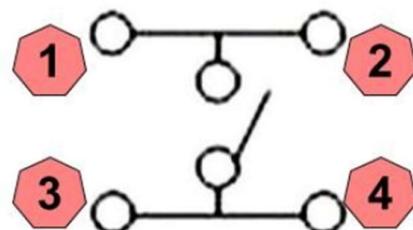
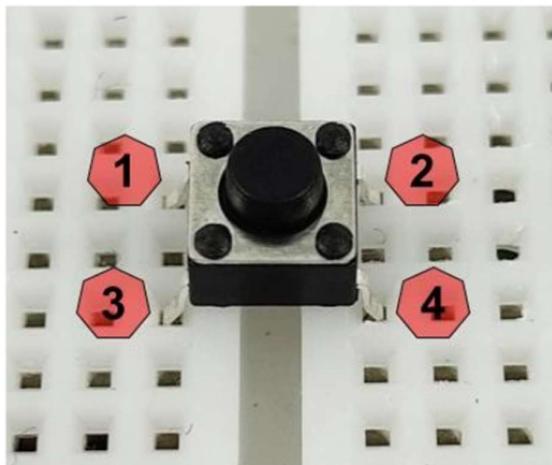


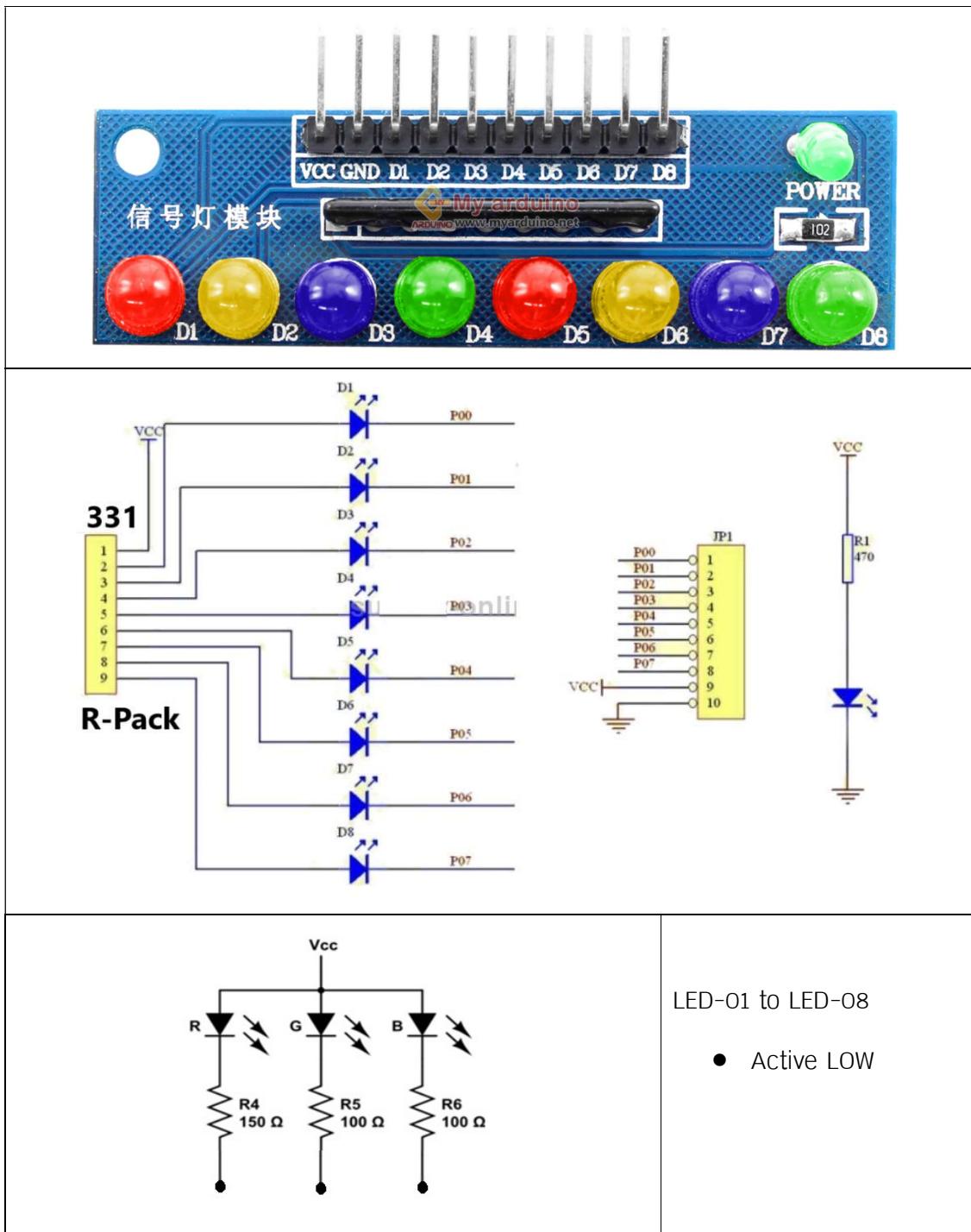
## Getting Start ESP32: ESP32 GPIO + ESP32 Interface

