CPE301 – SPRING 2019

Design Assignment 4A

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Directory: https://github.com/armonlatifi/sub_da/tree/master/DA4A

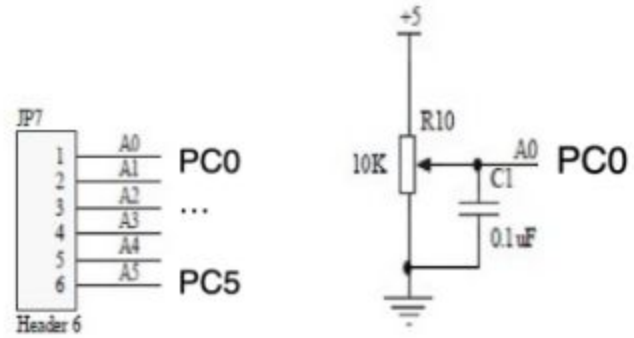
Submit the following for all Labs:

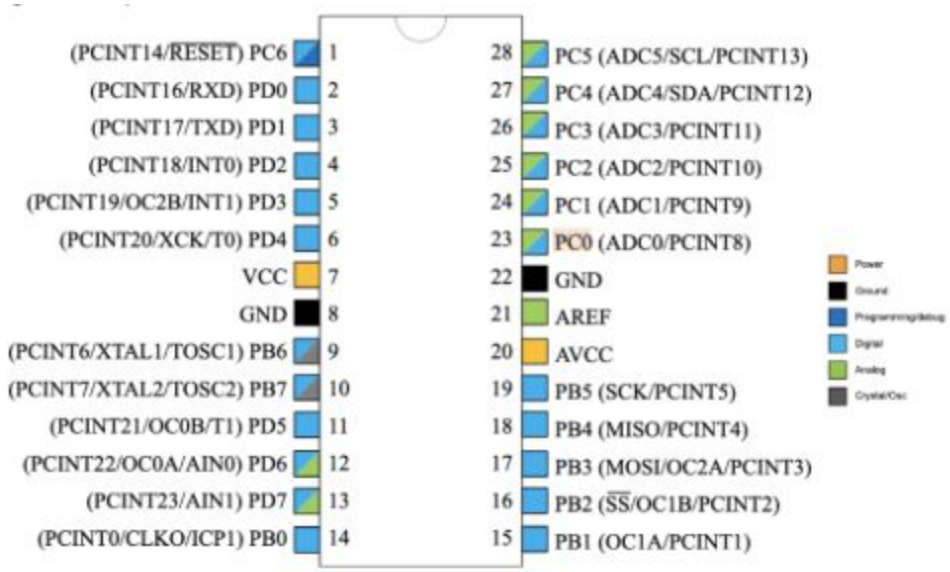
1. In the document, for each task submit the modified or included code (only) with highlights and justifications of the modifications. Also, include the comments.
2. Use the previously create a Github repository with a random name (no CPE/301, Lastname, Firstname). Place all labs under the root folder 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

List of Components used:

- Assembler
- Simulator
- Debugger
- Breadboard
- Atmega328P
- Wires (male/female)
- Microusb
- Driver
- Potentiometer
- DC Motor
- Atmel studio 7
- Arudino Multi-function shield



