

Figure 1.1 Arduino Uno board with important components

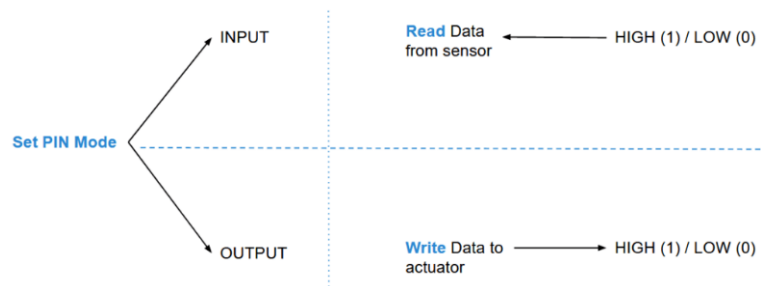


Figure 1.2 Input and output mode of digital pin

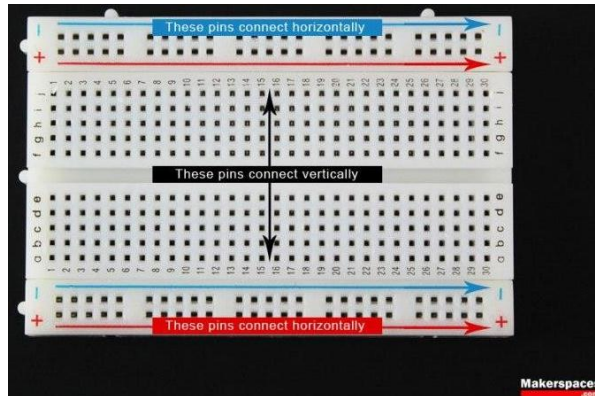


Figure 1.3 Breadboard internal pins connection

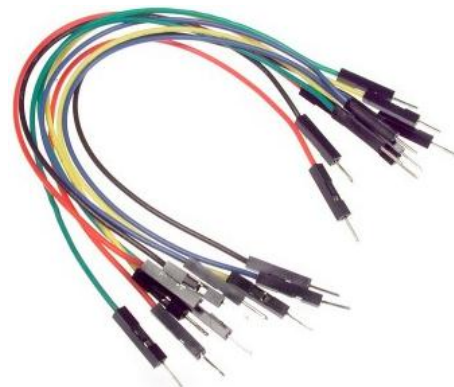


Figure 1.4 Jumper wire

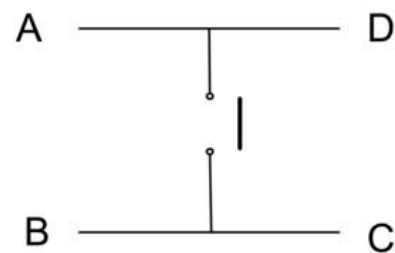
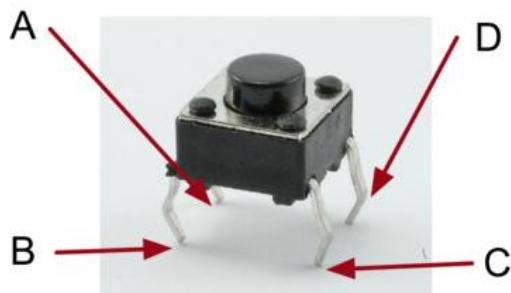


