오프라인 지뢰찾기 

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김수연
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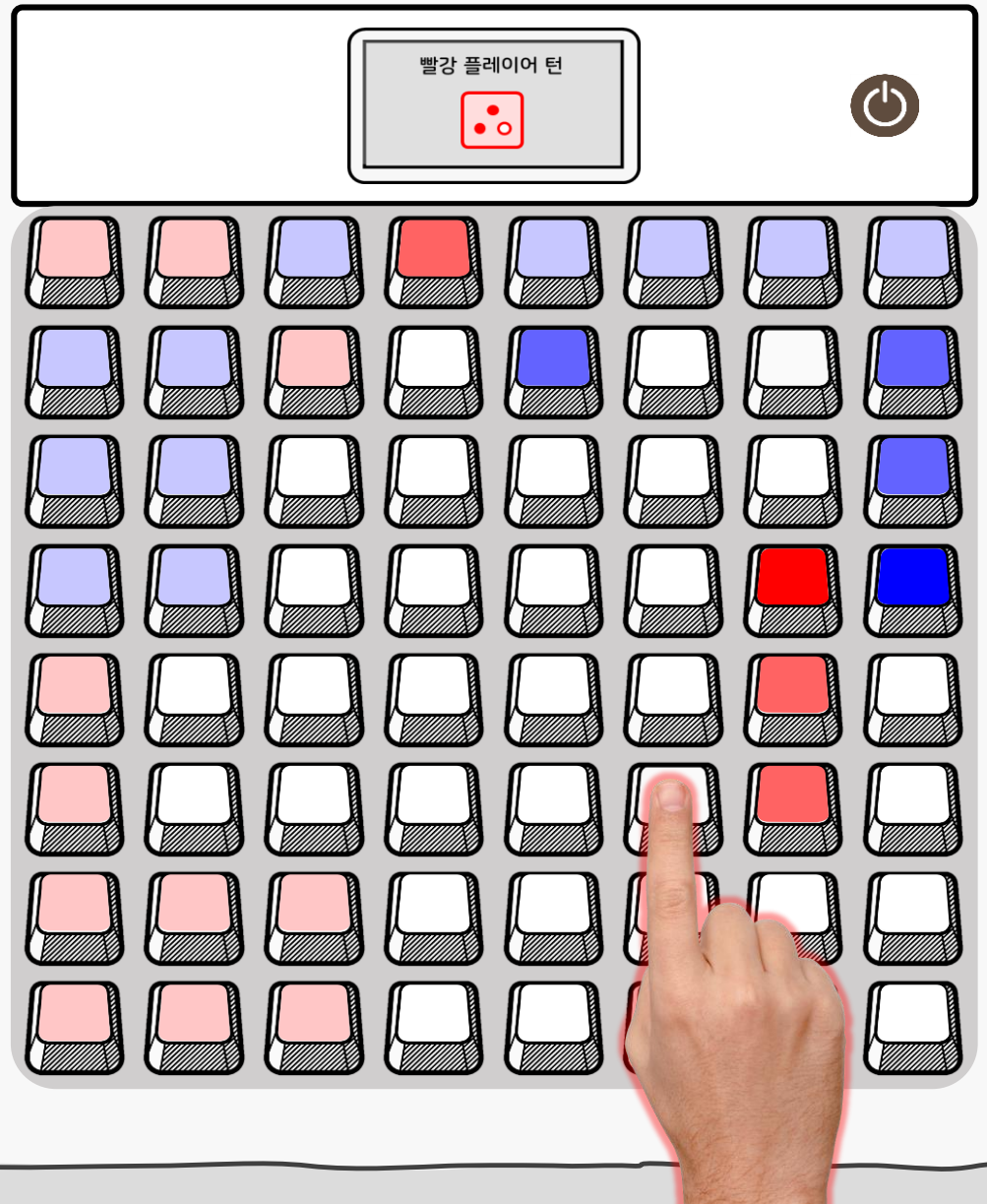
진행사항 - LCD_GUI

