Hope Foundation's
Finolex Academy of Management & Technology, Ratnagiri
Department of MCA
MCALE232 Internet of Things Lab

Practical 10

Aim: - To interface **DC Motor** with Arduino.

Components Required :

Arduino Board, Bread Board, DC Motor, Resistors, Connecting wires, Transistor

Theory:

The DC motor is considered as the simplest motor, which has various applications ranging from households to industries. Example includes an **electric window in cars, electric vehicles, elevators, etc.**

Working of DC Motor

The DC motor consists of a **stator, rotor, armature, and a commutator**. The commutator comes with brushes. There are two stationary magnets in the stator that are responsible for producing the magnetic field.

The armature present in the DC motor carries the alternating current. Electrical energy is converted into mechanical energy in the form of torque by the armature. It further transfers this mechanical energy via shaft.

The commutator is defined as the electrical switch. It can also reverse the direction of the current between the external circuit and the motor. The brushes act as an intermediate between the external power supply and the rotating coils.

The iron core at the center is wrapped with insulated wires concentrating on the magnetic field when current passes through the wires. The windings of insulated wire have many turns around the core of the motor.

The wire ends are connected to the commutator. The commutator further energizes the armature coils and connects the power supply and the rotating coils through brushes.

The advantages of using DC motors are listed below:

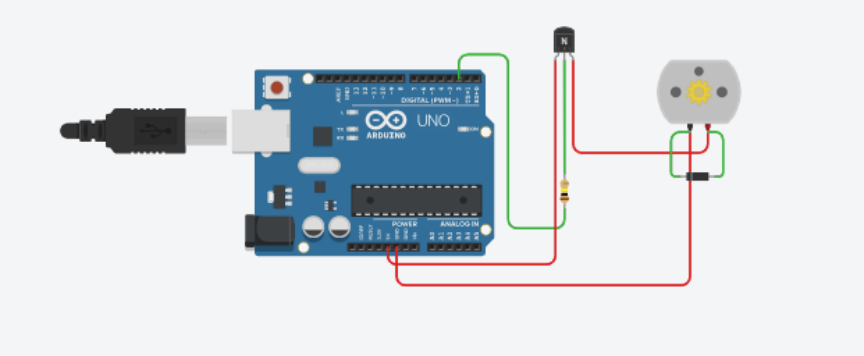
- Low cost
- Easy motor speed control
- High reliability
- Minimal Maintenance
- High starting torque
- Quick starting
- Variable speeds
- Harmonics free

Implementation :

The steps to set up the connection are listed below:

- Connect one end of the resistor to pin 10 (PWM) of the Arduino board.
- Connect the other end of the resistor to the middle pin of the transistor.
- Connect one end terminal of the transistor to the GND pin of the Arduino and another end terminal to the diode.
- Connect the band facing terminal of the diode to the 5V pin of the Arduino board.
- Connect one end terminal of the DC motor to band facing terminal of the diode.
- Connect another end terminal of the DC motor to the other end of the diode.

Circuit Diagram :

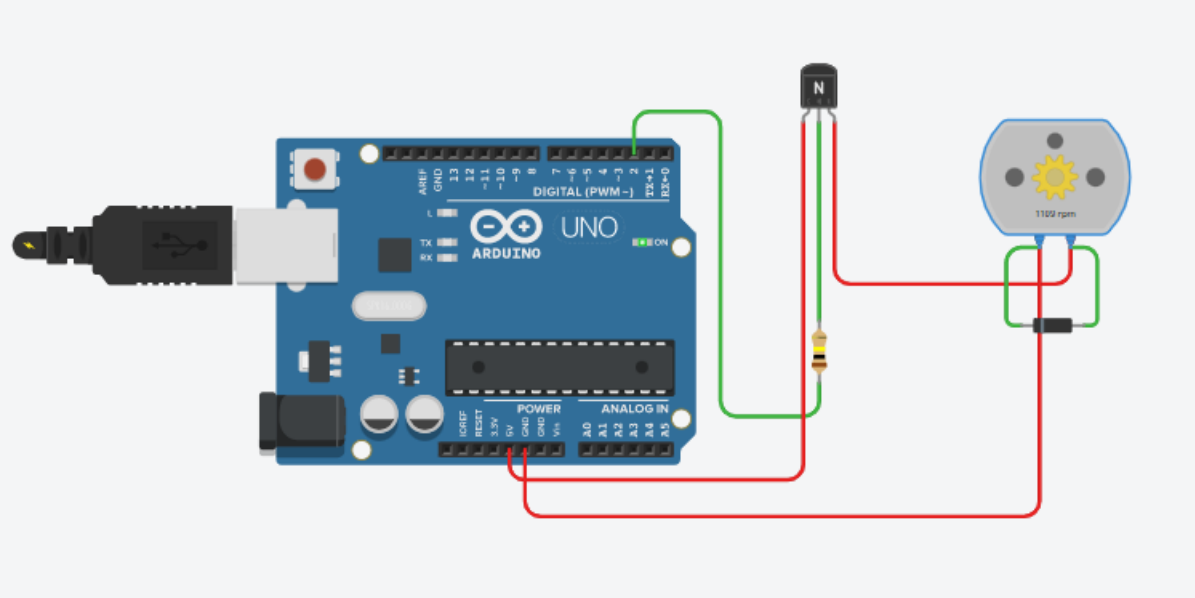


Code:

```
// C++ code
//
void setup()
{
  pinMode(2, OUTPUT);
}

void loop()
{
  digitalWrite(2, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

Output:



Conclusion: Thus we studied the interfacing of Light Dependent resistor and how the resistance changes depending on the light.