Program No:	**16**
Roll No :	**1554**
Title of Program :	**soil sensor to detect moisture level and start dc motor**
Objective :	**The code controls an LED indicator and a DC motor based on soil moisture levels read from a sensor, indicating dry, wet, or moderate conditions**

Theory:

What is a Soil Moisture Sensor?

Soil water content has important effects on many fundamental biophysical processes.

It influences seed germination, plant growth and nutrition, microbial degradation of soil organic matter, conversion of nutrients in the root zone, and water transfer at the land-air interface.

Quantification of soil water content is necessary for a variety of applications ranging from large-scale calibration of global climate models to field monitoring in agricultural and horticultural systems.

When we need to measure water content in the soil, the soil moisture sensor comes to mind.

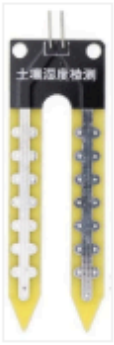
A soil moisture sensor is a type of sensor used to measure the volumetric water content of the soil.

Because, a direct gravimetric amount of soil moisture must be removed, dried and weighed.

These sensors do not directly measure volumetric water content using other soil laws such as permittivity, electrical resistivity, interaction with neutrons, and water content displacement.

The connection between estimated parameters and soil moisture has to be changed, and it can alter depending on environmental conditions such as temperature, soil type, and conductivity.

Reflected microwave radiation can be affected by soil moisture and is mainly used in remote sensing in agriculture and hydrology.



The main advantage of using soil moisture sensors to plan irrigation is more efficient water usage, thus reducing water consumption while allowing plant roots to grow deeper and avoiding over-watering or over-watering.

Nutrient leaching is avoided. Avoiding overwatering also eliminates favorable conditions for some pests and fungal diseases.

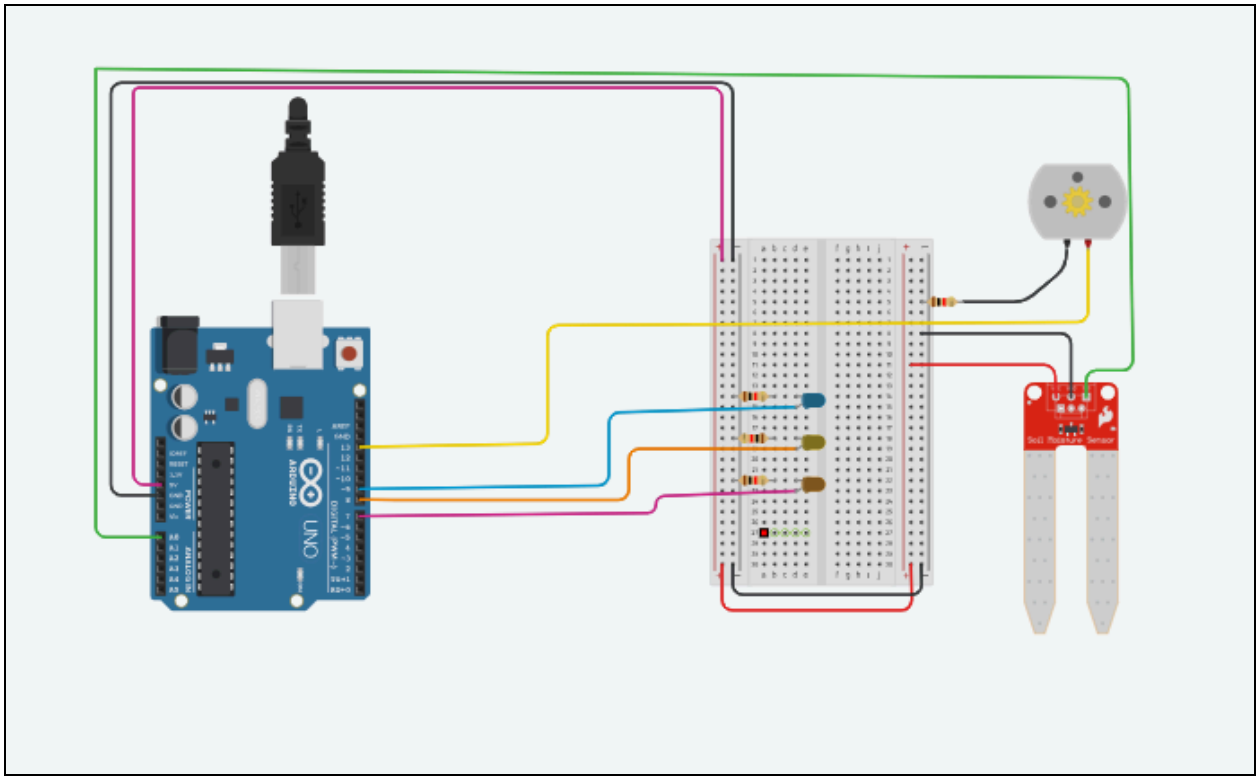
These statements are especially true for trees affected by citrus blight. This is because reduced root size and function can exacerbate the effects of drought.