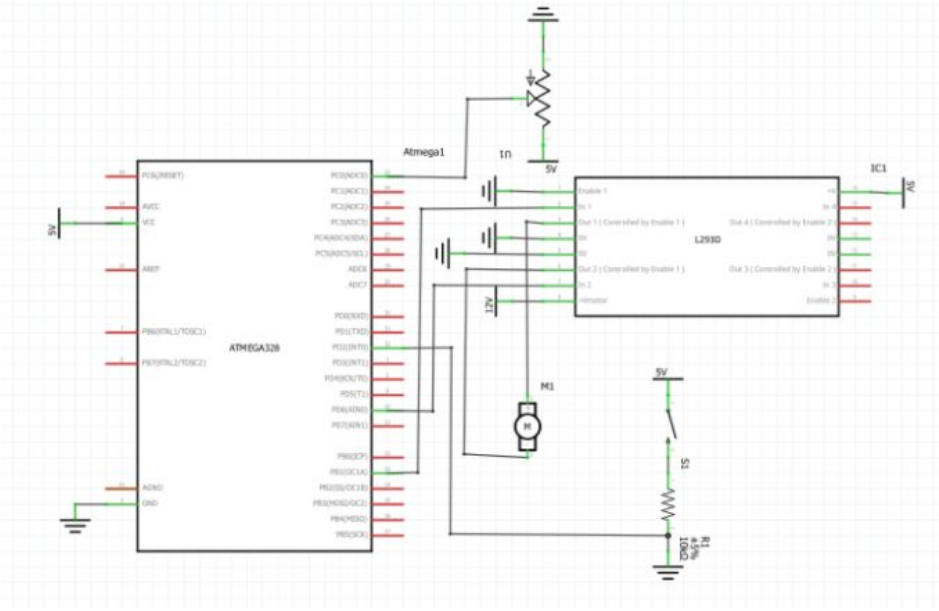


2. INITIAL/MODIFIED/DEVELOPED CODE OF TASK 1/A

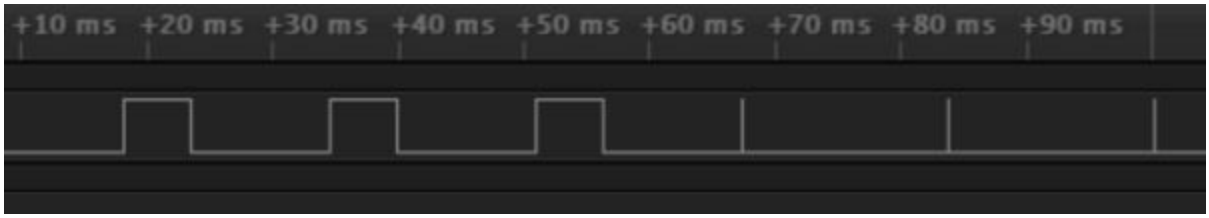
```
#define F_CPU 8000000UL //set clock speed
#include <avr/io.h>
#include <util/delay.h>
#include <avr/interrupt.h>

//create flag variable
int check = 0;

int main(void)
{

	DDRD = 0xFF;		//port d set as output
	DDRB = 0xFF;		//port b set as output
	EIMSK = 0x01;
	EIFR = 0x01;
	EICRA = 0x03;
	TCCR1B = 0b00000001; //no prescaler needed
	TCCR1A = 0x83;


	sei();					//enable interrupts

	ADMUX = 0x60;
	ADCSRA = 0xE6;


	while (1){

		while(!(ADCSRA & (1<<ADIF)));	//poll results
		ADCSRA |=0b00010000;
		OCR1A = ADCH;
	}
	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;

}
```

3. SCHEMATICS

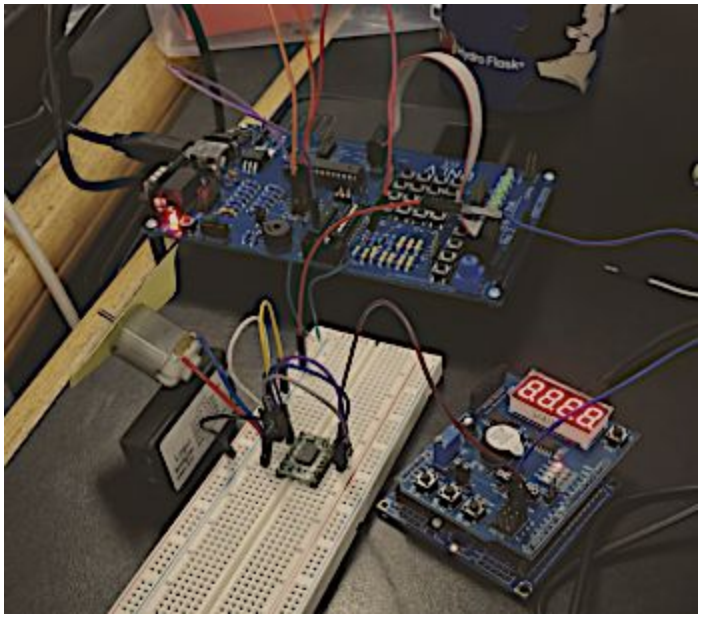
Use fritzing.org



4. SCREENSHOTS OF EACH TASK OUTPUT (ATMEL STUDIO OUTPUT)



5. SCREENSHOT OF EACH DEMO (BOARD SETUP)



6. GITHUB LINK OF THIS DA

https://github.com/armonlatifi/sub_da/tree/master/DA4A

Student Academic Misconduct Policy
http://studentconduct.unlv.edu/misconduct/policy.html

"*This assignment submission is my own, original work*".
Armon Latifi