Tkinter(GUI 모듈)_파이썬 이용

진행사항 – Arduino_PWM



1. PWM 시험 코드 깔끔하게 작성하기
2. 한 열과 행에 다양한 색 나타내기
3. 거리에 따른 3가지 색 정하기

거리		버튼색
1~2	⇨	
3~4	⇨	
5~6	⇨	

진행사항 – Arduino_PWM

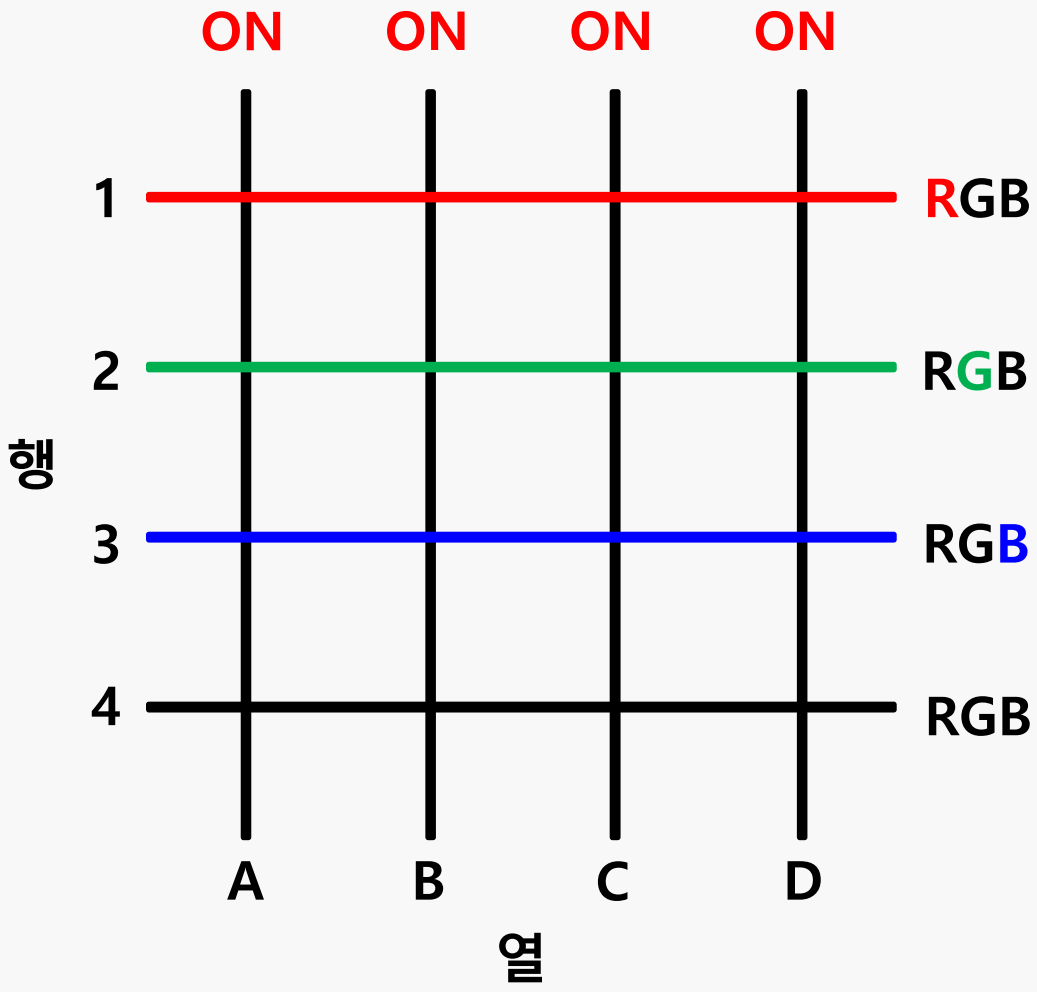
```
#define NUM_BTN_COLUMNS (4)
#define NUM_BTN_ROWS (4)
#define NUM_LED_COLUMNS (4)
#define NUM_LED_ROWS (4)

// 전역변수
//pin number 2~13 : PWM
static const uint8_t btncolumnpins[NUM_BTN_COLUMNS] = {29, 28, 27, 26};   // SWT-GND 1,2,3,4
static const uint8_t btnrowpins[NUM_BTN_ROWS]       = {22, 23, 24, 25};   // SWTICH 1,2,3,4
static const uint8_t ledcolumnpins[NUM_LED_COLUMNS] = {30, 31, 32, 33};   // LED-GND 1,2,3,4
static const uint8_t ledrowpins[NUM_LED_ROWS][3]     = {{2, 3, 44}, {5, 6, 7}, {8, 9, 10}, {11, 12, 45}};
                                                  //{RED1,GREEN1,BLUE1}, {RED2,GREEN2,BLUE2}, {RED3,GREEN3,BLUE3}, {RED4,GREEN4,BLUE4}
void setup()
{
  uint8_t i;
  Serial.begin(115200);

 for(i=0;i<NUM_LED_COLUMNS;i++){
//    pinMode(btncolumnpins[i],OUTPUT);
//    pinMode(btnrowpins[i],OUTPUT);
    pinMode(ledcolumnpins[i],OUTPUT);
    digitalWrite(ledcolumnpins[i], HIGH);
  }
}

