

Experiment – 4 : Programming with Arduino platform and Reading from Sensors

Aim To create a Programming with Arduino platform and Reading from Sensors and create a different application using

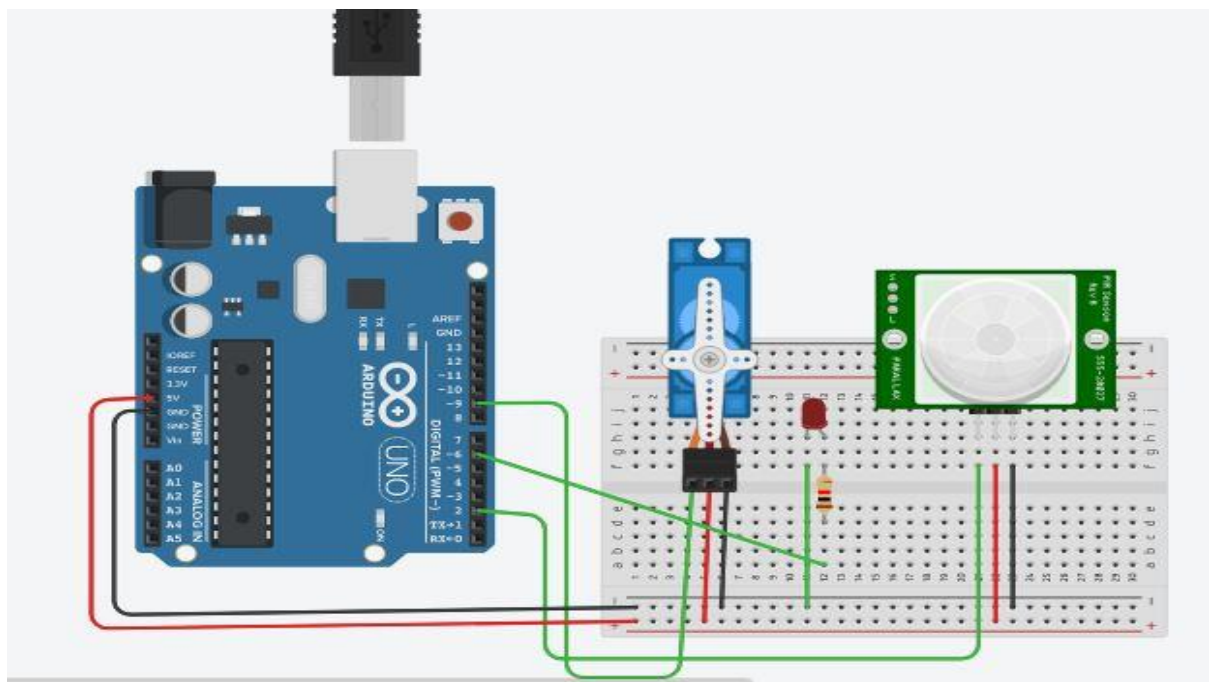
- a. IR Sensor - Actuator
- b. Temperature Sensor - Actuator
- c. Soil moisture Sensor - DC Motor
- d. Ultrasonic Sensor – Actuator

a. Programming with Arduino platform and Reading IR Sensor – and perform the Actuator operation

Apparatus Required :

- 1. Arduino Uno – IOT Kit
- 2. Bread Board
- 3. IR Sensor
- 4. Actuator

Circuit Connection :



Code :

