmel Studio 7.0

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

```
#define F_CPU 16000000UL    // 16MHz
#include <avr/io.h>         //
#include <avr/interrupt.h>  //
#include <util/delay.h>     //

void init_adc(void);
int control; // VARIABLE FOR ADC VALUE (NOT NEEDED)
int toggle = 0; // USED TO DETERMINE IF BUTTON SHOULD BE ON OR OFF

int main()
{
    DDRD = 0x40;           // MAKES PD6 AS PWM OUTPUT
    DDRB |= (1<<2);         // THIS IS JUST AN LED INDICATOR ON THE MULTIFUNCTION
    SHILED
    PORTB |= (1<<2);        // THIS TURNS IT ON/OFF
    DDRC = 0x02;           // SET PC0 AS INPUT AND PC1 AS OUTPUT FOR INTERUPTS , LEAVE
    INT1(PD3) AS INTERRUPT
    PORTC |= (1<<1);        // ENABLE PULL-UP RESISTOR
    TCCR0A=0x83;           // FAST PWM // CLEAR OCR0A ON MATCH
    TCCR0B=0x05;           // SET PRESCALAR TO 1024
    PCICR = 0x02;          // 0x02 IS PCIE1, THAT IS, ENABLE PCIE1 FOR PCMSK1 TO WORK
    //PCIFR = 0x02;         // ENABLE PCIF1 INTERRUPT FLAG
    PCMSK1 = 0x02;         //ENABLE PIN CHANGES ON PCINT9 (PC1)

    sei();                 // GLOBAL INTERRUPTS ENABLED
    ADMUX = (1<<REFS0);    // REFERENCE VOLTAGE AT AREF
    ADCSRA = (1<<ADEN)|(1<<ADSC)|(1<<ADATE)|(1<<ADPS2)|(1<<ADPS1)|(1<<ADPS0);

    while (1){}
}

ISR(PCINT1_vect){
    if(!(PINC & (1<<PINC1))){
        if(toggle == 0){
            OCR0A = 0;
            PORTB &= ~(1<<PORTB2);
            _delay_ms(1000);
        }
    }
}
```

```

if (toggle == 1){
    while((ADCSRA&(1<<ADIF))==0); // wait for conversion

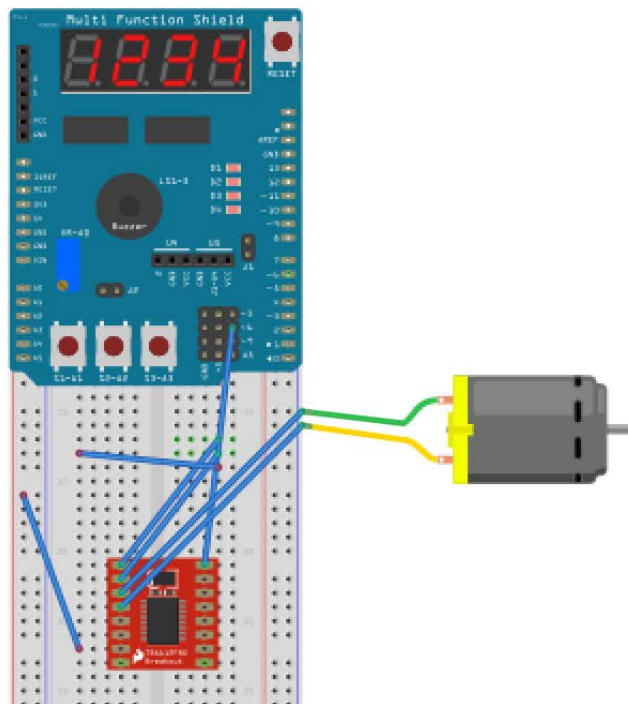
    control = ADC;
    OCR0A = control;                // ADC Conversion
                                    // Output to converted value to

    PORTB |= 1 << PORTB2;
    _delay_ms(1000);
}
toggle ^= 1; //update state of motor to on
}
}

