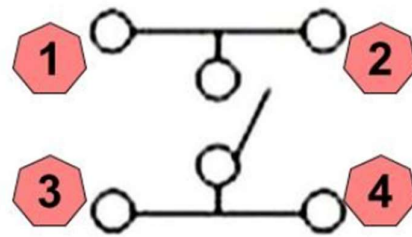
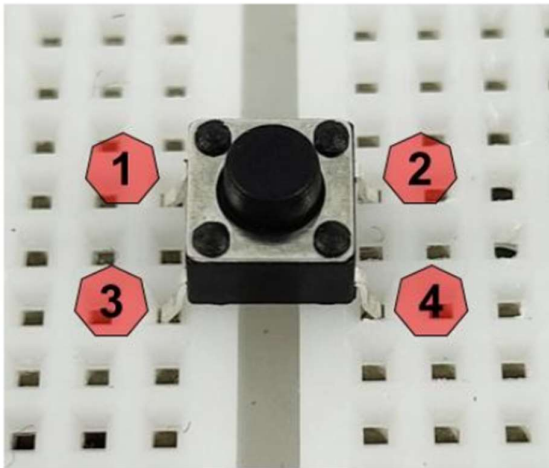


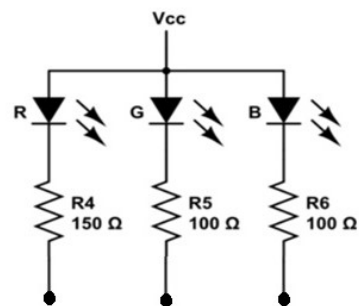
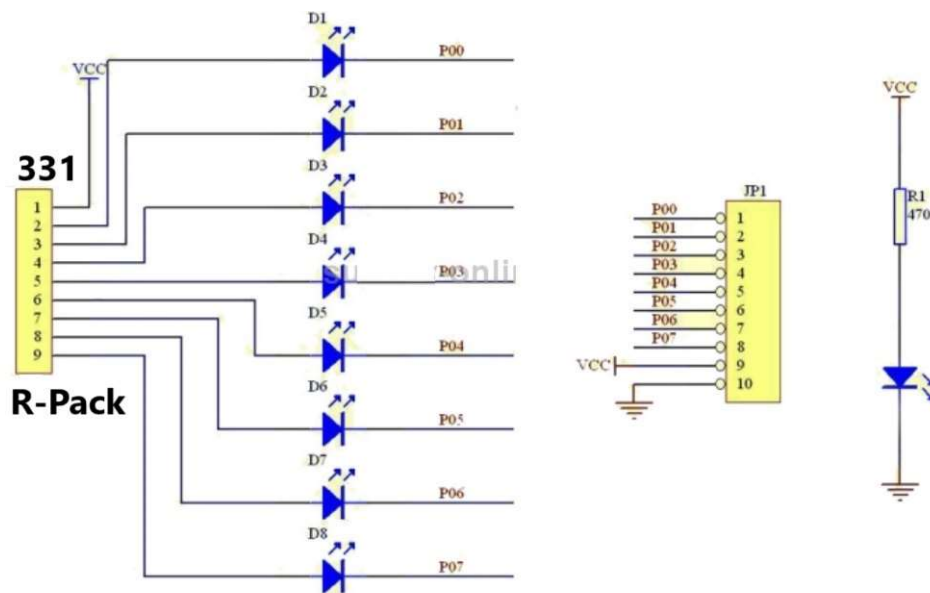
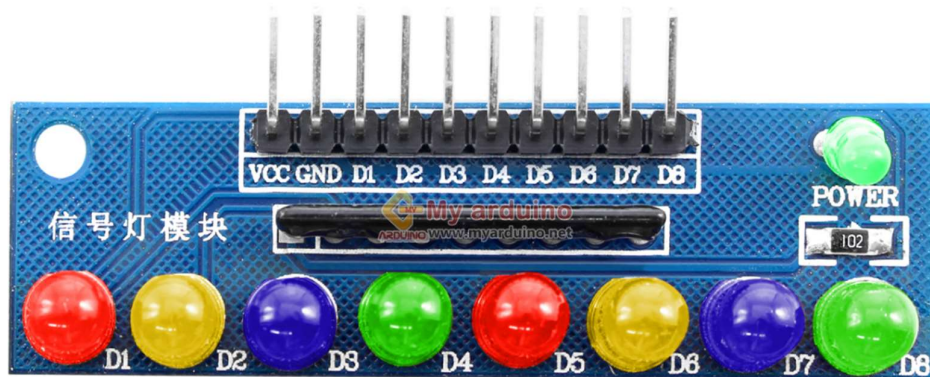
## Getting Start ESP32: ESP32 GPIO + ESP32 Interface