```

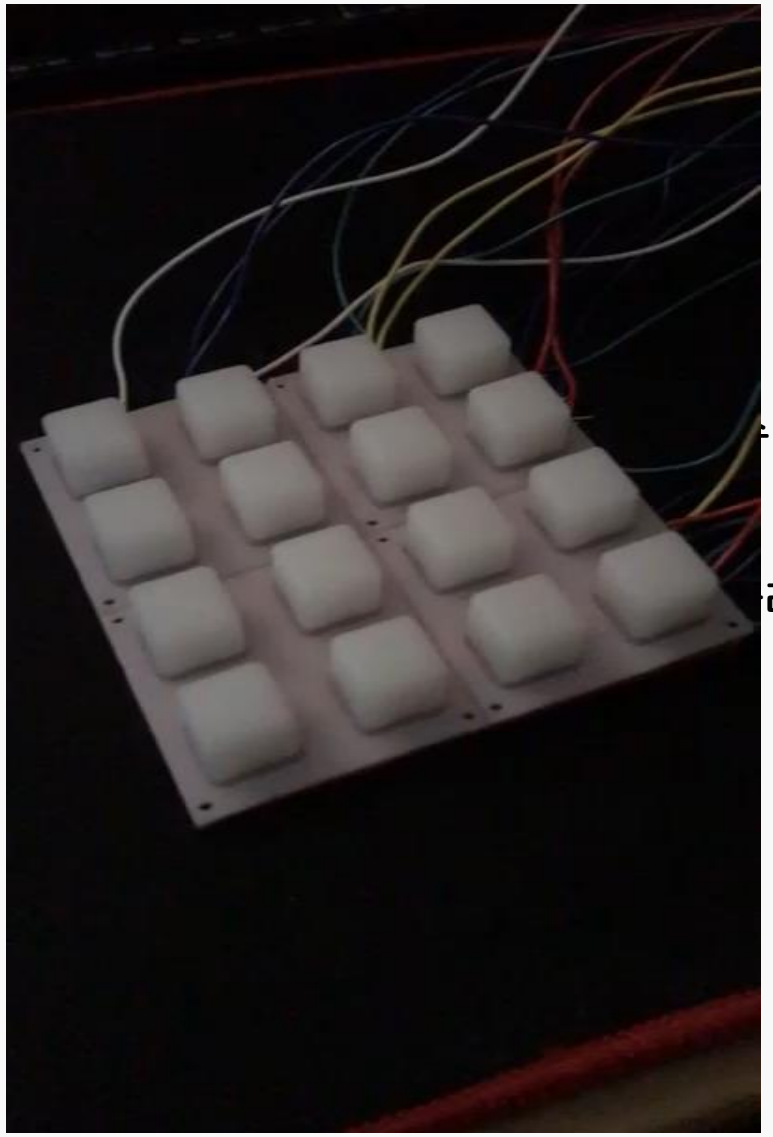
진행사항 – Arduino_PWM

```
26  void loop() {
27    Serial.println("start");
28
29    // 각 열의 신호 ON
30  //  digitalWrite(btncolumnpins[0], LOW);
31  //  digitalWrite(btncolumnpins[1], LOW);
32  //  digitalWrite(btncolumnpins[2], LOW);
33  //  digitalWrite(btncolumnpins[3], LOW);
34  //
35  //  digitalWrite(btnrowpins[0], LOW);
36  //  digitalWrite(btnrowpins[1], LOW);
37  //  digitalWrite(btnrowpins[2], LOW);
38  //  digitalWrite(btnrowpins[3], LOW);
39
40    digitalWrite(ledcolumnpins[0], LOW);
41    digitalWrite(ledcolumnpins[1], LOW);
42    digitalWrite(ledcolumnpins[2], LOW);
43    digitalWrite(ledcolumnpins[3], LOW);
44
```

```
45    // 각 행의 RGB 값 변경
46    // 1행
47    analogWrite(ledrowpins[0][0], 10);      // RED
48    analogWrite(ledrowpins[0][1], 10);      // BLUE
49    analogWrite(ledrowpins[0][2], 10);      // GREEN
50     // 2행
51    analogWrite(ledrowpins[1][0], 10);
52    analogWrite(ledrowpins[1][1], 10);
53    analogWrite(ledrowpins[1][2], 10);
54     // 3행
55    analogWrite(ledrowpins[2][0], 10);
56    analogWrite(ledrowpins[2][1], 10);
57    analogWrite(ledrowpins[2][2], 10);
58     // 4행
59    analogWrite(ledrowpins[3][0], 10);
60    analogWrite(ledrowpins[3][1], 10);
61    analogWrite(ledrowpins[3][2], 10);
62
63    Serial.println("end");
64  }
```

