ARDUINO PROJECTS: LED & TRAFFIC LIGHT

NOTES AND PROCEDURES

INTRODUCTION TO ARDUINO

- Arduino is a microcontroller board used for electronics projects.
- Popular board: Arduino Uno.
- Uses Arduino IDE for programming.

Main parts:

- USB Port (power & programming)
- Digital Pins (connect LEDs, sensors)
- Power Pins (5V, GND)
- Reset Button

SETUP ARDUINO AND LED

Materials Needed:

- Arduino Uno
- Breadboard
- LED
- Resistor (220Ω)
- Jumper wires
- USB Cable

STEPS

- 1. Connect Arduino to PC.
- 2. Place LED on breadboard.
- 3. Connect LED (+) to Pin 13, (-) to GND via resistor.
- 4. Open Arduino IDE and select board & port.
- 5. Upload Blink code

EXAMPLE ARDUINO LED BLINK CODE

```
1   // LED Blink Program
2   int ledPin = 13;
3
4   void setup() {
5     pinMode(ledPin, OUTPUT);  // set pin as output
6   }
7
8   void loop() {
9     digitalWrite(ledPin, HIGH);  // turn LED ON
10    delay(1000);                 // wait 1 second
11    digitalWrite(ledPin, LOW);   // turn LED OFF
12    delay(1000);                 // wait 1 second
13  }
14
```

TRAFFIC LIGHT PROJECT

Materials Needed:

- - Arduino Uno
- - Breadboard
- - 3 LEDs (Red, Yellow, Green)
- - 3 Resistors (220Ω)
- - Jumper Wires

Connections:

- - Red → Pin 13
- - Yellow → Pin 12
- - Green → Pin 11
- - Each LED (-) → GND via resistor

TRAFFIC LIGHT CODE

```
1   // Traffic Light Program
2   int red = 13;
3   int yellow = 12;
4   int green = 11;
5
6   void setup() {
7     pinMode(red, OUTPUT);
8     pinMode(yellow, OUTPUT);
9     pinMode(green, OUTPUT);
10  }
11
```

```
void loop() {
  // Red Light
  digitalWrite(red, HIGH);
  delay(3000);
  digitalWrite(red, LOW);

  // Green Light
  digitalWrite(green, HIGH);
  delay(3000);
  digitalWrite(green, LOW);

  // Yellow Light
  digitalWrite(yellow, HIGH);
  delay(2000);
  digitalWrite(yellow, LOW);
}
```