

Design Assignment 4A

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Primary Github address: <https://github.com/WorkuT1226/CPE301.git>

Directory:

Submit the following for all Labs:

- In the document, for each task submit the modified or included code (only) with highlights and justifications of the modifications. Also, include the comments.
 - 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.
 - If multiple asm/c files or other libraries are used, create a folder LabXX-TYY and place these files inside the folder.
 - 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).
-
- **COMPONENTS LIST AND CONNECTION BLOCK DIAGRAM w/ PINS**

List of Components used

Block diagram with pins used in the Atmega328P

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

```
/*
 * DA_4A.c
 * Author : Worku Tafara
 */

#define F_CPU 16000000UL
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>
int myMotor = 0;

int main(void){
    DDRD = 0x30;
```

```

DDRC = 0x02;
PORTC |= (1<<1);
TCCR0A |= (1<<COM0A1)|(1<<WGM01)|(1<<WGM00);
TCCR0B |= (1<<CS02)|(1<<CS00);
PCICR |= (1<<PCIE1);
PCMSK1 |= (1<<PCINT9);
ADMUX |= (1<<REFS0);
ADCSRA |= (1<<ADEN)|(1<<ADSC)|(1<<ADATE)|(ADPS2)|(1<<ADPS1)|(1<<ADPS0);
while (1) {
}

ISR (PCINT1_vect) {
    if (!(PINC & (1<<PIN1))) {
        if (myMotor == 1) {
            OCR0A = 0;
            PORTB &= ~(1<<PORTB2);
        }
        if (myMotor == 1) {
            while ((ADCSRA & (1<<ADIF)) == 0);

            OCR0A = ADC;
            PORTB |= (1<<PORTB3);
        }
        _delay_ms(1000);
        myMotor ^= 1;
    }
}

```

- **SCREENSHOTS OF EACH TASK OUTPUT (ATMEL STUDIO OUTPUT)**

```

/*
 * DA_4A.c
 * Author : Worku Tafara
 */

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#include <avr/io.h>
#include <avr/interrupt.h>
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int myMotor = 0;

int main(void){
    DDRD = 0x30;
    DDRC = 0x02;
    PORTC |= (1<<1);
    TCCR0A |= (1<<COM0A1)|(1<<WGM01)|(1<<WGM00);
    TCCR0B |= (1<<CS02)|(1<<CS00);
    PCICR |= (1<<PCIE1);
    PCMSK1 |= (1<<PCINT9);
    ADMUX |= (1<<REFS0);
    ADCSRA |= (1<<ADEN)|(1<<ADSC)|(1<<ADATE)|(ADPS2)|(1<<ADPS1)|(1<<ADPS0);
    while (1) {
    }
}

ISR (PCINT1_vect) {
    if (!(PINC & (1<<PIN1))) {
        if (myMotor == 1) {
            OCR0A = 0;
            PORTB &= ~(1<<PORTB2);
        }
        if (myMotor == 1) {
            while ((ADCSRA & (1<<ADIF)) == 0);

            OCR0A = ADC;
            PORTB |= (1<<PORTB3);
        }
        _delay_ms(1000);
        myMotor ^= 1;
    }
}

