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----------PRACTICAL 02----------

1) Interface LED with Arduino and using Push Button make LED On / Off.

Parts needed :

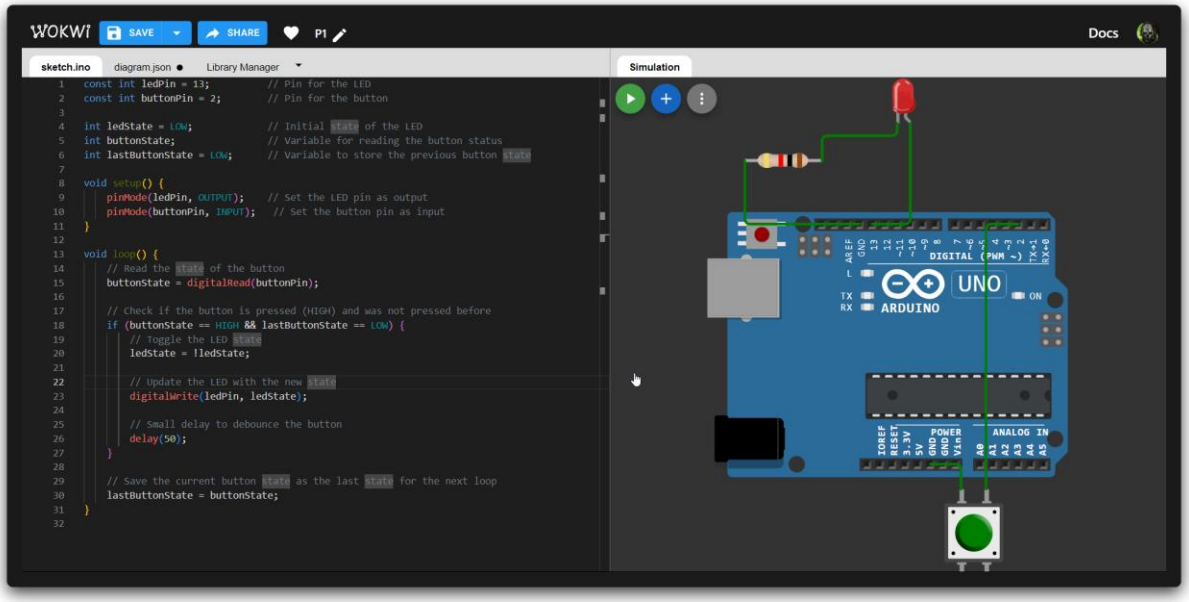
1) Arduino uno
2) red led
3) resistor
4) push button
5) Jumper wires