### Mission 2/12 – ESP32 GPIO

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

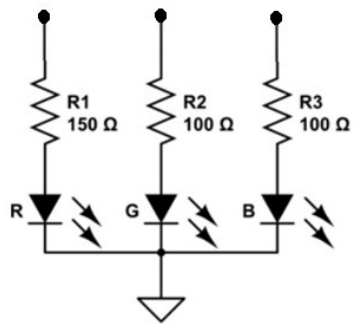
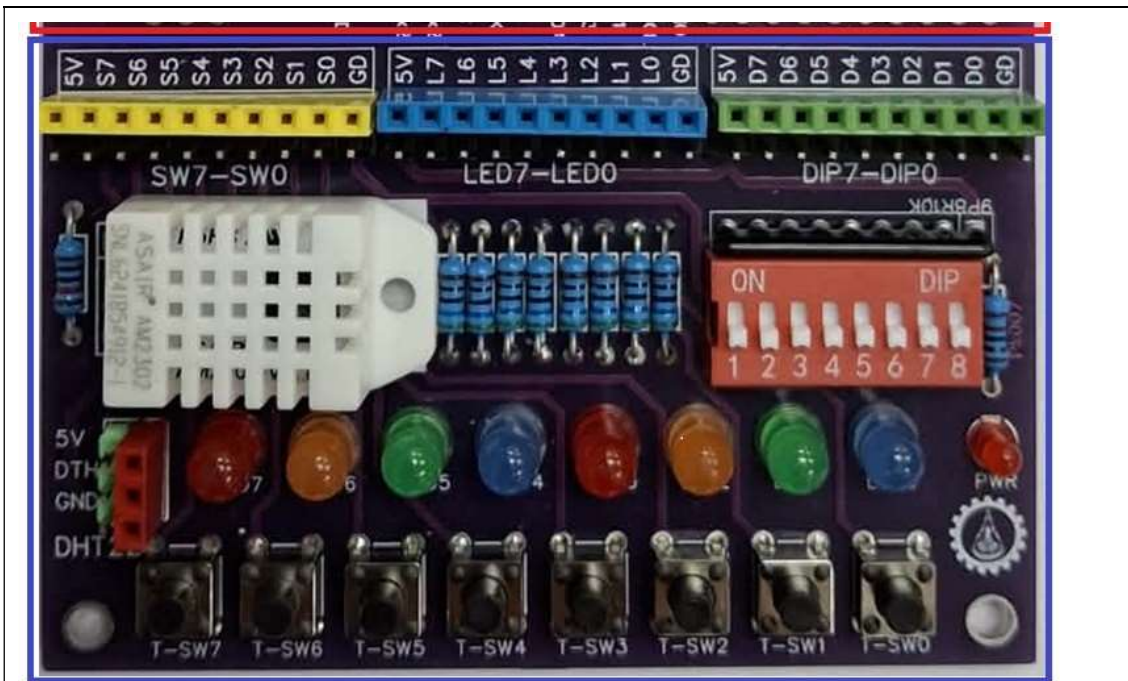


