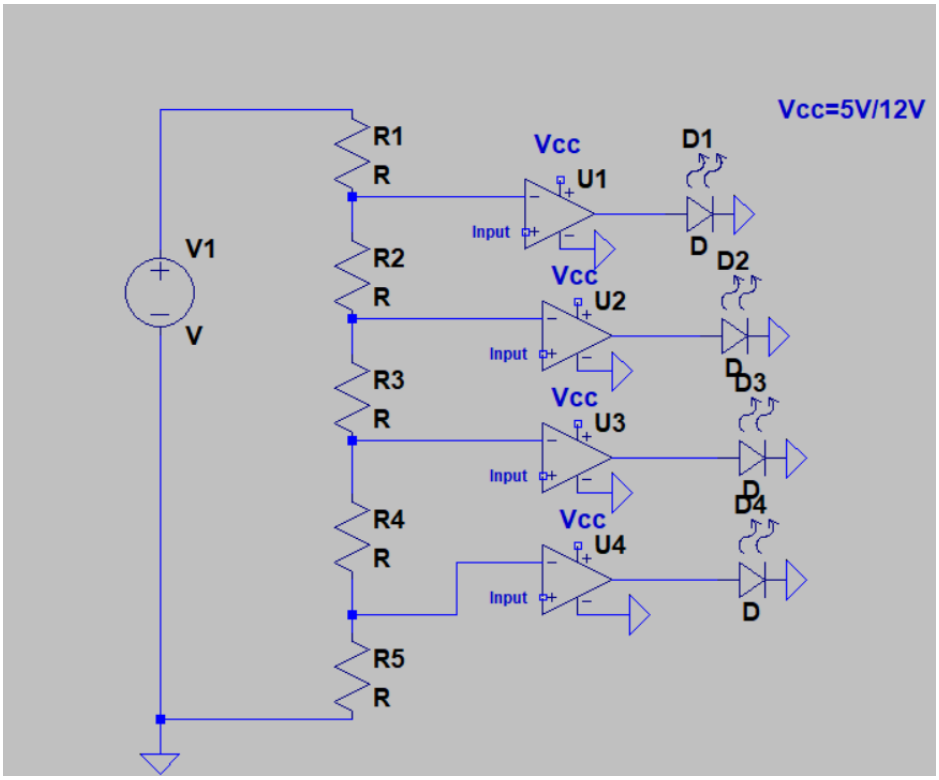
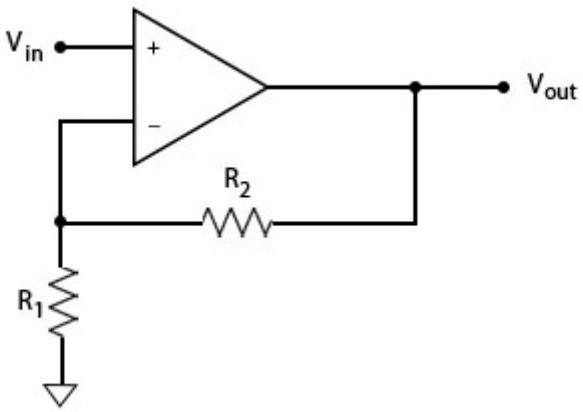
Circuit Schematics:

Comparator circuit:



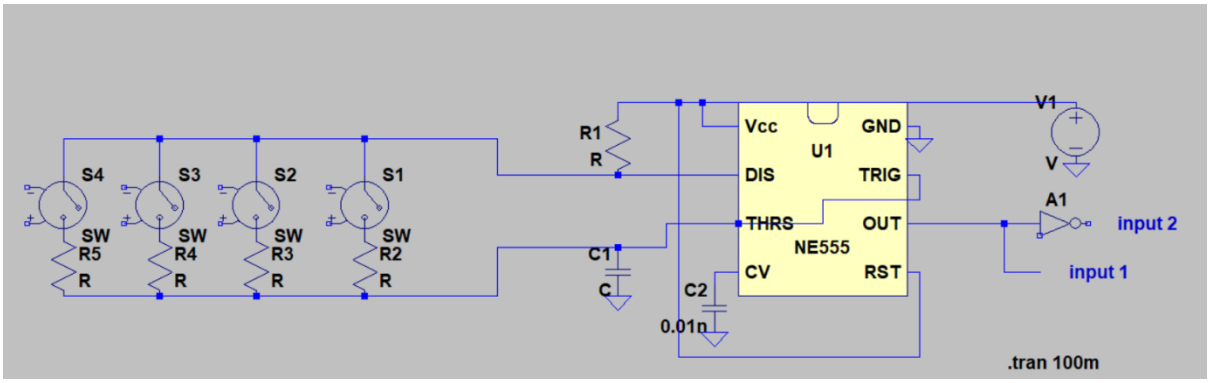
Input from the rain sensor goes through the comparator and gives the output signal to leds. The output signal from here are input signals to enable, input 1 and input 2 circuits. Speedometer also uses the circuit from the input from enable or motor voltage circuit.

Non-Inverting Amplifier:



For more ease to compare voltages we use the non inverting amplifier to amplify the input signal from rain sensor to comparator circuit. And we also use the amplifier for amplifying the output signal from comparator circuit to Motor Voltage circuit.

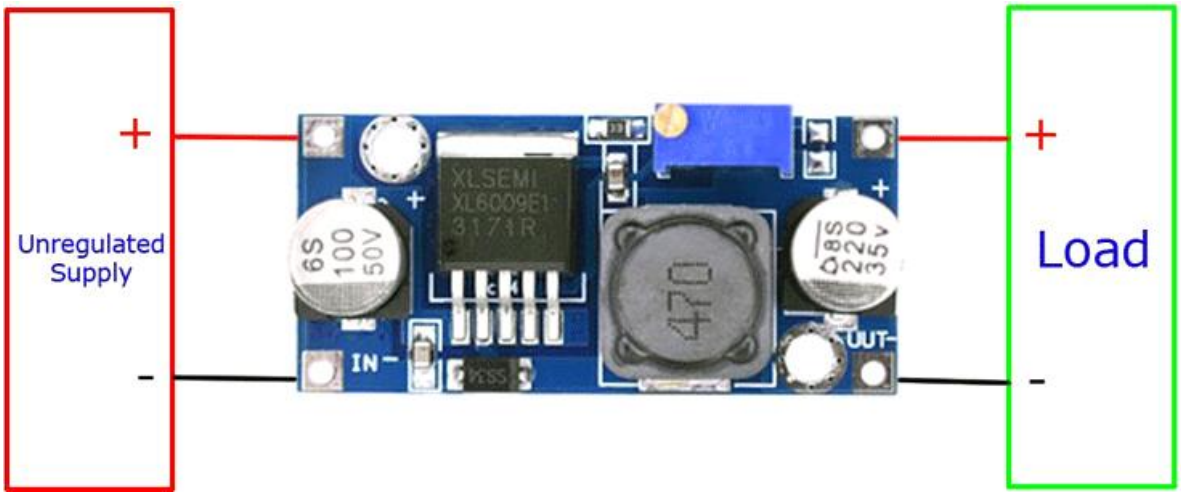
Input 1,2 circuit:



Above is Input circuit made using NE555 and combination of input sinals from comparator circuit to set the frequency of rotation of motor.

