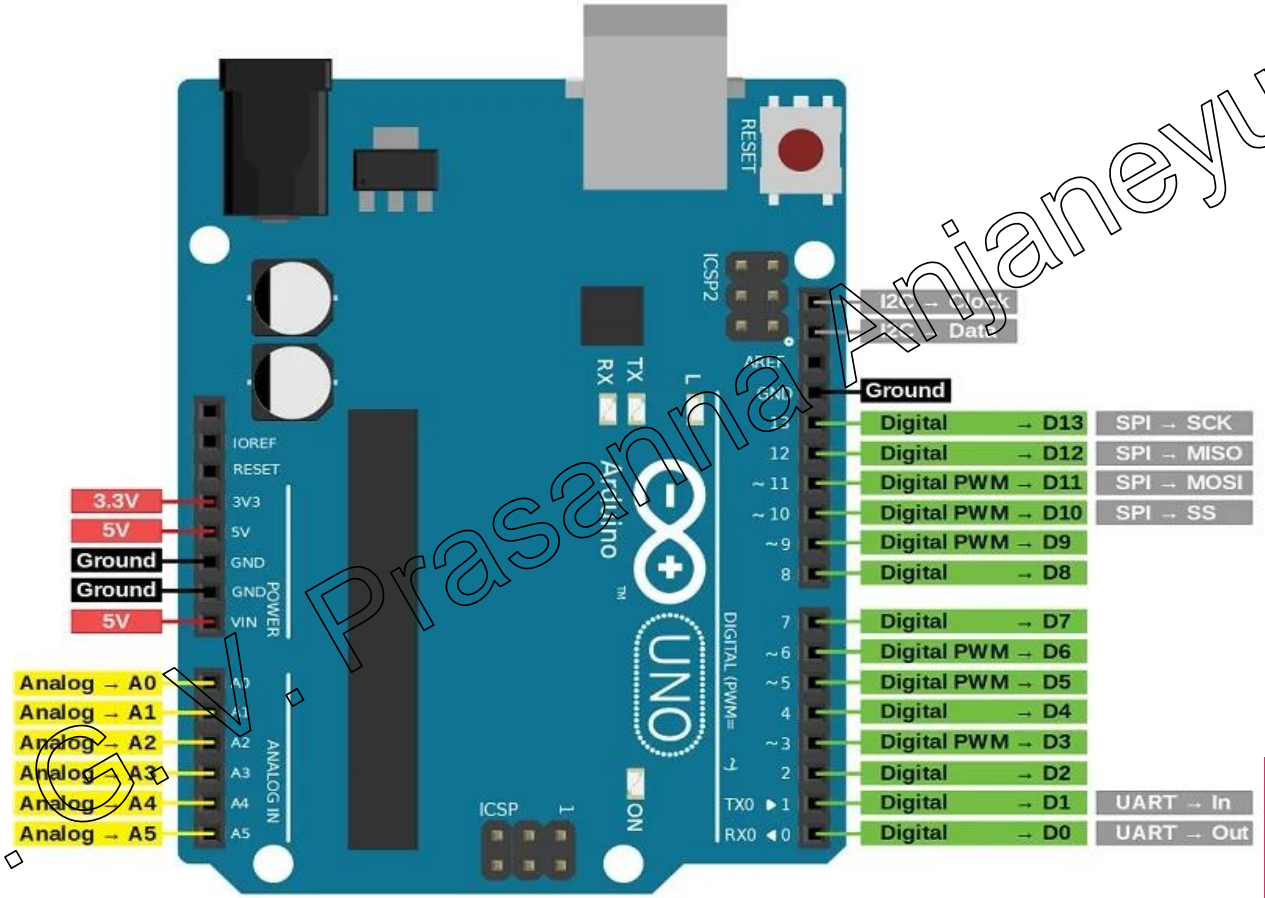
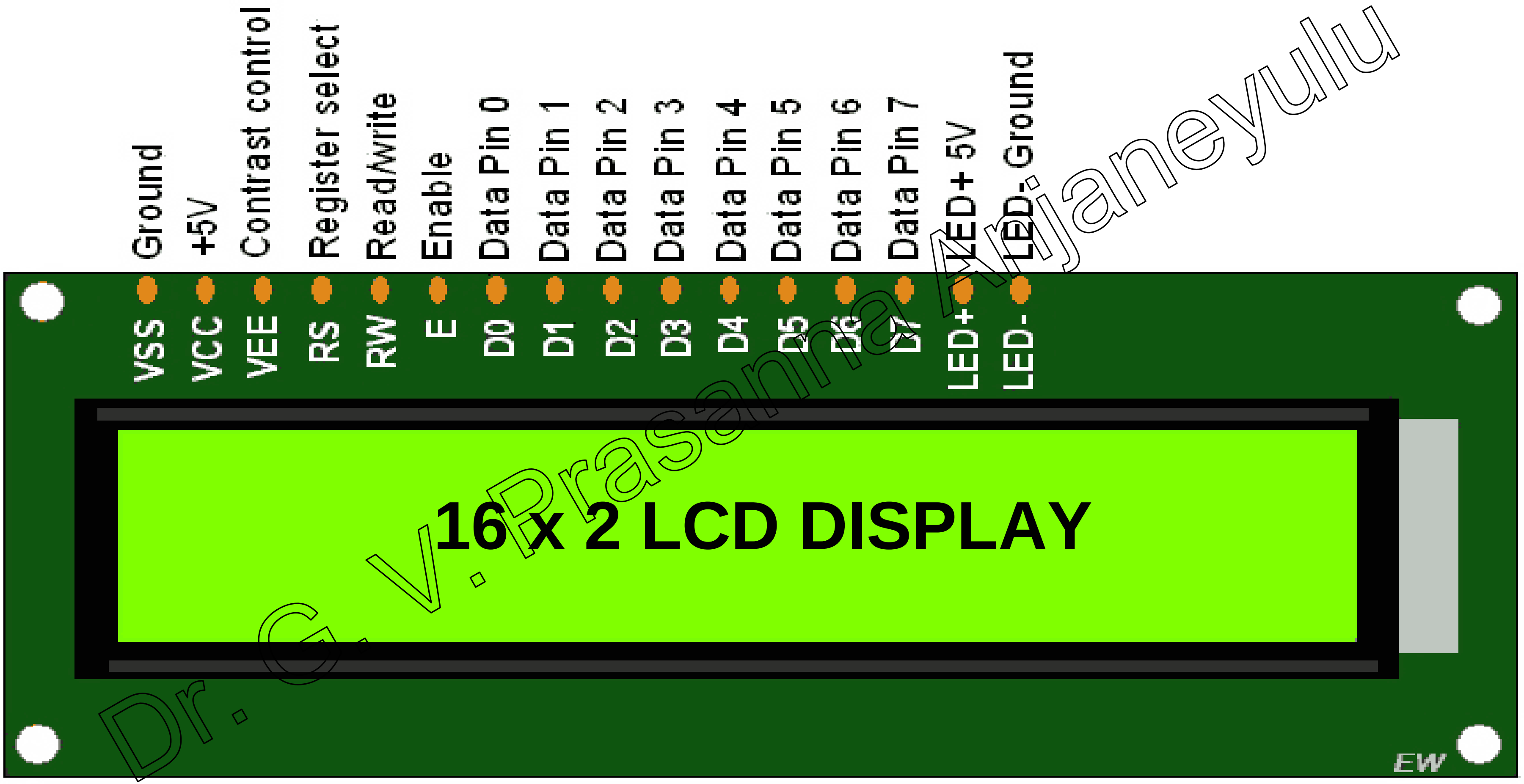
9.Voltage Measurement and Display in LCD with ARDUINO