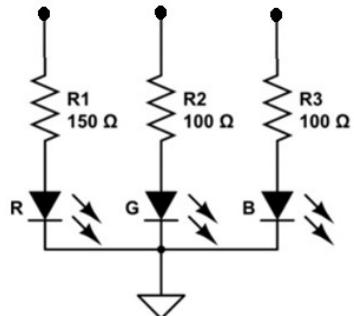
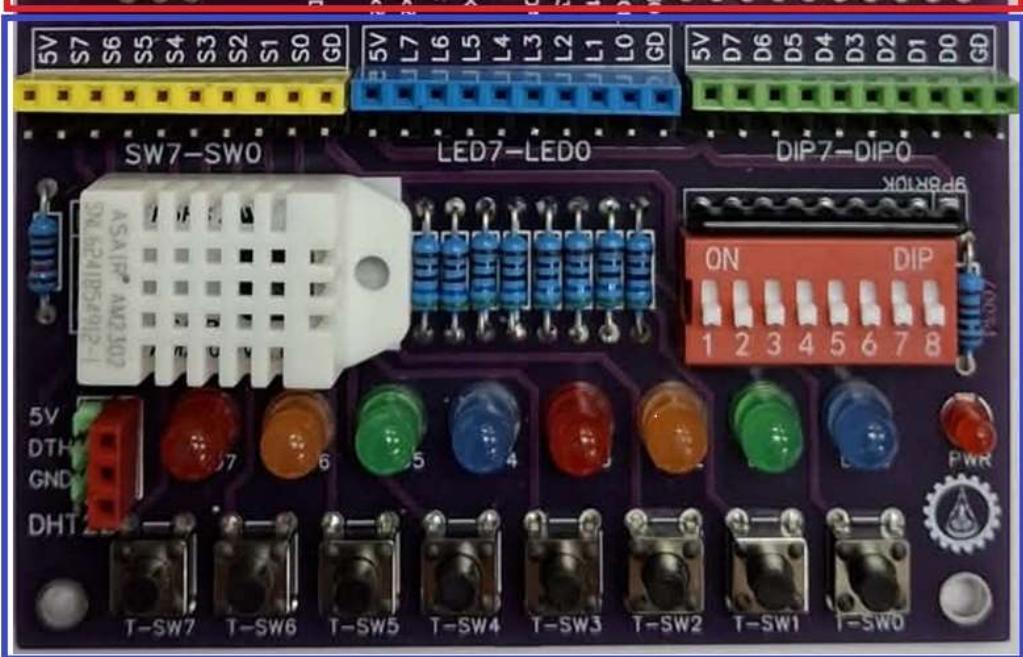
### Mission 2/12 – ESP32 GPIO

