**電通二乙微處理器實驗 實驗結報**

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| **實驗名稱** | **類比輸入** |
| **組員** | **孫晨瑋** |

1. **實驗目的**

**\*使用USB-Serial作為輸入輸出**

**\*讀取類比輸入之數值**

**1.量測0/0.5/1/1.5/2/2.5V之電壓值**

**2.量測可變電阻**

**3.量測光敏電阻**

1. **實驗步驟**
2. **由Arduino傳送訊息給PC**

**\*Arduino傳送一訊息”Hello,World!”至PC**

**2.PC經由Serial Monitor接收**

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

**3.由PC傳送指令至Arduino**

**\*傳送命令1及0至Arduino**

**\*Arduino收到’1’後,LED 7 亮**

**\*Arduino收到’0’後,LED 7 滅**

**4.量測電壓值**

**5.量測可變電阻值**

**6.量測光敏電阻值**

1. **程式碼**

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| --- |
| **int LED = 8;**  **void setup() {**  **// put your setup code here, to run once:**  **Serial.begin(9600);**  **Serial.println("Hello,world!");**  **pinMode(LED,OUTPUT);**  **}**  **void loop() {**  **char val**  **// put your main code here, to run repeatedly:**  **if(Serial.available())**  **val = Serial.read();**  **if(val=='1')**  **{**  **digitalWrite(LED,HIGH);**  **Serial.println("LED ON");**  **}**  **else if(val == '0')**  **{**  **digitalWrite(LED,LOW);**  **Serial.println("LED OFF");**  **}**  **}** |
| **int Analogin=0;**  **void setup() {**  **// put your setup code here, to run once:**  **Serial.begin(9600);**  **Serial.println("Hello,world!");**  **}**  **void loop() {**  **// put your main code here, to run repeatedly:**  **int i;**  **float Vin;**  **for(i=0;i<5;i++)**  **Analogin = 0.7 \* Analogin + 0.3 \* analogRead(A0);**  **Vin = Analogin \* 2.5 / 4095;**  **Serial.print("Analogin = ");**  **Serial.println(Analogin);**  **Serial.print("Vin = ");**  **Serial.println(Vin);**  **delay(1000);**  **}** |
| **float Analogin=0;**  **void setup() {**  **// put your setup code here, to run once:**  **Serial.begin(9600);**  **Serial.println("Hello,world!");**  **}**  **void loop() {**  **// put your main code here, to run repeatedly:**  **int i;**  **float val,R1,vin;**  **for(i=0;i<20;i++)**  **{**  **val = 0.7 \* val + 0.3 \* analogRead(A1);**  **delay(100);**  **}**  **vin = val \* 2.5 / 4095;**  **R1 = vin \* 1085100 / 2.5;**  **Serial.print("value = ");**  **Serial.println(val);**  **Serial.print("V = ");**  **Serial.println(vin);**  **Serial.print("R1 = ");**  **Serial.println(R1);**  **delay(500);**  **}** |
| **float Analogin=0;**  **void setup() {**  **// put your setup code here, to run once:**  **Serial.begin(9600);**  **Serial.println("Hello,world!");**  **}**  **void loop() {**  **// put your main code here, to run repeatedly:**  **int i;**  **float val,R1,vin;**  **for(i=0;i<20;i++)**  **{**  **val = 0.7 \* val + 0.3 \* analogRead(A0);**  **delay(100);**  **}**  **vin = val \* 2.5 / 4095;**  **R1 = vin \* 4300 / 2.5;**  **Serial.print("value = ");**  **Serial.println(val);**  **Serial.print("V = ");**  **Serial.println(vin);**  **Serial.print("R1 = ");**  **Serial.println(R1);**  **delay(500);**  **}** |

1. **實驗結果及分析**

**實驗一**

|  |  |  |
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| **PC輸入** | **SerialMonitor輸出** | **LED狀態** |
| **0** | **C:\Users\user\Downloads\擷取2.PNG** | **C:\Users\user\Downloads\IMG_20190306_132404.jpg** |
| **1** | **C:\Users\user\Downloads\擷取.PNG** | **C:\Users\user\Downloads\IMG_20190306_132356.jpg** |

**實驗二**

|  |  |  |
| --- | --- | --- |
| 實際電壓 | AnalogRead讀值 | 推測電壓(V) |
| **0** | **0** | **0** |
| **0.5** | **815** | **0.5** |
| **1** | **1635** | **1** |
| **1.5** | **2470** | **1.51** |
| **2** | **3281** | **2** |
| **2.5** | **4089** | **2.5** |

**實驗三**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 量測值 | 讀值 | 推測電壓 | 推測電阻 | 輸出 |
| 1.72K | **6.51** | **0.00** | **1724.06** | **C:\Users\user\Downloads\擷取3.PNG** |
| 1.08M | **4088.73** | **2.50** | **1083439.75** | **C:\Users\user\Downloads\擷取4.PNG** |
| 84.27K | **318.02** | **0.19** | **84269.78** | **C:\Users\user\Downloads\擷取5.PNG** |
| 817K | **3082.85** | **1.88** | **816898.81** | C:\Users\user\Downloads\擷取6.PNG |
| 835K | **3148.54** | **1.92** | **834306.63** | **C:\Users\user\Downloads\擷取7.PNG** |
| 860K | **3257.93** | **1.99** | **863291.63** | **C:\Users\user\Downloads\擷取8.PNG** |

**實驗四**

|  |  |  |  |
| --- | --- | --- | --- |
| 讀值 | 推測電壓 | 推測電阻 | 輸出 |
| 871.22 | **0.53** | **914.84** |  |
| 1869.17 | **1.14** | **1962.74** |  |
| 2871.61 | **1.75** | **3015.37** |  |
| 3030.73 | **1.85** | **3182.45** |  |
| 3931.40 | **2.40** | **4128.21** |  |
| 4088.73 | **2.50** | **4293.42** | **C:\Users\user\AppData\Local\Microsoft\Windows\INetCache\Content.Word\2.5V.PNG** |

**利用ADC將電壓數值化，也可通過算式算出電壓。只是7697雖然精度比Arduino高，但最高只能測2.5V。**

1. **心得討論**

**雖然實驗每個都不是做不出來，但是時常的接觸不良導致實驗很難時間內做完。**