CPE301 – SPRING 2019

MIDTERM 2

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Directory: Midterm 2

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/Midterm, 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

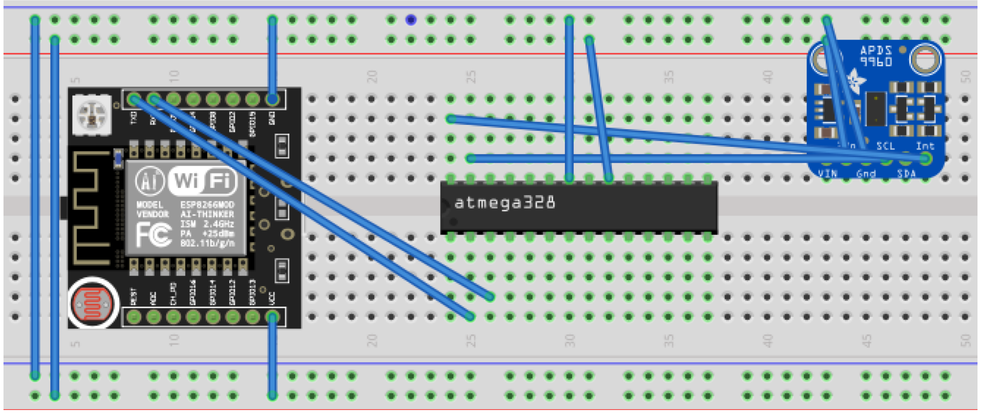
- ATmega328P
- ESP8266 (NodeMCU)
- APDS-9960

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

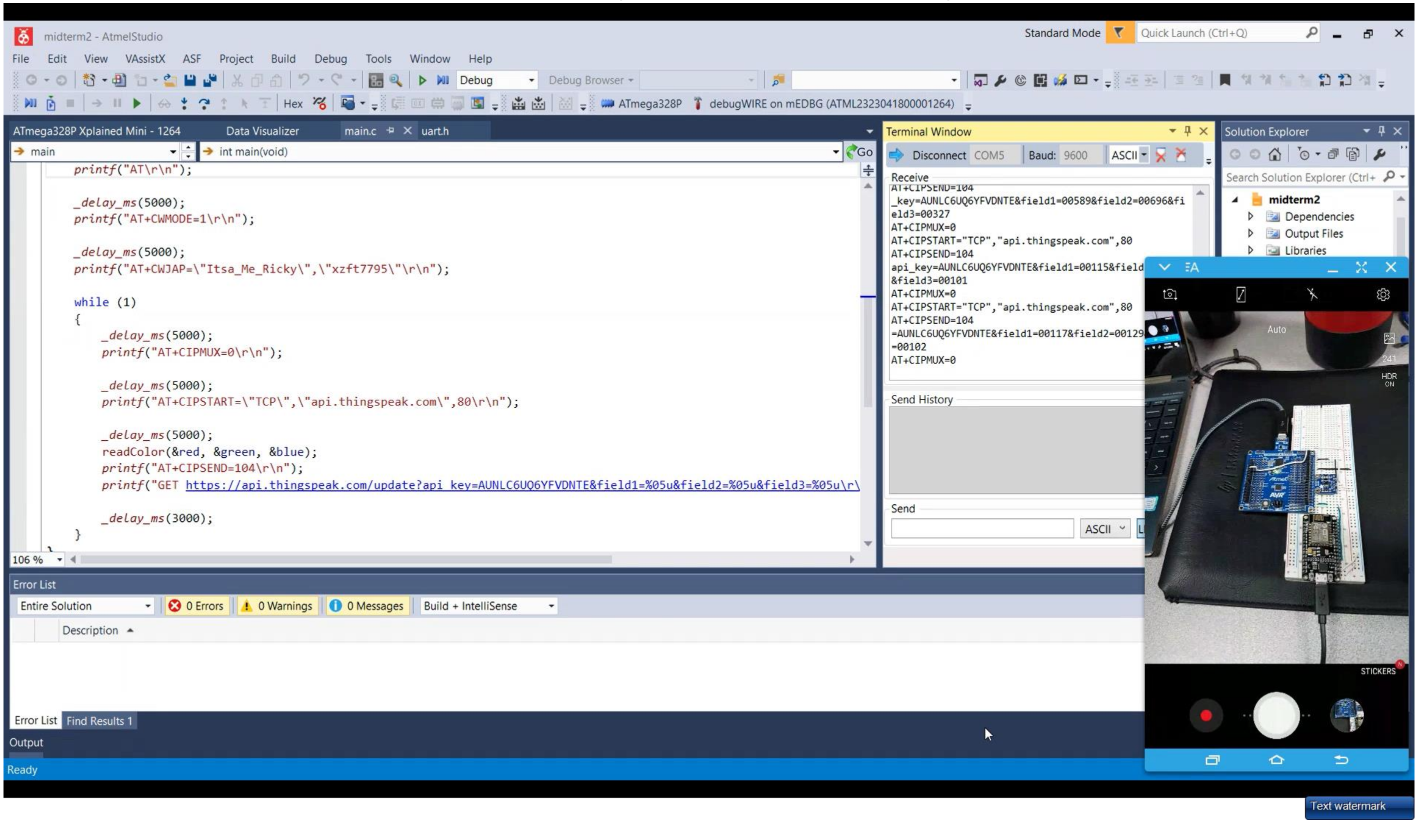
```
/************* Include Library/Header Files ************************************/
#define F_CPU 16000000UL
#include <avr/io.h>
#include <util/delay.h>
#include <stdio.h>
#include "i2c_master.h"
#include "uart.h"
#include "apds.h"
/*******************************************************************************/
FILE str_uart = FDEV_SETUP_STREAM(uart_putchar, NULL , _FDEV_SETUP_WRITE);
char results[256];

int main(void)
{
       uint16_t red = 0, green = 0, blue = 0;

       i2c_init();                             // initialize i2c
       init_UART();                                           // initialize uart
       stdout = &str_uart;
       apds_init();                                           // initialize apds-9960

       _delay_ms(2000);
 /**************************** Begining AT commands ***********************************/
       printf("AT\r\n");

       _delay_ms(5000);
       printf("AT+CWMODE=1\r\n");

       _delay_ms(5000);
       printf("AT+CWJAP=\"Last_CPE301_Midterm\",\"CpE301!!!\"\r\n");
/***************************************************************************************/
    while (1)
    {
              _delay_ms(5000);
              printf("AT+CIPMUX=0\r\n");

              _delay_ms(5000);
              printf("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80\r\n");

              _delay_ms(5000);
              readColor(&red, &green, &blue); // will read and update RGB colors
              printf("AT+CIPSEND=104\r\n");

       // print out RGB colors and upload them to thingspeak
```

```
                printf("GET 
https://api.thingspeak.com/update?api_key=AUNLC6UQ6YFVDNTE&field1=%05u&field2=%05u&field3
=%05u\r\n", red, green, blue);

                _delay_ms(3000);
    }
}
```