```

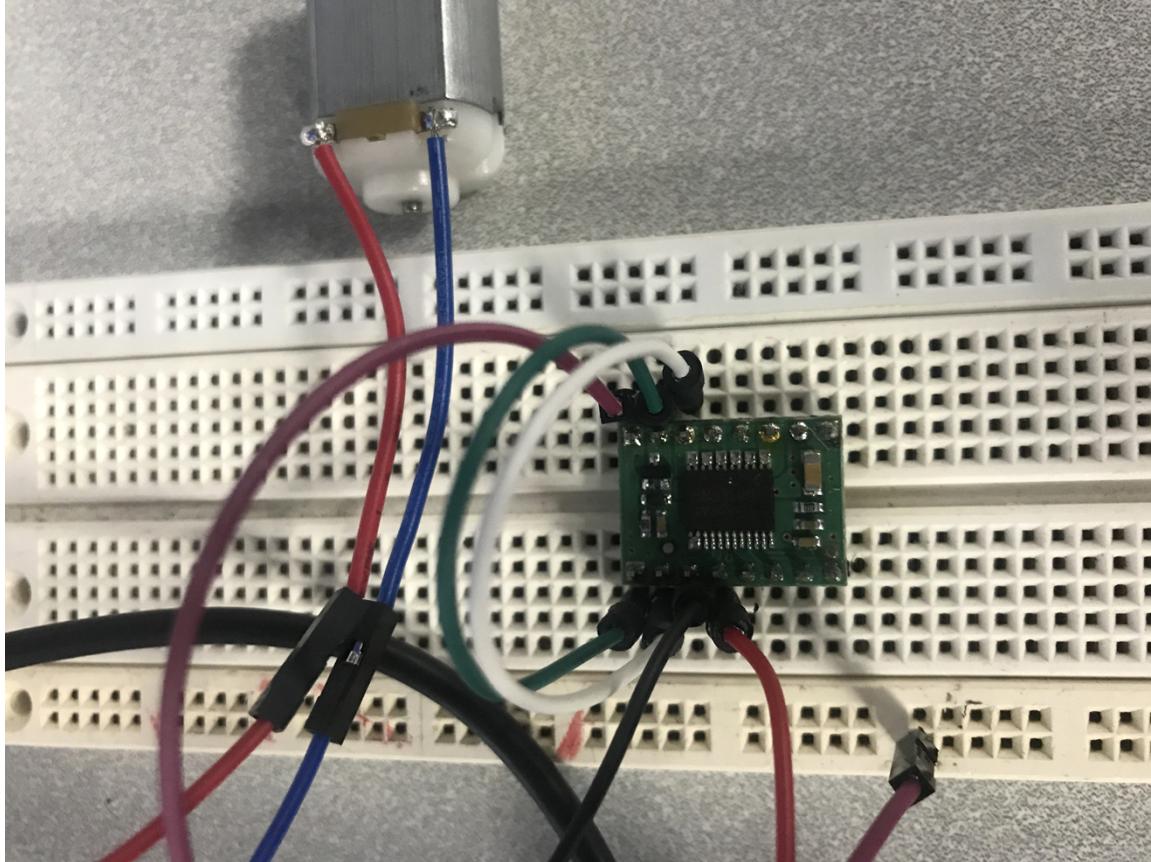
```
Output  X Atmega328P Xplained Mini - 0615      Error List      main.c      DA_4A
Show output from: Build  |  |  |  |  |  |
----- Build started: Project: DA_4A, Configuration: Debug AVR -----
Build started.
Project "DA_4A.cproj" (default targets):
Target "PreBuildEvent" skipped, due to false condition; ('$(PreBuildEvent)' != '') was evaluated as (''!=').
Target "CoreBuild" in file "D:\Atmel Studio 7\7.0\Vs\Compiler.targets" from project "D:\Atmel Studio 7\Projects\Assignments\DA_4A\DA_4A\DA_4A.cproj" (target "Build" dependency group "Build"):
  Using "RunCompilerTask" task from assembly "D:\Atmel Studio 7\7.0\Extensions\Application\AvrGCC.dll".
    Task "RunCompilerTask"
      Shell Utils Path: D:\Atmel Studio 7\7.0\shellUtils
      D:\Atmel Studio 7\7.0\shellUtils\make.exe all --jobs 4 --output-sync
      make: Nothing to be done for 'all'.
    Done executing task "RunCompilerTask".
  Using "RunOutputFileVerifyTask" task from assembly "D:\Atmel Studio 7\7.0\Extensions\Application\AvrGCC.dll".