Figure 1.5 Push button switch internal pin connection

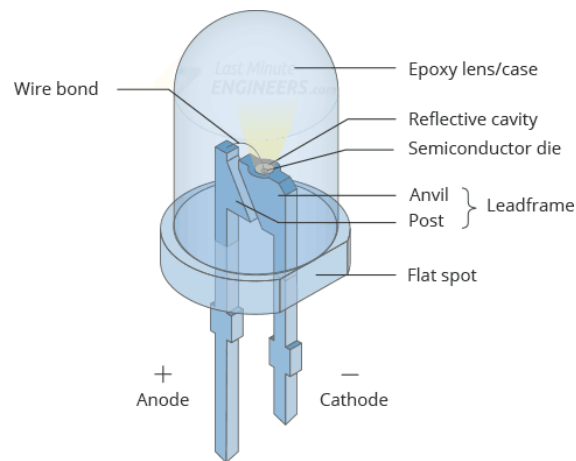


Figure 1.6 LED Schematic

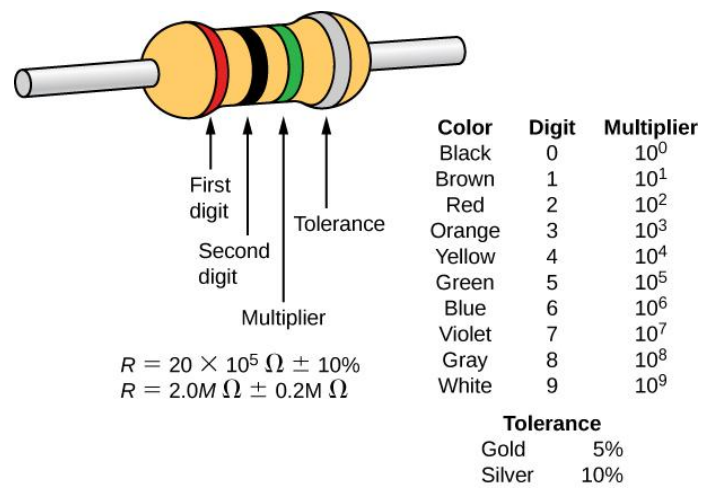


Figure 1.7 Resistor and Its color code

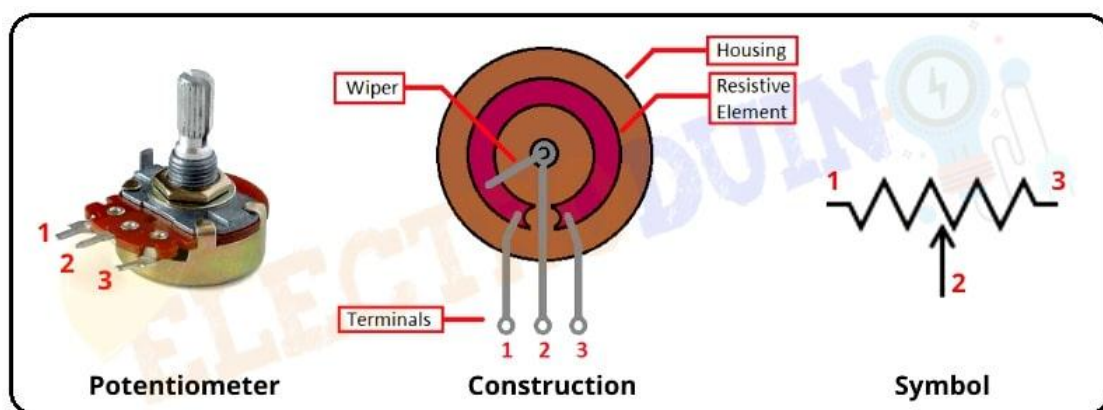


Figure 1.8 Potentiometer and its pin schematic

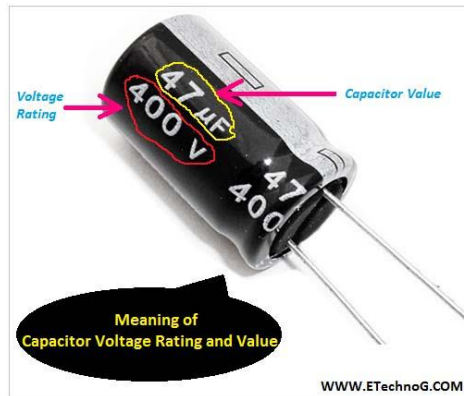


Figure 1.9 Capacitor shown with value and ratings

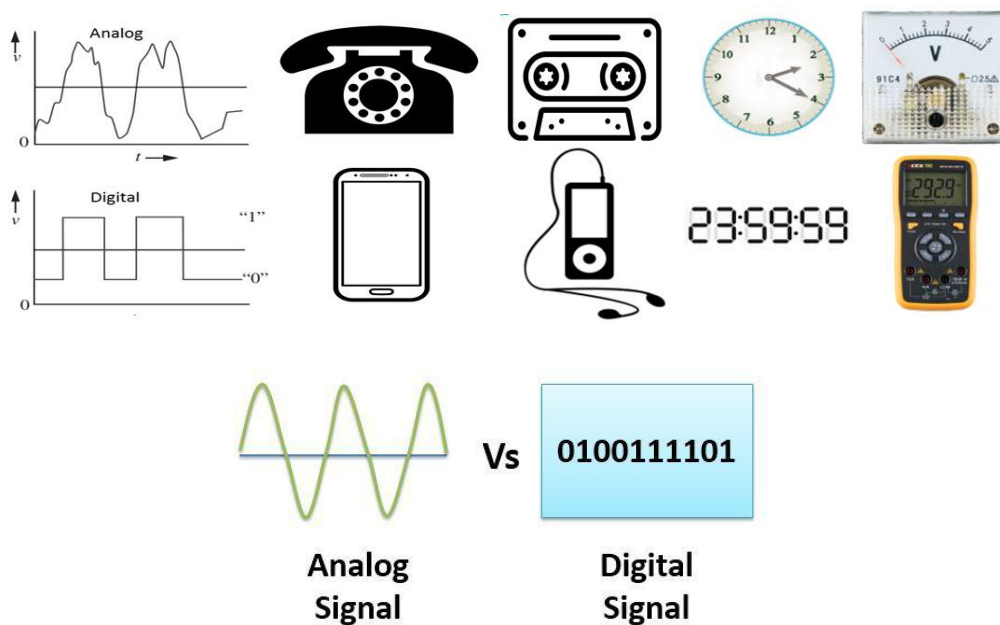


Figure 1.10 Analog and digital signal, device and difference

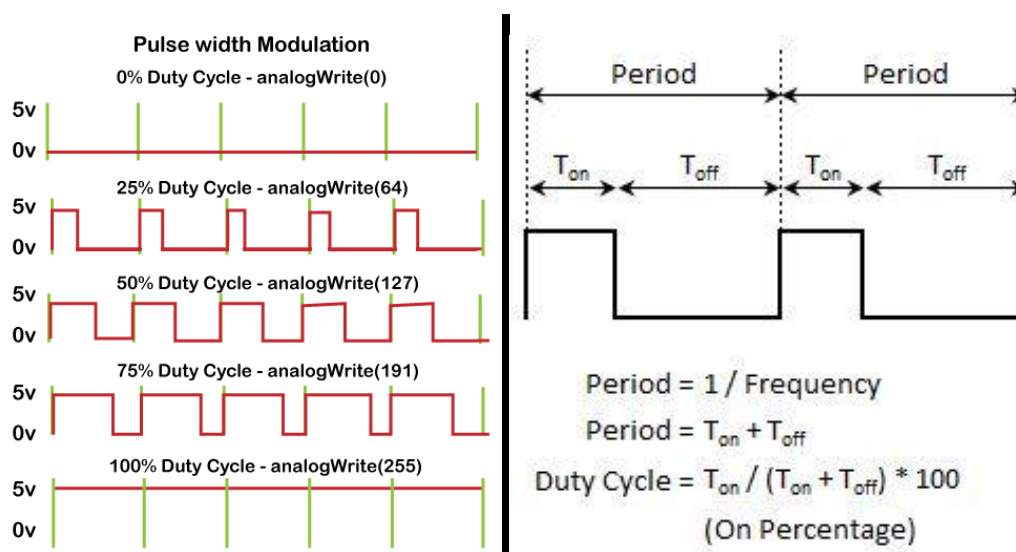


Figure 1.11 PWM and duty cycle calculation

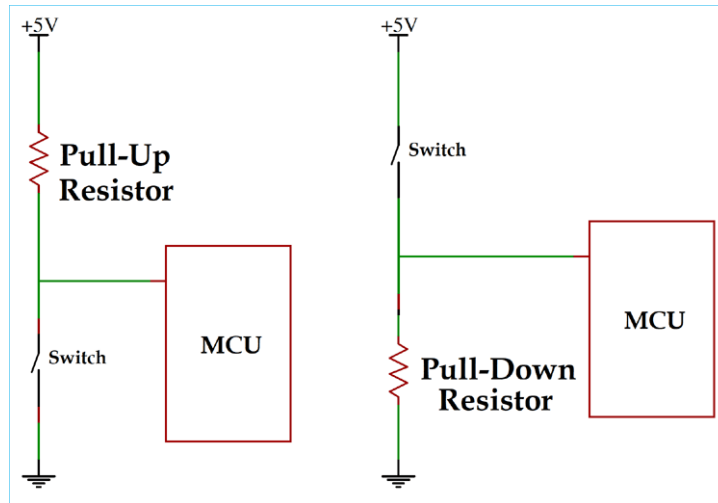


Figure 1.12 Pull up and pull down resistor connection

The screenshot shows the Arduino.cc website. The 'CODE ONLINE' button is circled in red. Below the website screenshot, the text 'Downloads' is displayed. Further down, the 'Arduino IDE 2.0.3' download page is shown, with the 'Linux' download options circled in red.