```

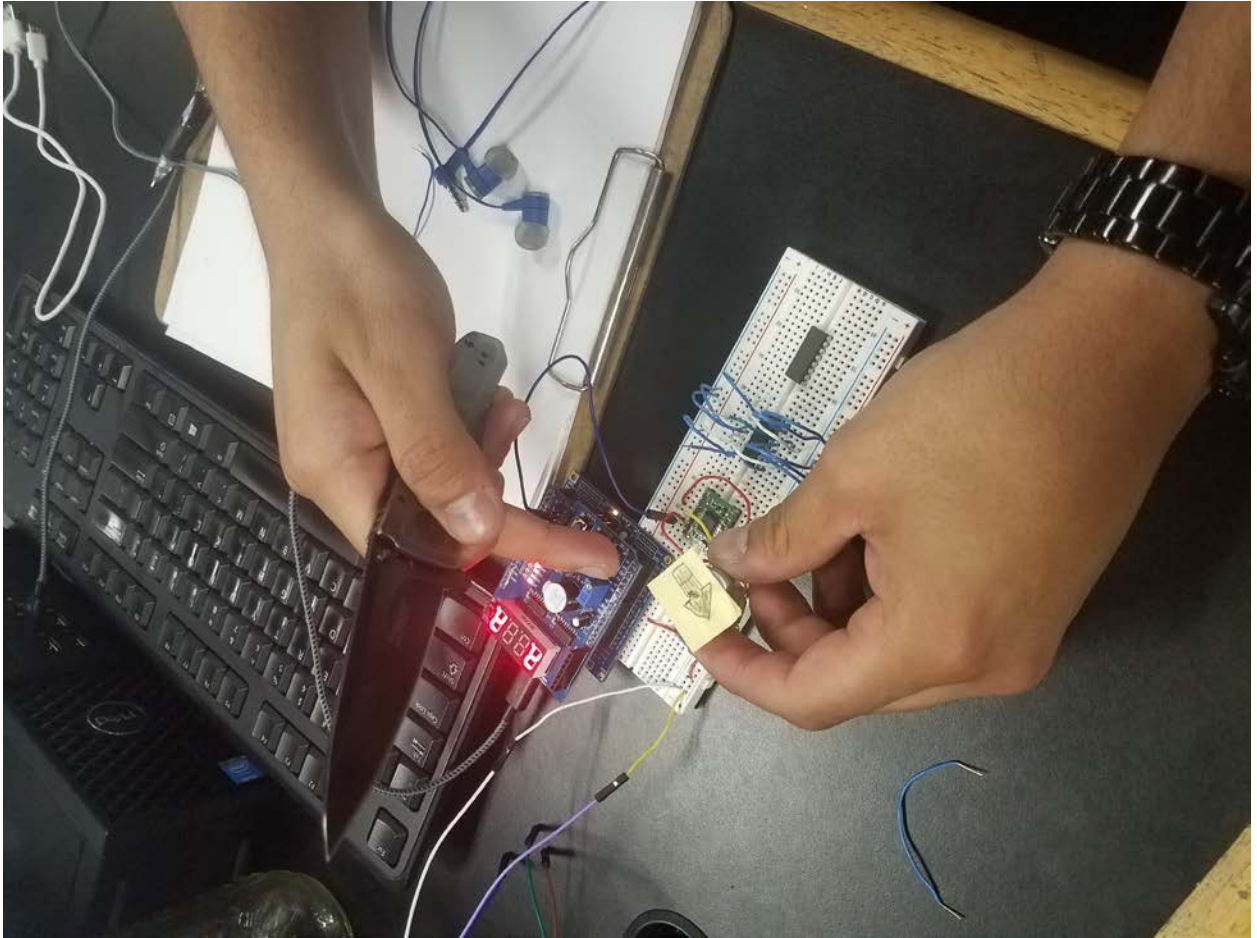
3. SCHEMATICS

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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=zP2bg6LImpA>

7. GITHUB LINK OF THIS DA

https://github.com/mendos1/submission_da/DA4A

Student Academic Misconduct Policy

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

"This assignment submission is my own, original work".

NAME OF THE STUDENT