Speed Control circuit:

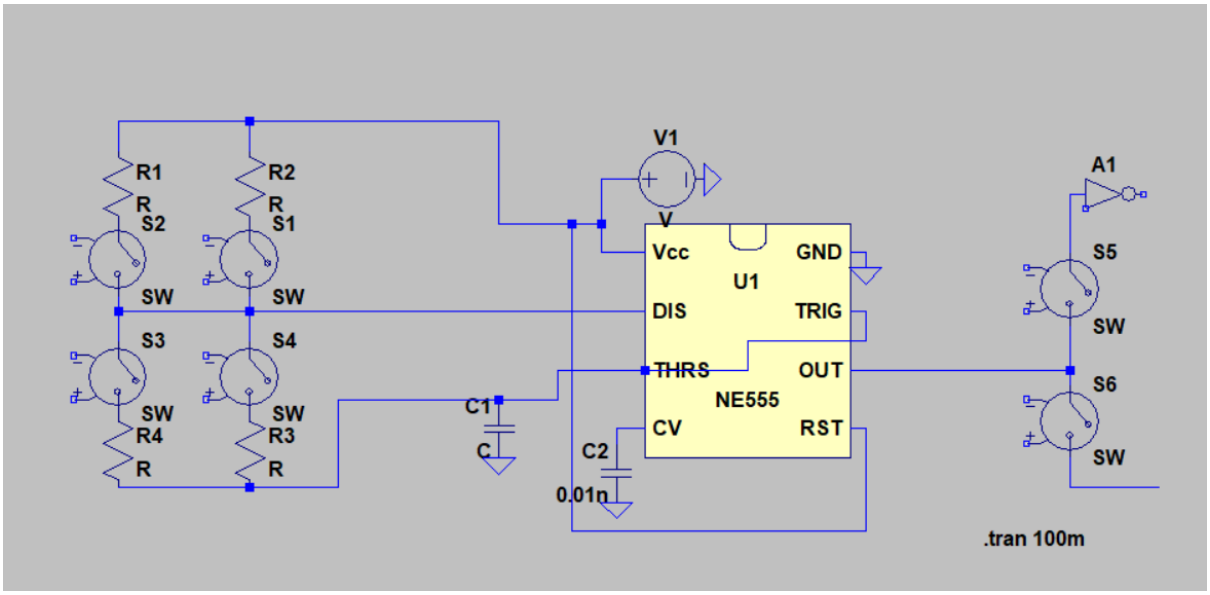
1)Motor Voltage circuit using Buck Converter:



In this circuit we supply a steady voltage of 5V for enable pin. We change the motor supply voltage using buck converter for voltages of 12V,9V,7V,5V which changes the speed of motor.

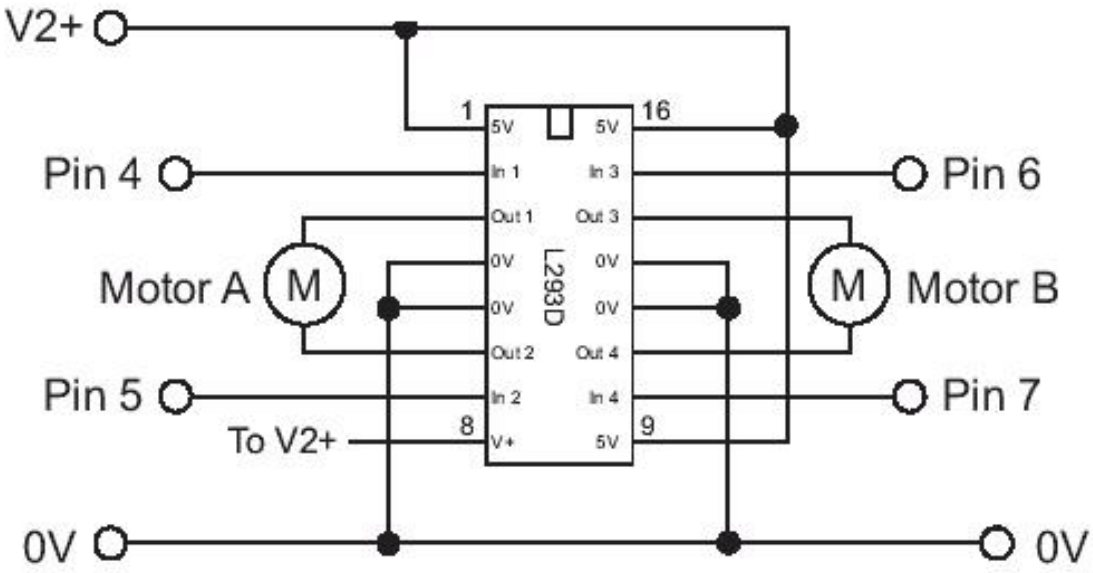
(OR)