Downloads

Arduino IDE 2.0.3

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code

DOWNLOAD OPTIONS

- Windows** Win 10 and newer, 64 bits
- Windows** MSI installer
- Windows** ZIP file
- Linux** Appliance 64 bits (X86-64)
- Linux** ZIP file 64 bits (X86-64)

Figure 2.1 Arduino software downloading option

The screenshot shows a file explorer window displaying the contents of the Arduino IDE 2.0.3 zip file. The 'drivers' folder is highlighted. A callout box points to the 'arduino-1.8.19-wi' zip file.

Extracted file

Zip file

arduino-1.8.19

arduino-1.8.19-wi

Name	Date modified	Type	Size
drivers	12/20/2021 5:12 PM	File folder	
examples	12/20/2021 5:12 PM	File folder	
hardware	12/20/2021 5:12 PM	File folder	
java	12/20/2021 5:13 PM	File folder	
lib	12/20/2021 5:12 PM	File folder	
libraries	12/20/2021 5:12 PM	File folder	
tools	12/20/2021 5:12 PM	File folder	
tools-builder	12/20/2021 5:12 PM	File folder	
arduino	12/20/2021 5:13 PM	Application	72 KB
arduino.l4j	12/20/2021 5:13 PM	Configuration sett...	1 KB
arduino_debug	12/20/2021 5:13 PM	Application	69 KB
arduino_debug.l4j	12/20/2021 5:13 PM	Configuration sett...	1 KB
arduino-builder	12/20/2021 5:12 PM	Application	23,156 KB
libusb0.dll	12/20/2021 5:12 PM	Application extens...	43 KB
msvcpr100.dll	12/20/2021 5:12 PM	Application extens...	412 KB
msvcpr100.dll	12/20/2021 5:12 PM	Application extens...	753 KB
revisions	12/20/2021 5:12 PM	Text Document	97 KB
wrapper-manifest	12/20/2021 5:13 PM	XML Document	1 KB

Figure 2.2 Arduino software zip with application and driver

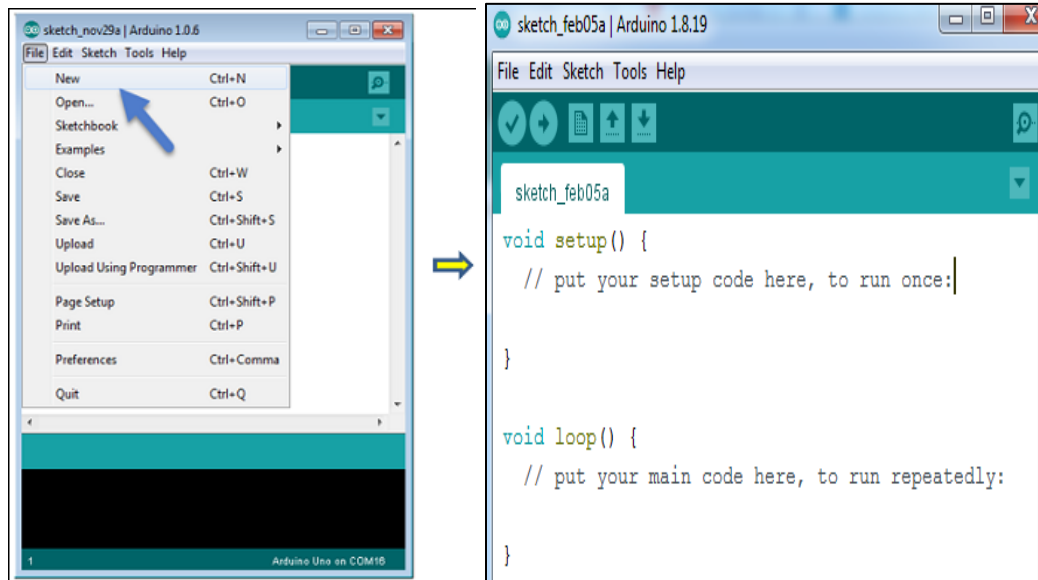
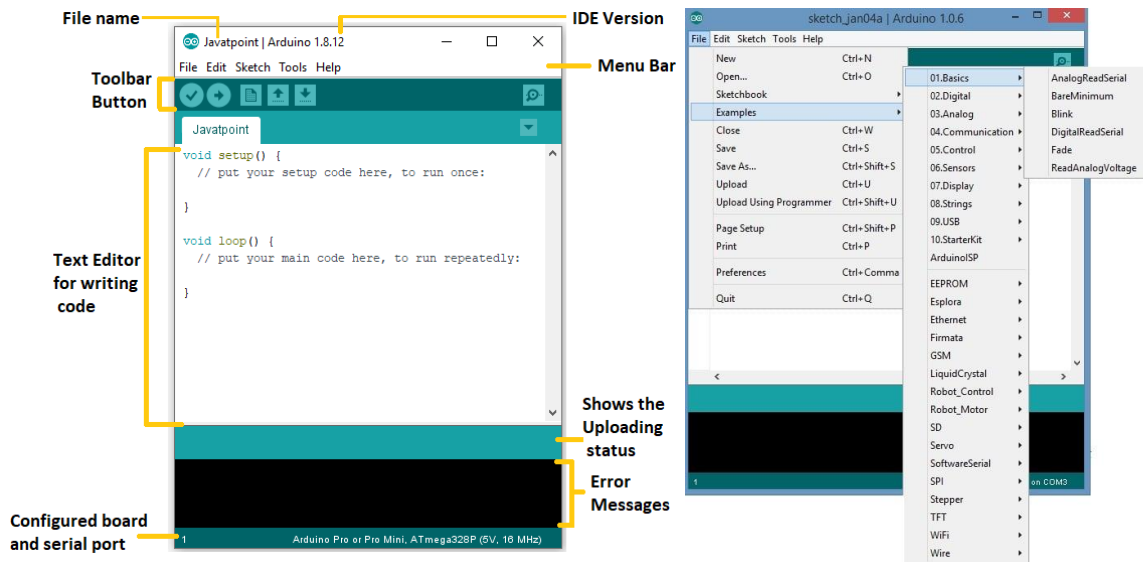