문제점 – Arduino_PWM





있음

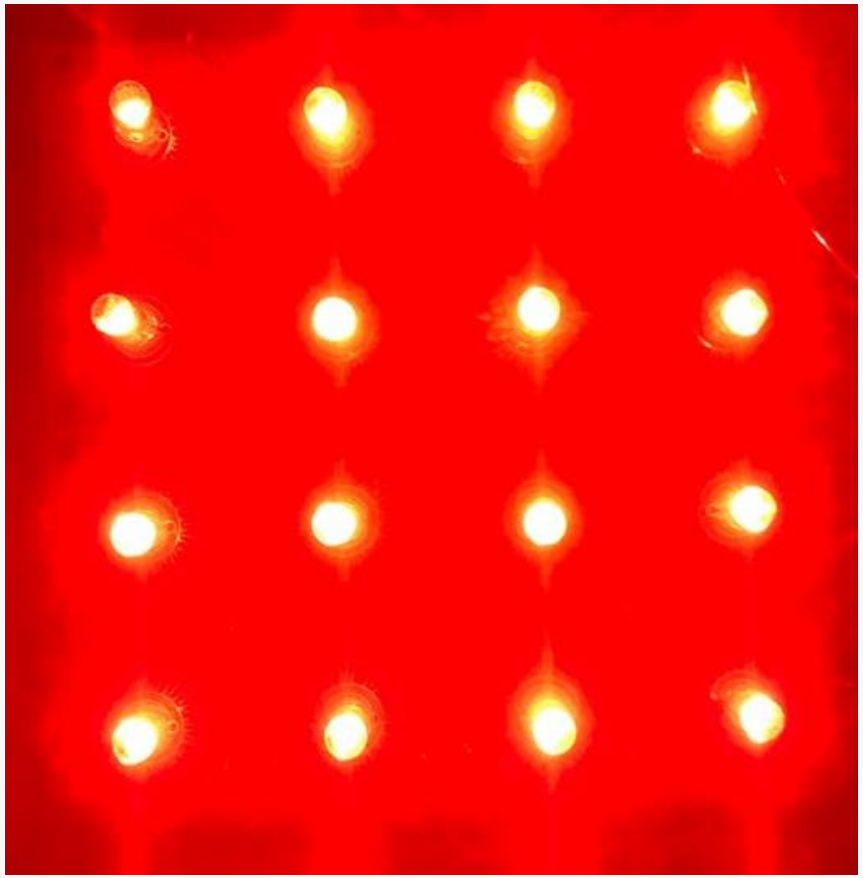
려함

문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

행 RGB value(0-255)