2)Enable circuit made using NE555:



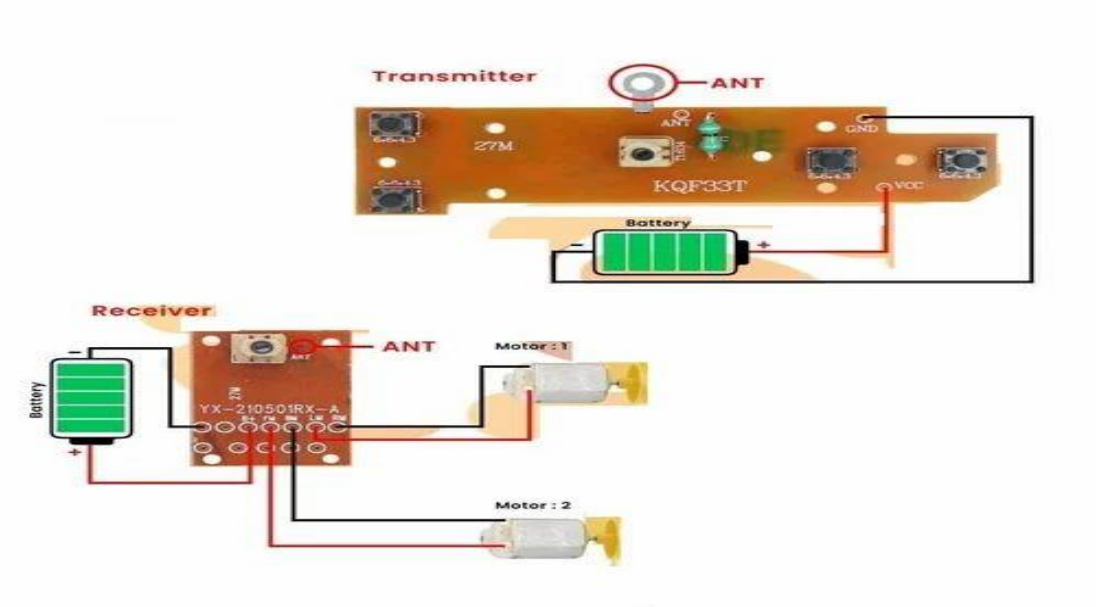
Above is the enable circuit made using NE555. The combination of input signals set the resistors and not gate for output. Here, it works on the principal of changing duty cycle for changing magnitude of voltage give to L293D for different speeds. Here we supply Motor Voltage a constant supply of 12V.

Motor Driver L293D:



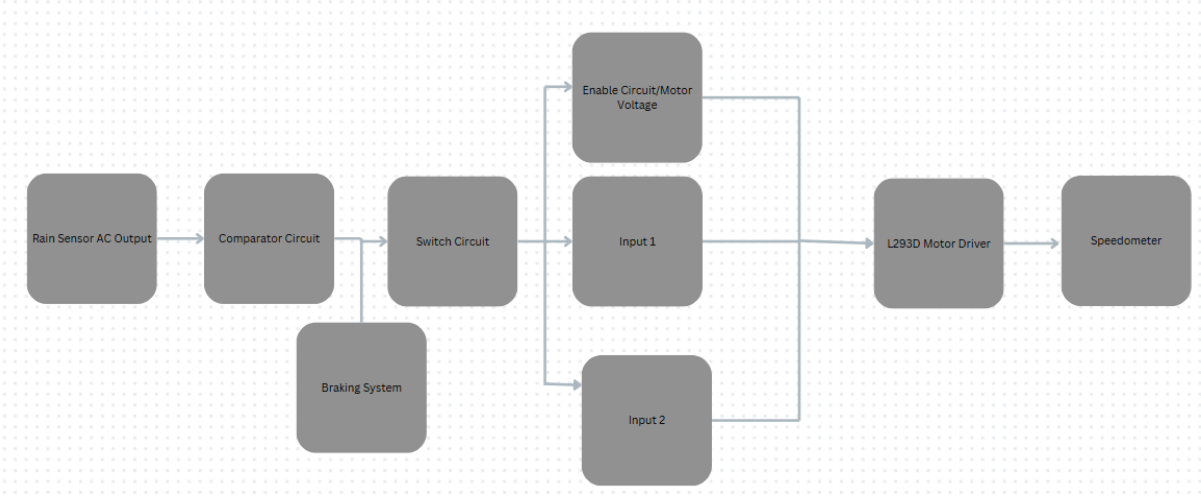
Here in pin 1 we give the enable circuit, input 1 in pin 4 and input 2 in pin 5,Motor voltage in pin 8. This motor driver uses H-bridge principles for changing the direction of motor using input 1 and 2 signals.

