**電通二甲微處理器實驗 實驗結報**

|  |  |  |  |
| --- | --- | --- | --- |
| **實驗名稱** | **Arduino lab02** | | |
| **組別** | **電通二甲** | **組員** | **06050136陳庭薇** |

1. **實驗目的**

**LinkIt 7697 D1 – D8 分別接到 LED，實作跑馬燈展示**

1. **實驗步驟**

* **啟動Arduino撰寫程式**
* **接上LED電路**
* **將程式燒錄至LinkIt 7697版中**
* **觀察LED閃爍間隔**
* **修改程式碼，符合題目要求**
* **畫出電路圖**

1. **程式碼**

CHECK POINT 1 **LED 向左及向右執行花色展示**

const byte LEDs[] = {10,11,12,13,14,15,16,17};

byte index = 0;

int i;

void setup()

{

for (byte i=0;i<8;i++)

{

pinMode(LEDs[i], OUTPUT);

}

}

void loop()

{

for (i=0;i<8;i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i=7;i>=0;i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

}

**實驗二**

CHECK POINT 2**所有LED亮滅兩次 -> 左移八次 -> 所有LED亮滅兩次 -> 右移八次**

const byte LEDs[] = {10,11,12,13,14,15,16,17};

byte index = 0;

int i;

void setup()

{

for(byte i=0;i<8;i++)

{

pinMode(LEDs[i], OUTPUT);

}

}

void loop()

{

for(int i=0;i<8;i++)//全亮

{

digitalWrite(LEDs[i],HIGH);

}

delay(200);

for(int i=0;i<8;i++)//全暗

{

digitalWrite(LEDs[i],LOW);

}

delay(200);

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

}

delay(200);

for(byte i=0;i<8;i++)

{

digitalWrite(LEDs[i],LOW);

}

delay(200);

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

}

delay(200);

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],LOW);

}

delay(200);

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],HIGH);

}

delay(200);

for(int i=0;i<8;i++)

{

digitalWrite(LEDs[i],LOW);

}

delay(200);

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

for(int i=7;i>=0;i--)

{

digitalWrite(LEDs[i],HIGH);

delay(200);

digitalWrite(LEDs[i],LOW);

delay(200);

}

delay(200);

}

**實驗三**

CHECK POINT3 開關 OFF -> LED 向左及向右執行花色展示 開關 ON -> 執行自定花色展示

const byte LEDs[] = {10, 11, 12, 13, 14, 15, 16, 17};

byte index = 0;

int i;

void setup()

{

pinMode(6, INPUT);

for (byte i = 0; i < 8; i++)

{

pinMode(LEDs[i], OUTPUT);

}

}

void loop()

{

if (digitalRead(6) == 0)

{

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

}

else

{

for (i = 0; i < 8; i++) //全亮

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH); //全暗

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

delay(100);

}

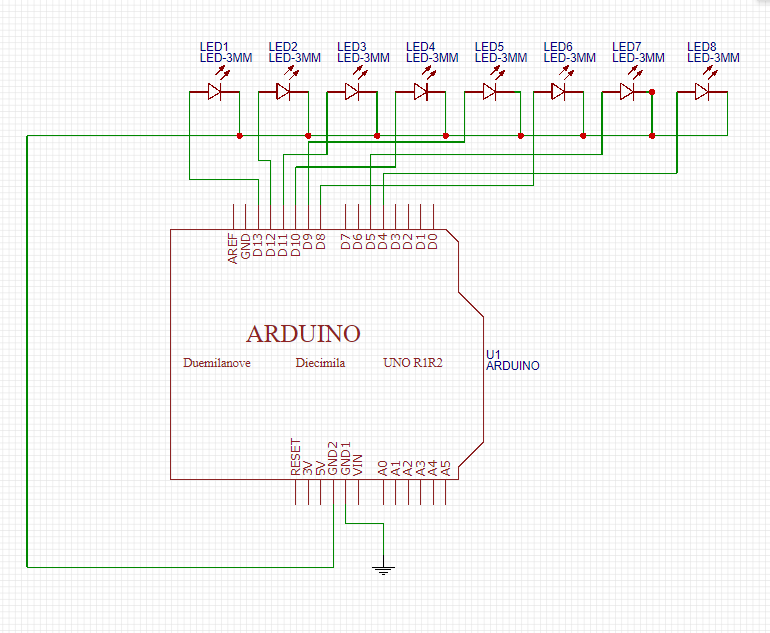
}

1. **實驗結果及分析**

**使用for迴圈，藉由i值遞增或遞減，使得LED逐一閃爍**

1. **心得討論**

**這次的實驗內容很多，還要燒錄到裡，工作內容突然增加了很多，再加上沒有帶麵包版，所以沒辦法準時完成，希望下次的實驗可以更順利完成，包括檢查跟繳交結報。**

1. **修正電路圖**
2. **修正程式碼**

CHECK POINT 1 **LED 向左及向右執行花色展示**

const byte LEDs[] = {4,5,8,9,10,11,12,13};

const byte total = sizeof(LEDs);

byte index = 0;

int i;

void setup()

{

for (byte i=0;i<total;i++)

   {

pinMode(LEDs[i], OUTPUT);

}

}

void loop()

{

for (i=0;i<8;i++)

{

digitalWrite(LEDs[i], HIGH);

      delay(100);

      digitalWrite(LEDs[i], LOW);

   }

 for (i=7;i>=0;i--)

{

digitalWrite(LEDs[i], HIGH);

      delay(100);

      digitalWrite(LEDs[i], LOW);

}

}

**實驗二**

CHECK POINT 2**所有LED亮滅兩次 -> 左移八次 -> 所有LED亮滅兩次 -> 右移八次**

const byte LEDs[] = {4,5,8,9,10,11,12,13};

const byte total = sizeof(LEDs);

byte index = 0;

int i;

void setup()

{

 for(byte i=0;i<total;i++)

 {

  pinMode(LEDs[i], OUTPUT);

 }

}

void loop()

{

for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

}

delay(200);

 for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],LOW);

}

delay(200);

  for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

}

delay(200);

 for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],LOW);

}

delay(200);

  for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

  for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

  for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

  }

for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

  for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

 }

  delay(200);

    for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],LOW);

}

    delay(200);for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],HIGH);

}

  delay(200);

    for(byte i=0;i<8;i++)

{

  digitalWrite(LEDs[i],LOW);

}

  delay(200);

 for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

    for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

     for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

     for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

     for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

     for(byte i=7;i>=0;i--)

{

  digitalWrite(LEDs[i],HIGH);

  delay(200);

  digitalWrite(LEDs[i],LOW);

}

 delay(200);

}

**實驗三**

CHECK POINT**3 開關 OFF -> LED 向左及向右執行花色展示 開關 ON -> 執行自定花色展示**

const byte LEDs[] = {10, 11, 12, 13, 14, 15, 16, 17};

byte index = 0;

int i;

void setup()

{

pinMode(6, INPUT);

for (byte i = 0; i < 8; i++)

{

pinMode(LEDs[i], OUTPUT);

}

}

void loop()

{

if (digitalRead(6) == 0)

{

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

}

else

{

for (i = 0; i < 8; i++) //全亮

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH); //全暗

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], HIGH);

}

delay(100);

for (i = 0; i < 8; i++)

{

digitalWrite(LEDs[i], LOW);

}

delay(100);

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

for (i = 7; i >= 0; i--)

{

digitalWrite(LEDs[i], HIGH);

delay(100);

digitalWrite(LEDs[i], LOW);

delay(100);

}

delay(100);

}

}