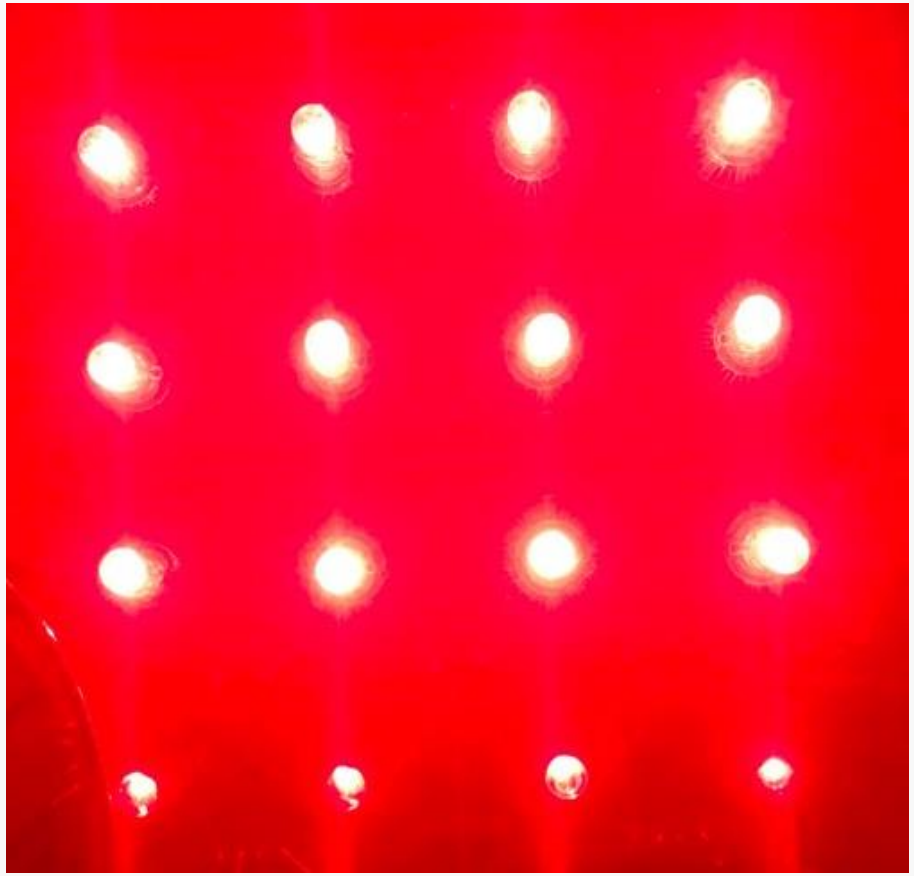
```
analogWrite(ledrowpins[0][0], 255);
analogWrite(ledrowpins[1][0], 255);
analogWrite(ledrowpins[2][0], 255);
analogWrite(ledrowpins[3][0], 255);
```



문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

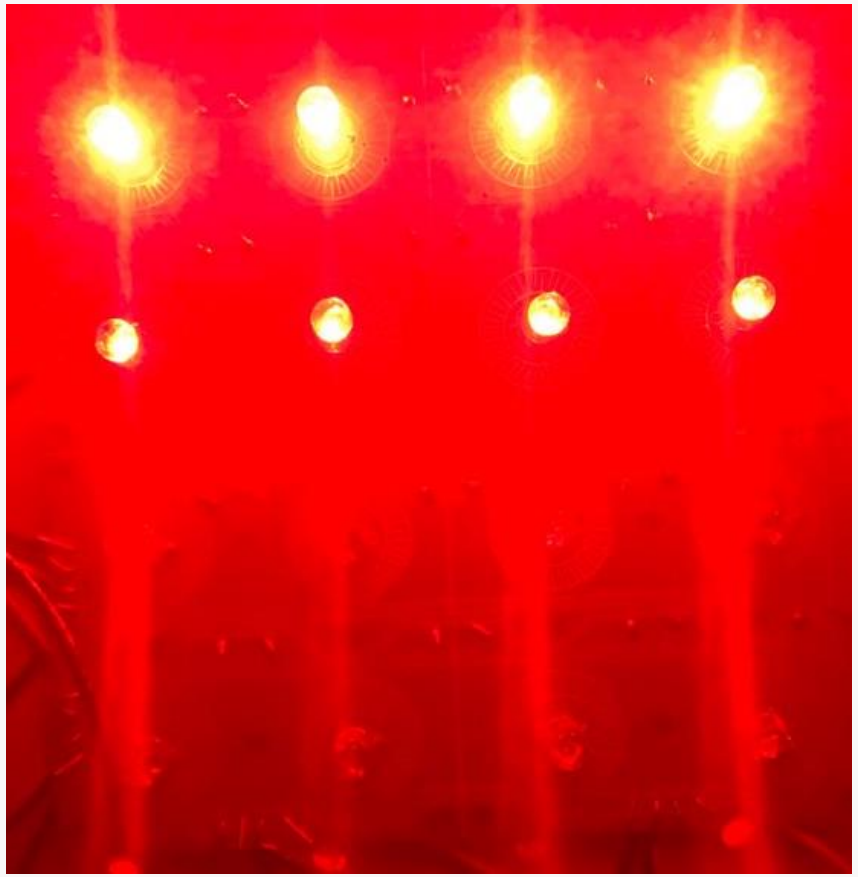
```
analogWrite(ledrowpins[0][0], 255);
analogWrite(ledrowpins[1][0], 255);
analogWrite(ledrowpins[2][0], 255);
analogWrite(ledrowpins[3][0], 10);
```