Figure 2.3 Arduino software tools, example and new sketch for coding

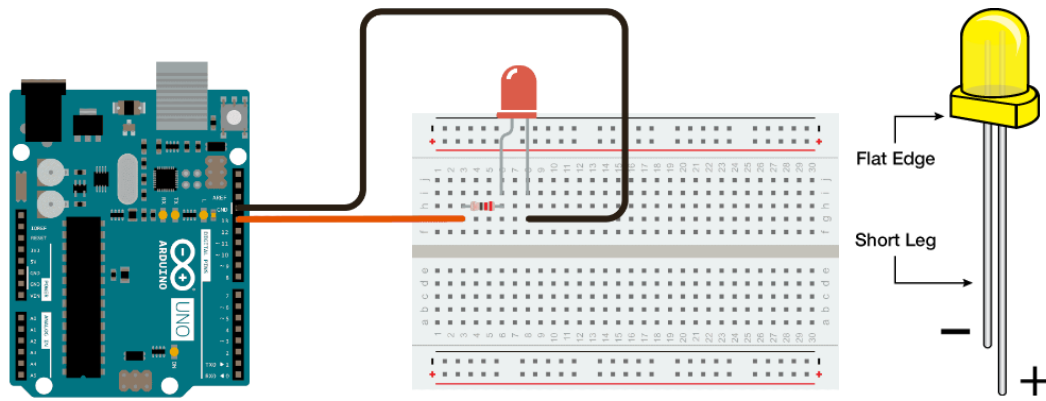


Figure 3.1 Circuit diagram for LED blinking

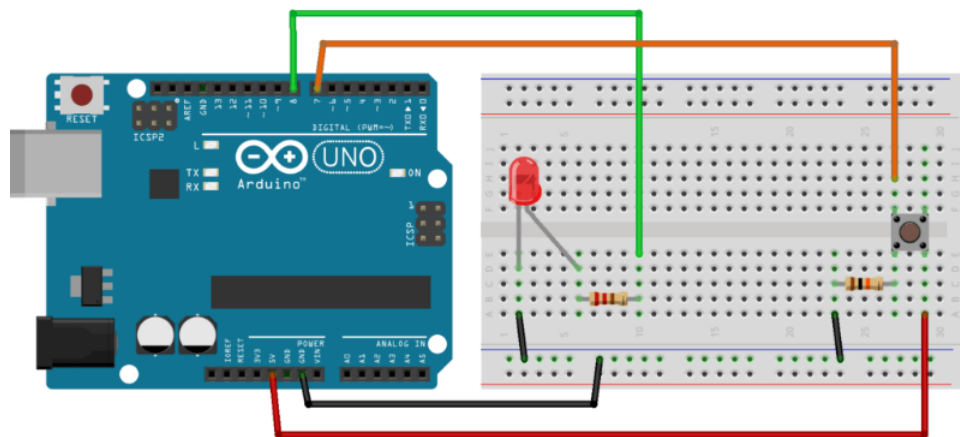


Figure 4.1 Arduino circuit diagram for led blink using external pull down resistor

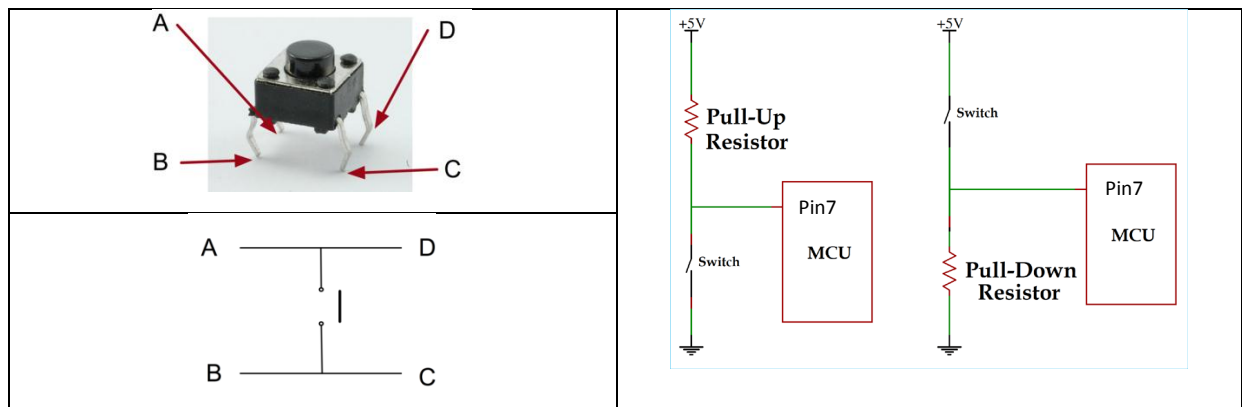


Figure 4.2 (a) Circuit diagram Schematic of Push Button Switch (b) Arduino (MCU) with external pull down resistor (https://roboticsbackend.com/arduino-input_pullup-pinmode/)

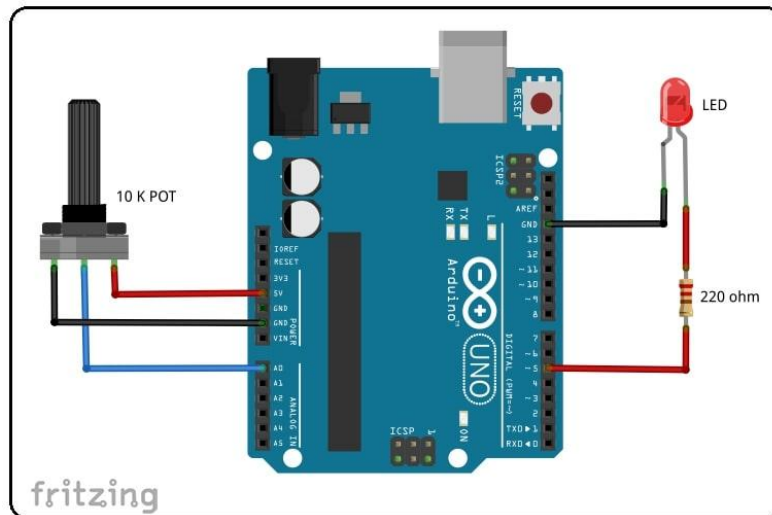


Figure 5.1 Circuit Diagram for LED Brightness Control using Potentiometer
<https://www.electroduino.com/led-brightness-control-using-potentiometer/>

