**電通二乙微處理器實驗 實驗結報**

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| **實驗名稱** | **Lab8** | | |
| **組別** | **電通二甲** | **組員** | **黃柏文** |

1. **實驗目的**

**如何讀取超音波測距之值**

**如何將超音波測距之值顯示於 LCD?**

**Arduino 如何規劃外部中斷 INT0?**

**接一 SW, 當 SW 按下時暫停所有中斷, 結果如何?**

1. **實驗步驟**
2. **程式碼**

**Check Point 1**

#include <Ultrasonic.h>

#include <LiquidCrystal.h>

#define TRIGGER\_PIN 14

#define ECHO\_PIN 13

Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {

lcd.begin(20, 2);

Serial.begin(9600);

}

void loop() {

float cmMsec, inMsec;

long microsec = ultrasonic.timing();

cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM);

Serial.print(cmMsec);

Serial.print(", CM: ");

Serial.print(cmMsec);

lcd.setCursor(0, 0);

lcd.print(cmMsec);

delay(1000);

}

**Check Point 2**

#include <Ultrasonic.h>

#include <LiquidCrystal.h>

#define TRIGGER\_PIN 14

#define ECHO\_PIN 13

Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {

pinMode(6, INPUT\_PULLUP);

attachInterrupt(6, int0, RISING); //assign int0

}

void loop() {

}

void int0() {

float cmMsec, inMsec;

long microsec = ultrasonic.timing();

cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM);

Serial.print(cmMsec);

Serial.print(", CM: ");

Serial.print(cmMsec);

lcd.setCursor(0, 0);

lcd.print(cmMsec);

delay(1000);

}

**Check Point 3**

#include <Ultrasonic.h>

#include <LiquidCrystal.h>

#define TRIGGER\_PIN 14

#define ECHO\_PIN 13

Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup() {

pinMode(2, INPUT\_PULLUP);

pinMode(6, INPUT\_PULLUP);

lcd.begin(20, 2);

Serial.begin(9600);

attachInterrupt(2, int0, RISING); //assign int0

}

void loop() {

if(digitalRead(6))

{

interrupts();

}

else

noInterrupts();

}

void int0() {

lcd.clear();

float cmMsec, inMsec;

long microsec = ultrasonic.timing();

cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM);

lcd.print(", CM: ");

lcd.print(cmMsec);

delay(1000);

}

1. **實驗結果及分析**

**成功讀取超音波測距並在lcd上顯示**

1. **心得討論**

**這是我唯一沒有做完的一次實驗,lcd的接線我其實還是沒有很熟,看來要找時間多多練習了,不過這次的超音波讓我想到大一的樂高機器人,有點懷念,看來我也是老屁股了**

1. **修正電路圖**
2. **修正程式碼**