문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

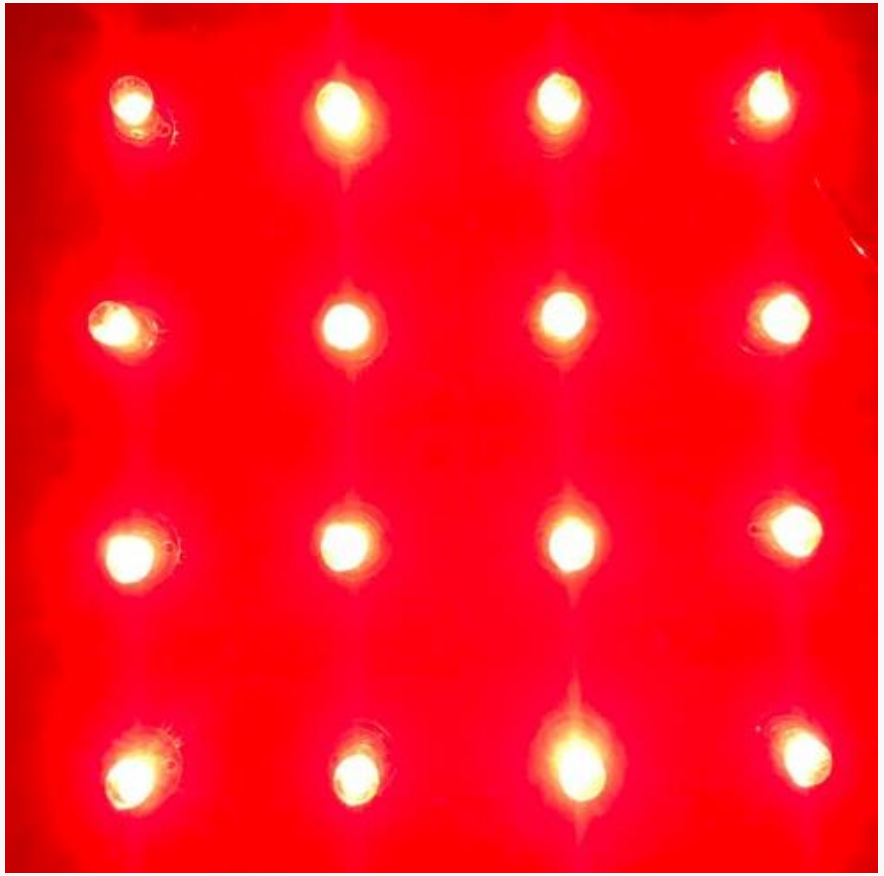
```
analogWrite(ledrowpins[0][0], 255);
analogWrite(ledrowpins[1][0], 255);
analogWrite(ledrowpins[2][0], 10);
analogWrite(ledrowpins[3][0], 10);
```



