## 電通二乙微處理器實驗 實驗結報

實驗名稱	Lab03			
組別	11	組員	陳奕璁	

#### 1. 實驗目的

使用 USB-Serial 作為數入輸出

讀取類比輸入之數值

量測 0/0.5/1/1.5/2/2.5V 之電壓值

量測可變電阻之數值

量測光敏電阻之數值

### 2. 實驗步驟

(1)

由 Ardiuno 傳送訊息給 pc

Arduino 傳送一訊息"Hello,World"至PC

PC 經由 Serial Monitor 接收

打開 Arduino IDE 的 Serial Monitor,確認有收到訊息

由 PC 傳送指令至 Arduino

傳送命令1及0至 Arduino

Arduino 收到 1 後.LED7 亮

Arduino 收到 0 後,LED7 滅

(2)

#### 量測電壓值

將電源供應器 Vout 輸出接到 A0,電壓不得超過 2.5V

數位電表 GND 與 Arduino 共地

將電源供應器調整為 0/0.5/1.5/2/2.5,並分別測量 5 次電壓後經由串列通訊 回傳給 pc

(3)

#### 測量可變電阻值

將 A1 接至可變電阻

將可變電阻亦接至三用電表.紀錄轉動旋鈕時最大/最小分壓

及最大/最小電阻

每隔 0.5 秒測量一次 ADC 值,量續測量 20 次,計 10 秒

量測結果轉換成電壓(0-2.5)後

由電壓換算求得相對之電阻

將電阻值傳回傳回 PC 計 20 次

於量測時,轉動可變電阻之旋,觀測螢幕顯示結果是否與

電壓表之量測值相符

(4)

### 量測光熐電阻值

選擇兩電阻值 R1 及 R2

將 A2 接至光敏電阻

將可變電阻亦接至電壓表

每隔 0.5 秒量測一次電阻值,連續量測 20 次,計 10 秒

量測結果轉換成電壓(0-2.5V)後,傳回 PC,計 20 次 於量測時,用物品遮住光敏電阻,觀測螢幕顯示結果是否與 電壓表之量測值相符

## 3. 程式碼

Setup: Analogin = 0; Loop: for (i=0;i<=5;i++) Analogin = 0.7\* Analogin + 0.3\* analogRead(A0); Vin = Analogin \* 2.5 / 4095 Use Serial.Print to Diaplay Vin Sleep 0.5 sec

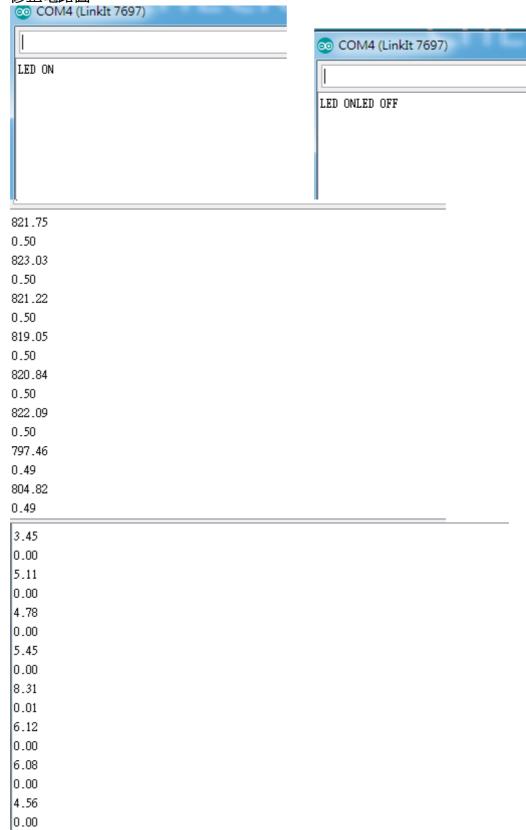
# 4. 實驗結果及分析

- (1)宣告變數 放在 loop 裡面和外面 會有些許的誤差值 整體跑下來誤差就有點大了
- (2)電源供應器的實際輸出和你選的值會有點出入 接通前最好測一下 以免條最大值時一個誤差就把 Arduino 燒了
- 5. 心得討論

