DS20613 - Assignment 4 – Pull Up/Down Resistor
Submitted on 23 October 2020

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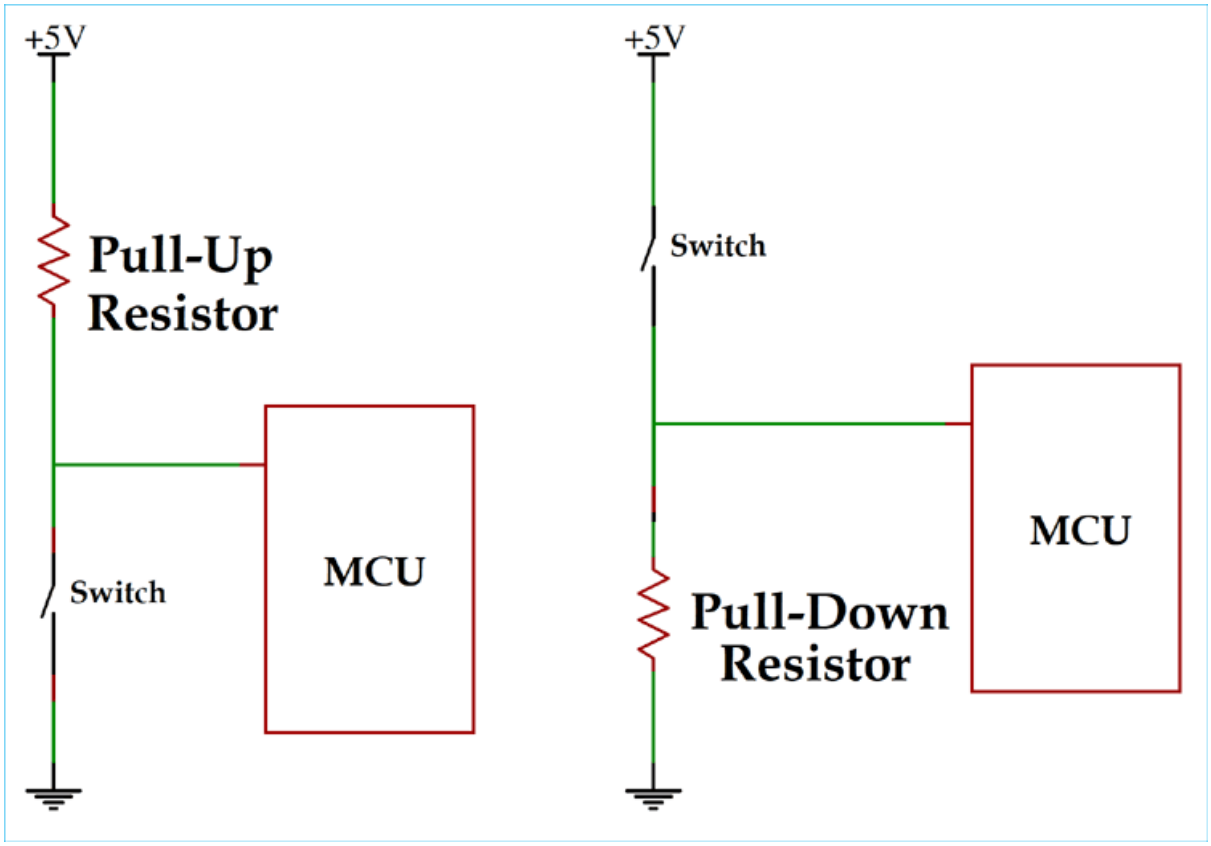
List of Components