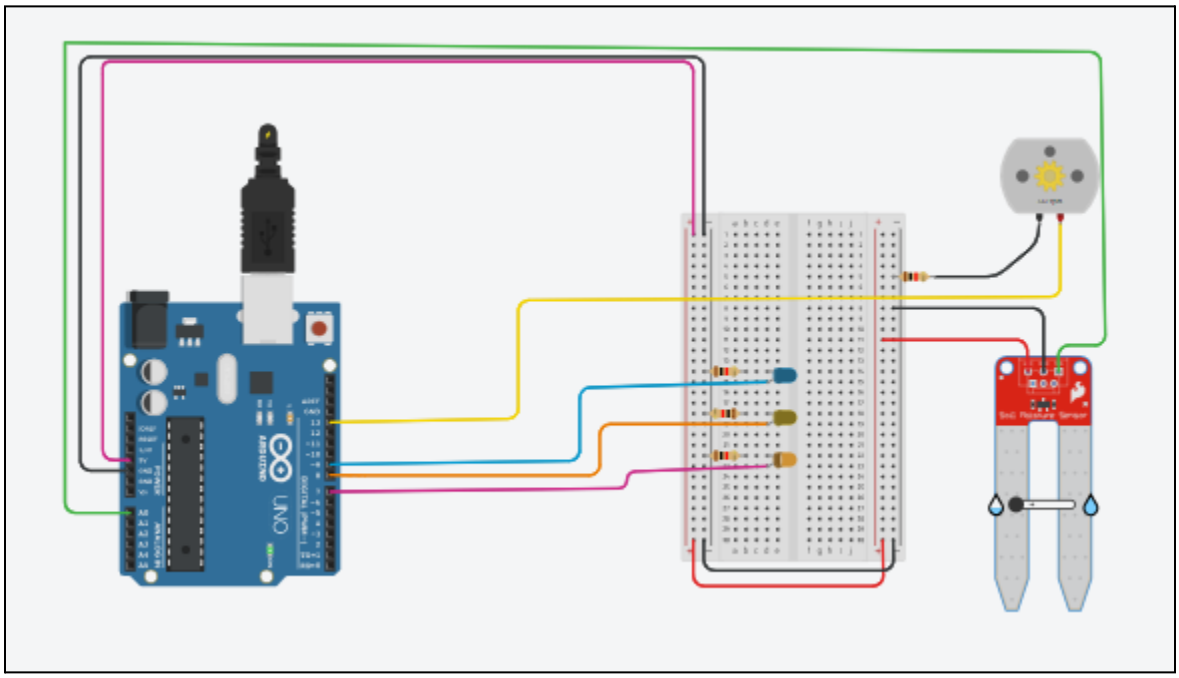
Source Code:

```
// declare variable for pins
const int sensorpin = A0;
const int blue = 9;
const int yellow = 8;
const int red = 7;
const int dcmotor = 13;

int sensor;
int wet = 800;
int dry = 500;

void setup()
{
  pinMode(red, OUTPUT);
  pinMode(yellow, OUTPUT);
  pinMode(blue, OUTPUT);
  pinMode(dcmotor, OUTPUT);
  pinMode(sensorpin, INPUT);
  Serial.begin(9600);
```

```
}

void loop()
{
  sensor = analogRead(sensorpin);
  Serial.println(sensor);

  if(sensor > wet) {
          digitalWrite(red, LOW);
    digitalWrite(yellow, LOW);
    digitalWrite(blue, HIGH);
    digitalWrite(dcmotor, LOW);
  }
  else if (sensor < dry) {
    digitalWrite(red, HIGH);
    digitalWrite(yellow, LOW);
    digitalWrite(blue, LOW);
    digitalWrite(dcmotor, HIGH);
  } else
  {
          digitalWrite(red, LOW);
    digitalWrite(yellow, HIGH);
    digitalWrite(blue, LOW);
    digitalWrite(dcmotor, LOW);
  }
  delay(1000);
}
```

OutPut:


ARDUINO
UNO
Soil Moisture Sensor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