### 3. LED Module 8ดวง

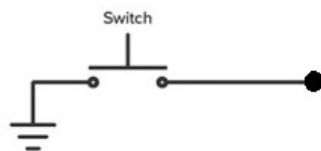


LED-01 to LED-08

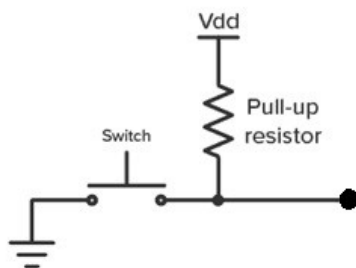
- Active LOW



LED-01 to LED-08  
Active HIGH

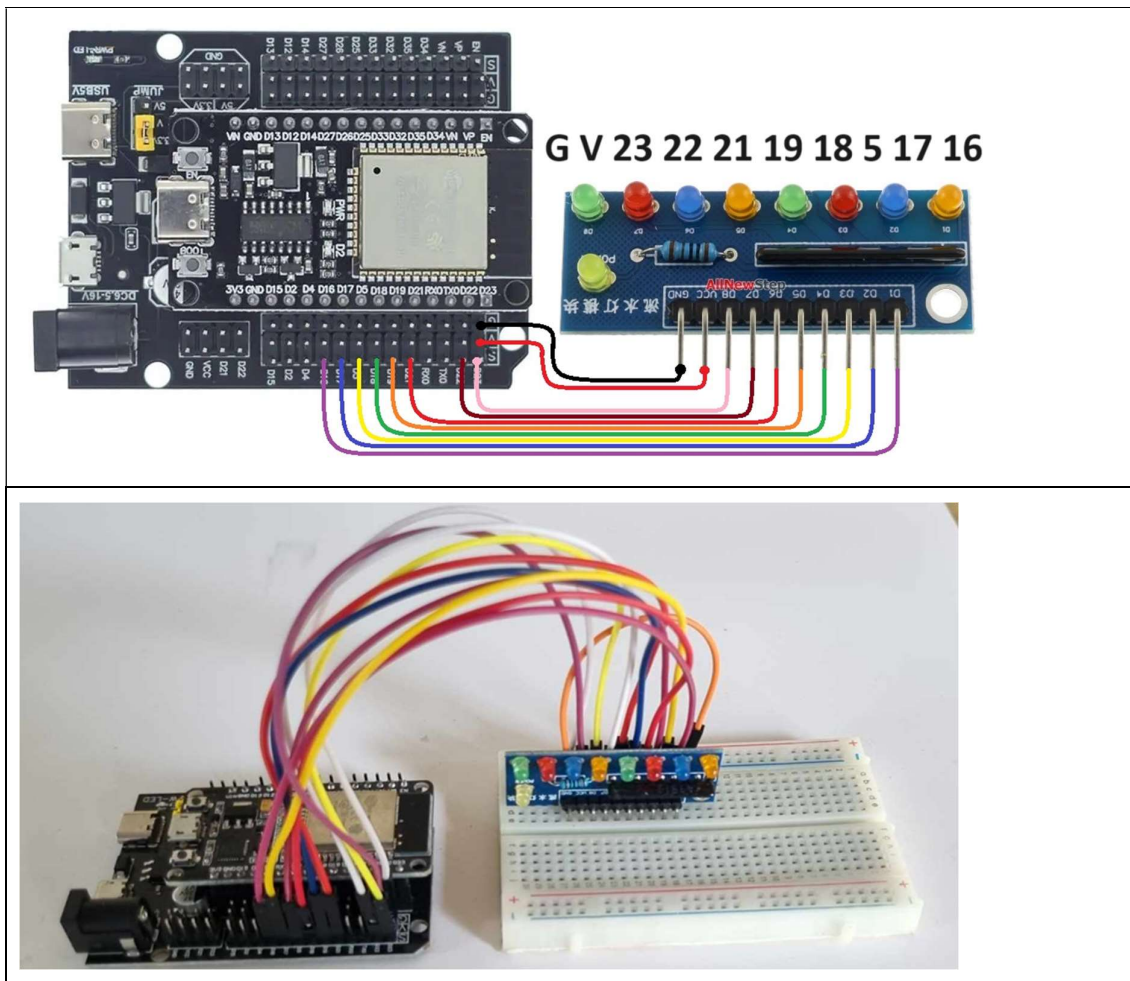


SW7-SW0  
Active LOW without Pull-Up



DIP7-DIP0  
Active LOW with Pull-Up

#### 4. Wiring “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>	<ul style="list-style-type: none"> <li>• fix 23</li> </ul>
<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>	<ul style="list-style-type: none"> <li>• #define</li> </ul>
<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>	<ul style="list-style-type: none"> <li>• int variable</li> </ul>