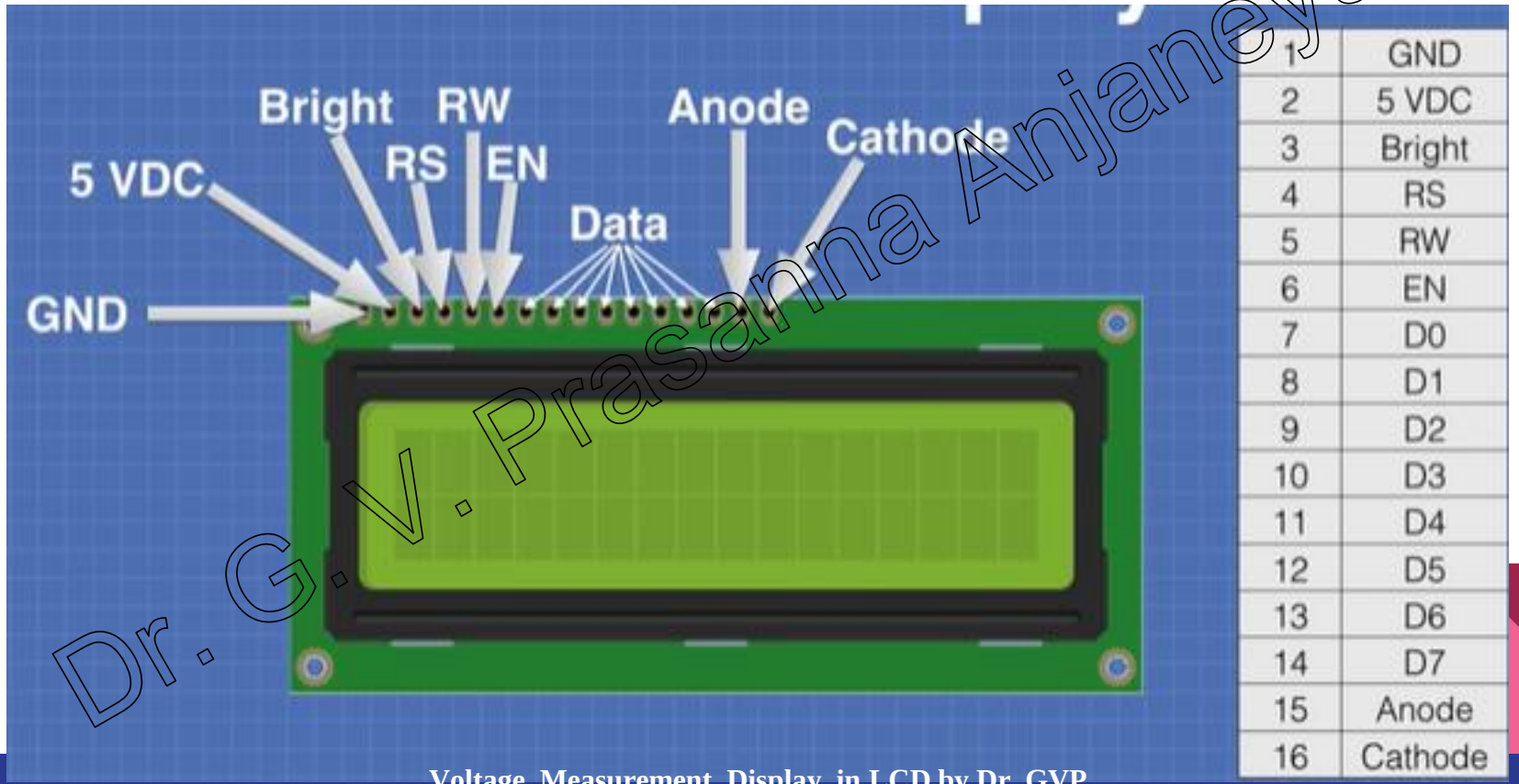
From
Dr.G.V. Prasanna Anjaneyulu



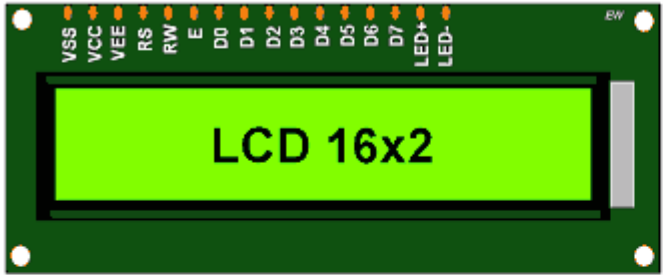
Recap of LCD



LCD1602 Display