1. Read <https://www.allnewstep.com/b/157>
2. Toggle Switch



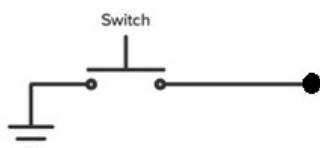
### 3. LED Module 8ดวง





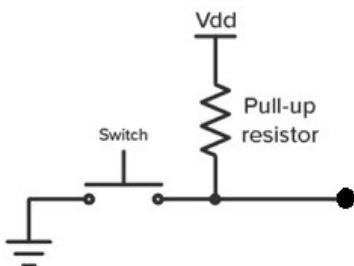
LED-01 to LED-08

Active HIGH



SW7-SW0

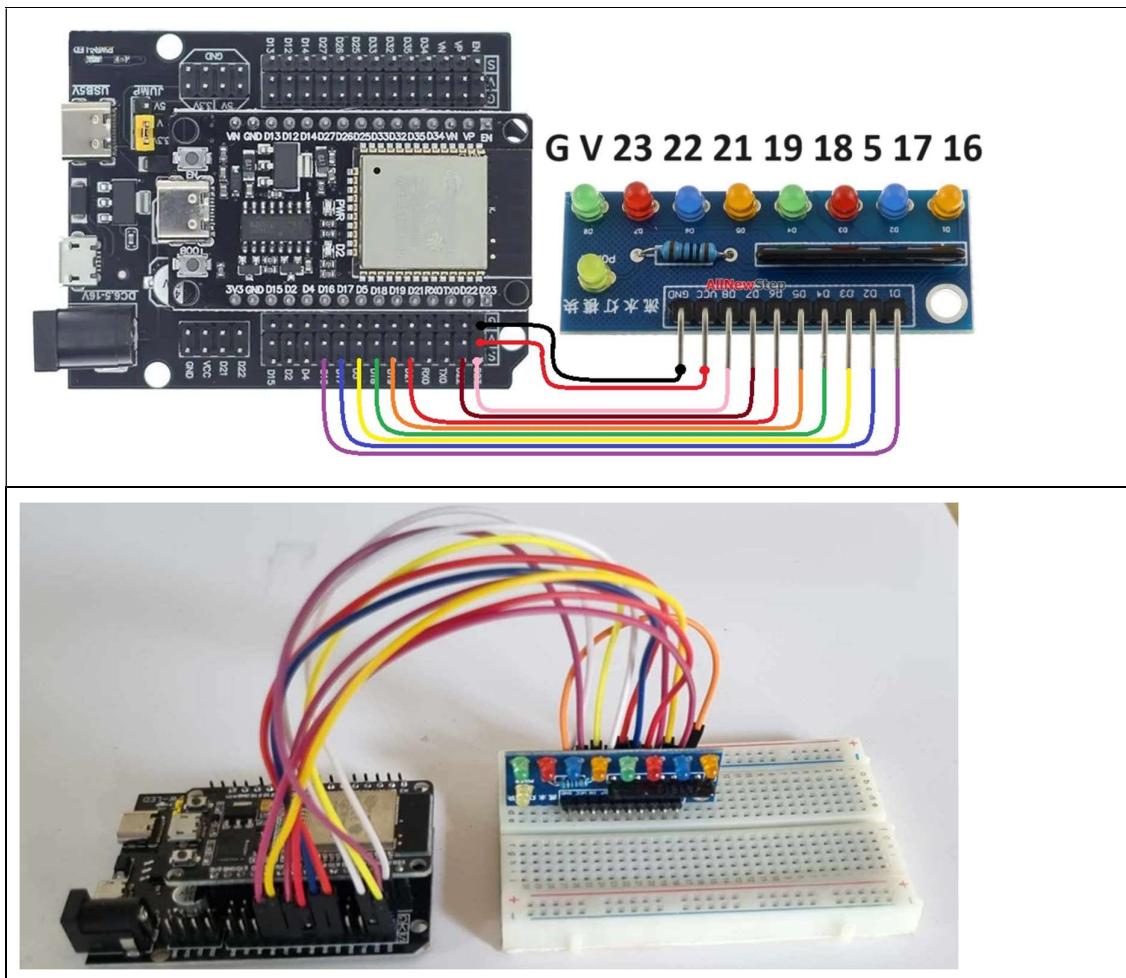
Active LOW without Pull-Up



DIP7-DIPO

Active LOW with Pull-Up

#### 4. Winding “Circuit-02”



#### 5. Test Code “Test0201-D23 Blink”

<pre>void setup() {   pinMode(23, OUTPUT); }  void loop() {   digitalWrite(23, HIGH); delay(1000);   digitalWrite(23, LOW); delay(1000); }</pre>	● fix 23
<pre>#define Test_LED 23 void setup() {   pinMode(Test_LED, OUTPUT); }  void loop() {   digitalWrite(Test_LED, HIGH); delay(1000);   digitalWrite(Test_LED, LOW); delay(1000); }</pre>	● #define