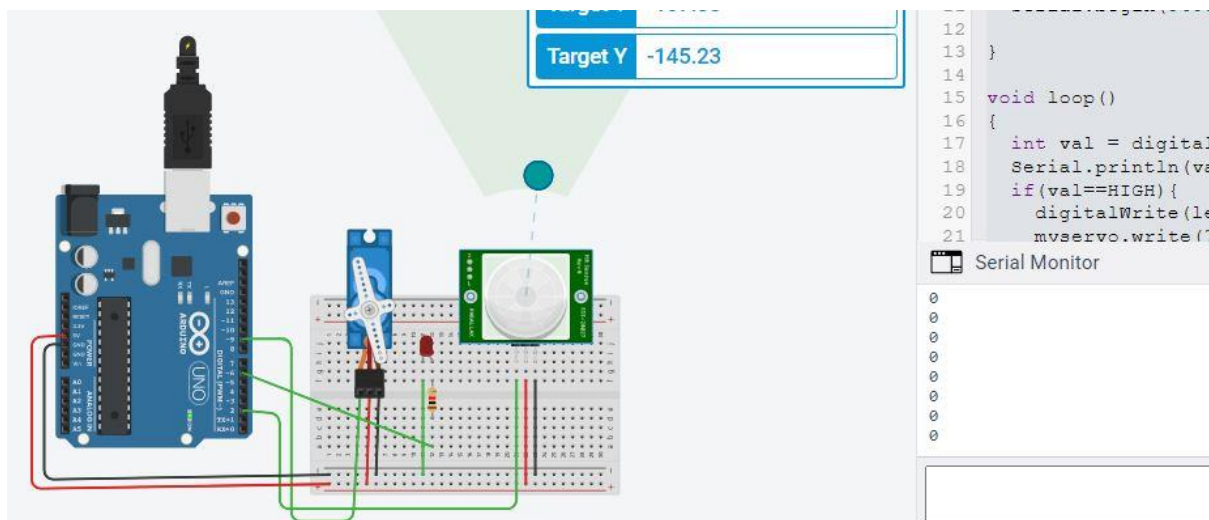
```
#include <Servo.h>
Servo myservo;
int led=6;
int pir=2;
void setup()
{
```

```

pinMode(pir,INPUT);
pinMode(led,OUTPUT);
myservo.attach(9);
Serial.begin(9600);
}
void loop()
{
  int val = digitalRead(pir);
  Serial.println(val);
  if(val==HIGH){
    digitalWrite(led,HIGH);
    myservo.write(70);
  }
  else{
    digitalWrite(led,LOW);
    myservo.write(10);
  }
  delay(10);
}

```

OutPut : Depending upon the Distance detected by IR Sensor the actuator will Rotate to open or close the Door .

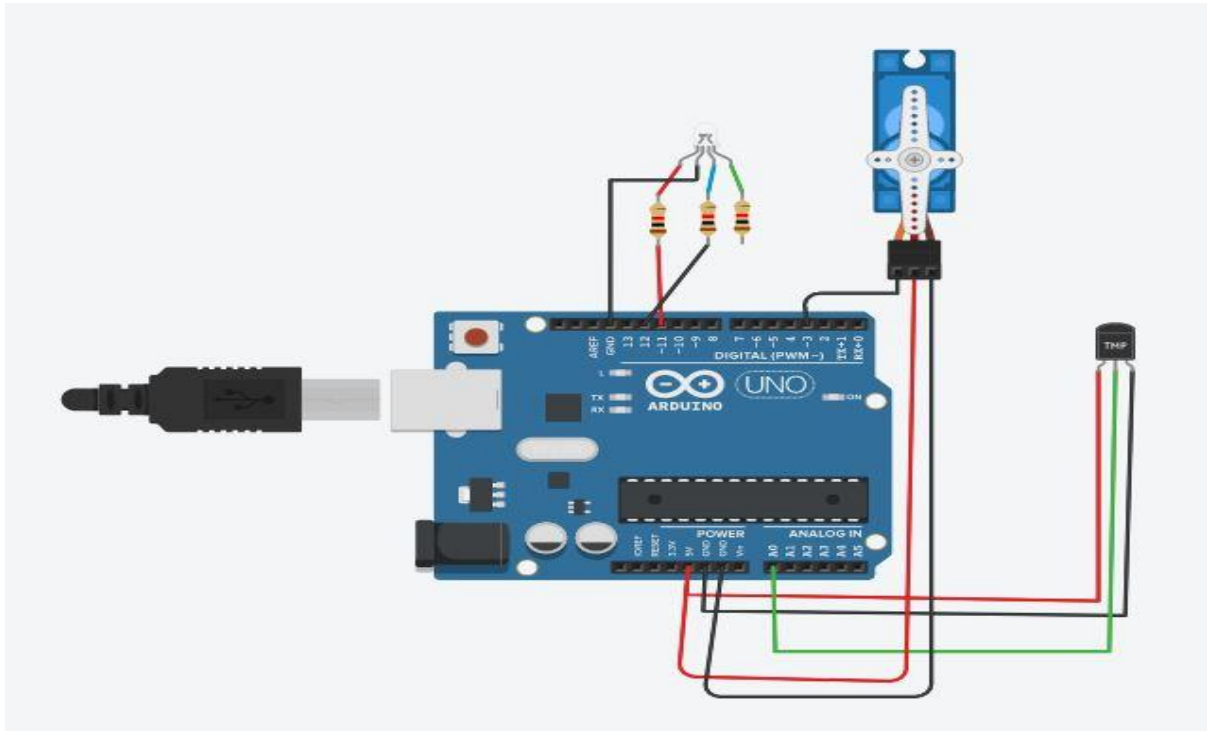


b. Programming with Arduino platform and Reading Temperature Sensor – and perform the Actuator operation