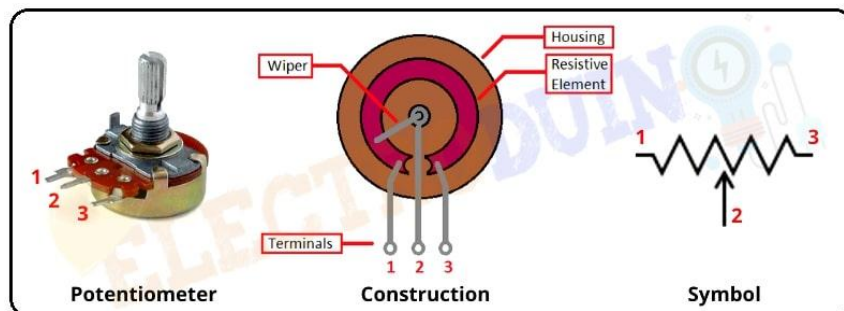


Figure 5.2 Potentiometer internal construction and symbol

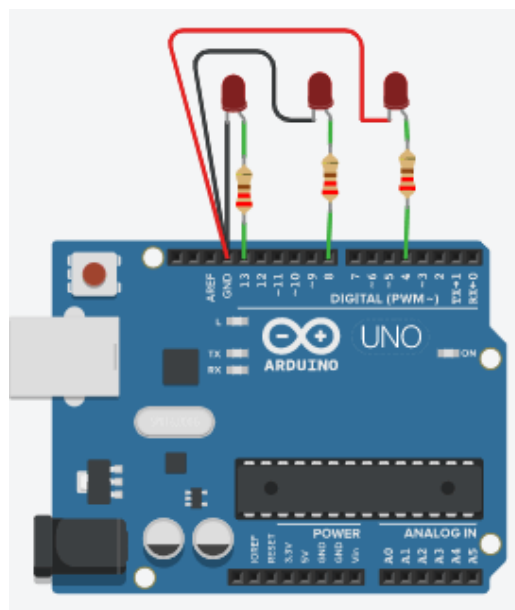


Figure 6.1 Circuit Diagram for blinking multiple LED at same time

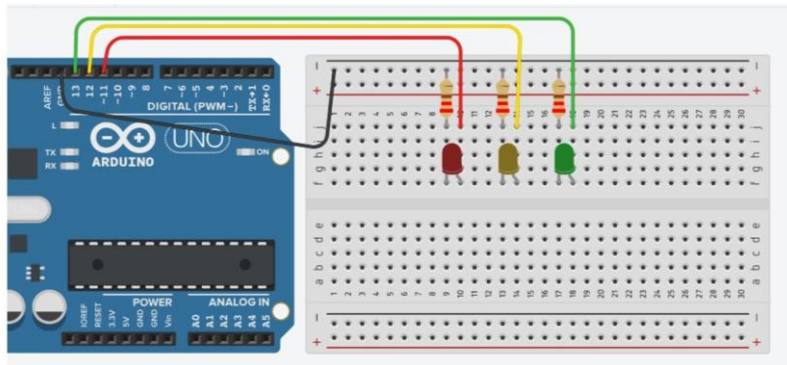


Figure 7.1 Circuit Diagram for scrolling RGB LEDs

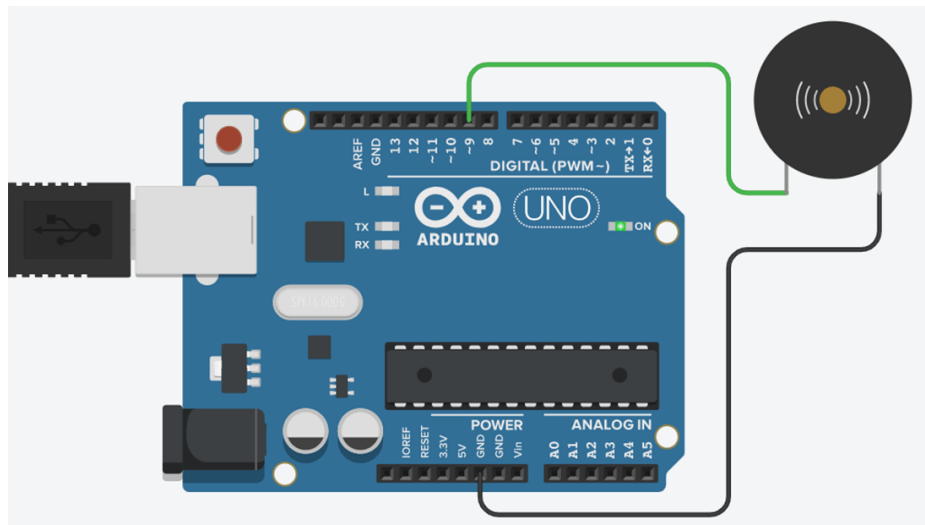


Figure 8.1 Circuit Diagram for Piezo buzzer
(<https://www.electrovigyan.com/arduino/piezo-buzzer/>)