3. SCHEMATICS



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

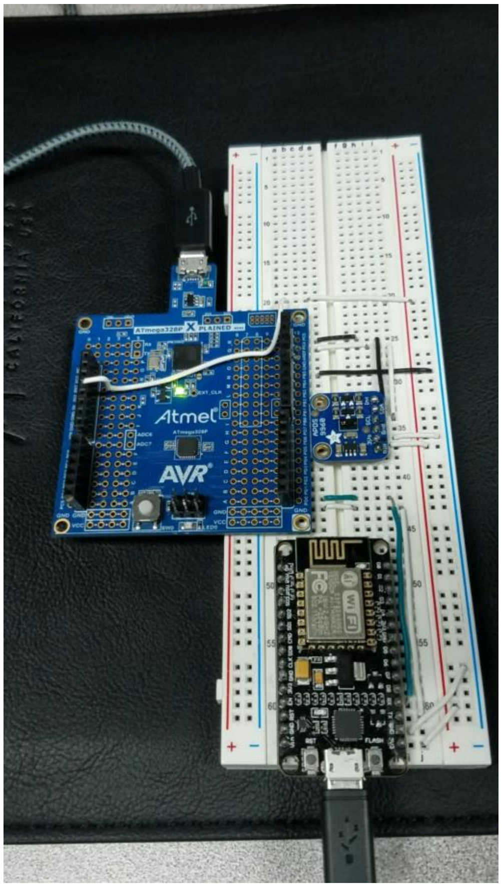


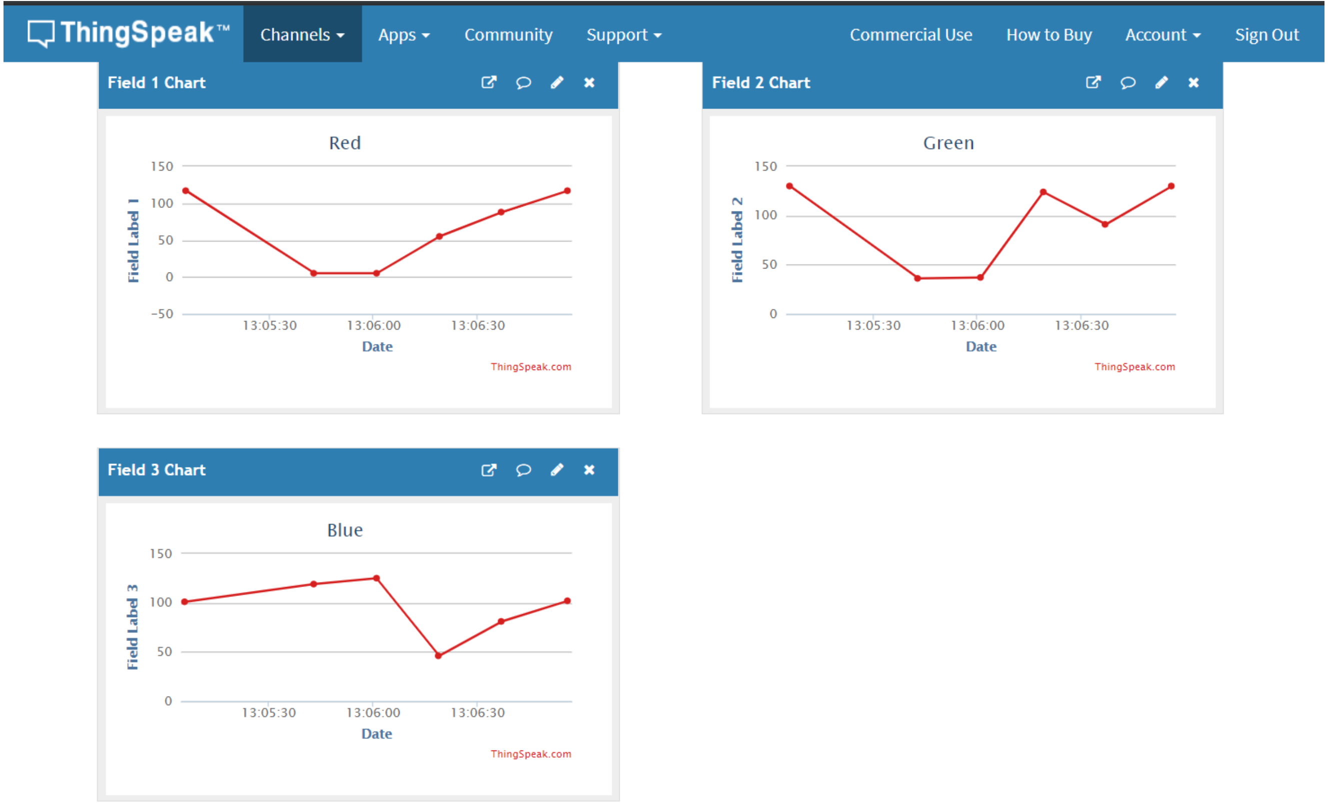
```
    printf("AT\r\n");

    _delay_ms(5000);
    printf("AT+CWMODE=1\r\n");

    _delay_ms(5000);
    printf("AT+CWJAP=\"Itsa_Me_Ricky\",\"xzft7795\"\r\n");

    while (1)
    {
        _delay_ms(5000);
        printf("AT+CIPMUX=0\r\n");

        _delay_ms(5000);
        printf("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80\r\n");

        _delay_ms(5000);
        readColor(&red, &green, &blue);
        printf("AT+CIPSEND=104\r\n");
        printf("GET https://api.thingspeak.com/update?api_key=AUNLC6UQ6YFVDNTE&field1=%05u&field2=%05u&field3=%05u\r\

        _delay_ms(3000);
    }
```

```
AT+CIPSEND=104
_key=AUNLC6UQ6YFVDNTE&field1=00589&field2=00696&fi
eld3=00327
AT+CIPMUX=0
AT+CIPSTART="TCP","api.thingspeak.com",80
AT+CIPSEND=104
api_key=AUNLC6UQ6YFVDNTE&field1=00115&field
&field3=00101
AT+CIPMUX=0
AT+CIPSTART="TCP","api.thingspeak.com",80
AT+CIPSEND=104
=AUNLC6UQ6YFVDNTE&field1=00117&field2=00129
=00102
AT+CIPMUX=0
```

Text watermark

5. SCREENSHOT OF EACH DEMO (BOARD SETUP)





6. VIDEO LINKS OF EACH DEMO

https://youtu.be/rWMqEPpWZ_0

7. GITHUB LINK OF THIS DA

https://github.com/RickyPerez79/submission_da.git

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

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