Project Overview: LED Brightness Control using PWM

This project gradually increases and decreases the brightness of an LED using **Pulse Width Modulation (PWM)** on an **Arduino board**.

How It Works:

1. The **LED pin (D12)** is set as an output.
2. In the `loop()`, the brightness of the LED is controlled using `analogWrite()`.
3. A **for loop** increases the brightness from **0 (OFF) to 255 (FULL brightness)**.
4. Another **for loop** decreases the brightness from **255 back to 0**.
5. A small **delay of 20ms** between each brightness change creates a smooth fading effect.
6. A **200ms delay** at the end provides a brief pause before repeating the cycle.

Applications:

- Smooth LED dimming effects
- Indicator lights with adjustable brightness
- LED-based visual alerts