Wireless Braking System:



We are using 4ch Remote control Transmitter Receiver for the wireless braking system by connecting one of the receiver wires to the rain sensor comparator circuit's component by an or gate.

Block Diagram:



Arduino Code for SpeedoMeter:

```
#include <Servo.h>


// Define LED pins
const int led1 = A0; // LED 1 connected to pin A0
const int led2 = A1; // LED 2 connected to pin A1
```

```
const int led3 = A2; // LED 3 connected to pin A2
const int led4 = A3; // LED 4 connected to pin A3

// Define servo pin
const int servoPin = 9;

// Create a servo object
Servo myServo;

// Define angles corresponding to LEDs
const int angle1 = 30;  // Angle for LED 1
const int angle2 = 60;  // Angle for LED 2
const int angle3 = 120; // Angle for LED 3
const int angle4 = 150; // Angle for LED 4

void initializePins() {
  // Attach the servo to the pin
  myServo.attach(servoPin);

  // Set the servo to the initial position (0 degrees)
  myServo.write(0);

  // Start serial communication
  Serial.begin(9600);
}

int getAverageAnalogRead(int pin) {
  long sum = 0;
```

```
  for (int i = 0; i < 10; i++) {
    sum += analogRead(pin);
    delay(10); // Small delay between readings
  }
  return sum / 10; // Return the average
}

int getGlowingLedAngle() {
  // Debug code
  Serial.print("LED4: ");
  Serial.println(getAverageAnalogRead(led4));
  Serial.print("LED3: ");
  Serial.println(getAverageAnalogRead(led3));

  // Check LEDs in priority order (LED4 -> LED1)
  if (getAverageAnalogRead(led4) >= 200) {
    return angle4;
  } else if (getAverageAnalogRead(led3) >= 200) {
    return angle3;
  } else if (getAverageAnalogRead(led2) >= 200) {
    return angle2;
  } else if (getAverageAnalogRead(led1) >= 200) {
    return angle1;
  } else {
    return 0; // Default angle if no LED is glowing
  }
}
```

```
void moveServoToAngle(int angle) {
  // Move the servo to the specified angle
  Serial.print("Moving servo to angle: ");
  Serial.println(angle);
  myServo.write(angle);
  delay(50); // Stabilize the servo movement
}

void setup() {
  initializePins();
}

void loop() {
  int targetAngle = getGlowingLedAngle(); // Get the target angle based on the LED intensity
  moveServoToAngle(targetAngle); // Move the servo to the calculated angle
}
```

Components Used:

- LM339
- LM358
- UA741
- AND Gate
- NOT Gate
- OR Gate
- LED
- NE555
- L293D
- DC Motor
- IC4066
- Buck Converter
- Resistors
- Capacitors
- Bread Board

- Arduino
- Connecting Wires
- Transistors(NPN & PNP)
- 4ch Remote Control Transmitter Receiver