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

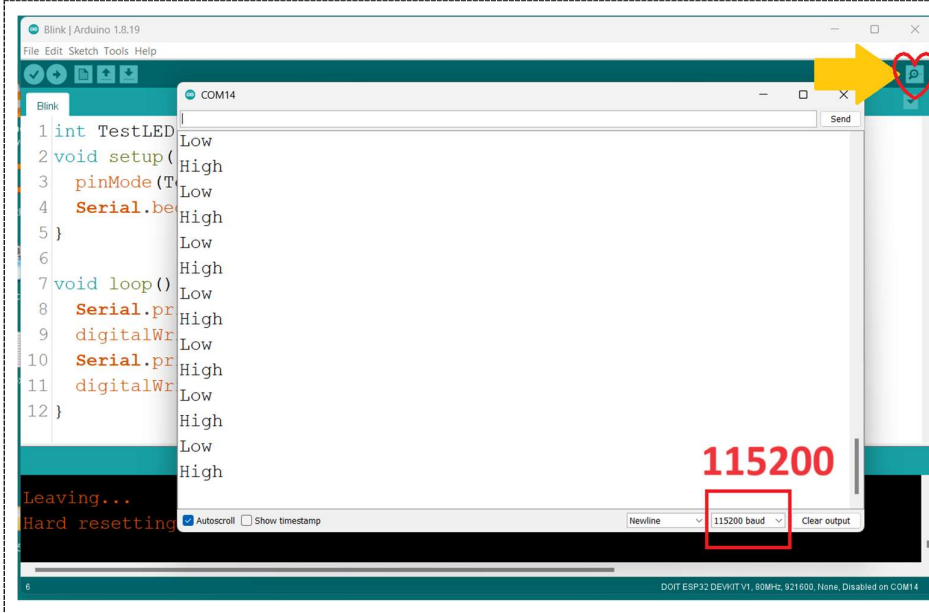
```
int TestLED = 23;
void setup() {
  pinMode(TestLED, OUTPUT);
  Serial.begin(115200);
}

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};

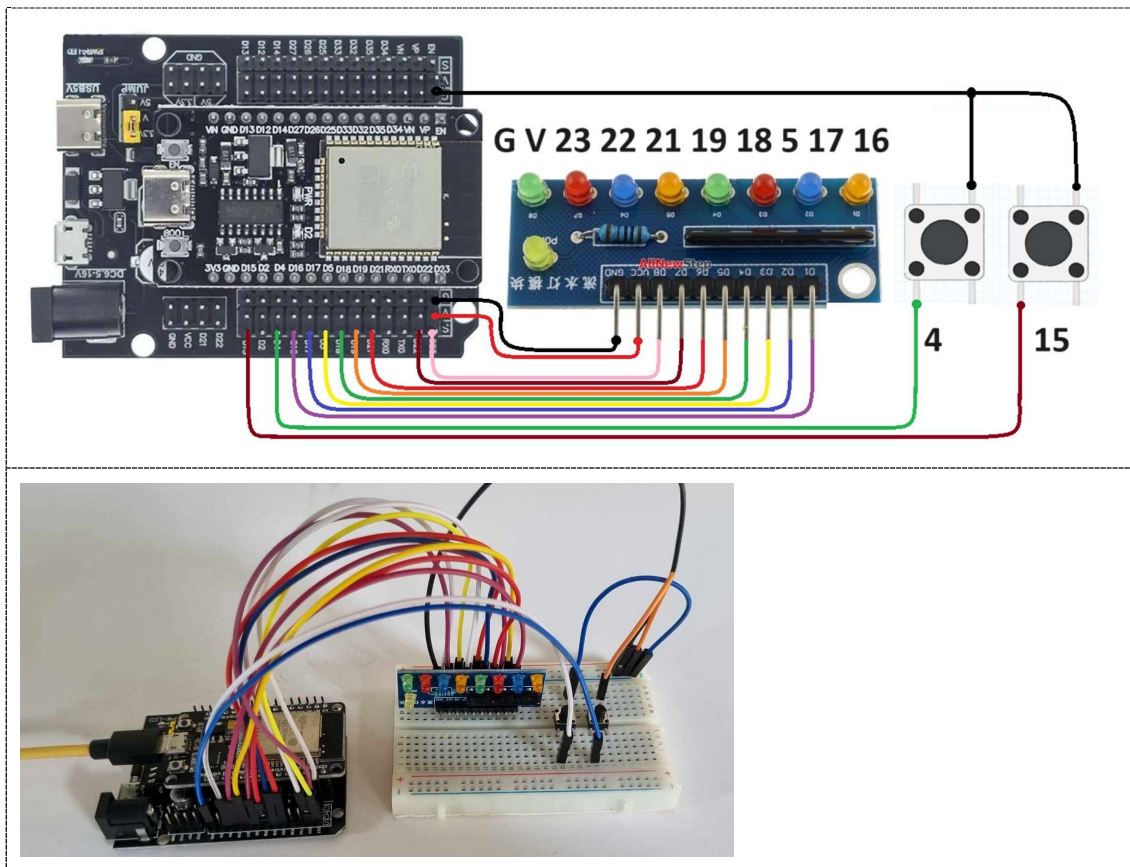
void setup() {
  for (int i = 0; i <= 7; i++) {
    pinMode(pinIO[i], OUTPUT);
    digitalWrite(pinIO[i], HIGH); // Active Low
  }
}

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"



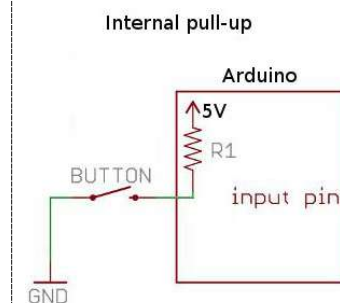
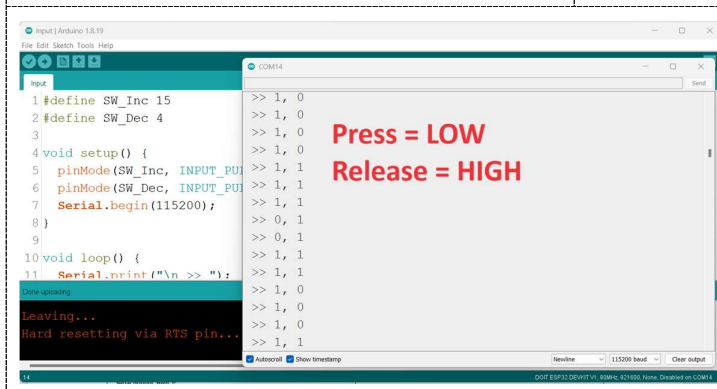
## 9. Test Code "Test0204-Input Switch"