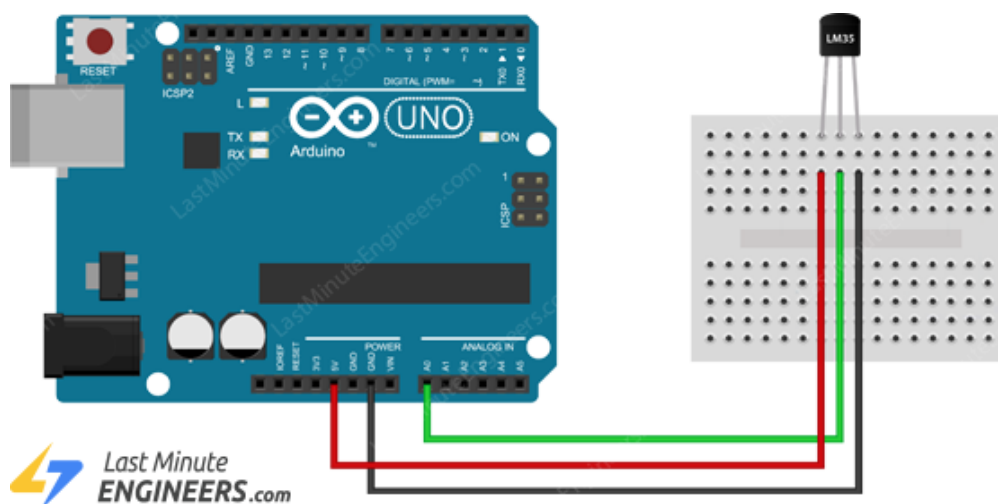


Figure 9.1 Circuit Diagram for temperature sensor using LM35

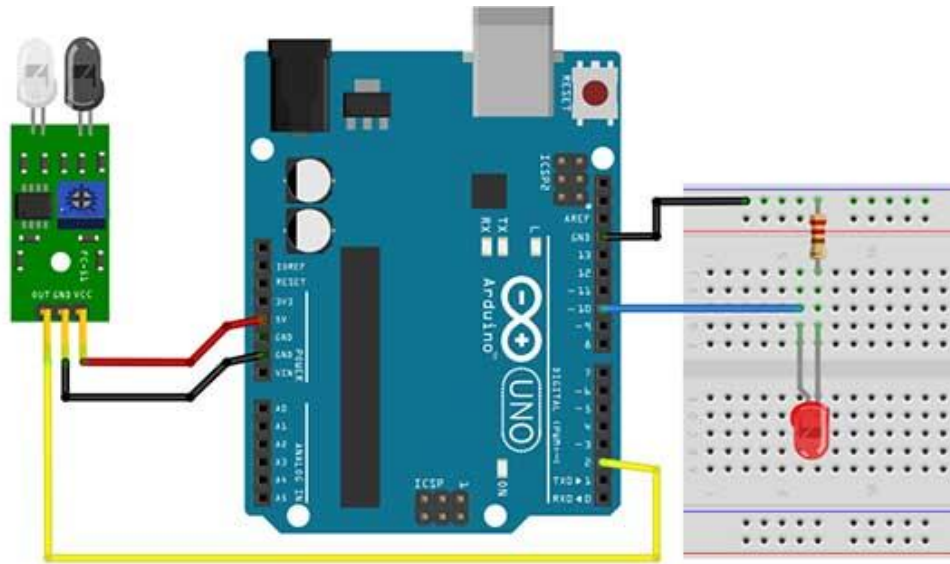


Figure 10.1 Circuit Diagram for Obstacle Avoidance Sensor using Infrared IR Sensor

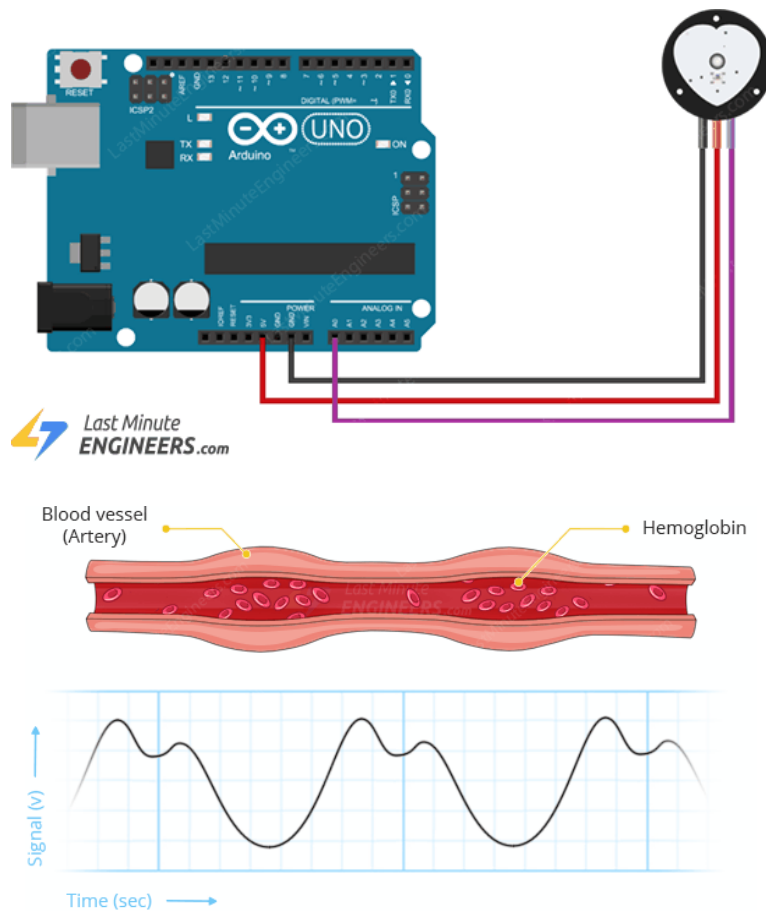


Figure 11.1 Circuit diagram for Arduino heart beat send and its working principle