Apparatus Required :

1. Arduino Uno – IOT Kit
2. Bread Board
3. Temperature Sensor
4. Actuator

Circuit Connection :



Code :

```
#include <Servo.h>                                // Servo library
Servo myservo;                                     // to control the servo motor
int pos = 0;
void setup() {
  Serial.begin(9600);
  pinMode(12, OUTPUT); pinMode(11, OUTPUT);
  myservo.attach(3);                               // servo on pin 3
}

void loop() {
  float value = analogRead(A0);
  float tempr = (value * 500) / 1024;              // calc of temperature in celcius
  Serial.print("Temperature: ");
  Serial.print(tempr);
  Serial.print("*C");
  Serial.println();                                // it'll show in the serial monitor

  if (tempr <= 40){                                // less than 40
    digitalWrite(12, LOW);
    digitalWrite(11, HIGH);
    myservo.detach();                              // stops the servo motor
  }
  else if (tempr >= 40){                            // greater than 40
```

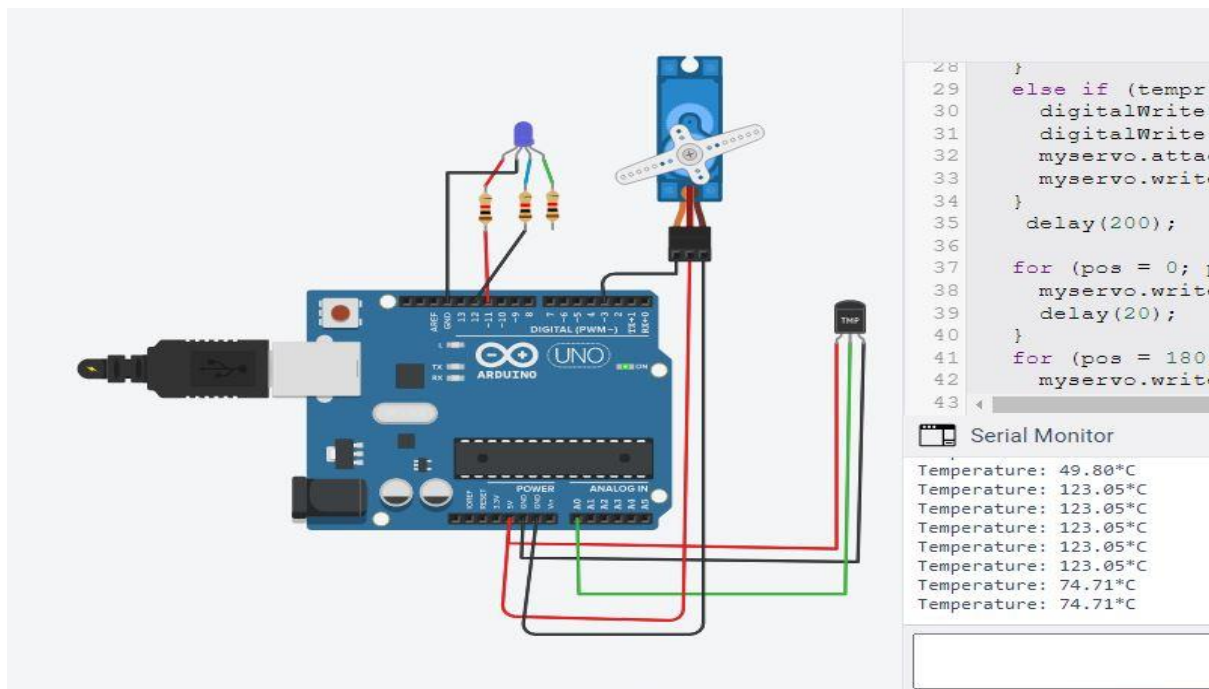
```

digitalWrite(12, HIGH);
digitalWrite(11, LOW);
myservo.attach(3);
myservo.write(pos);                                // position for the servo to turn
}
delay(200);

for (pos = 0; pos <= 180; pos += 1){                // go forward 180 degrees
  myservo.write(pos);
  delay(20);
}
for (pos = 180; pos <= 0; pos -= 1) {                // go backward 180 degrees
  myservo.write(pos);
  delay(20);
}
}

```

OutPut :



OutPut:

Depending upon the temperature the the actuator will turn to open or close the Window or Door.

