



# Lab 5: LCM實習重點

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## 基本操作步驟

- Step 1: Use **Function set** instruction
  - **DL** (Data Length), **N** (Number of lines), **F** (Font)
- Step 2: Use **Entry mode** instruction
  - **I/D** (Increment/Decrement), **S** (Shift)
- Step 3: Use **Display on/off control** instruction
  - **D** (Display), **C** (Cursor), **B** (Blink)
- Step 4: Use the other instructions – **WriteIns()**
  - **Clear display** and **Return home** instructions
  - **Set DDRAM address** (移動 cursor 位置) instruction - **SetCursor()**
  - **Write data to CG or DDRAM** (輸出資料到display) instruction – **WriteData()**
  - **Read busy flag and AC address** instruction – **CheckBusy()**
  - **Cursor or display shift** instruction

# 實習操作要求 (1)

## ➤ (1) Function set 設定

- DL = 1 (8-bit), **try N = 1 (2 line) and N = 0 (1 line)**, F = 0 (5x8 dots)
- **Display\_1Line()** and **Desplay\_2Line()**

## ➤ (2) Entry mode 設定

- **try I/D = 1** and **I/D = 0** (Understand cursor moving direction)
- **try S = 1** and **S = 0** (Understand if cursor moving or not)
  - **Problem 1: Why cursor not moving for S = 1 ?**
  - **Problem 2: What are the effects of S = 1 for I/D = 0 and I/D = 1?**

## ➤ (3) Display on/off control設定

- **try D = 1** (display on), **C = 1/0** and **B = 1/0**
  - **Problem 3: C = 1 and C = 0 差別 ?**
  - **Problem 4: B = 1 and B = 0 差別 ?**

## 實習操作要求 (2)

- (4) Cursor or display shift 設定
  - try  $S/C = 1/0$  and  $R/L = 1/0$ 
    - Problem 5:  $S/C = 1$  and  $S/C = 0$  差別？
    - Problem 6:  $R/L = 1$  and  $R/L = 0$  差別？
- (5) SetCursor() 練習 - 移動 cursor 位置
  - 1 line mode
    - Problem 7: Display memory address 範圍？
  - 2 line mode
    - Problem 8: 第一列 Display memory address 範圍？
    - Problem 9: 第二列 Display memory address 範圍？
- (6) Clear display and Return home instructions
  - Problem 10: What's the difference between Clear display and Return home instructions?