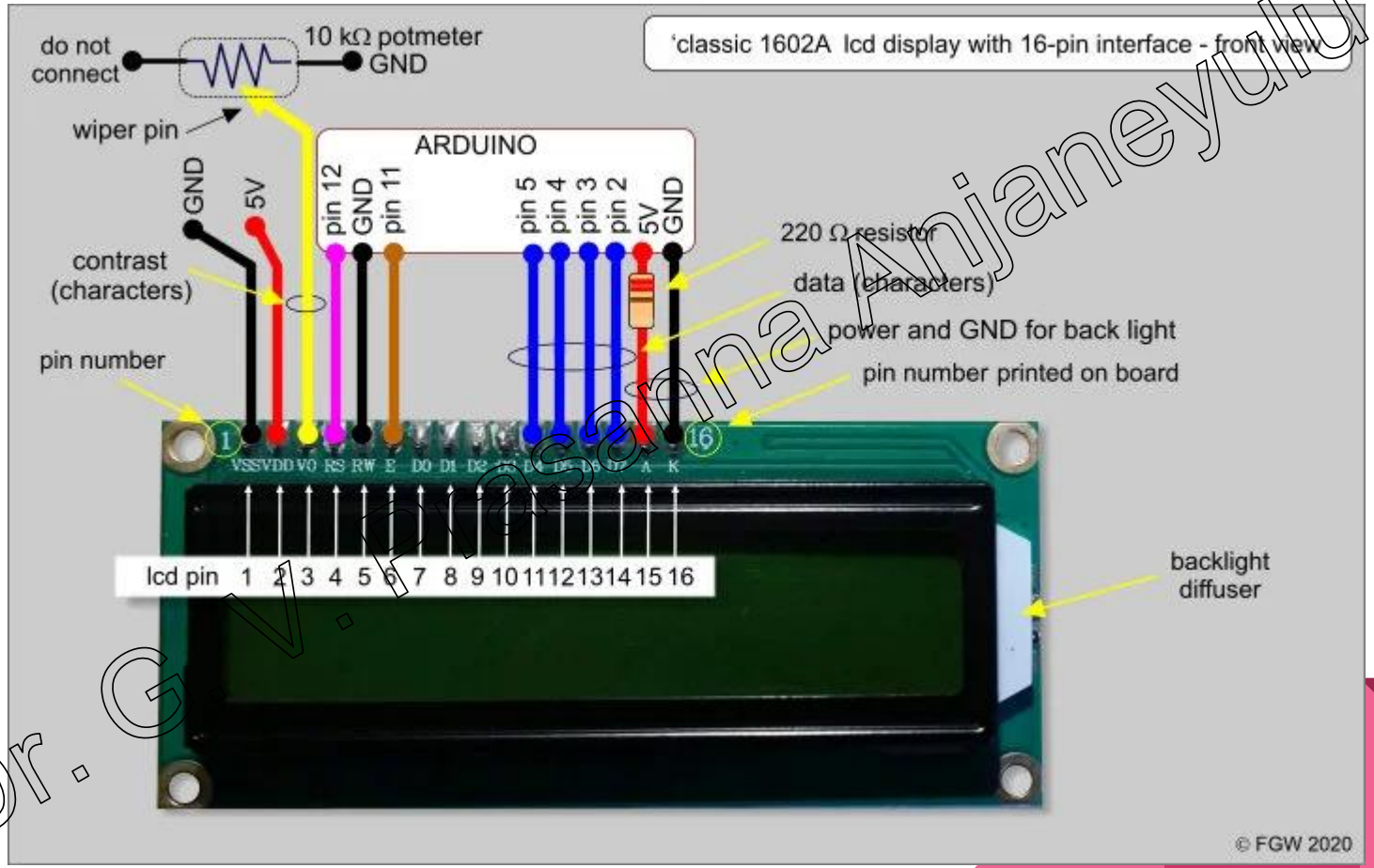
1	GND
2	5 VDC
3	Bright
4	RS
5	RW
6	EN
7	D0
8	D1
9	D2
10	D3
11	D4
12	D5
13	D6
14	D7
15	Anode
16	Cathode