문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

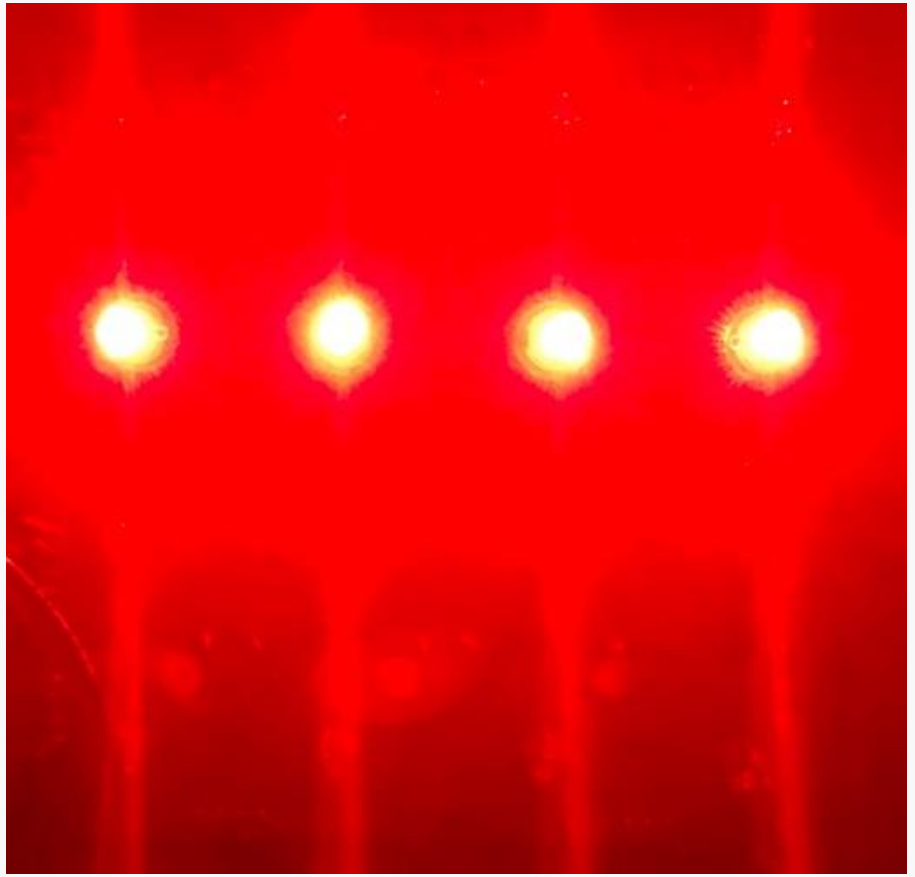
```
analogWrite(ledrowpins[0][0], 155);
analogWrite(ledrowpins[1][0], 155);
analogWrite(ledrowpins[2][0], 155);
analogWrite(ledrowpins[3][0], 155);
```



문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

```
analogWrite(ledrowpins[0][0], 155);
analogWrite(ledrowpins[1][0], 155);
analogWrite(ledrowpins[2][0], 155);
analogWrite(ledrowpins[3][0], 10);
```