```
#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(digitalRead(SW_Dec));
  delay(250);
}
```

- pinMode = INPUT, INPUT\_PULLUP, OUTPUT



## 10. Test Code "Test0205-Push Counter"

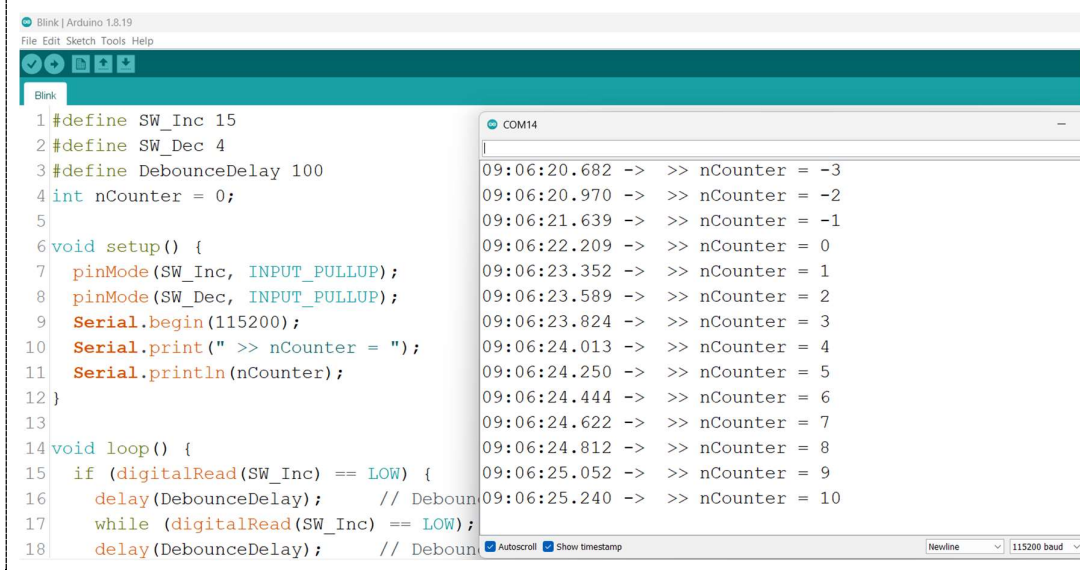
```
#define SW_Inc 15
#define SW_Dec 4
#define DebounceDelay 100
int nCounter = 0;