現在上傳到 Arduino 已經沒什麼問題了 寫程式比較有問題

常常跑不出自己想要的結果 有夠頭痛的

# 6. 修正電路圖



1.50

2453.42

1.50

2454.19

1.50

2453.54

1.50

2453.37

1.50

2446.66

1.49

2448.26

1.49

2450.28

1.50

2447.80

1.00

1634.69

1.00

1635.09

1.00

1635.96

1.00

1635.07

1.00

1635.95

1.00

1637.17

1.00

1638.32

1.00

1638.52

2.50

4094.44

2.50

4094.61

2.50

4092.62

2.50

4093.34

2.50

4086.04

2.49

4088.73

2.50

4090.61

2.50

```
2.00
3270.71
2.00
3270.20
2.00
3269.24
2.00
3269.77
2.00
3268.64
2.00
3259.75
1.99
3262.82
1.99
3264.38
analogRead=767
                sensorVoltage=0.84
                                         R=1000000.00
                                                          R1=168792.16
                                                                          R2=831207.88
analogRead=785
                sensorVoltage=0.83
                                         R=1000000.00
                                                          R1=166760.78
                                                                          R2=833239.25
analogRead=775
                sensorVoltage=0.84
                                         R=1000000.00
                                                          R1=167055.77
                                                                          R2=832944.25
analogRead=769
                sensorVoltage=0.83
                                         R=1000000.00
                                                          R1=166829.66
                                                                          R2=833170.38
analogRead=757
                sensorVoltage=0.83
                                         R=1000000.00
                                                          R1=166087.39
                                                                          R2=833912.63
analogRead=776
                sensorVoltage=0.83
                                         R=1000000.00
                                                          R1=166992.31
                                                                          R2=833007.69
analogRead=775
                sensorVoltage=0.83
                                         R=1000000.00
                                                          R1=166153.16
                                                                          R2=833846.88
 analogRead=4
                 sensorVoltage=0.00
                                          R=1000000.00
                                                           R1=301.62
                                                                           R2=999698.38
 analogRead=1
                 sensorVoltage=0.00
                                          R=1000000.00
                                                          R1=215.47
                                                                           R2=999784.50
 analogRead=1
                 sensorVoltage=0.00
                                          R=1000000.00
                                                           R1=251.37
                                                                           R2=999748.63
 analogRead=2
                 sensorVoltage=0.01
                                          R=1000000.00
                                                           R1=1317.02
                                                                           R2=998683.00
 analogRead=2
                 sensorVoltage=0.00
                                          R=1000000.00
                                                           R1=215.47
                                                                           R2=999784.50
 analogRead=2
                 sensorVoltage=0.00
                                          R=1000000.00
                                                           R1=302.65
                                                                           R2=999697.38
analogRead=1
                 sensorVoltage=0.00
                                          R=1000000.00
                                                          R1=215.47
                                                                           R2=999784.50
analogRead=1163 sensorVoltage=1.26
                                         R=1000000.00
                                                          R1=252331.92
                                                                          R2=747668.06
analogRead=1142 sensorVoltage=1.26
                                         R=1000000.00
                                                          R1=252374.70
                                                                          R2=747625.31
analogRead=1174 sensorVoltage=1.25
                                         R=1000000.00
                                                          R1=250755.03
                                                                          R2=749245.00
analogRead=1151 sensorVoltage=1.26
                                         R=1000000.00
                                                          R1=251796.92
                                                                          R2=748203.06
analogRead=1174 sensorVoltage=1.26
                                         R=1000000.00
                                                          R1=251822.20
                                                                          R2=748177.81
analogRead=1402 sensorVoltage=1.52
                                                         R1=304197.31
                                                                          R2=695802.69
                                         R=1000000.00
analogRead=1421 sensorVoltage=1.52
                                         R=1000000.00
                                                                          R2=695112.69
                                                         R1=304887.31
analogRead=1414 sensorVoltage=1.52
                                                         R1=304359.31
                                         R=1000000.00
                                                                          R2=695640.69
analogRead=1415 sensorVoltage=1.52
                                         R=1000000.00
                                                         R1=304484.47
                                                                          R2=695515.50
analogRead=1412 sensorVoltage=1.52
                                         R=1000000.00
                                                         R1=304316.00
                                                                          R2=695684.00
analogRead=1391 sensorVoltage=1.52
                                         R=1000000.00
                                                         R1=304979.88
                                                                          R2=695020.13
analogRead=1408 sensorVoltage=1.52
                                         R=1000000.00
                                                         R1=304541.06
                                                                          R2=695458.94
                                                                          DO COFOOO 35
   1 D 1 4440
                      1T 1 .
                                         B 1000000 00
                                                         D4 004047 00
```