<pre>int Test_LED = 23; void setup() {   pinMode(Test_LED, OUTPUT); }  void loop() {   digitalWrite(Test_LED, HIGH); delay(1000);   digitalWrite(Test_LED, LOW); delay(1000); }</pre>	● int variable

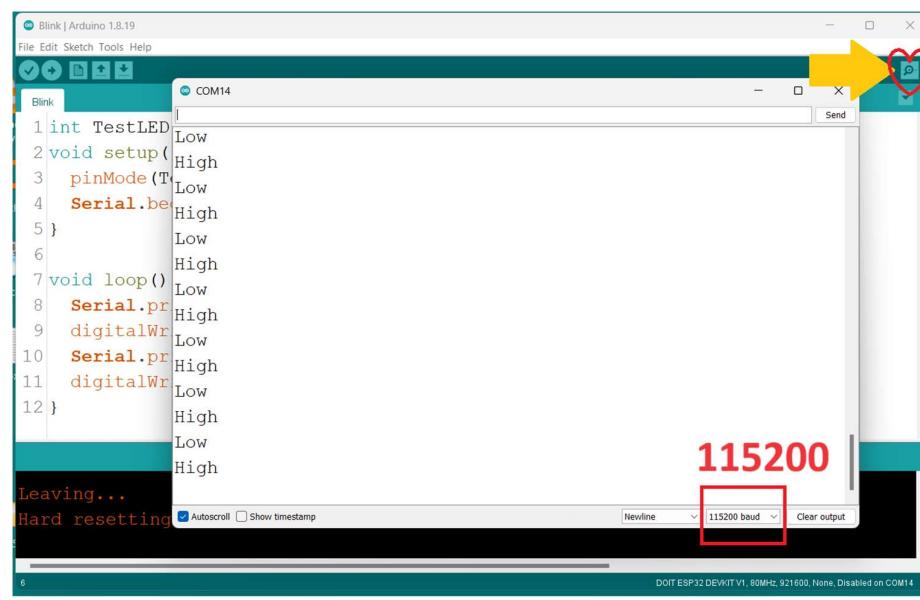
## 6. Test Code “Test0202-D23 Blink with Serial Monitor”

```
int TestLED = 23;  
void setup() {  
    pinMode(TestLED, OUTPUT);  
    Serial.begin(115200);  
}  
  
void loop() {  
    Serial.println("High");  
    digitalWrite(TestLED, HIGH); delay(1000);  
    Serial.println("Low");  
    digitalWrite(TestLED, LOW); delay(1000);  
}
```

