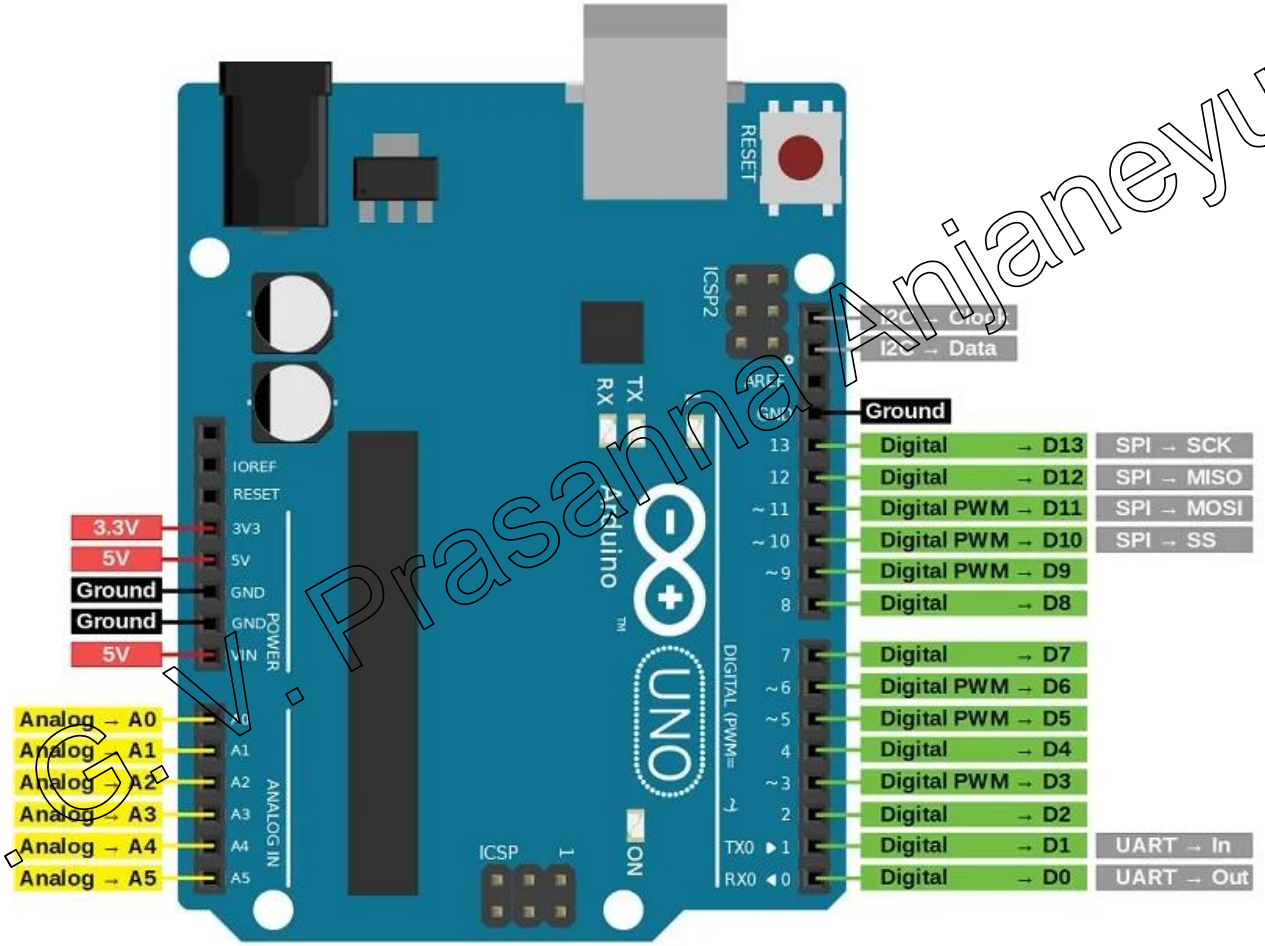
8.DC_Motor Speed & Direction Control

With ARDUINO



Note