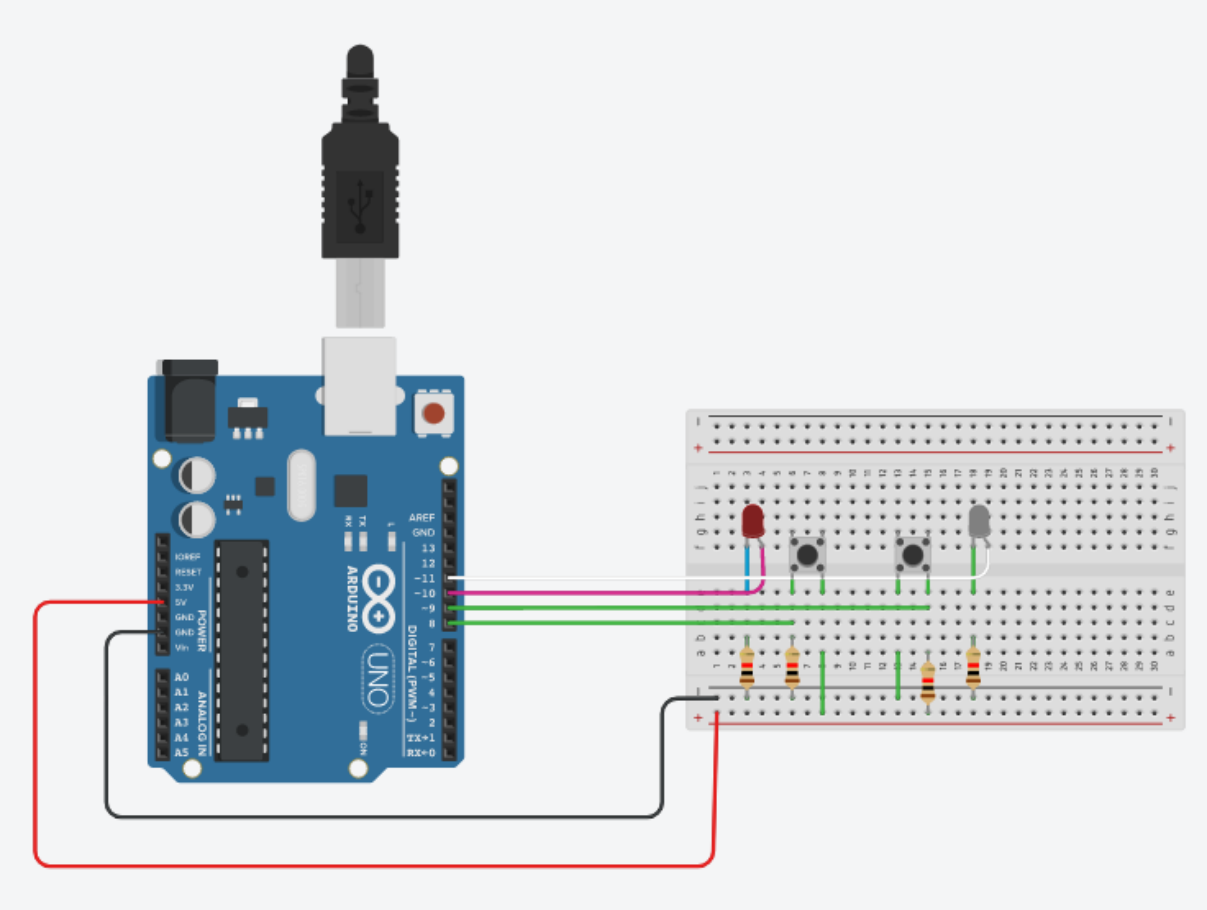
Name	Quantity	Component
U1	1	Arduino Uno R3
D1	1	White LED
D2	1	Red LED
R1		
R2		
R3		
R4	4	10 kΩ Resistor
B1		
B2	2	Push Button