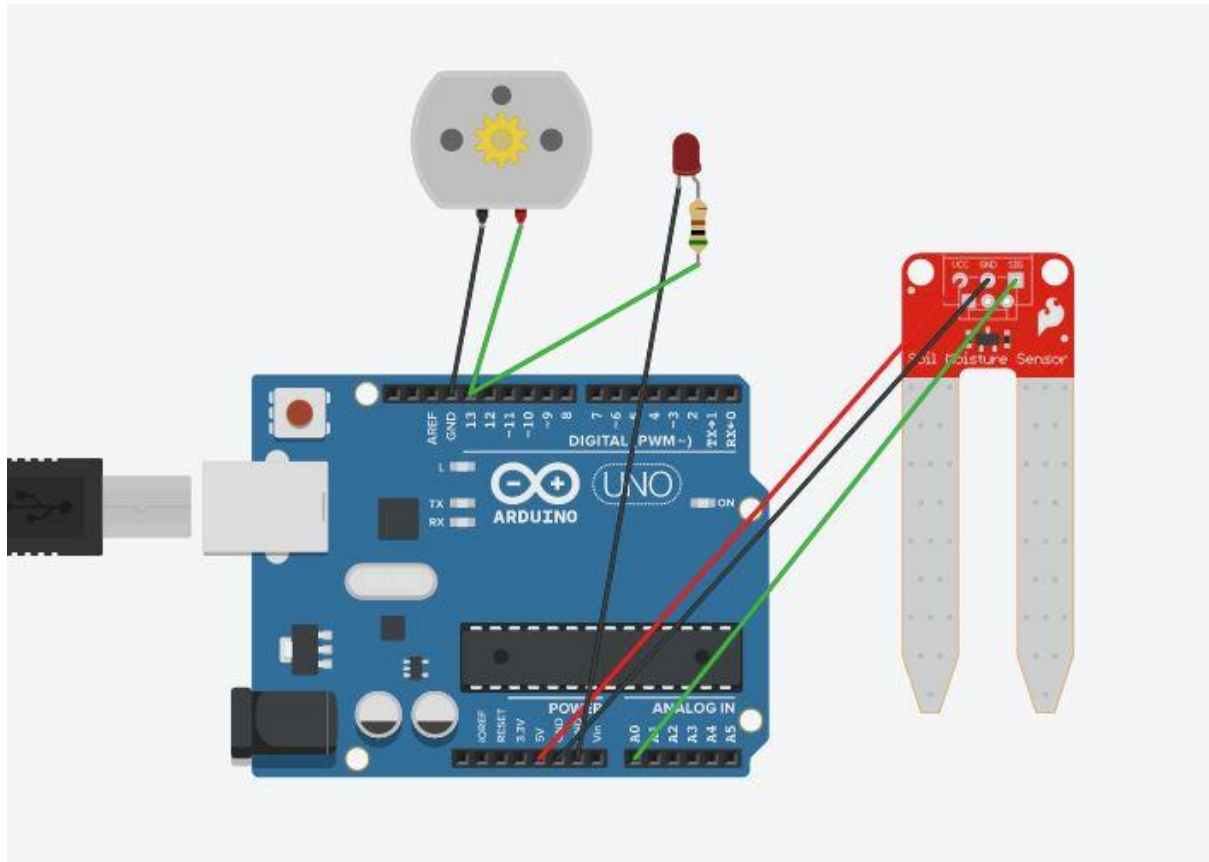
C. Programming with Arduino platform and Reading soil Moisture Sensor – and perform the DC operation

Apparatus Required :

1. Arduino Uno – IOT Kit
2. Bread Board
3. IR Sensor

4. Actuator

Circuit Connection :