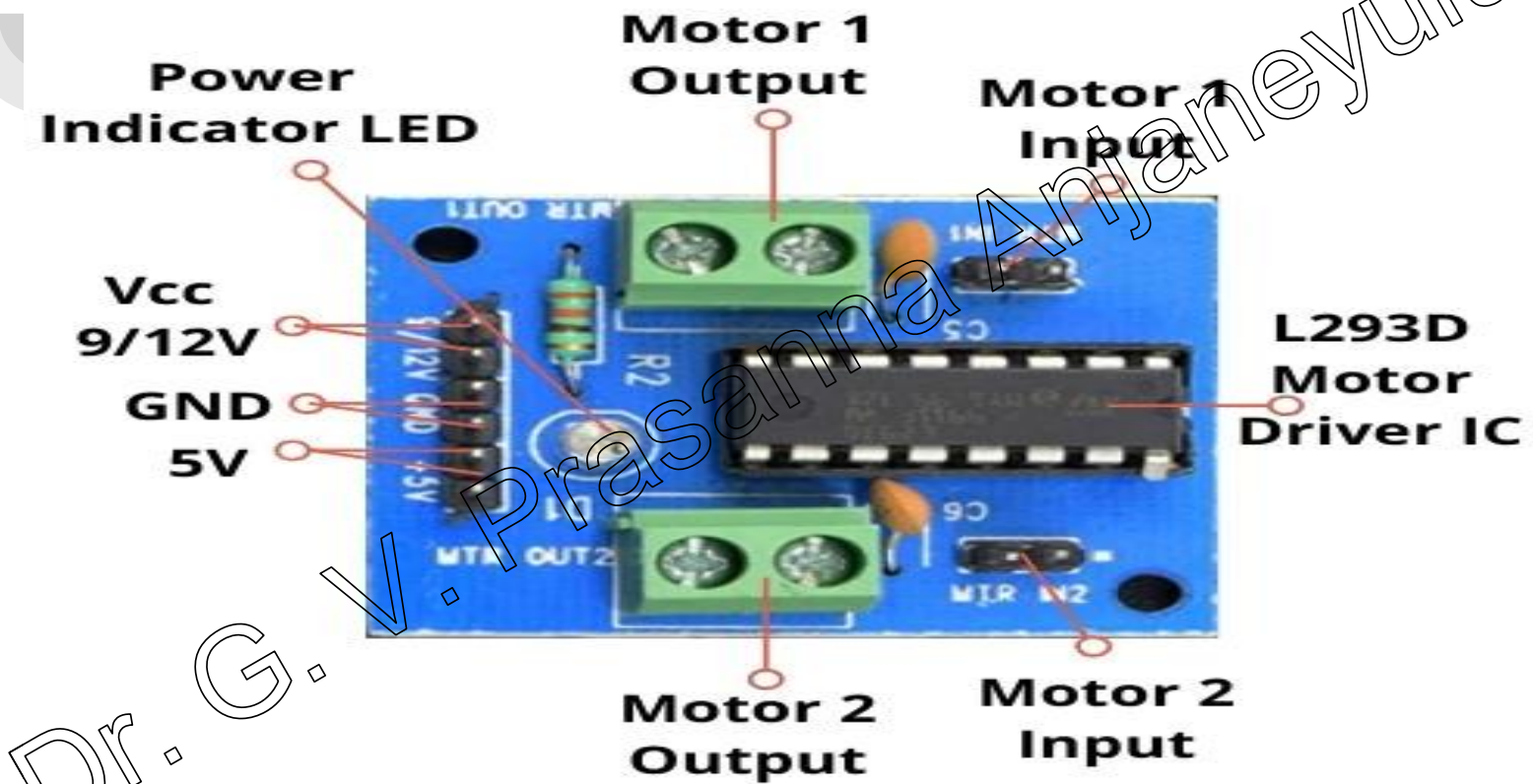
In built microcontroller cann't run DC motor because motor draws large current