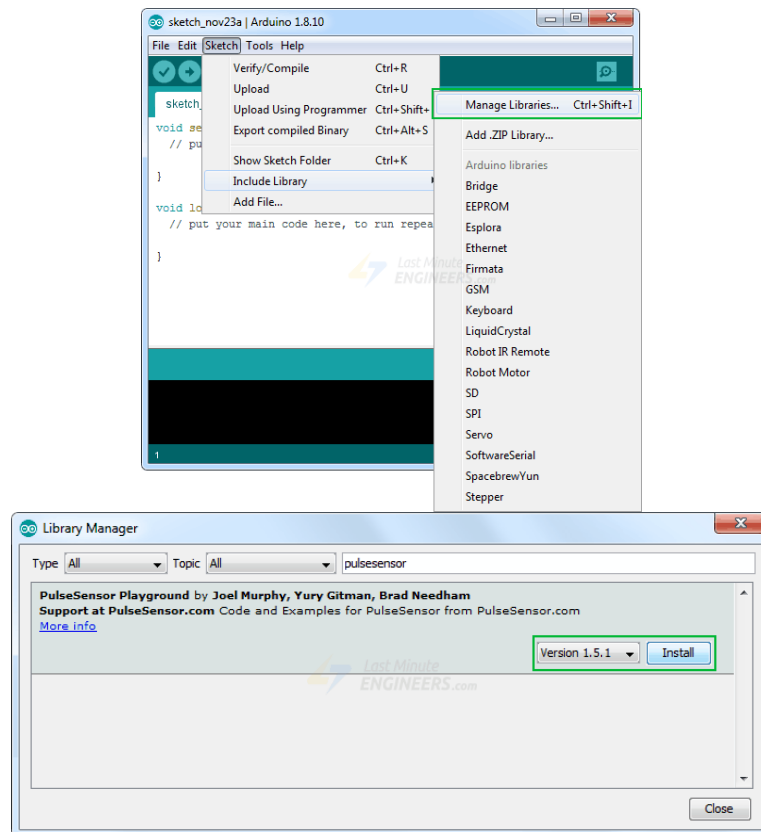


Figure 11.2 Library Installation

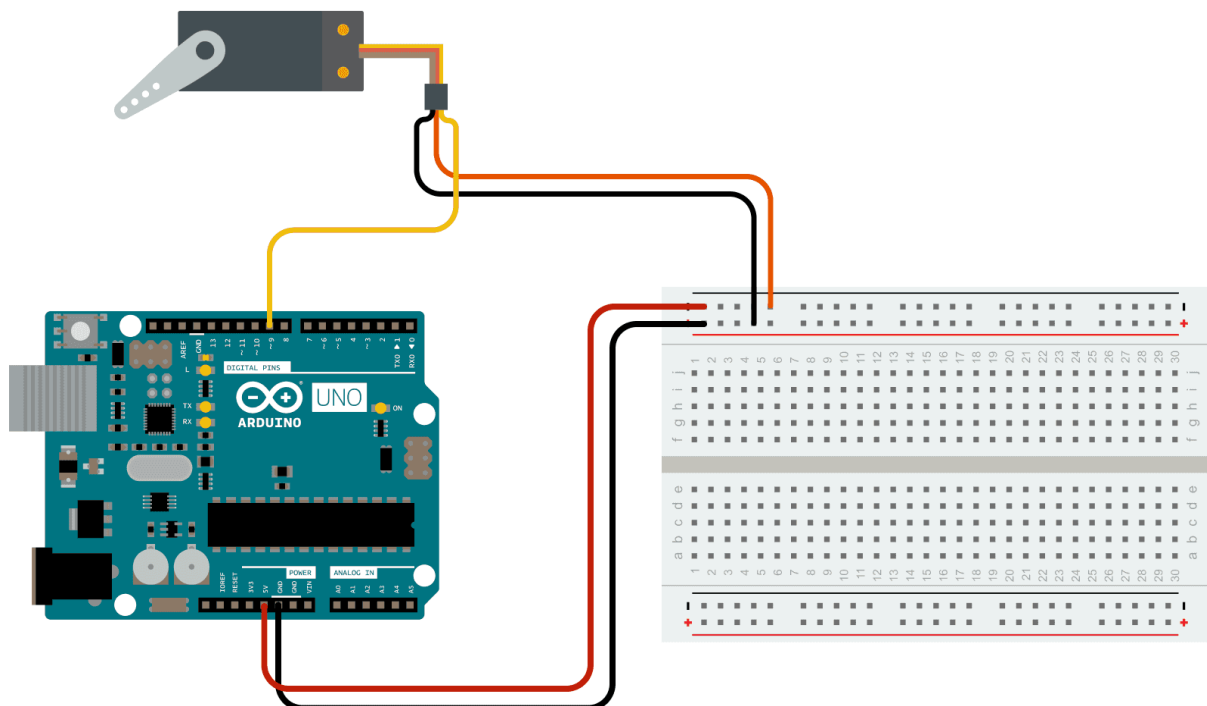


Figure 12.1 Circuit diagram for servo back and forth range of motion

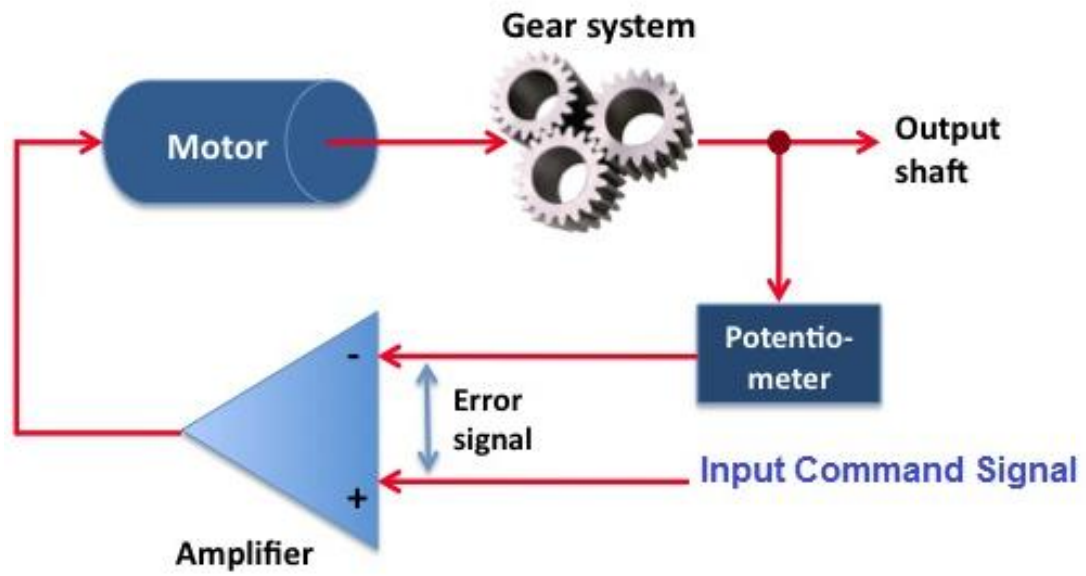


Figure 13.1 Servo motor and its mechanism