Wire Diagram of Pull up and Pull down Resistor

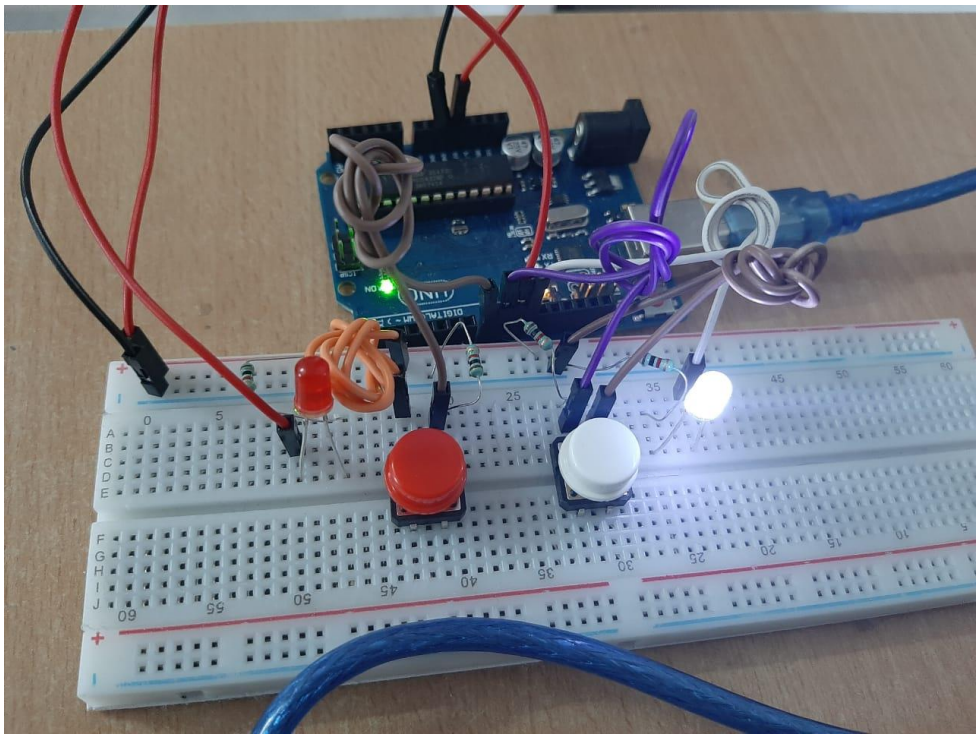


***MCU - Micro Controller Unit**

Breadboard view:

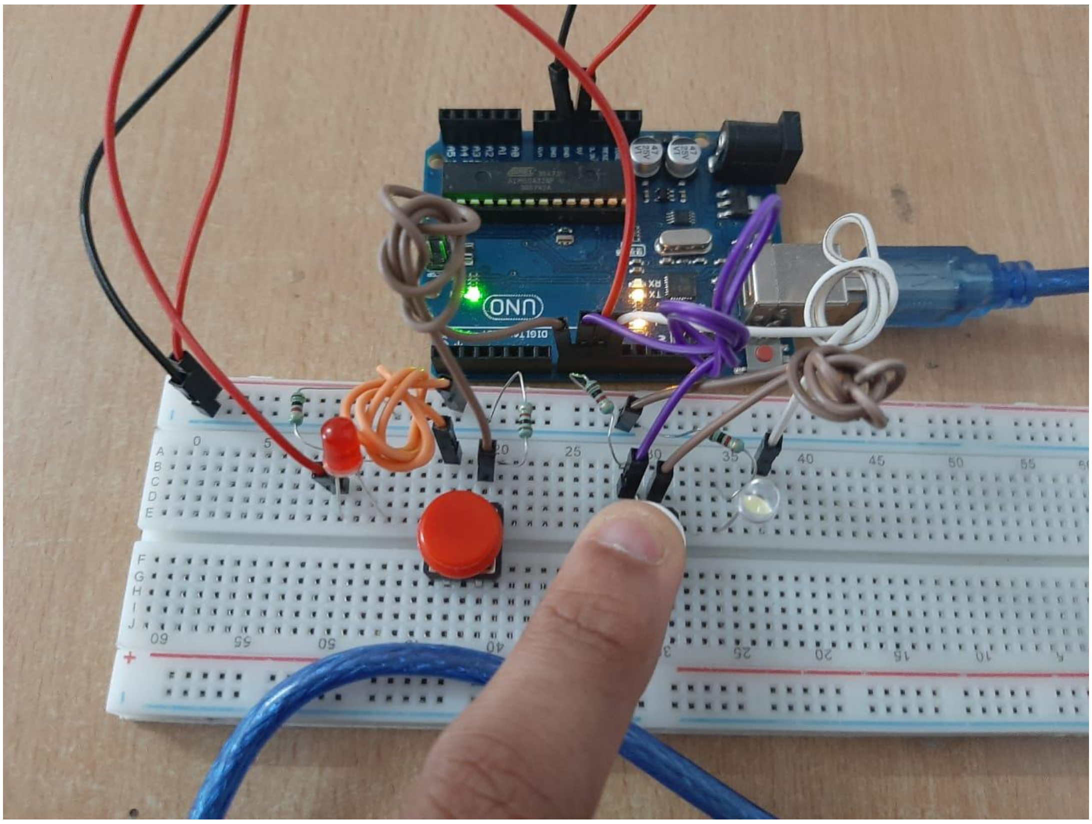


Live implementation view

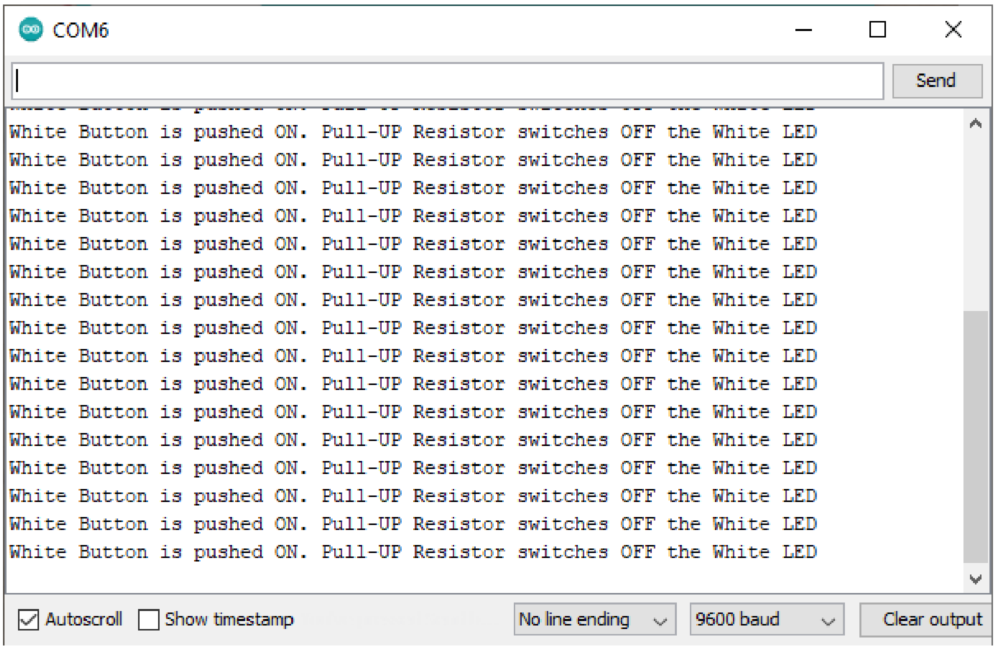


Pull Up Mode: In Pull-up configuration, the power source(5V) is connected to the resistor followed by the Digital INPUT pin9 which make the Digital Input value always HIGH. A switch is connected from Digital pin 9 to the ground. Whenever the White Switch is pressed, the voltage at the Digital INPUT Pin 9 will go low as the pin is gets shorted to Ground (0V).

In this experiment, we will read the status of Digital INPUT pin 9 and accordingly Power ON/OFF a White LED connected to Digital INPUT pin 11.

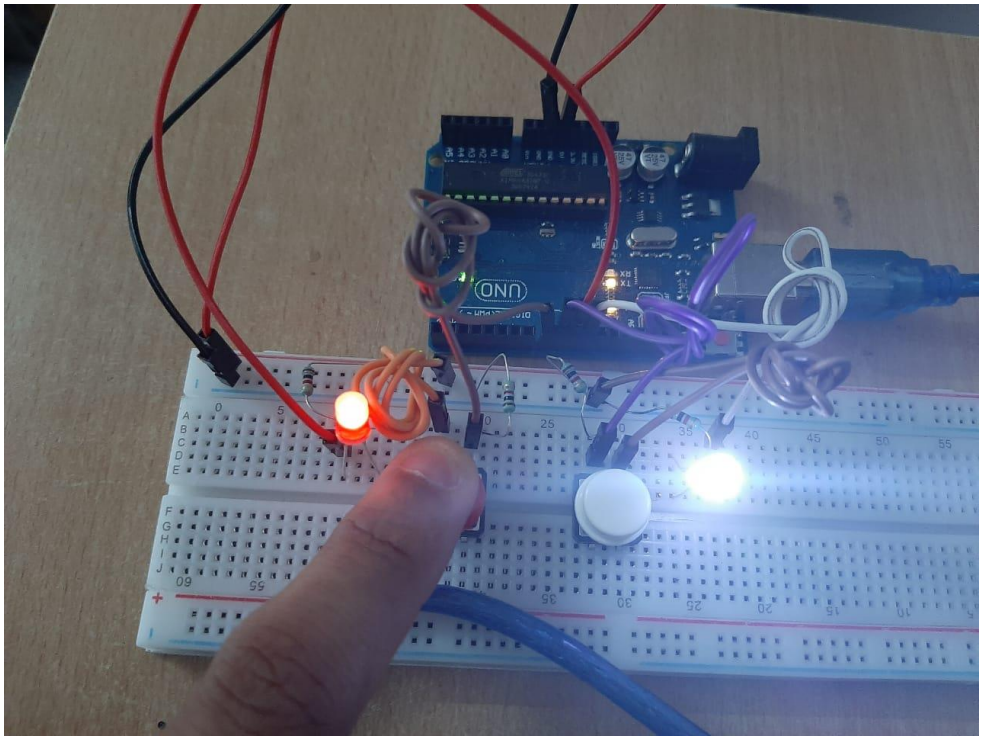


Serial Ouptut:

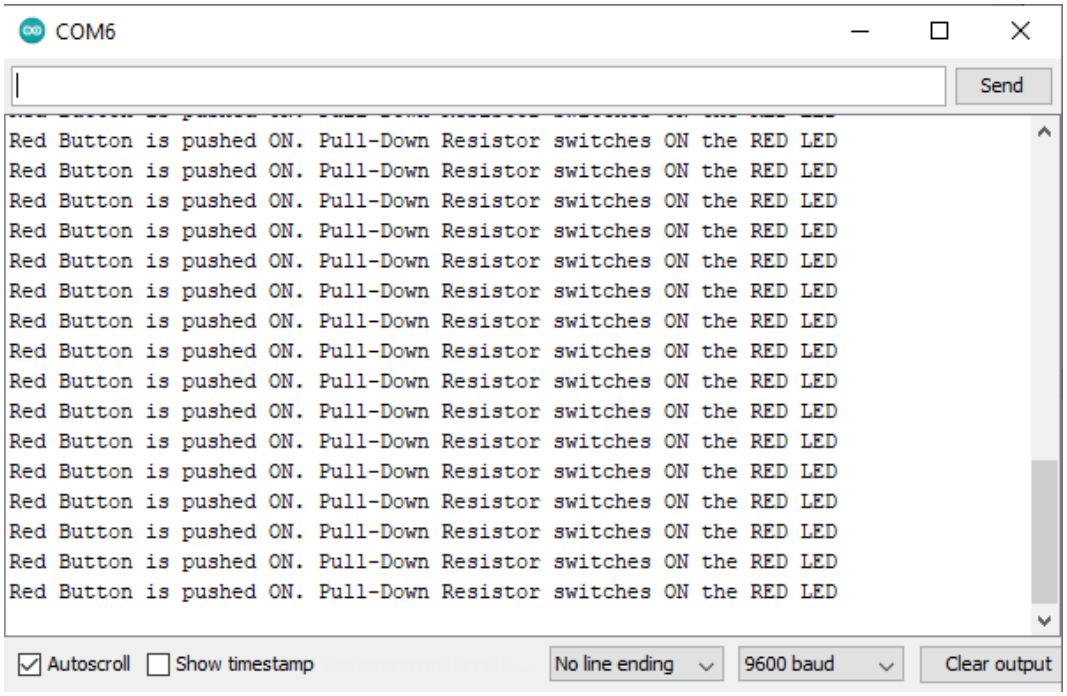


Pull Down Mode: In Pull-down configuration, the power source(5V) is connected to the switch followed by the Digital INPUT pin8 which make the Digital Input value always LOW. A resistor is connected from Digital pin 8 to the ground to maintain a reference voltage of 0V in the Digital Pin 8. Whenever the Red Switch is pressed, the voltage at the Digital INPUT Pin 8 will be HIGH as the power source(5V) gets shorted to Digital INPUT Pin 8.

In this experiment, we will read the status of Digital INPUT pin 8 and accordingly Power ON/OFF a RED LED connected to Digital INPUT pin 10.



Serial Ouptut:



Code:

```
/*
@author: Theivaprakasham H
@title:  Pull Up and Pull Down Resistors with Switch
*/

// Initializing two variables to store the state of the buttons
int buttonState1, buttonState2;

void setup() {
  //start serial connection
  Serial.begin(9600);

// Setting button1 = D8(Input) ;  button2 = D9(Input);  RedLed =  D10(Output); WhiteLed =  D11(Output);
DDRB = B00001100;
}

void loop() {

  // Read the state of the pushbutton value:
   buttonState1 = PINB & B00000001;  //performing AND operation to PINB to extract D8 value
   buttonState2 = PINB & B00000010;  //performing AND operation to PINB to extract D9 value


 // Checking the status of Button1
 if (buttonState1 == B00000001) { PORTB = PORTB | B00000100;  // turn on Red Led(D10)
   Serial.println("Red Button is pushed ON. Pull-Down Resistor switches ON the RED LED");
 } else {
   PORTB = PORTB & B11111011;  // turn RED LED off
 }

  // Checking the status of Button2
 if (buttonState2 == B00000010) { PORTB = PORTB | B00001000;  // turn ON White Led(D11)
 } else {
   PORTB = PORTB & B11110111;  // turn WHITE LED off
   Serial.println("White Button is pushed ON. Pull-UP Resistor switches OFF the White LED");
 }
}
```