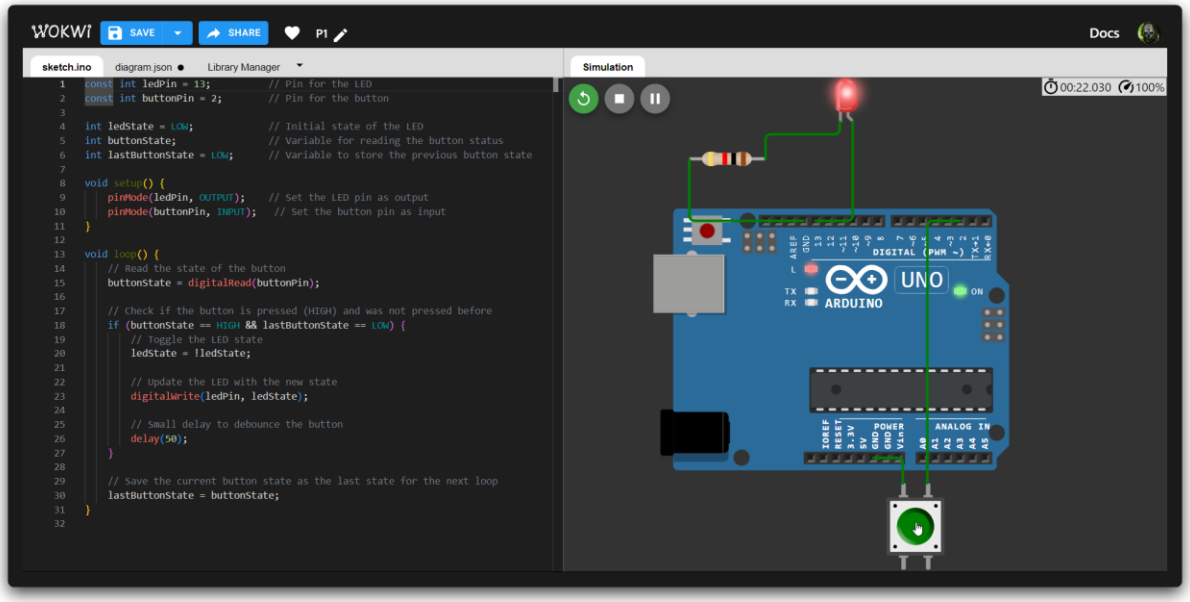
✓ **Source Code :**

```
const int ledPin = 13;          // Pin for the LED
const int buttonPin = 2;        // Pin for the button

int ledState = LOW;             // Initial state of the LED
int buttonState;                // Variable for reading the button status
int lastButtonState = LOW;      // Variable to store the previous button state

void setup() {
    pinMode(ledPin, OUTPUT);    // Set the LED pin as output
    pinMode(buttonPin, INPUT);   // Set the button pin as input
}

void loop() {
    // Read the state of the button
    buttonState = digitalRead(buttonPin);

    // Check if the button is pressed (HIGH) and was not pressed before
    if (buttonState == HIGH && lastButtonState == LOW) {
        // Toggle the LED state
        ledState = !ledState;
```

```
        // Update the LED with the new state
        digitalWrite(ledPin, ledState);

        // Small delay to debounce the button
        delay(50);
    }

    // Save the current button state as the last state for the next loop
    lastButtonState = buttonState;
}
```

✓ Output :



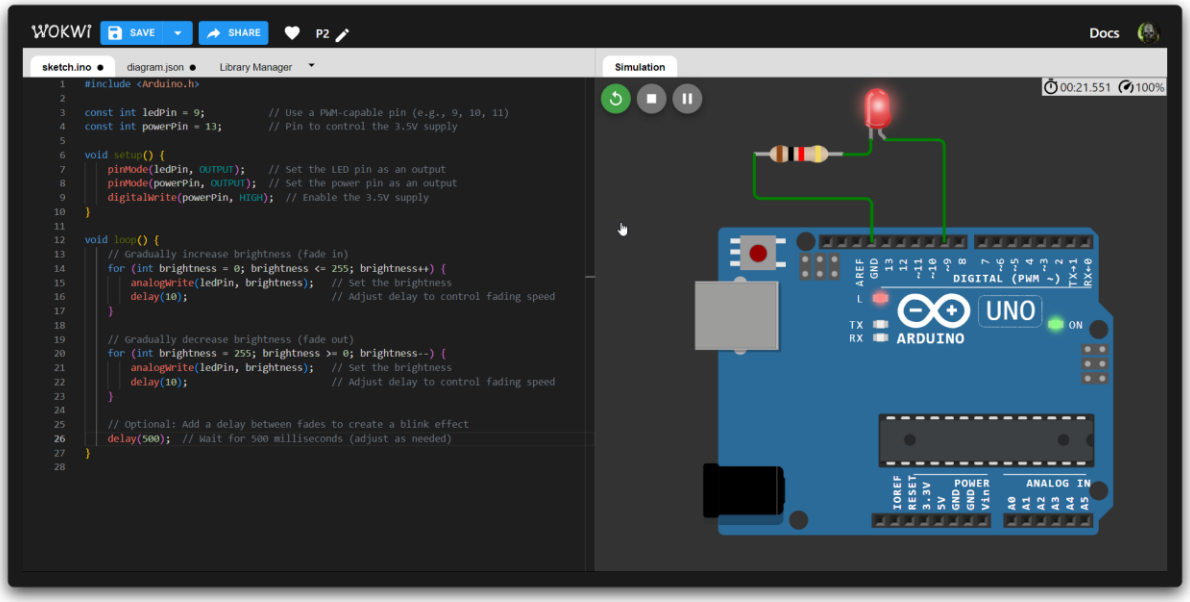


2) Fading LED with the help of Arduino.