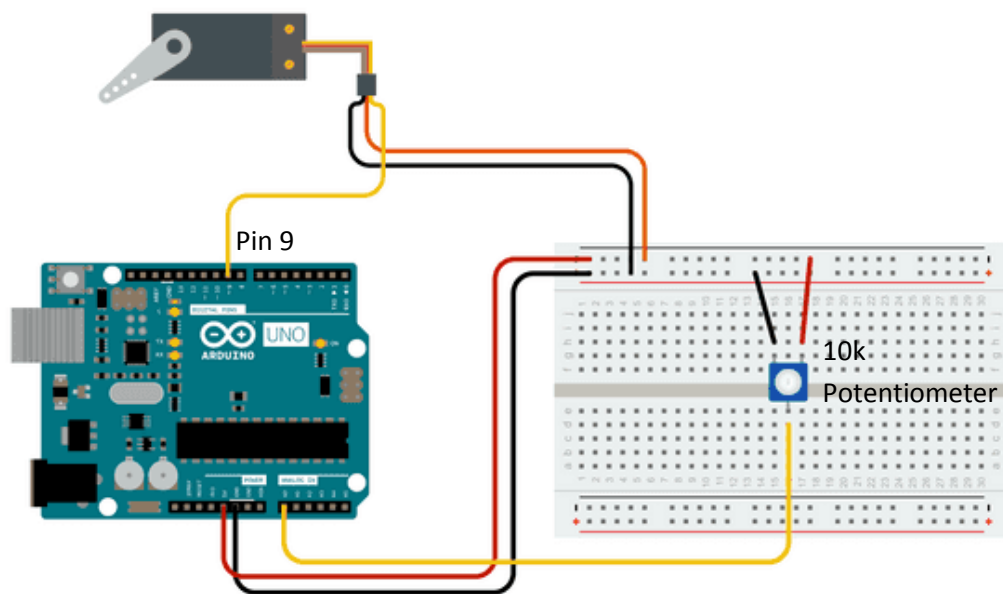


Figure 13.2 Circuit diagram for servo motor control with Arduino

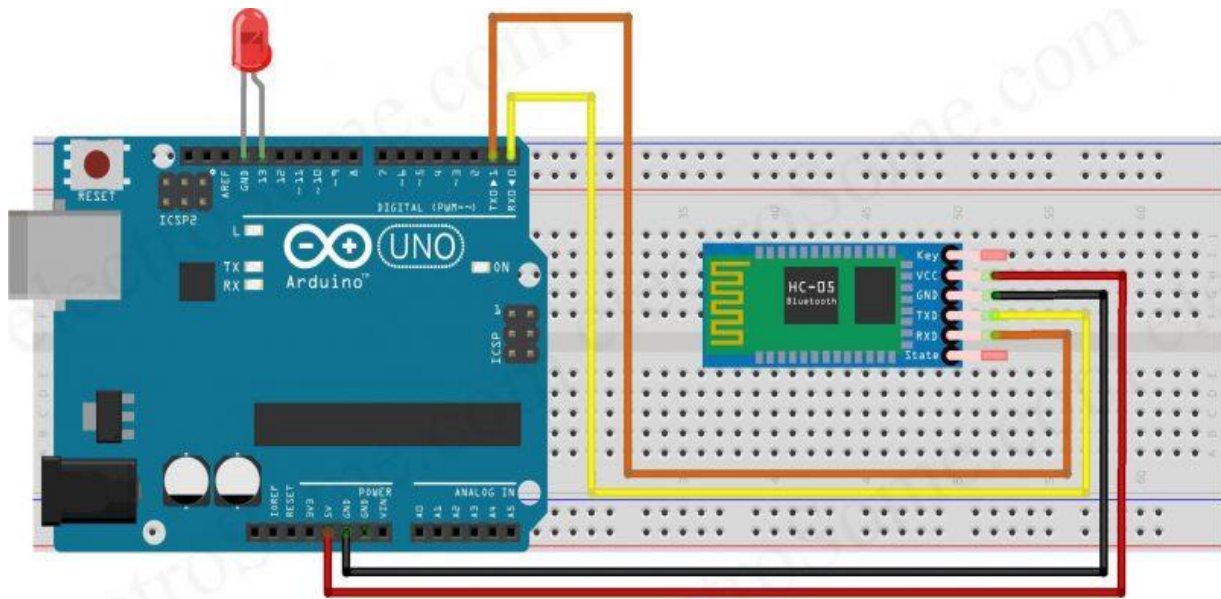


Figure 14.1 Circuit diagram for Bluetooth module with Arduino

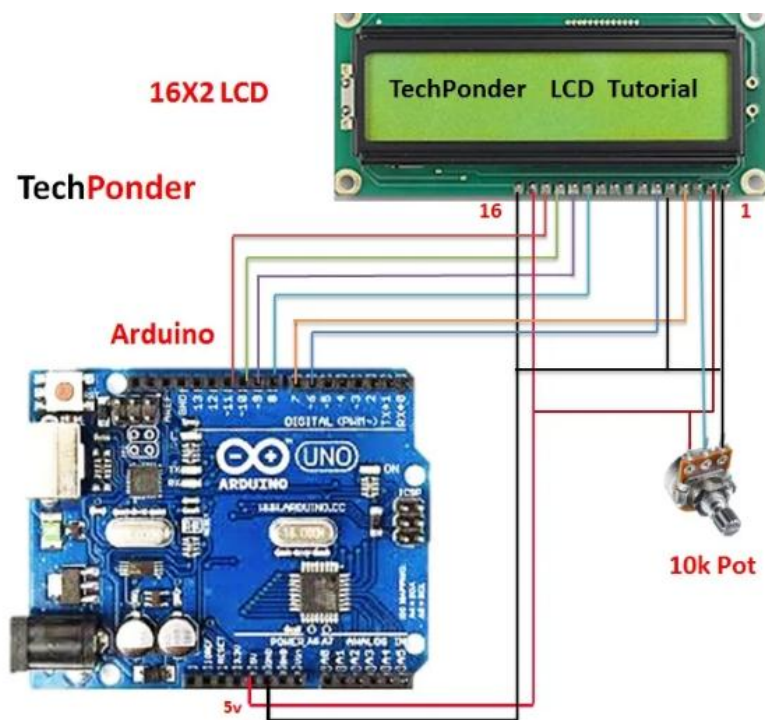


Figure 15.1 Circuit diagram for LCD display