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`



The screenshot shows the Arduino IDE interface. The main window displays the code from the previous block, with line numbers 1 through 18. The serial monitor on the right, titled 'COM14', shows the output of the code. It displays a series of timestamps followed by the text '>> nCounter = ' and a value. The values start at -3 and increase by 1 for each subsequent line, reaching 10 at the end of the shown output. The serial monitor settings at the bottom indicate a baud rate of 115200 and a newline character.

```
1 #define SW_Inc 15
2 #define SW_Dec 4
3 #define DebounceDelay 100
4 int nCounter = 0;
5
6 void setup() {
7   pinMode(SW_Inc, INPUT_PULLUP);
8   pinMode(SW_Dec, INPUT_PULLUP);
9   Serial.begin(115200);
10  Serial.print(">> nCounter = ");
11  Serial.println(nCounter);
12 }
13
14 void loop() {
15   if (digitalRead(SW_Inc) == LOW) {
16     delay(DebounceDelay); // Deboun
17     while (digitalRead(SW_Inc) == LOW);
18     delay(DebounceDelay); // Deboun
```

Serial Output (COM14):

```
09:06:20.682 -> >> nCounter = -3
09:06:20.970 -> >> nCounter = -2
09:06:21.639 -> >> nCounter = -1
09:06:22.209 -> >> nCounter = 0
09:06:23.352 -> >> nCounter = 1
09:06:23.589 -> >> nCounter = 2
09:06:23.824 -> >> nCounter = 3
09:06:24.013 -> >> nCounter = 4
09:06:24.250 -> >> nCounter = 5
09:06:24.444 -> >> nCounter = 6
09:06:24.622 -> >> nCounter = 7
09:06:24.812 -> >> nCounter = 8
09:06:25.052 -> >> nCounter = 9
09:06:25.240 -> >> nCounter = 10
```

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

<pre>#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 &lt;= 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 &lt; minIndex ? maxIndex : CountRun;   CountRun = CountRun &gt; maxIndex ? minIndex : CountRun;   Serial.print("\n &gt; ");   Serial.print(CountRun);   Serial.print(", ");   Serial.print(StepRun);   digitalWrite(pinIO[CountRun], LOW); // On LED   delay(250);   digitalWrite(pinIO[CountRun], HIGH); // Off LED }</pre>	<p>● XX</p>
--	-------------

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

<pre>#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 &lt;= 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-&gt;L     while (digitalRead(SW_L2R) == LOW); // wait until release     delay(DebounceDelay); // Debounce Delay L-&gt;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 &lt; minIndex ? maxIndex : CountRun;   CountRun = CountRun &gt; maxIndex ? minIndex : CountRun;   Serial.print("\n &gt; ");   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 }</pre>	<p>● XX</p>
---	-------------