**電通二甲微處理器實驗 實驗結報**

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| **實驗名稱** | **Lab 08 –中斷控制與超音波測距** | | |
| **學號** | **06050252** | **組員** | **單任瑜** |

1. **實驗目的**

**Arduino 於 當按下 Pin 2 外部中斷 0 時, 讀入超音波測距之值並顯示PC上**

1. **實驗步驟**

**然後把腳位都接好，在把程式碼燒到7697**

**程式碼**

**1.**

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| **#include <Ultrasonic.h>**  **#include <LiquidCrystal.h>**  **#define TRIGGER\_PIN 15**  **#define ECHO\_PIN 16**  **Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);**  **LiquidCrystal lcd(12, 11, 5, 4, 3, 2);**  **void setup()**  **{**  **lcd.begin(16, 2);**  **Serial.begin(9600);**  **}**  **void loop()**  **{**    **float cmMsec, inMsec;**  **long microsec = ultrasonic.timing();**  **cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM); // 計算距離，單位: 公分**  **inMsec = ultrasonic.convert(microsec, Ultrasonic::IN); // 計算距離，單位: 英吋**  **lcd.print("MS:"); lcd.print(microsec);**  **lcd.setCursor(0, 1);**  **lcd.print("CM:"); lcd.print(cmMsec);**  **delay(1000);**  **lcd.clear();**  **}** |

**2.**

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| **#include <Ultrasonic.h>**  **#include <LiquidCrystal.h>**  **#define TRIGGER\_PIN 15**  **#define ECHO\_PIN 16**  **Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);**  **LiquidCrystal lcd(12, 11, 5, 4, 3, 7);**  **const byte intPin=8; //interrupt pin**  **void setup()**  **{**  **lcd.begin(16, 2);**  **pinMode(2, INPUT\_PULLUP);**  **attachInterrupt(2, int0, FALLING); //assign int0**  **Serial.begin(9600);**  **}**  **void loop()**  **{**  **}**  **void int0() //interrupt handler**  **{**  **lcd.clear();**  **float cmMsec, inMsec;**  **long microsec = ultrasonic.timing();**  **cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM); // 計算距離，單位: 公分**  **inMsec = ultrasonic.convert(microsec, Ultrasonic::IN); // 計算距離，單位: 英吋**  **lcd.print("MS:"); lcd.print(microsec);**  **lcd.setCursor(0, 1);**  **lcd.print("CM:"); lcd.print(cmMsec);**    **}** |

**3.**

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| **#include <Ultrasonic.h>**  **#include <LiquidCrystal.h>**  **#define TRIGGER\_PIN 15**  **#define ECHO\_PIN 16**  **Ultrasonic ultrasonic(TRIGGER\_PIN, ECHO\_PIN);**  **LiquidCrystal lcd(12, 11, 5, 4, 3, 7);**  **void setup()**  **{**  **lcd.begin(16, 2);**  **pinMode(2, INPUT\_PULLUP);**  **pinMode(6,INPUT);**  **attachInterrupt(2, int0, FALLING); //assign int0**  **Serial.begin(9600);**  **}**  **void loop()**  **{**  **if(digitalRead(6))**  **{**  **noInterrupts();**  **}**  **else**  **{**  **interrupts();**  **}**  **}**  **void int0() //interrupt handler**  **{**  **lcd.clear();**  **float cmMsec, inMsec;**  **long microsec = ultrasonic.timing();**  **cmMsec = ultrasonic.convert(microsec, Ultrasonic::CM); // 計算距離，單位: 公分**  **inMsec = ultrasonic.convert(microsec, Ultrasonic::IN); // 計算距離，單位: 英吋**  **lcd.print("MS:"); lcd.print(microsec);**  **lcd.setCursor(0, 1);**  **lcd.print("CM:"); lcd.print(cmMsec);**    **}** |

1. **實驗結果及分析**

**超音波感測器的讀值在LCD上顯示，跟外部中斷**

1. **心得討論**

**這次實驗很怕型號看錯**