

Project Title

RGB LED Color Mixer using Arduino

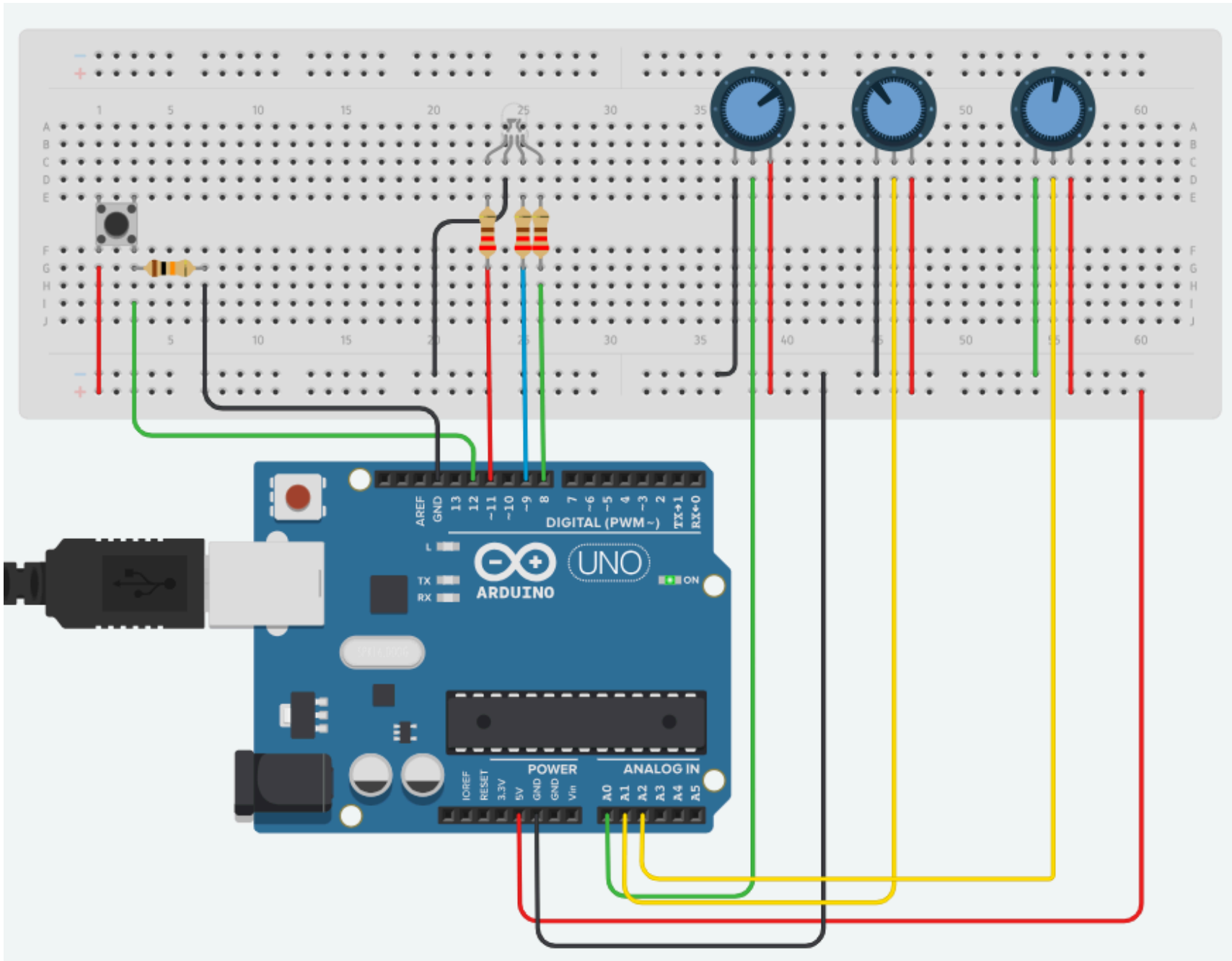
Objective

To build a simple system that mixes red, green, and blue light using potentiometers to control the intensity of each color in an RGB LED, demonstrating color mixing using PWM (Pulse Width Modulation).

Components/Modules Used

Arduino Uno	RGB Common Cathode LED	3× 10kΩ Potentiometers	3× 220Ω Resistors	USB Cable for Programming	Breadboard and Jumper Wires
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Circuit Diagram



Working Principle

Each potentiometer controls one color channel (Red, Green, or Blue).

- The Arduino reads analog values from the potentiometers (0–1023).
- These values are mapped to PWM outputs (0–255).

- PWM controls the brightness of each color in the RGB LED.
- By adjusting the knobs, you mix different amounts of R, G, and B to produce new colors.

Software Used

- **Arduino IDE** for coding and uploading the sketch.
- **Tinkercad** for creating the circuit diagram.

Results

- Changing potentiometer positions creates different color combinations.
- Maximum Red + Green = **Yellow**, Red + Blue = **Magenta**, Green + Blue = **Cyan**, and all full = **White**.
- Users visually observe smooth color transitions.

Future Scope

- Add IoT control using Blynk App .
- Save and recall color presets.
- Add an LCD to display RGB values.
- Use touch sliders instead of potentiometers for modern UI.

Conclusion

The RGB LED Color Mixer successfully demonstrated how analog inputs (potentiometers) and PWM outputs can be used to create real-time color mixing with an RGB LED. It is useful for understanding basic electronics and microcontroller interfacing.

References

- [How RGB LEDs Work — Adafruit Guide](#)
- [Basics of Potentiometers with Arduino](#)