alogKead=2226 sensorVoltage=2.4U	K=1000000.00	R1=479277.50	K2=52U722.5U
alogRead=2197 sensorVoltage=2.37	R=1000000.00	R1=473032.44	R2=526967.56
alogRead=2194 sensorVoltage=2.37	R=1000000.00	R1=474783.00	R2=525217.00
alogRead=2185 sensorVoltage=2.38	R=1000000.00	R1=475049.16	R2=524950.88
alogRead=2189 sensorVoltage=2.37	R=1000000.00	R1=473207.00	R2=526793.00
alogRead=2193 sensorVoltage=2.37	R=1000000.00	R1=473529.84	R2=526470.13
alogRead=2189 sensorVoltage=2.37	R=1000000.00	R1=473349.84	R2=526650.13
alogRead=2201 sensorVoltage=2.37	R=1000000.00	R1=473453.31	R2=526546.69
analogRead=3088 sensorVoltage=3.40	R=1000000.00	R1=679369.94	R2=320630.06
· ·			
analogRead=3106 sensorVoltage=3.37	R=1000000.00	R1=674179.00	R2=325821.00
analogRead=3202 sensorVoltage=3.46	R=1000000.00	R1=692255.63	R2=307744.38
analogRead=3168 sensorVoltage=3.46	R=1000000.00	R1=692442.94	R2=307557.06
analogRead=3209 sensorVoltage=3.44	R=1000000.00	R1=688781.38	R2=311218.63
analogRead=3209 sensorVoltage=3.45	R=1000000.00	R1=690050.56	R2=309949.44
analogRead=3199 sensorVoltage=3.40	R=1000000.00	R1=680646.75	R2=319353.25
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00
analogRead=4095 sensorVoltage=4.41	R=1000000.00	R1=882351.00	R2=117649.00

# 7. 修正程式碼

(1)

```
const byte ledPin = 13;
      void setup()
       Serial.begin(9600);
       Serial.println("Hello,");
       Serial.print("\tLED pin is: ");
       Serial.print(ledPin);
       Serial.print("\nBYE!");
      void loop()
       byte val;
       if(Serial.available())
         val =Serial.read();
         if(val == '1')
          digitalWrite(ledPin, HIGH);
          Serial.print("LED ON");
         else if(val == '0')
          digitalWrite(ledPin, LOW);
          Serial.print("LED OFF");
         }
        }
(2)
      float Analogin = 0;
      float k=0;
      void setup()
       Serial.begin(9600);
       pinMode(14,INPUT);
      void loop()
       for(int i=0;i<=5;i++)
          Analogin = 0.7*Analogin+0.3*analogRead(14);
```

```
k = Analogin*2.5/4095;
          Serial.println(Analogin);
          Serial.println(k);
        delay(500);
(3)
      int val;
      float Vin = 5;
      float R=1000000;
      float R1;
      float R2;
      void setup()
      {
        Serial.begin(9600);
       pinMode(15,OUTPUT);
      }
      void loop()
      {
       int i;
       float sensorValue=0;
       float sensorVoltage;
       for (i=0;i<=5;i++)
         sensorValue = 0.7* sensorValue + 0.3* analogRead(15);
        sensorVoltage = sensorValue * 5 / 4095;
       R1 = sensorVoltage * R / Vin;
       R2=R-R1;
        sensorVoltage = (Vin*R1) / R;
        val = analogRead(15);
        Serial.print("analogRead=");
        Serial.print(val);
        Serial.print("\tsensorVoltage=");
        Serial.print(sensorVoltage);
        Serial.print("\tR=");
        Serial.print(R);
        Serial.print("\tR1=");
        Serial.print(R1);
        Serial.print("\tR2=");
        Serial.println(R2);
        delay(500);
}
(4)
      float val;
```

```
float Vin = 5;
      float R=5000000;
      float R1;
      float sensorValue=0;
       float sensorVoltage;
      void setup()
       Serial.begin(9600);
       pinMode(15,OUTPUT);
      }
      void loop()
       int i;
       for (i=0;i<=5;i++)
        sensorValue = 0.7* sensorValue + 0.3* analogRead(15);
       sensorVoltage = sensorValue * 2.5 / 4095;
       R1 = sensorVoltage * R / 2.5;
       val = analogRead(15);
       Serial.print("analogRead=");
       Serial.print(val);
       Serial.print("\tsensorVoltage=");
       Serial.print(sensorVoltage);
       Serial.print("\tR=");
       Serial.print(R);
       Serial.print("\tR1=");
       Serial.println(R1);
       delay(500);
}
```