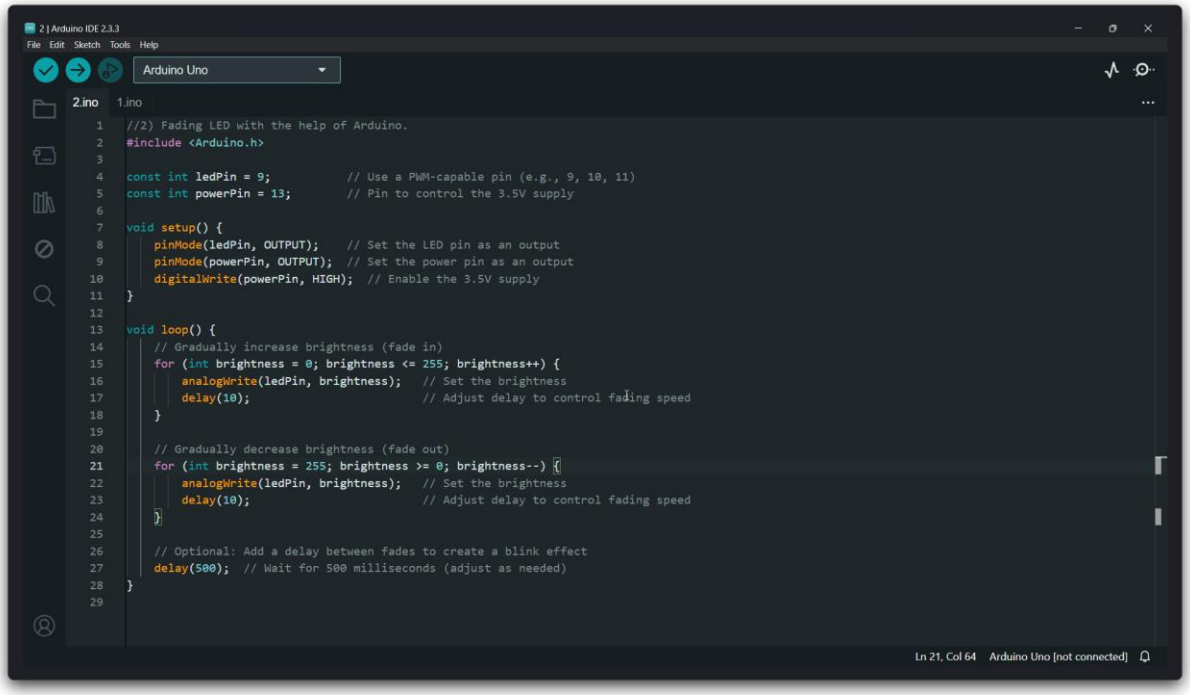
✓ **Source Code :**

```
#include <Arduino.h>

const int ledPin = 9;           // Use a PWM-capable pin (e.g., 9, 10,
11)
const int powerPin = 13;        // Pin to control the 3.5V supply

void setup() {
    pinMode(ledPin, OUTPUT);    // Set the LED pin as an output
    pinMode(powerPin, OUTPUT);  // Set the power pin as an output
    digitalWrite(powerPin, HIGH);  // Enable the 3.5V supply
}

void loop() {
    // Gradually increase brightness (fade in)
    for (int brightness = 0; brightness <= 255; brightness++) {
        analogWrite(ledPin, brightness);   // Set the brightness
        delay(10);                         // Adjust delay to control
fading speed
    }

    // Gradually decrease brightness (fade out)
    for (int brightness = 255; brightness >= 0; brightness--) {
        analogWrite(ledPin, brightness);   // Set the brightness
        delay(10);                         // Adjust delay to control
fading speed
    }

    // Optional: Add a delay between fades to create a blink effect
    delay(500);  // Wait for 500 milliseconds (adjust as needed)
}
```