- Serial Baud rate = 115200

Tools → Serial Monitor

Set baud = 115200

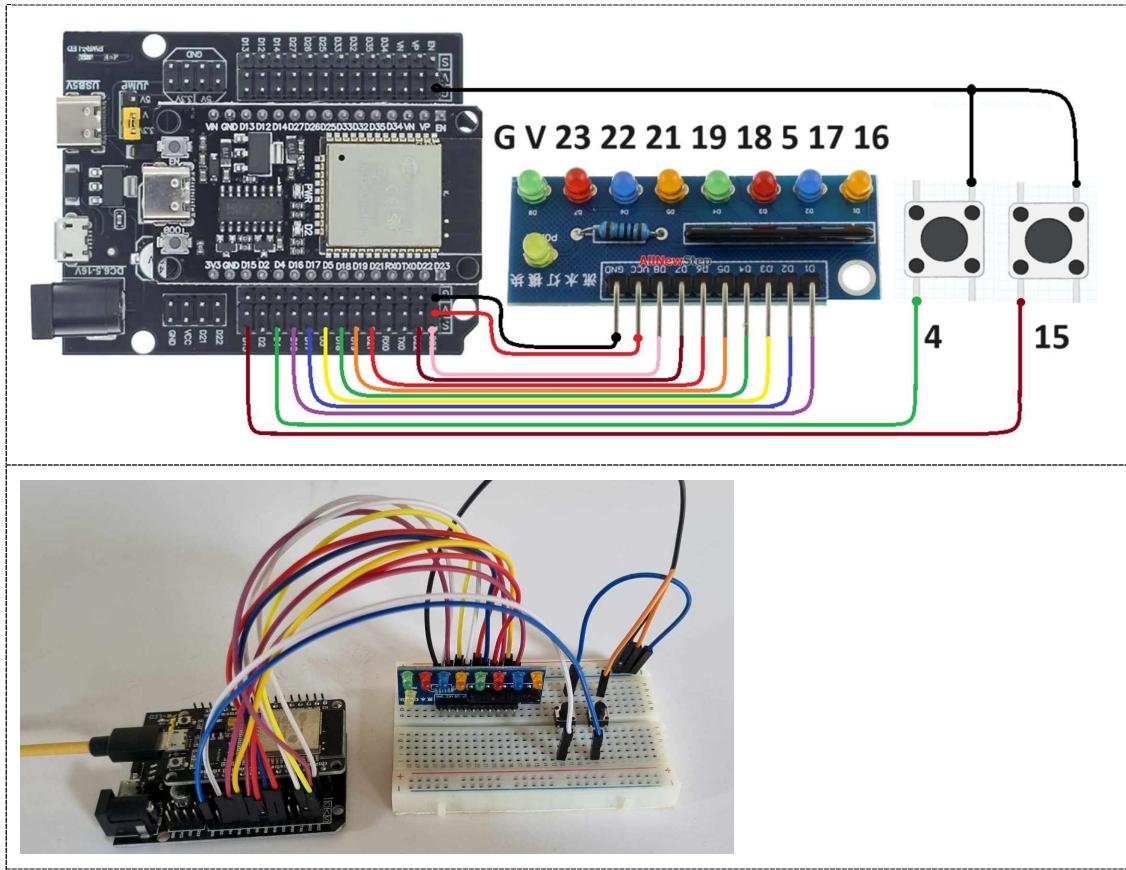


## 7. Test Code “Test0203-Moving LED”

```
int pinIO[] = {23, 22, 21, 19, 18, 5, 17, 16};  
  
void setup() {  
    for (int i = 0; i <= 7; i++) {  
        pinMode(pinIO[i], OUTPUT);  
        digitalWrite(pinIO[i], HIGH); // Active Low  
    }  
}  
  
void loop() {  
    for (int i = 0; i <= 7; i++) {  
        digitalWrite(pinIO[i], LOW); // On LED  
        delay(250);  
        digitalWrite(pinIO[i], HIGH); // Off LED  
    }  
}
```