문제점 – Arduino_PWM

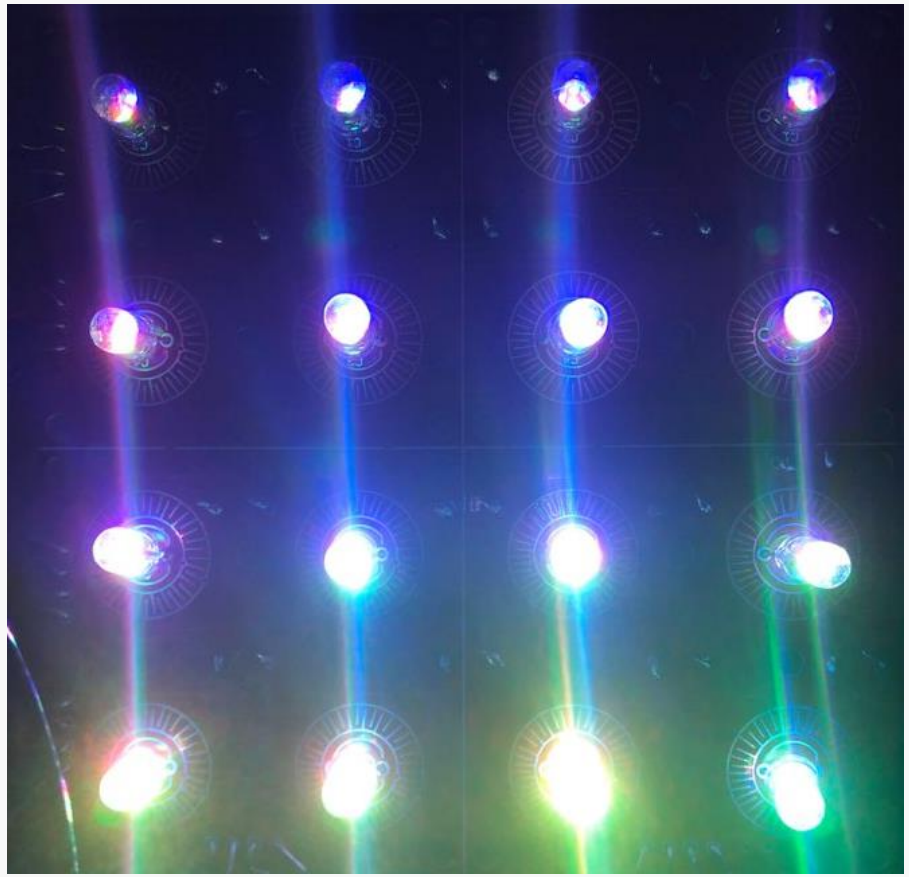
2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

```
  analogWrite(ledrowpins[0][0], 10);
  analogWrite(ledrowpins[0][1], 10);
//  analogWrite(ledrowpins[0][2], 10);
//
  analogWrite(ledrowpins[1][0], 50);
  analogWrite(ledrowpins[1][1], 50);
//  analogWrite(ledrowpins[1][2], 50);
//
  analogWrite(ledrowpins[2][0], 100);
  analogWrite(ledrowpins[2][1], 100);
//  analogWrite(ledrowpins[2][2], 150);
//
  analogWrite(ledrowpins[3][0], 255);
  analogWrite(ledrowpins[3][1], 255);
//  analogWrite(ledrowpins[3][2], 255);
```

문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

```
analogWrite(ledrowpins[0][0], 10);
analogWrite(ledrowpins[0][1], 10);
analogWrite(ledrowpins[0][2], 10);

analogWrite(ledrowpins[1][0], 50);
analogWrite(ledrowpins[1][1], 50);
analogWrite(ledrowpins[1][2], 50);

analogWrite(ledrowpins[2][0], 150);
analogWrite(ledrowpins[2][1], 150);
analogWrite(ledrowpins[2][2], 150);

analogWrite(ledrowpins[3][0], 255);
analogWrite(ledrowpins[3][1], 255);
analogWrite(ledrowpins[3][2], 255);
```



문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

```
  analogWrite(ledrowpins[0][0], 155);
//  analogWrite(ledrowpins[0][1], 10);
//  analogWrite(ledrowpins[0][2], 10);

  analogWrite(ledrowpins[1][0], 155);
  analogWrite(ledrowpins[1][1], 155);
//  analogWrite(ledrowpins[1][2], 10);

  analogWrite(ledrowpins[2][0], 100);
  analogWrite(ledrowpins[2][1], 100);
  analogWrite(ledrowpins[2][2], 100);

  analogWrite(ledrowpins[3][0], 10);
//  analogWrite(ledrowpins[3][1], 10);
//  analogWrite(ledrowpins[3][2], 10);
```

문제점 – Arduino_PWM

2. 여러가지 밝기(여러가지 analogwrite value값)를 동시에 주는 것이 제한됨

```
  analogWrite(ledrowpins[0][0], 255);
//  analogWrite(ledrowpins[0][1], 10);
//  analogWrite(ledrowpins[0][2], 10);

  analogWrite(ledrowpins[1][0], 255);
  analogWrite(ledrowpins[1][1], 255);
//  analogWrite(ledrowpins[1][2], 50);

//  analogWrite(ledrowpins[2][0], 255)
  analogWrite(ledrowpins[2][1], 255);
  analogWrite(ledrowpins[2][2], 255);

  analogWrite(ledrowpins[3][0], 255);
  analogWrite(ledrowpins[3][1], 255);
  analogWrite(ledrowpins[3][2], 255);
```

해결책 - Arduino_PWM

1. Switch 도입해서 한 행에 여러가지 색 출력

2. 한 가지 색으로 여러 밝기를 출력하는 데 오류가 생기는 이유 고찰

3. 몇 개의 LED를 켜든 같은 밝기를 유지하도록 설정