Even if it runs, but it cannot reverse the direction of motor

So L293D driver IC is used

With this IC 2-DC motors are controlled at a time

L293D Driver-IC



Apparatus

1.PC with Arduino IDE

2.Arduino UNO Board

3.USB cable

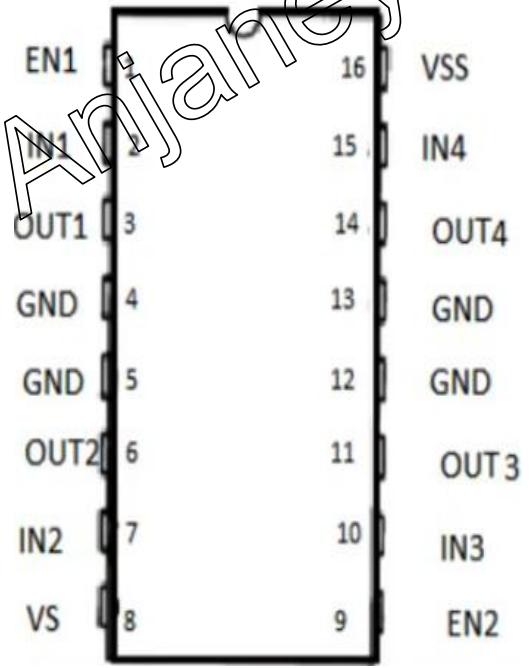
4.DC motor

5.Bread board

6.1kΩ resistor

7.Jumper wires