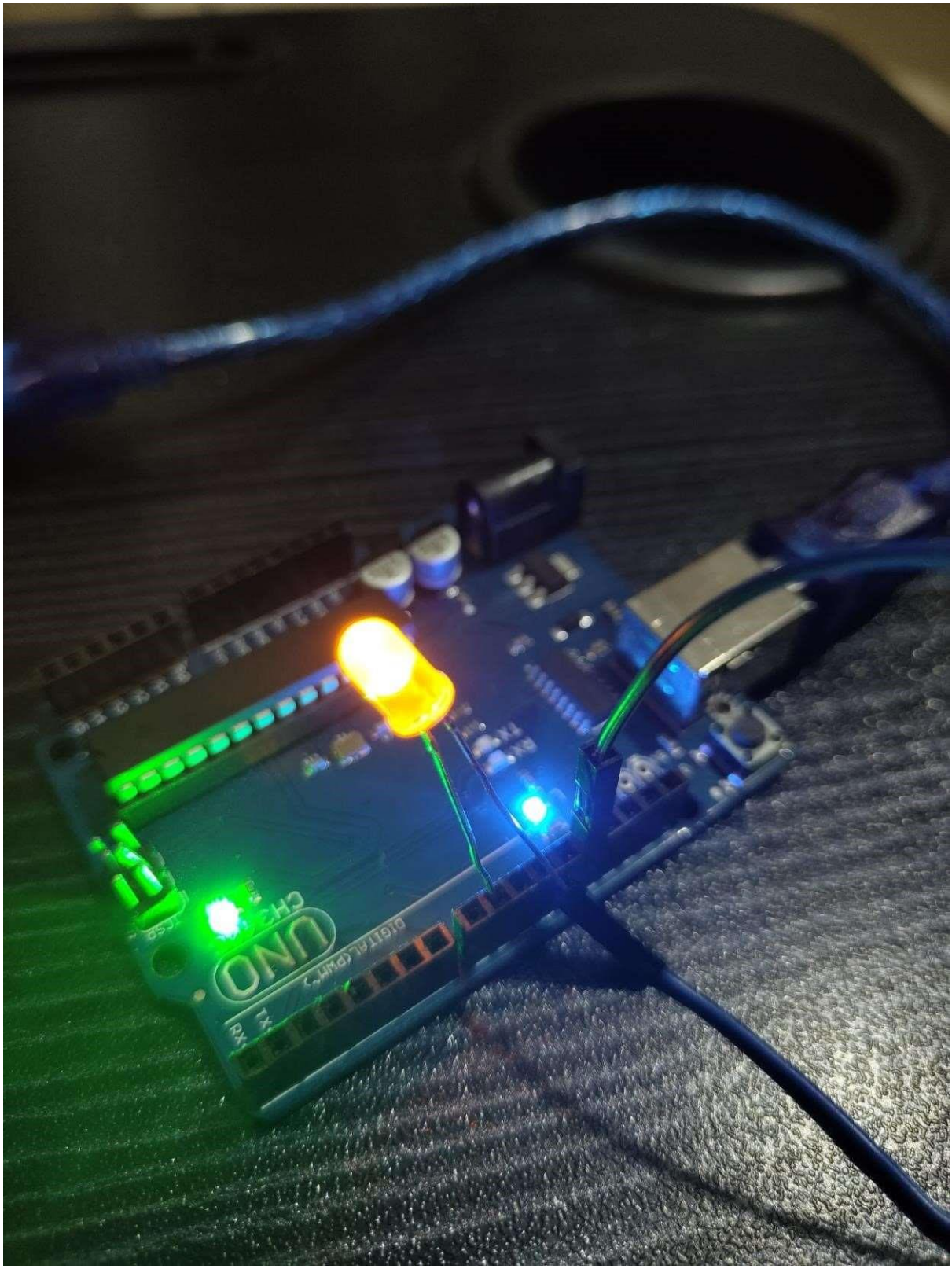
✓ Output :