    Task "RunOutputFileVerifyTask"
      Program Memory Usage : 344 bytes 1.0 % Full
      Data Memory Usage : 2 bytes 0.1 % Full
    Done executing task "RunOutputFileVerifyTask".
  Done building target "CoreBuild" in project "DA_4A.cproj".
Target "PostBuildEvent" skipped, due to false condition; ('$(PostBuildEvent)' != '') was evaluated as (''!=').
Target "Build" in file "D:\Atmel Studio 7\7.0\Vs\Avr.common.targets" from project "D:\Atmel Studio 7\Projects\Assignments\DA_4A\DA_4A\DA_4A.cproj" (entry point):
  Done building target "Build" in project "DA_4A.cproj".
Done building project "DA_4A.cproj".

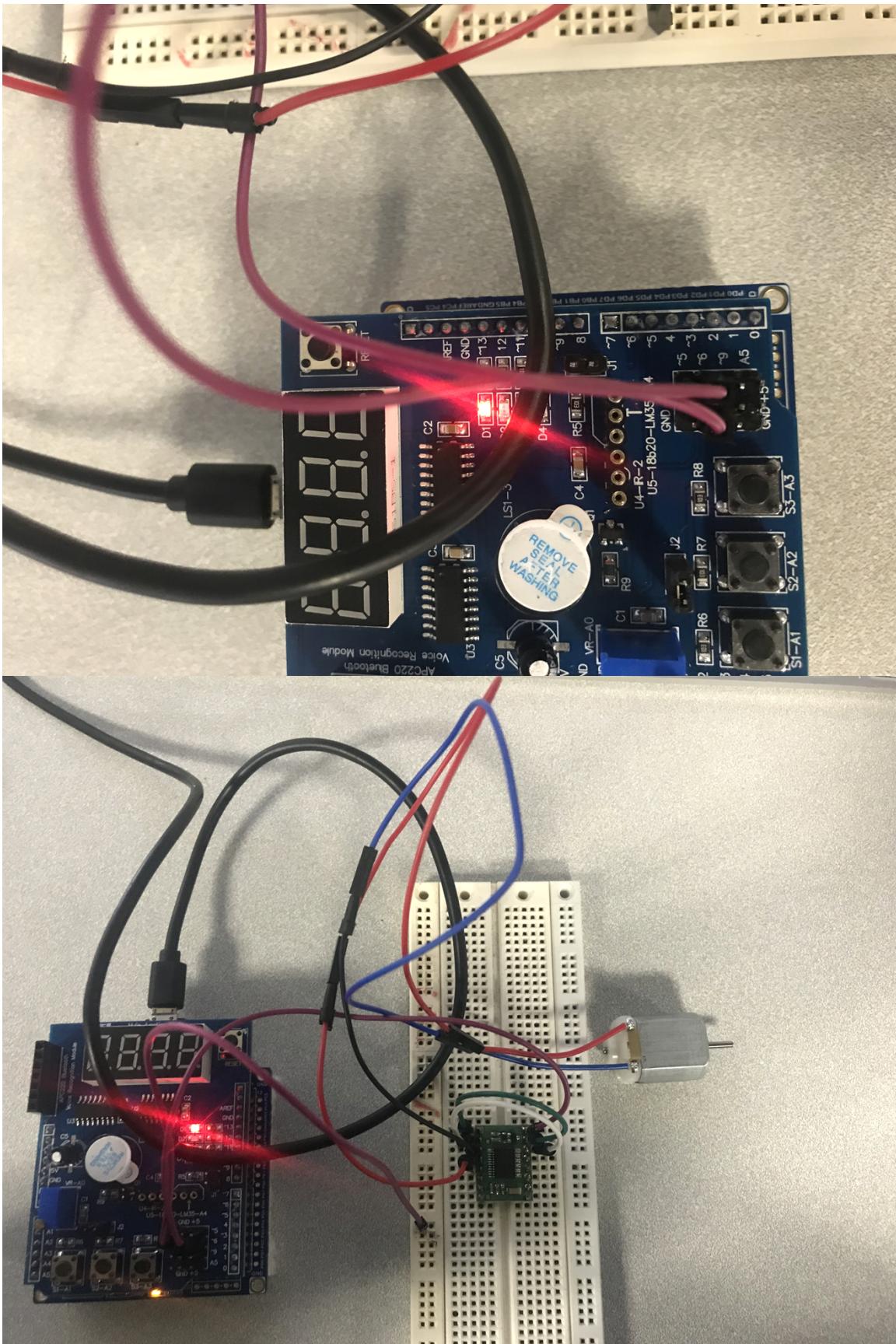
Build succeeded.
========== Build: 1 succeeded or up-to-date, 0 failed, 0 skipped ==========

```

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- **SCREENSHOT OF EACH DEMO (BOARD SETUP)**





- **VIDEO LINKS OF EACH DEMO**
- **GITHUB LINK OF THIS DA**

Student Academic Misconduct Policy

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

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

Worku Tafara