

My Name

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SUBJECT / ARDUINO

My dear doctors :

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Arduino project

the project:-

1. We have a temp sensor that measures the temperature based on it and controls the speed of the motor so that

The temperature is less than 20 >> The motor is parked

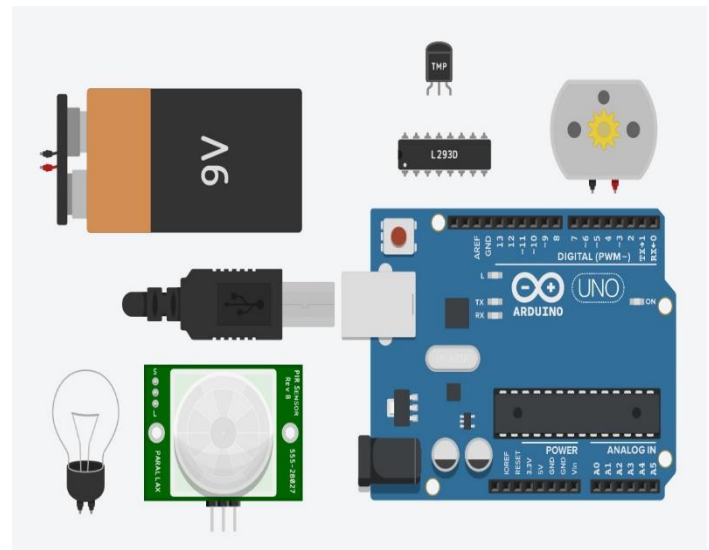
temperature 20 >> motor winding by 50%

The temperature is between 20 and 40 >> the motor will rotate at a speed proportional to the degree

The temperature is greater than 40 >> The motor will rotate at the highest possible speed
2. In addition to the PIR sensor, when there is movement, it will turn on the bulb, and otherwise it will turn it off

Project tools:-

1. battery
2. Arduino
3. L293D
4. Temperature sensor
5. DC Motor
6. PIR Sensor
7. Bulb



The benefit of each tool

1. **Battery:**

- a. The energy store is what gives us energy

2. **Arduino:**

- a. it is microcontroller which we can install my code on it to control any device connected with it by signals which it send

3. **L293D:**

- a. The advantage of the L293D is it will be much easier to hook up. The advantage of a discrete solution is you can configure it to handle just about any amount of power you need.
- b. It considers that it connect the battery with devices which connected with it when Arduino send signal. so mean the devices turn on when Arduino ask

4. **Temperature sensor:**

- a. It measures temperatures by sending specific volts in range 20 to 358. each volt represents a specific temperature

5. **DC Motor:**

- a. it convert the energy from electric energy to kinetic energy.
- b. The direction of movement is determined by the terminals. If we connect the positive terminal of the motor to the positive source terminal and the negative terminal of the motor to the negative source terminal, then the direction of movement is in the direction of the clock movement, and if we connect the positive terminal of the motor to the negative source terminal and the negative terminal of the motor to the positive source terminal, it rotates the opposite.

6. **PIR Sensor:**

- a. it is sensor used for know there is movement in where or not.
- b. it send signal if there is movement and otherwise it not send

7. **Bulb:**

- a. It converts energy from electrical energy to light energy

The tools terminals:

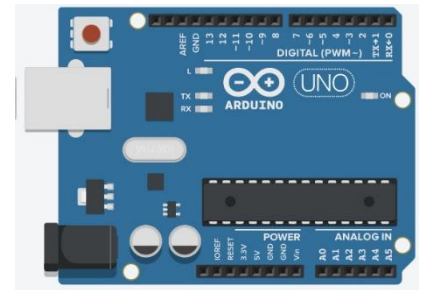
1. Battery:

- a. Positive terminal
- b. Negative terminal



2. Arduino:

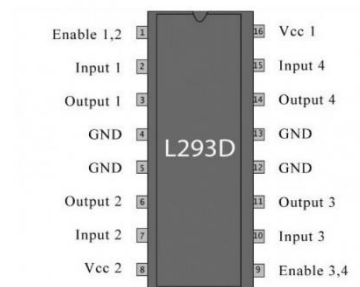
- a. ANALOG PINS
- b. DIGITAL PINS
- c. POWER PINS



3. L293D:

a. *On each side*

- i. Two ground pins : connected with battery ground
- ii. Two output pins : connected with device terminals
- iii. Two input pins : connected with arduino
- iv. One VCC : connected with power(battery)
- v. One Enable : connected with power(battery)



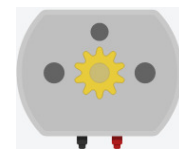
4. Temperature sensor:

- a. vout
- b. power
- c. ground



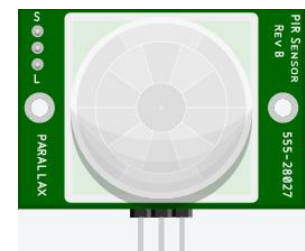
5. DC Motor:

- a. Positive terminal
- b. Negative terminal



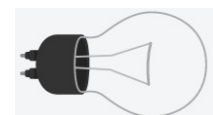
6. PIR Sensor:

- a. signal
- b. power
- c. ground



7. Bulb:

- a. Two Terminals



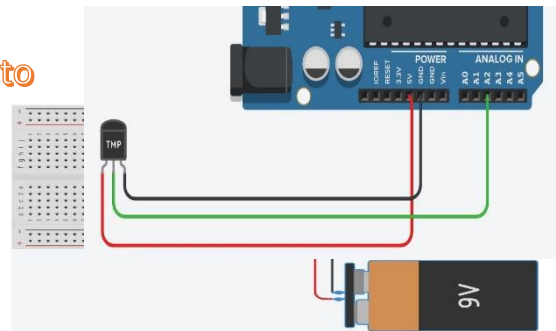
connection method:

1. Connect L293D with battery:

- Positive battery terminal → Each VCC and power terminal in L293D : to give L293D energy
- Negative battery terminal → Each GND terminal in L293D

2. Connect Temperature sensor with arduino:

- Sensor power terminal → 5V pin in arduino : to take energy from Arduino to turn on a sensor
- Sensor GND terminal → GND in arduino
- Sensor VOUT termina → pin A2 in analog part in Arduino : to send a signal to Arduino

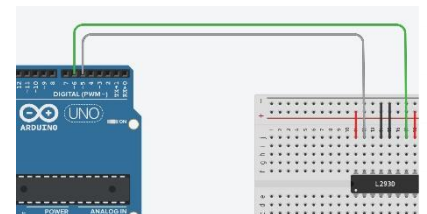


3. Connect Arduino with DC motor by L293D:

- First we need to connect Arduino with L293D then connect L293D with motor because we mustn't connect Arduino with motor direct because the motor need more than 5volt.

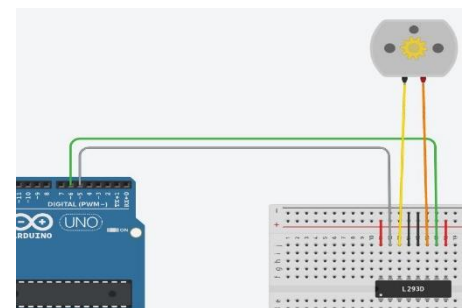
i. Connect Arduino with L293D :

- Connect pins number 5 → input 3 in L293D : so that Arduino can send signal.
- Connect pins number 6 → input 4 in L293D : so that Arduino can send signal.



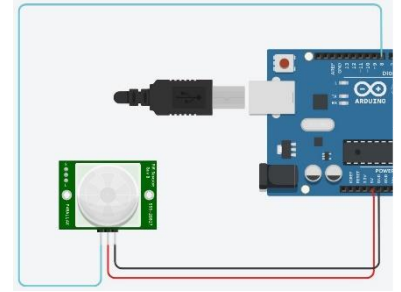
ii. Connect L293D with motor:

- Connect output 3 in L293D → motor terminal
- Connect output 4 in L293D → the other motor terminal



4. Connect PIR with Arduino:

- a. Signal terminal of PIR → PIN number 8 in Arduino : to send the signal to Arduino so that Arduino can access and understand it
- b. Power terminal of PIR → 5V PIN in Arduino : to get energy
- c. ground terminal of PIR → GND PIN in Arduino

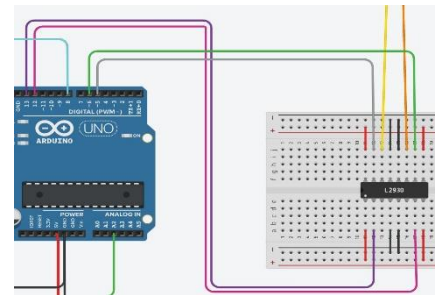


5. Connect Arduino with Bulb by L293D:

- a. First we need to connect Arduino with L293D then connect L293D with Bulb because we mustn't connect Arduino with Bulb direct because the Bulb need more than 5volt.

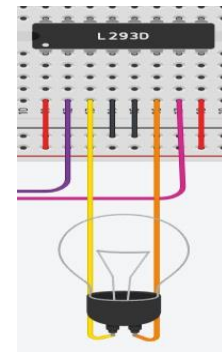
- i. Connect Arduino with L293D :

- 1) Connect pins number 12 → input 1 in L293D : so that Arduino can send signal.
- 2) Connect pins number 13 → input 2 in L293D : so that Arduino can send signal.



- ii. Connect L293D with Bulb:

- 1) Connect output 1 in L293D → Bulb terminal
- 2) Connect output 2 in L293D → the other Bulb terminal



The code:

1. First we will define the pins and the variables which we use it:

<code>int TemIN = A2;</code>	(it is pin in which temperature sensor connected with it)
<code>int motorOut1 = 6;</code>	(its are the pins which connected with L293D which
<code>int motorOut2 = 5;</code>	by it the motor work)
<code>int pirPin = 8;</code>	(it is pin in which PIR sensor connected with it)
<code>int ledPin1 = 12;</code>	(it is pin in which the terminal1 bulb connected with it)
<code>int ledPin2 = 13;</code>	(it is pin in which the terminal2 bulb connected with it)
<code>int sensorInput;</code>	(it is variable we will use it)
<code>int temp;</code>	(it is variable we will use it)
<code>int dc;</code>	(it is variable we will use it)
<code>int pirsensor;</code>	(it is variable we will use it)

2. Second is setup() function:

```
void setup()
{
  pinMode(TemIN, INPUT);
  pinMode(motorOut1,OUTPUT);
  pinMode(motorOut2,OUTPUT);
  pinMode(pirPin, INPUT);
  pinMode(ledPin1, OUTPUT);
  pinMode(ledPin2, OUTPUT);
}
```

this function that you want to run one time as soon as the program starts running. You set things like pinMode in this section to define the function with each pin.