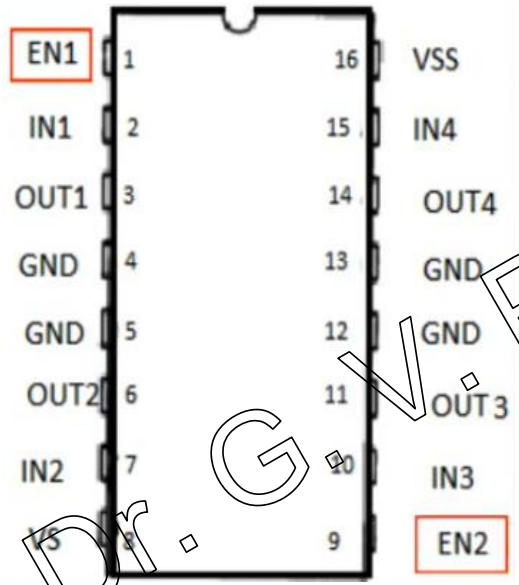
8.L293D motor IC



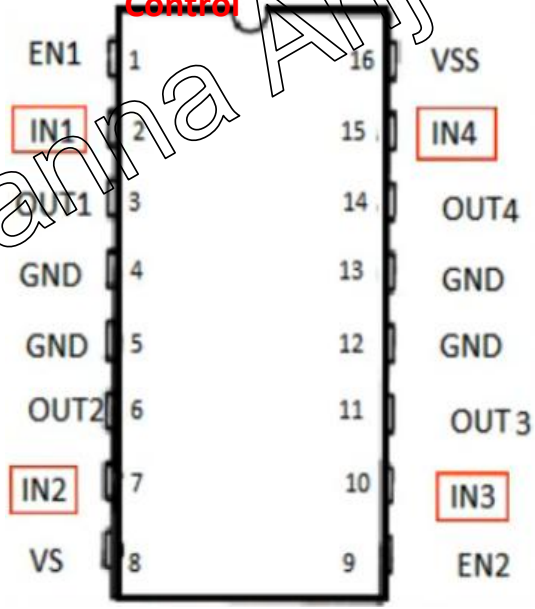
L293D Motor Driver IC

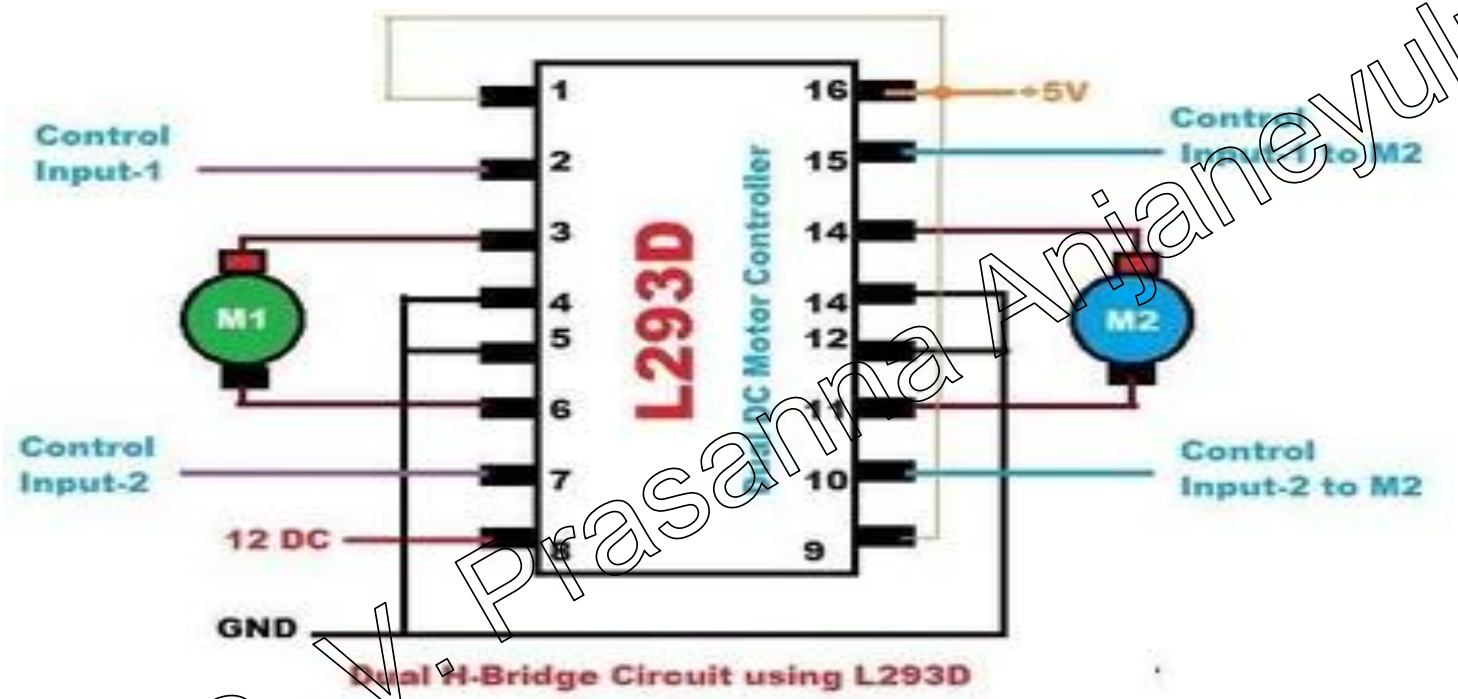
By using this we can control 2-motors at a time, but here using for 1-motor control only.
For Speed control EN1, EN2 used
For Direction control IN1-IN2,IN3-IN4 used