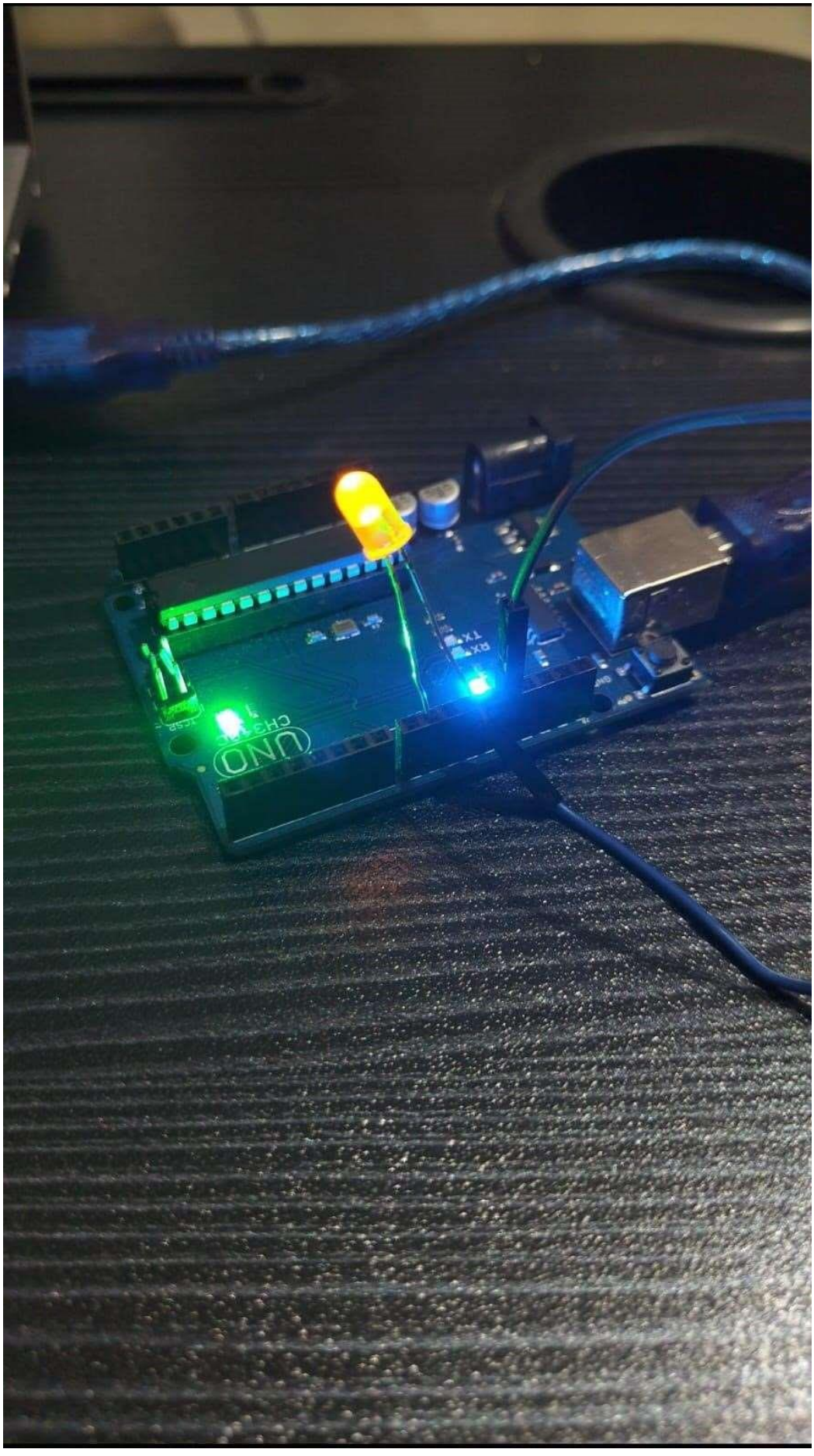


✓ Arduino IDE :



✓ **Output :**

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