No.	PIN	Function
1	VSS	Ground
2	VCC	+5 Volt
3	VEE	Contrast control 0 Volt: High contrast.

No.	PIN	Function
4	RS	Register Select 0: Commannd Reg. 1: Data Reg.
5	RW	Read / write 0: Write 1: Read
6	E	Enable H-L pulse
7-14	D0 - D7	Data Pins D7: Busy Flag Pin
15	LED+	+5 Volt
16	LED-	Ground

EW



Voltage Measurement Components

1.PC with Arduino IDE

2.Arduino UNO Board

3.USB cable

4.Potentiometer (pot type)

5.Bread board

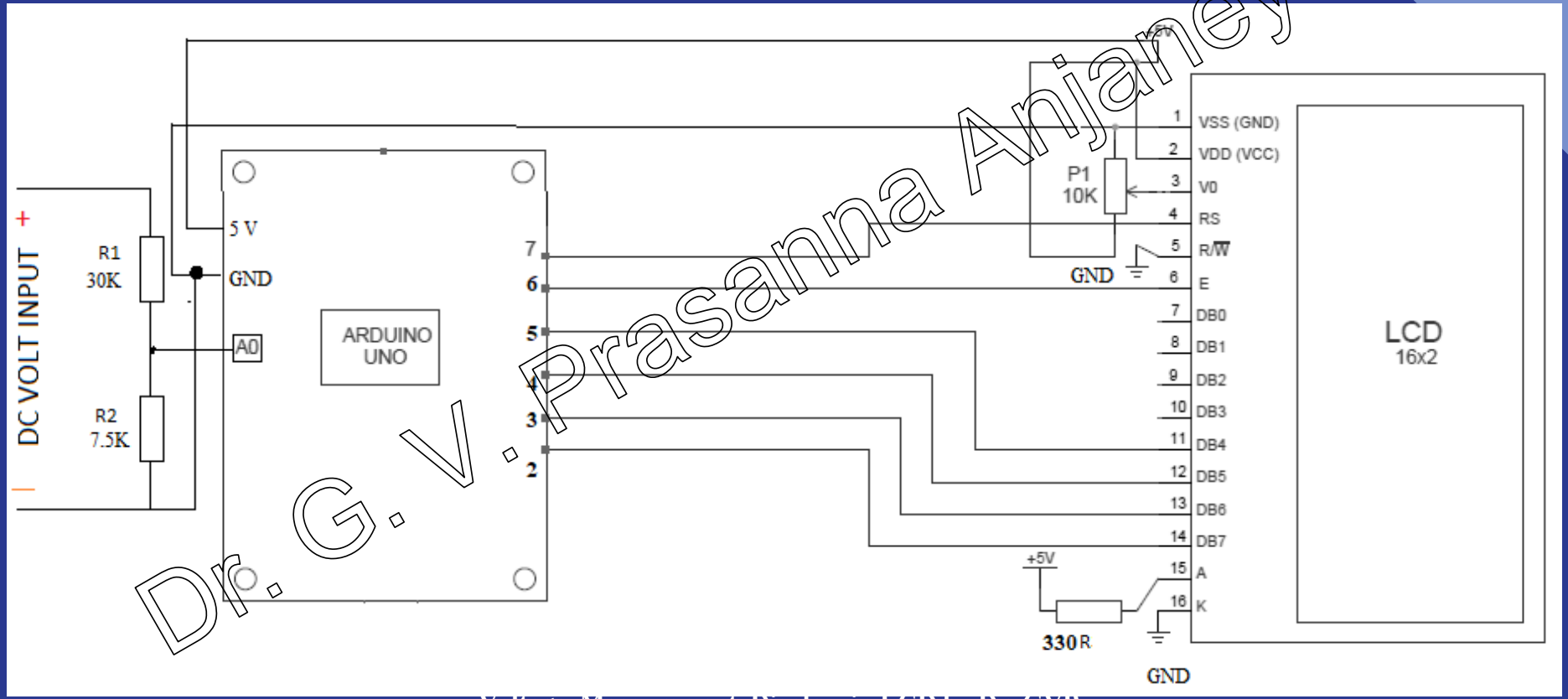
6.220Ω,30k,7.5k resistors

7. 16*2 LCD

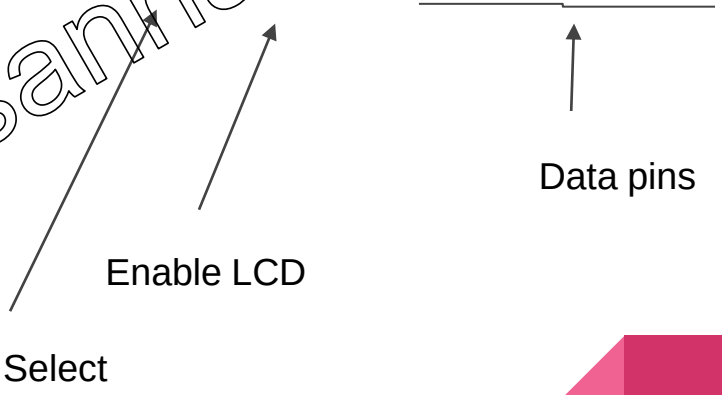
8. 9V battery - connecting terminals

8.Jumper wires

Circuit Diagram

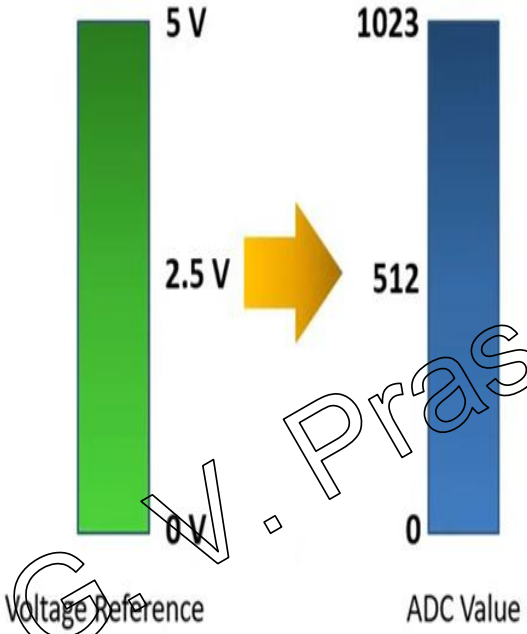


LiquidCrystal lcd(7,6,5,4,3,2);



Program

```
#include "LiquidCrystal.h"
const int voltageSensor = A0;
float vOUT = 0.0;
float vIN = 0.0;
float R1 = 30000.0;
float R2 = 7500.0; int value = 0;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2); // RS, E, D4, D5, D6, D7
void setup()
{
  //Serial.begin(9600);
  lcd.begin(16,2);
  lcd.print(" Measure < 25V ");
  delay(2000);
}
void loop()
{
value = analogRead(voltageSensor);
vOUT = (value * 5.0) / 1024.0;
 vIN = vOUT / (R2/(R1+R2));
  //Serial.print("Input = ");
  //Serial.println(vIN);
  lcd.setCursor(0,0);
  lcd.print("Input = ");
  lcd.setCursor(8,0);
  lcd.print(vIN);
  delay(500);
}
```