Speed Control



Direction Control

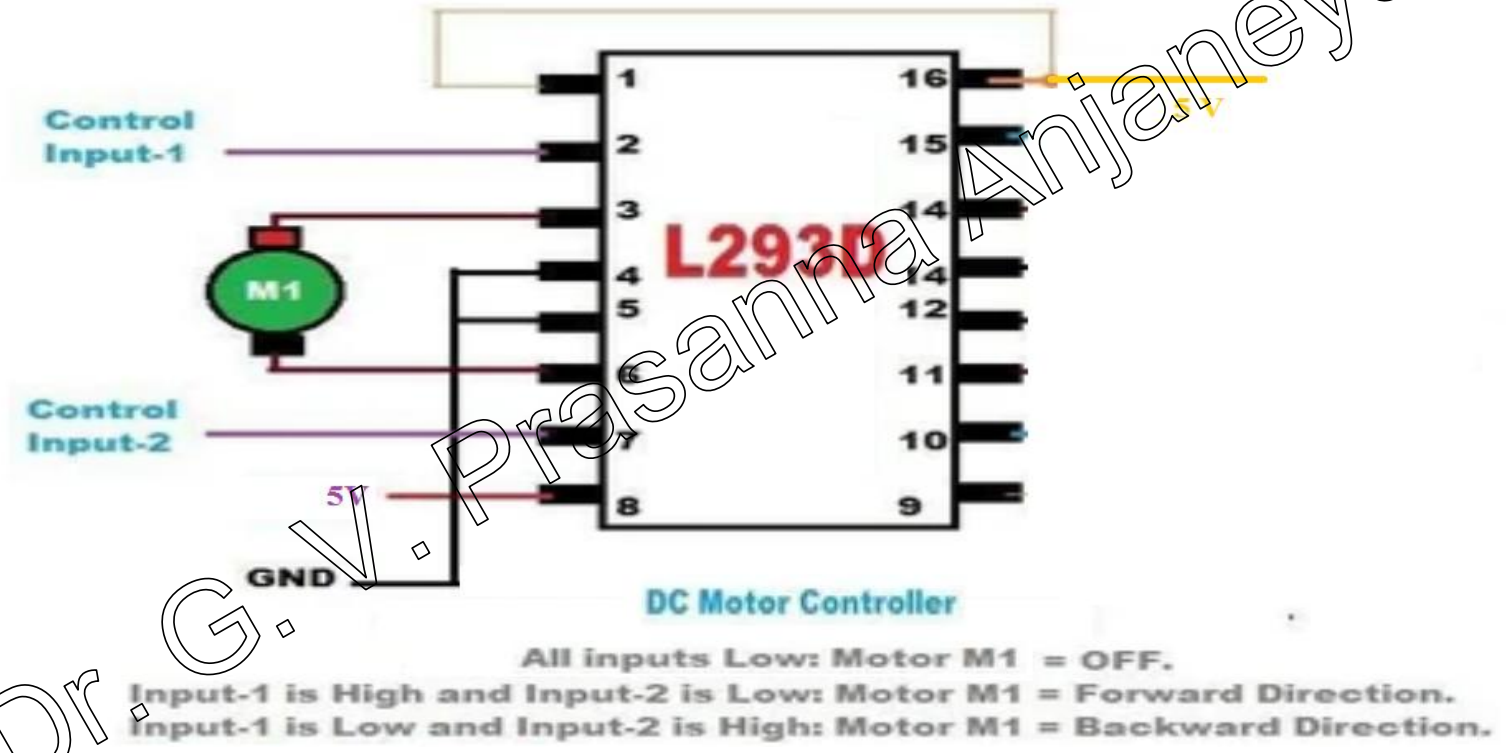




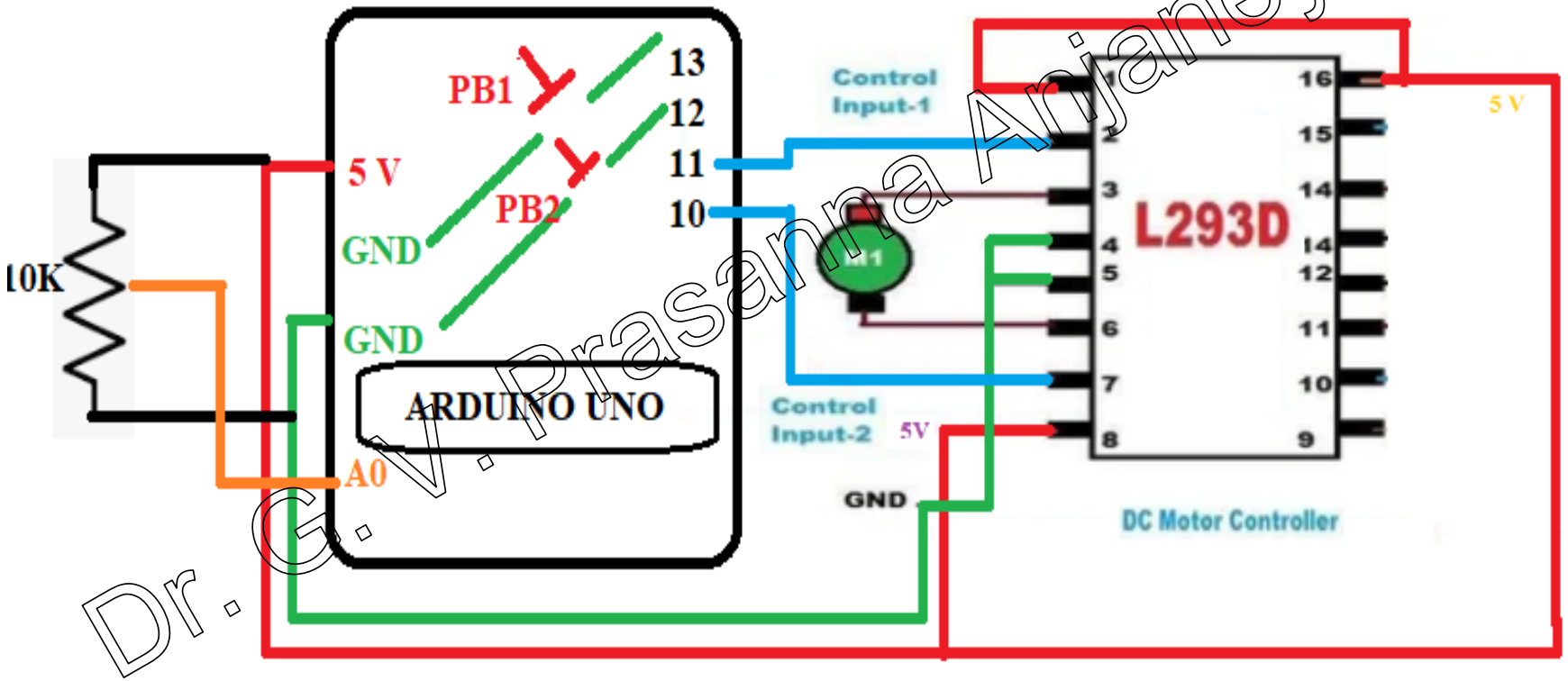
Dual H-Bridge Circuit using L293D

All inputs Low: Motor M1 & M2 = OFF.
Input-1 is High and Input-2 is Low: Motor M1 = Forward Direction.
Input-1 is Low and Input-2 is High: Motor M1 = Backward Direction.
Same Condition to M2.

Single DC motor Control circuit



Circuit Diagram



Program

```
// speed_direction_control_DC-Motor
const int potPin = A0;
const int fwdbuttonPin = 13;
const int bckbuttonPin = 12;
const int ICpin2 = 11;
const int ICpin7 = 10;
int potValue = 0;
int motorValue = 0;
int fwdbuttonState = 0;
int bckbuttonState = 0;

void setup()
{
pinMode(fwdbuttonPin, INPUT_PULLUP);
pinMode(bckbuttonPin,INPUT_PULLUP);
pinMode(ICpin2, OUTPUT);
pinMode(ICpin7, OUTPUT);
}
```

```
void loop()
{
potValue = analogRead(potPin);
motorValue = map(potValue, 0, 1023, 0, 255);
fwdbuttonState = digitalRead(fwdbuttonPin);
bckbuttonState = digitalRead(bckbuttonPin);
delay (500);
if(fwdbuttonState == LOW || bckbuttonState == LOW)
{
analogWrite(fwdbuttonState == LOW ? ICpin2 : ICpin7, motorValue);
digitalWrite(fwdbuttonState == LOW ? ICpin7 : ICpin2, LOW);
}
else
{
digitalWrite(ICpin2, LOW);
digitalWrite(ICpin7, LOW);
}
}
```

Circuit Diagram