

Understanding Input_Pullup and Potentiometers

Input_Pullup:

When you set a pin as INPUT_PULLUP, you're essentially connecting a very large resistor (usually around 20-50k ohms) between the pin and 5V power supply.¹ This resistor pulls the voltage on the pin high (close to 5V) when nothing is connected to it.²

Potentiometer:

A potentiometer is a variable resistor.³ It has three terminals: two fixed terminals and one adjustable terminal.⁴ By turning the knob of the potentiometer, you can change the resistance between the adjustable terminal and one of the fixed terminals. This, in turn, changes the voltage at the adjustable terminal.⁵

How to use a button as a potentiometer:

While you can't directly use a button as a potentiometer, you can create a circuit that simulates a potentiometer's behavior using a button and a few resistors.

Here's a basic idea:

1. **Connect one end of the button to 5V.**
2. **Connect the other end of the button to ground through a resistor.**
3. **Connect the middle pin of the button to an analog input pin on your microcontroller.**

When the button is not pressed, the input pin will read a high voltage (close to 5V). When the button is pressed, the voltage on the input pin will drop to a low value (close to 0V).

By pressing the button for different durations, you can simulate different resistance values, similar to turning a potentiometer knob. This technique can be useful for creating simple input devices or controlling the behavior of your microcontroller.

However, keep in mind that this method is not as precise as a real potentiometer. The voltage levels will depend on factors like the button's resistance and the microcontroller's internal resistance.

[Arduino INPUT_PULLUP Explained \(pinMode\)](#)