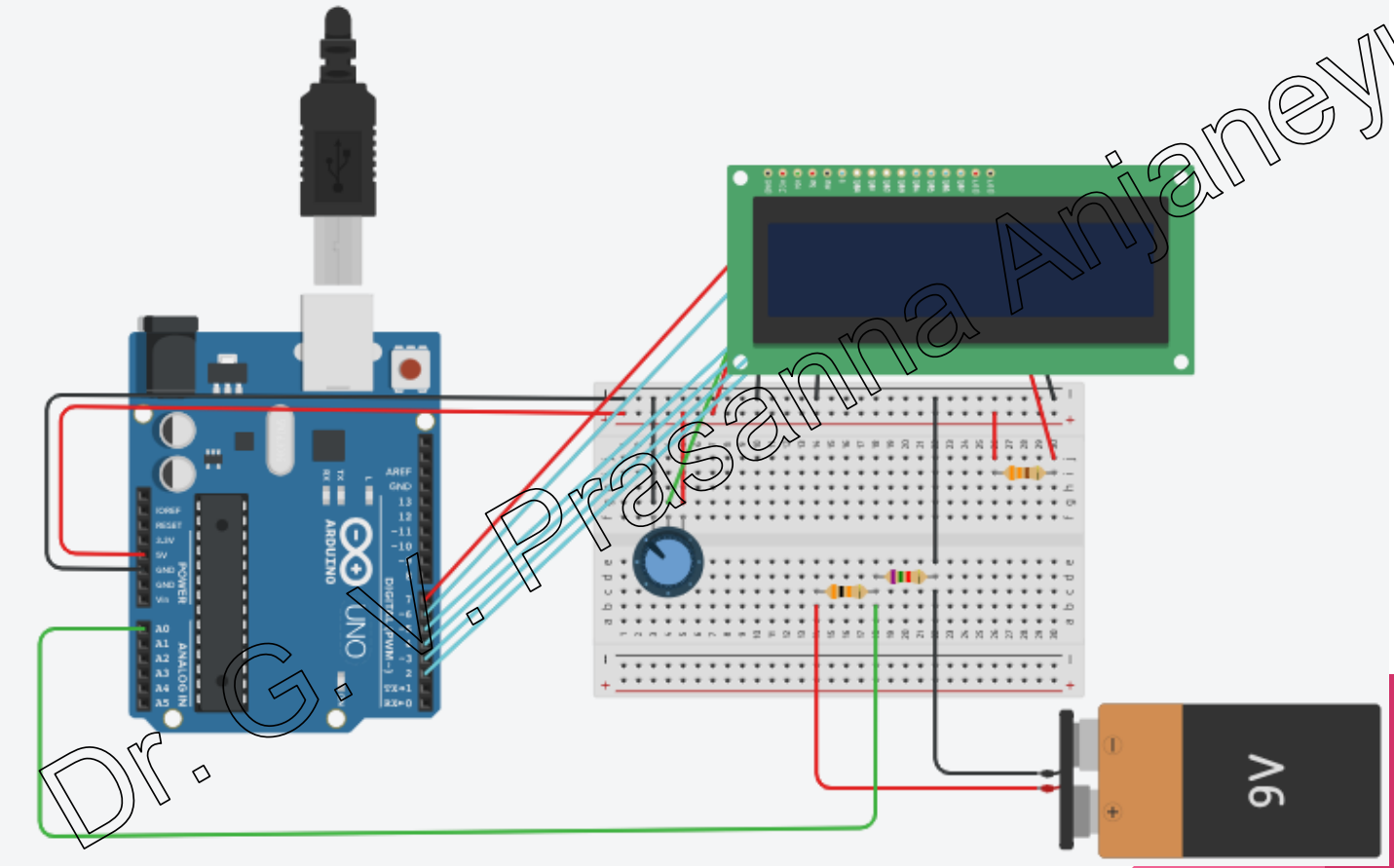


Conversion Scale