- Show L2R Moving
- How to show R2L Moving
- How to show R2L and L2R Moving

## 8. Add 2 Switch in “Circuit-02”



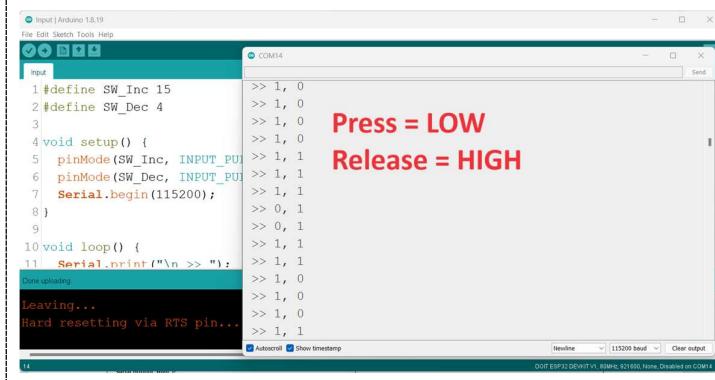
## 9. Test Code “Test0204-Input Switch”

```
#define SW_Inc 15
#define SW_Dec 4

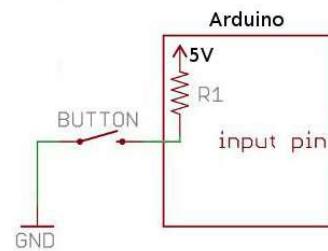
void setup() {
    pinMode(SW_Inc, INPUT_PULLUP);
    pinMode(SW_Dec, INPUT_PULLUP);
    Serial.begin(115200);
}

void loop() {
    Serial.print("\n>> ");
    Serial.print(digitalRead(SW_Inc));
    Serial.print(" , ");
    Serial.print(digitalRead(SW_Dec));
    delay(250);
}
```

- `pinMode = INPUT, INPUT_PULLUP, OUTPUT`



Internal pull-up



## 10. Test Code “Test0205-Push Counter”

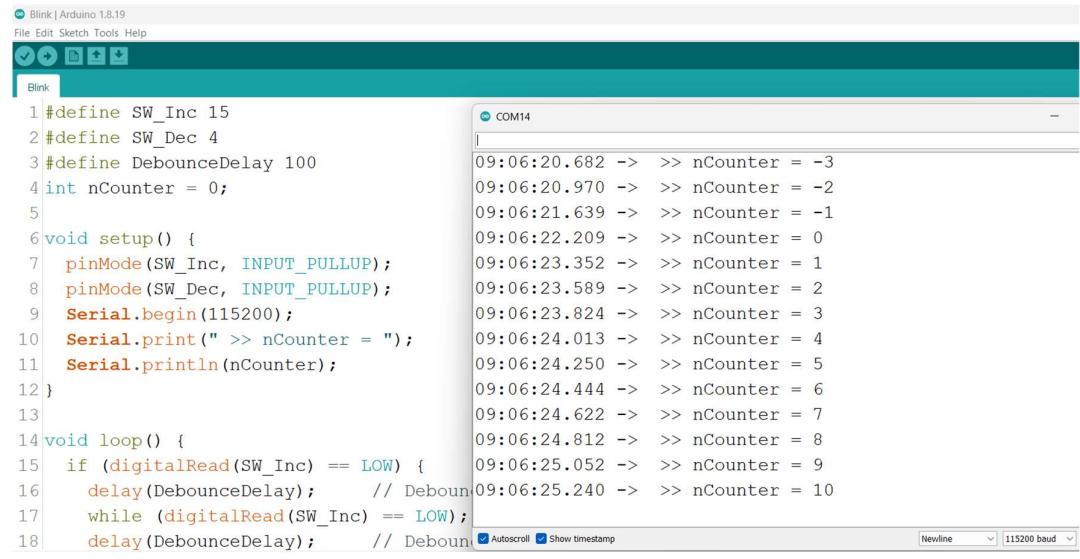
```
#define SW_Inc 15
#define SW_Dec 4
#define DebounceDelay 100
int nCounter = 0;

void setup() {
  pinMode(SW_Inc, INPUT_PULLUP);
  pinMode(SW_Dec, INPUT_PULLUP);
  Serial.begin(115200);
  Serial.print(" >> nCounter = ");
  Serial.println(nCounter);
}

void loop() {
  if (digitalRead(SW_Inc) == LOW) { // If Switch Press
    delay(DebounceDelay); // Debounce Delay H->L
    while (digitalRead(SW_Inc) == LOW); // wait until release
    delay(DebounceDelay); // Debounce Delay L->H
    nCounter++;
    Serial.print(" >> nCounter = ");
    Serial.println(nCounter);
  }

  if (digitalRead(SW_Dec) == LOW) {
    delay(DebounceDelay);
    while (digitalRead(SW_Dec) == LOW);
    delay(DebounceDelay);
    nCounter--;
    Serial.print(" >> nCounter = ");
    Serial.println(nCounter);
  }
}
```

