Smart Doorbell with LED & Buzzer

Lesson 5

Smart Doorbell with LED & Buzzer

Button as the doorbell

When pressed, the buzzer should beep and the LED should flash.

Buzzer sound pattern

Instead of a continuous tone, make the buzzer beep in short bursts (e.g., ON 200 ms, OFF 200 ms).

LED behavior

LED should blink at the same time as the buzzer.

Duration setting

Use a potentiometer on A0 to set how long the doorbell rings (from 1 to 5 seconds).
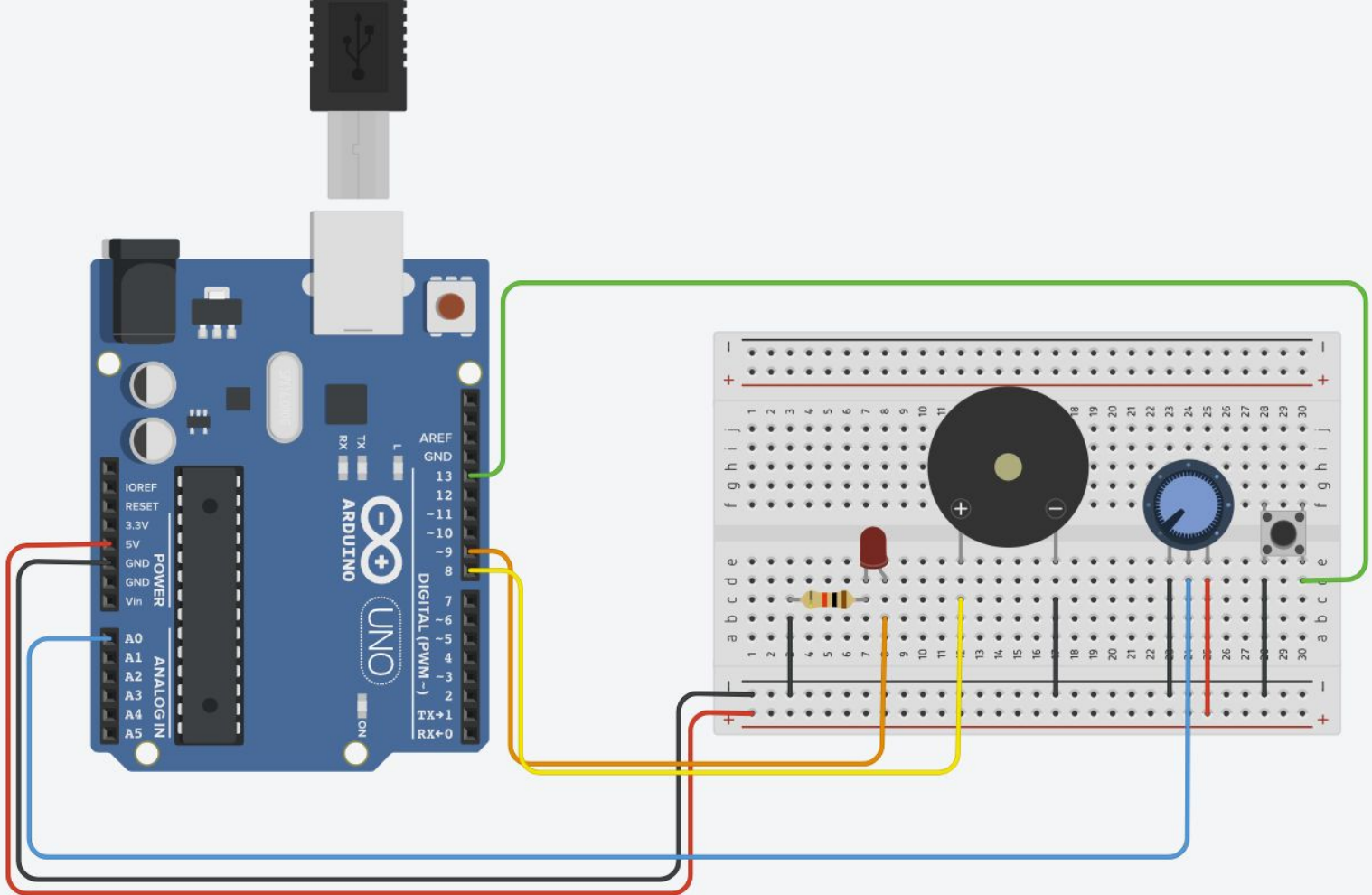
1 LED

resistor

1 Buzzer

1 Pushbutton

1 Potentiometer

How it works

When you press the button, the Arduino detects it (LOW because of INPUT_PULLUP).

It reads the potentiometer to know how long to keep the LED and buzzer ON.

map() converts 0–1023 (from potentiometer) into 1000–5000 ms (1–5 seconds).

LED and buzzer turn ON → Arduino waits → then both turn OFF.

```cpp
const int ledPin = 9;
const int buzzerPin = 8;
const int buttonPin = 13;
const int potPin = A0;

void setup() {
  pinMode(ledPin, OUTPUT);
  pinMode(buzzerPin, OUTPUT);
  pinMode(buttonPin, INPUT_PULLUP);
}

void loop() {

  if (digitalRead(buttonPin) == LOW) {

    int potValue = analogRead(potPin);


    int duration = map(potValue, 0, 1023, 1000, 5000);


    digitalWrite(ledPin, HIGH);
    digitalWrite(buzzerPin, HIGH);


    delay(duration);


    digitalWrite(ledPin, LOW);
    digitalWrite(buzzerPin, LOW);
  }
}
```

Automatic doorbell(Touch-Free Doorbell)

Need to build a simple automatic doorbell that turns ON and OFF if someone is someone is nearby.

by using an ultrasonic sensor that detects people nearby.

When someone comes close:

> The buzzer makes a sound.

> The LED turns on as a visual indicator.

After a few seconds (or when the person leaves), the LED and buzzer turn off automatically.