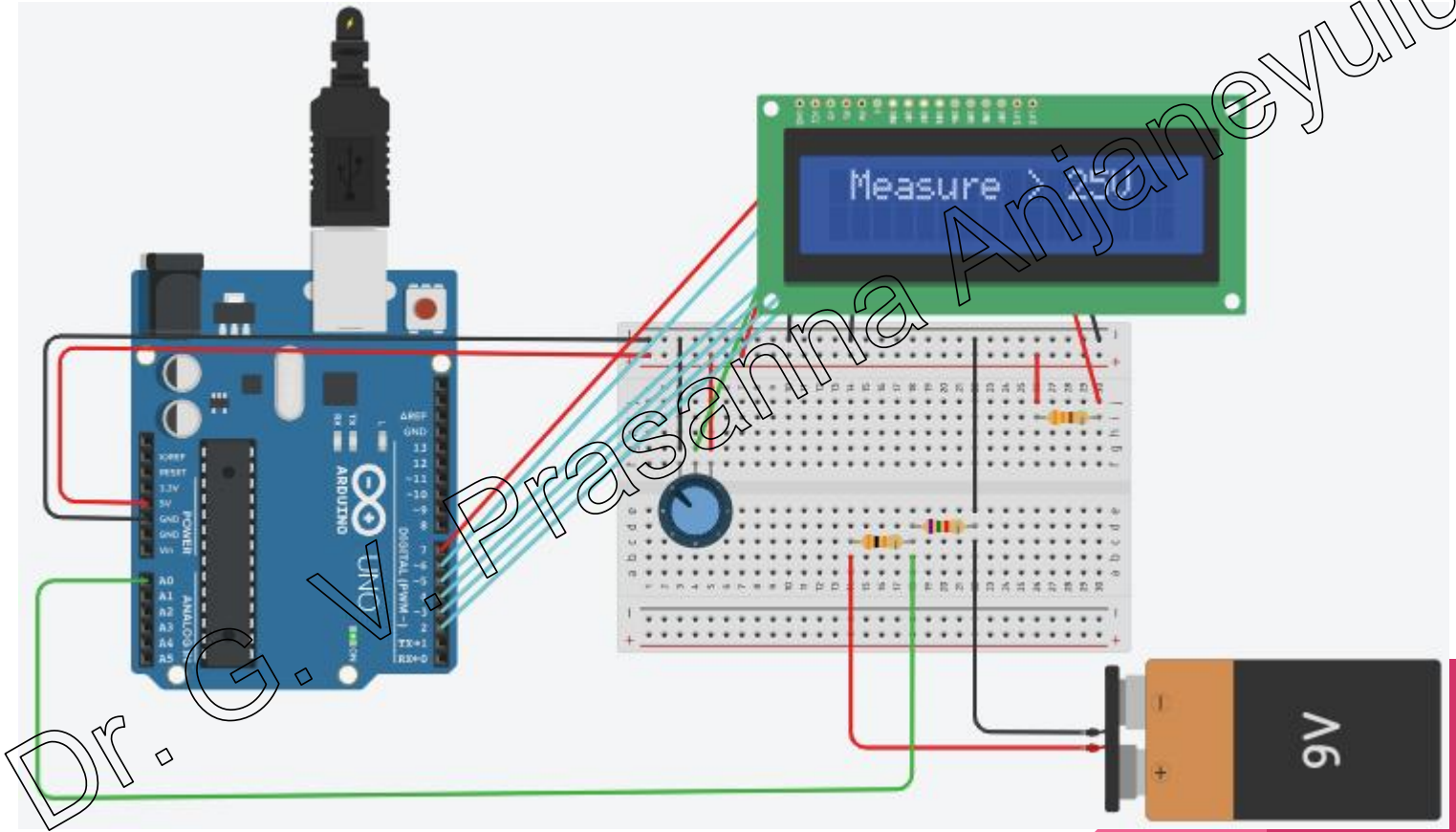
note:

1. In tinkercad voltage sensor not available so potential divider used with resistors
2. ATmega have inbuilt 10 Bit ADC so its value in digital format of 0 to 1023 for a voltage of 0 to 5V
3. To convert to normal form multiplication factor 5/1024 used

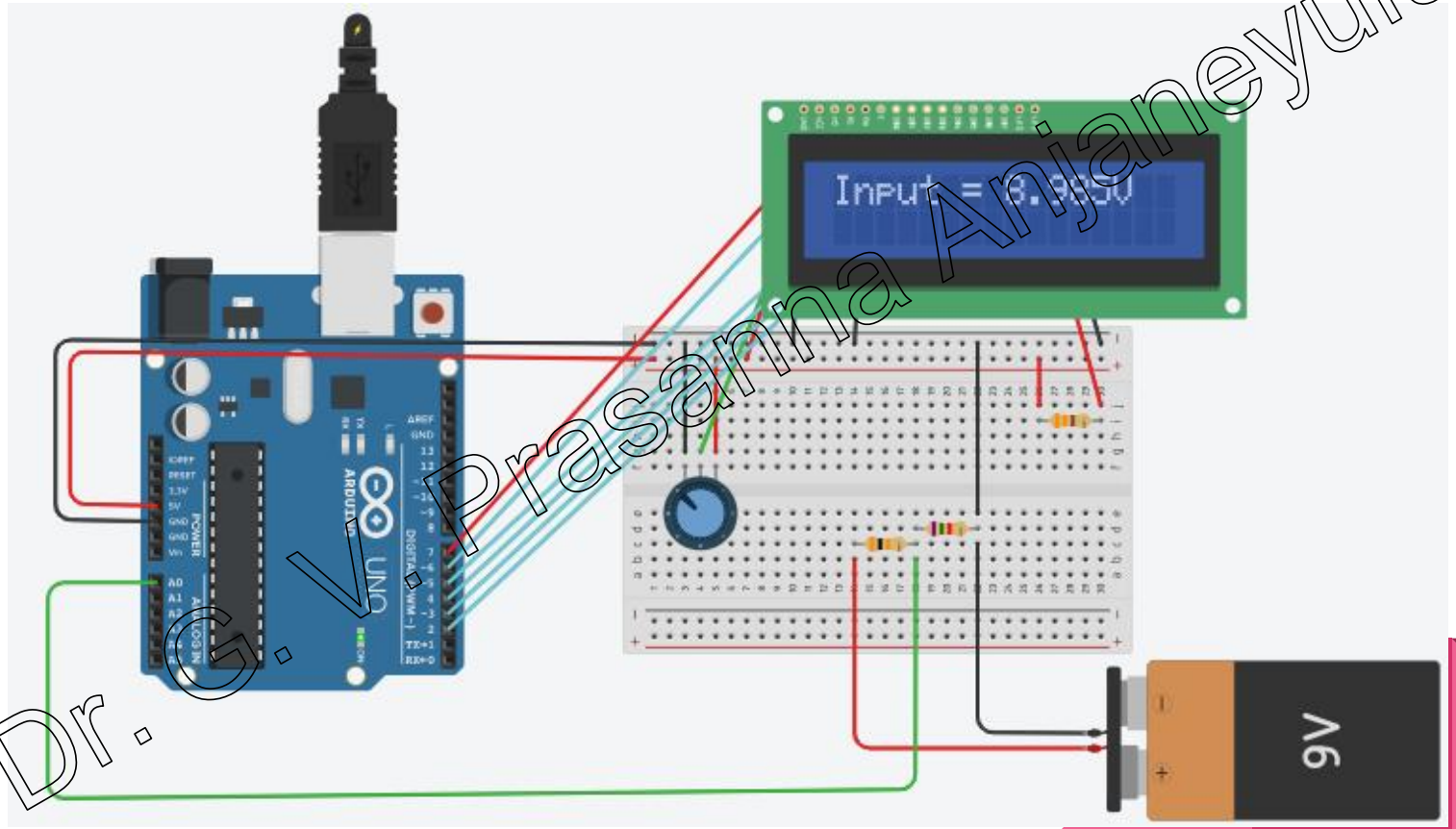