- Test for changing pinMode  
pinMode(SW\_Inc, INPUT);
- Test for short debounce delay  
#define DebounceDelay 1
- Test for long debounce delay  
#define DebounceDelay 10000



## 11. Test Code “Test0206-Moving LED with 2 Switch”

```
#define SW_L2R 15
#define SW_R2L 4
int pinIO[] = {23, 22, 21, 19, 18, 5, 17, 16};

void setup() {
    for (int i = 0; i <= 7; i++) {
        pinMode(pinIO[i], OUTPUT);
        digitalWrite(pinIO[i], HIGH); // Active Low
    }
    pinMode(SW_L2R, INPUT_PULLUP);
    pinMode(SW_R2L, INPUT_PULLUP);
    Serial.begin(115200);
}

int CountRun = 0, StepRun = 0;
int minIndex = 0, maxIndex = 7;
void loop() {
    if (digitalRead(SW_L2R) == LOW) StepRun += 1;
    if (digitalRead(SW_R2L) == LOW) StepRun -= 1;
    CountRun += StepRun; // Next Step
    CountRun = CountRun < minIndex ? minIndex : CountRun;
    CountRun = CountRun > maxIndex ? maxIndex : CountRun;
    Serial.print("\n > ");
    Serial.print(CountRun);
    Serial.print(" , ");
    Serial.print(StepRun);
    digitalWrite(pinIO[CountRun], LOW); // On LED
    delay(250);
    digitalWrite(pinIO[CountRun], HIGH); // Off LED
}
```

● XX

## 12. Test Code “Test0207-Moving LED with 1 Switch”

```
#define SW_L2R 15
#define SW_R2L 4
#define DebounceDelay 100

int pinIO[] = {23, 22, 21, 19, 18, 5, 17, 16};
int CountRun = 0, RunMode = 0;
int minIndex = 0, maxIndex = 7;

void setup() {
    for (int i = 0; i <= 7; i++) {
        pinMode(pinIO[i], OUTPUT);
        digitalWrite(pinIO[i], HIGH); // Active Low
    }
    pinMode(SW_L2R, INPUT_PULLUP);
    pinMode(SW_R2L, INPUT_PULLUP);
    Serial.begin(115200);
}

void SwitchCheck() {
    if (digitalRead(SW_L2R) == LOW) { // If Switch Press
        delay(DebounceDelay); // Debounce Delay H->L
        while (digitalRead(SW_L2R) == LOW); // wait until release
        delay(DebounceDelay); // Debounce Delay L->H
        RunMode = RunMode == 0 ? +1 : 0;
    }

    if (digitalRead(SW_R2L) == LOW) {
        delay(DebounceDelay);
        while (digitalRead(SW_R2L) == LOW);
        delay(DebounceDelay);
        RunMode = RunMode == 0 ? -1 : 0;
    }
}

void loop() {
    CountRun += RunMode; // Next Step
    CountRun = CountRun < minIndex ? minIndex : CountRun;
    CountRun = CountRun > maxIndex ? maxIndex : CountRun;
    Serial.print("\n > ");
    Serial.print(CountRun);
    Serial.print(" , ");
    Serial.print(RunMode);
    digitalWrite(pinIO[CountRun], LOW); // On LED
    SwitchCheck(); delay(50);
    SwitchCheck(); delay(50);
    SwitchCheck(); delay(50);
    digitalWrite(pinIO[CountRun], HIGH); // Off LED
}
```

● XX