3. third is loop() function:

This is the function you always want to run as long as the program is running.

```
void loop()
{

sensorInput = analogRead(TemIN);
temp = map(sensorInput,20,358,-40,125);

if(temp<20) {
    digitalWrite(motorOut1,LOW);
    digitalWrite(motorOut2,LOW);
}

else if(temp == 20) {
    analogWrite(motorOut1,127.5);
    digitalWrite(motorOut2,LOW);
}

else if(temp>20&&temp<40) {
    dc = map(temp,-40,125,0,255);
    analogWrite(motorOut1,dc);
    digitalWrite(motorOut2,LOW);
}

else if(temp>40) {
    analogWrite(motorOut1,255);
    digitalWrite(motorOut2,LOW);
}

pirsensor = digitalRead(pirPin);
if (pirsensor == 1) {
    digitalWrite(ledPin1, HIGH);
    digitalWrite(ledPin2, LOW);
}

else {
    digitalWrite(ledPin1, LOW);
    digitalWrite(ledPin2, LOW);
}

}
```

Here we will use sensorInput variable to read and store the volts of temperature sensor (20:358) And we use this volts to enter it in map function to get specific values of temperature from -40 to 125

Here we will write our cases :

If The temperature is less than 20 >> The motor is parked

temperature 20 >> motor winding by 50%

The temperature is between 20 and 40 >> the motor will rotate at a speed proportional to the degree

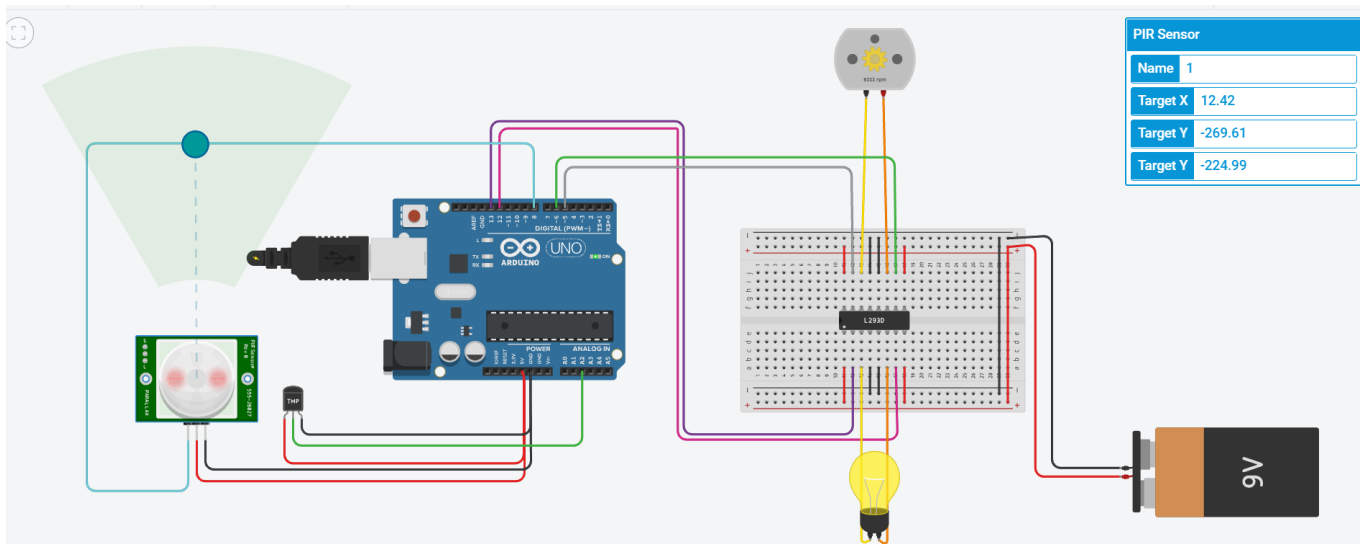
The temperature is greater than 40 >> The motor will rotate at the highest possible speed

Here we will use prisensor variable to read and store the signal of PIR sensor

So if this variable equal 1 ,it means that there is movement so we will send HIGH signal to ledpin1 and send LOW signal to ledpin2 to turn on the bulb.

otherwise we will send LOW signal to ledpin1 and ledpin2 to turn off the bulb

After running the project:



the project link:

https://www.tinkercad.com/things/hdpAJJphayi-glorious-juttuli/editel?sharecode=Ze2pZ_xJrZXEnnNsJramijLmLbVSmo4pK0kvh96hh-c