Implementation in TINKERCAD



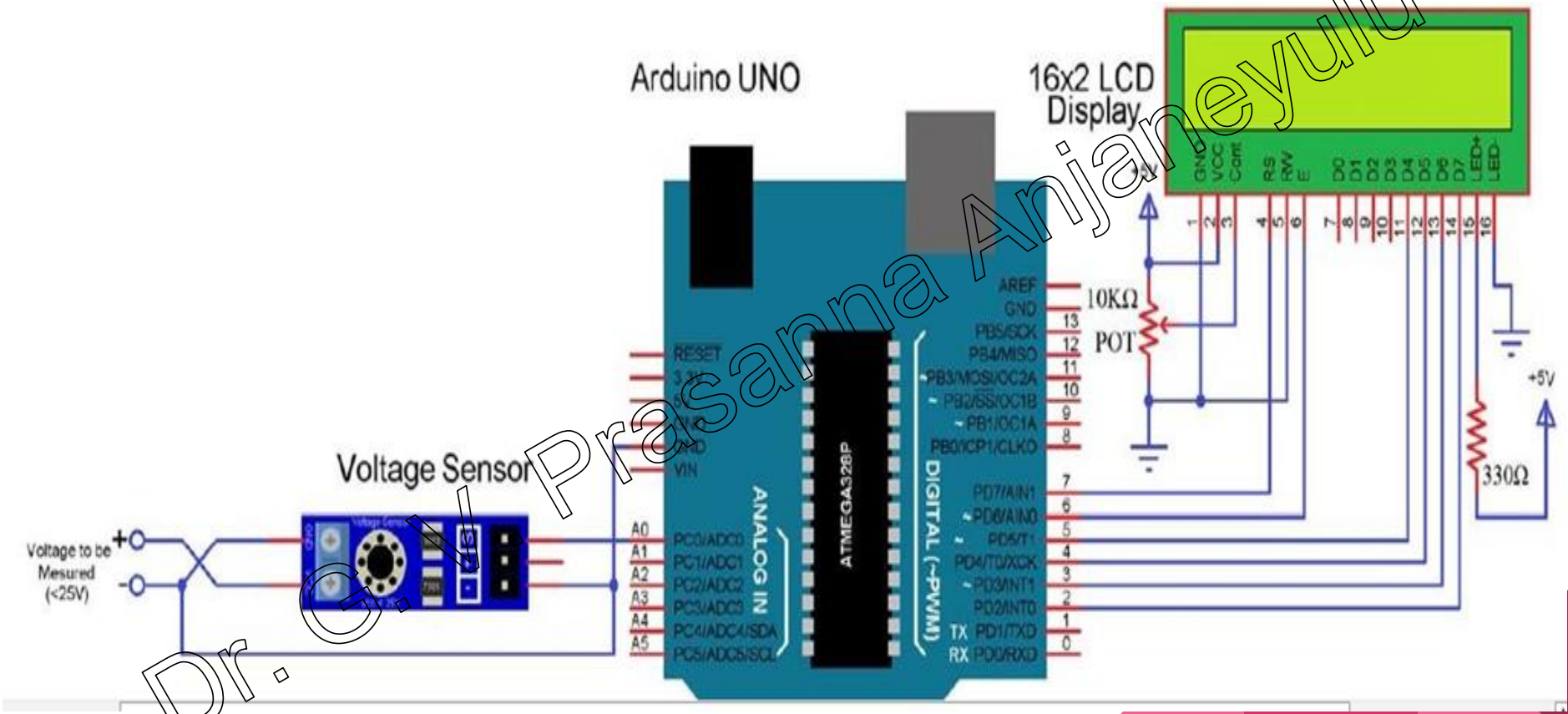
Execution……



Results…..



Implementation in LAB (with Voltage Sensor)



Voltage sensor

Functionally it is same as potential divider with two resistors 30k, 7.5k as shown in figure [note: N/C —- No connection]