Code :

```
int moisture;  
float percentage;  
void setup(){  
  pinMode(A0,INPUT);  
  pinMode(13,OUTPUT);  
  Serial.begin(9600);  
}  
void loop(){  
  moisture=analogRead(A0);  
  percentage=(moisture/539.00)*100;  
  if(percentage>25){  
    digitalWrite(13,HIGH);  
  }  
  else{  
    digitalWrite(13,LOW);  
  }  
  Serial.print(percentage);  
  Serial.print("\n");  
}
```

OutPut :

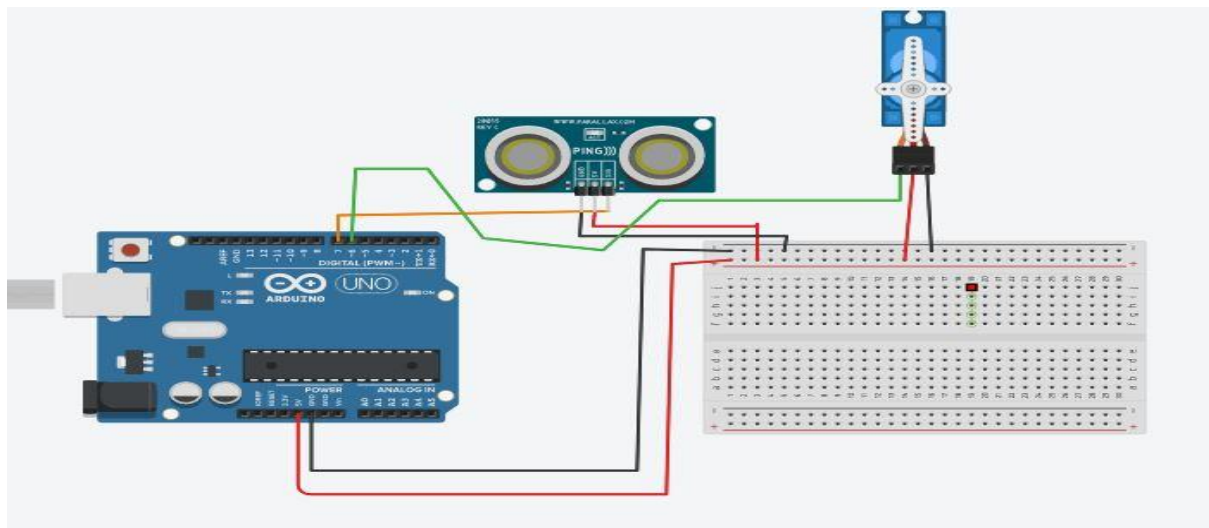
Depending upon the soil moisture the DC Motor will turn ON automatically

D. Programming with Arduino platform and Reading Ultrasonic Sensor – and perform the Actuator operation

Apparatus Required:

1. Arduino Uno – IOT Kit
2. Bread Board
3. Ultrasonic Sensor
4. Actuator

Circuit Connection:



Code:

```
#include <Servo.h>
int V_distance = 0;
Servo servo_6;
long readUltrasonicDistance(int triggerPin, int echoPin)
{
    pinMode(triggerPin, OUTPUT); // Clear the trigger
    digitalWrite(triggerPin, LOW);
    delayMicroseconds(2); // Sets the trigger pin to HIGH state for 10 microseconds
    digitalWrite(triggerPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(triggerPin, LOW);
    pinMode(echoPin, INPUT); // Reads the echo pin, and returns the sound wave travel time in
    microseconds
    return pulseIn(echoPin, HIGH);
}
void setup()
{
    servo_6.attach(6, 500, 2500);
```

```

}
void loop()
{
  servo_6.write(90);
  V_distance = 0.01723 * readUltrasonicDistance(7, 7);
  if (V_distance <= 20)
  {
    servo_6.write(180);
    delay(5000); // Wait for 5000 millisecond(s)
    servo_6.write(90);
  }
  servo_6.write(90);
}

```

OutPut : Programming with Arduino platform and Reading Ultrasonic Sensor – and perform the Actuator operation is successfully Executed

Result : Using Tinkercad website and Arduino platform successfully created different application using IR Sensor , Temperature Sensor , Soil moisture sensor ,and Ultra Sonic Sensor by reading from Sensors and with servo motor and DC Motor perform different application.