SPRINT 1

TEAM ID	**PNT2022TMID15961**
PROJECT TITLE	**SMART FARMER – IOT ENABLED SMART FARMING APPLICATION**
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```
#include "DHT.h"
#define DHTPIN 2     // what digital pin we're connected to
#define DHTTYPE DHT22 // DHT 22 (AM2302), AM2321
DHT dht(DHTPIN, DHTTYPE);

const int SOIL_MOISTURE_SENSOR_PIN = A0;
const int WATER_PUMP_PIN = 4;

const int dry = 520;
const int wet = 270;
const int moistureLevels = (dry - wet) / 3;

// TODO: Should we have a counter so if it waters for X times, then take a
break?
// OPTIMIZE: how dry to start watering and for how long.
const int soilMoistureSartWatering = 400;
const int soilMoistureStopWatering = 300;
```

```
// 60 seconds
const long waterDuration = 1000L * 60L;
// 60 seconds
const long sensorReadIntervals = 1000L * 60L;
// 2 hr
const long waterIntervals = 1000L * 60L * 60L * 2;
long lastWaterTime = -waterIntervals - 1;
boolean isWatering = false;

void setup()
  { Serial.begin(9600);
  pinMode(WATER_PUMP_PIN, OUTPUT);
  waterPumpOff();
  dht.begin();
}

void loop()
  { mainLoop
  ();
}

void mainLoop() {
  float temperature = getTemperature();
  float humidity = getHumidity();
  long soilMoisture = analogRead(SOIL_MOISTURE_SENSOR_PIN);
  Serial.println("Soil Moisture: " + readableSoilMoisture(soilMoisture) + ", " +
soilMoisture);
  Serial.println("Temperature: " + String(temperature) + " *F");Serial.println("Humidity:
  " + String(humidity) + " %");
  if (millis() - lastWaterTime > waterIntervals)
    {waterPlants(soilMoisture);
    lastWaterTime = millis();
  }

  delay(sensorReadIntervals);
}

void waterPlants(int soilMoisture) {
    // Should this take a moving avg of the soilMoisture?
    // Can get outliers on the right after watering.
  if (soilMoisture > soilMoistureSartWatering)
  { isWatering = true;
  } else if (soilMoisture < soilMoistureStopWatering)
    {isWatering = false;
  }
  Serial.println(isWatering ? "Starting to water" : "Skipping water");

  if (isWatering) { waterPumpOn();
    delay(waterDuration);
    waterPumpOff();
    Serial.println("Done watering");
  }
}

String readableSoilMoisture(int
  soilMoisture){if (soilMoisture <= wet) {
  return "Water";
  } else if (soilMoisture > wet && soilMoisture < (wet + moistureLevels))
```

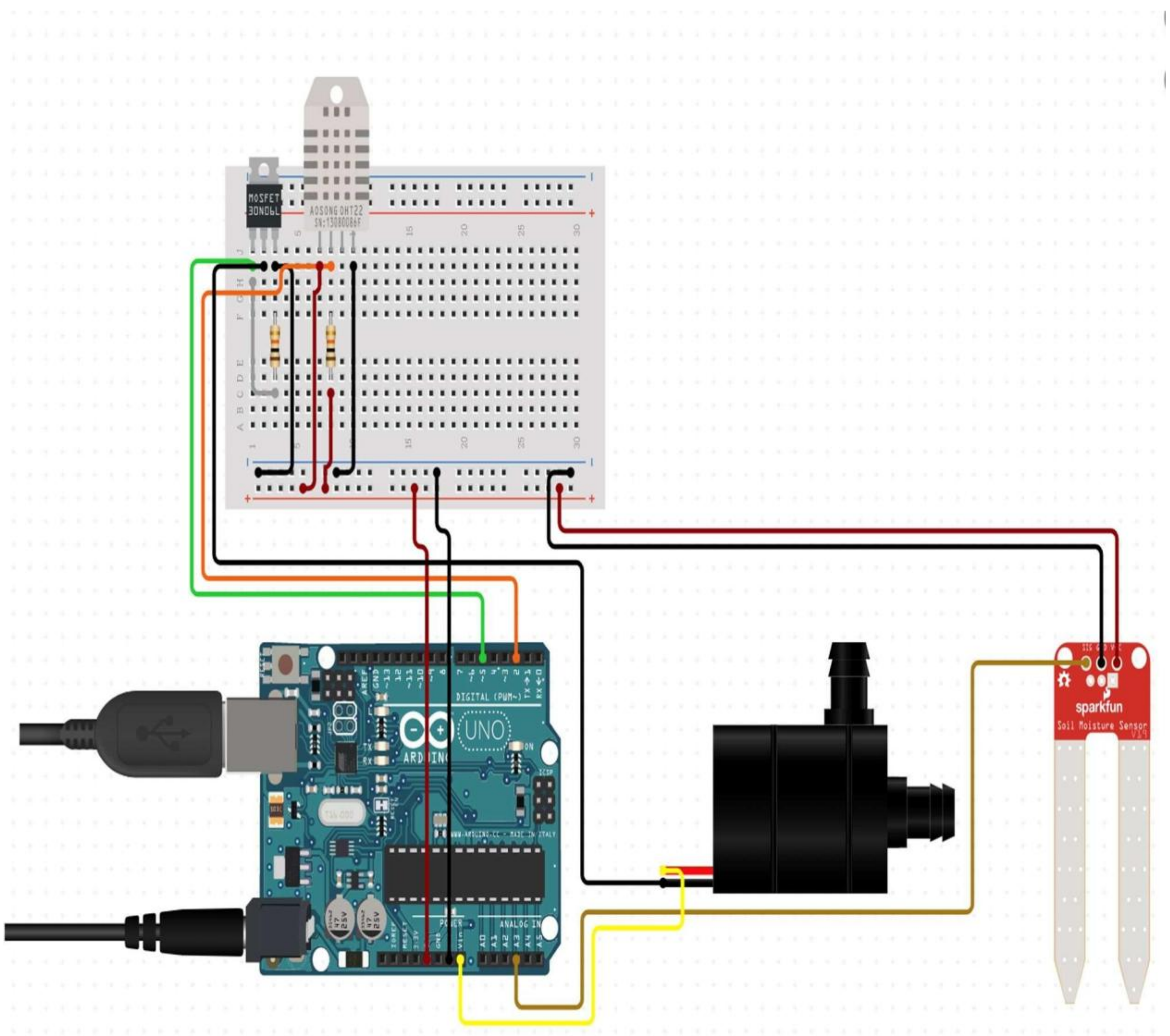
```
    {return "Very Wet";
  } else if (soilMoisture > (wet + moistureLevels) && soilMoisture < (dry -
moistureLevels)) {
     return "Wet";
  } else if (soilMoisture < dry && soilMoisture > (dry - moistureLevels))
    {return "Dry";
  } else
    { return
    "Air";
  }
}
float getTemperature() {
  // Read temperature as Fahrenheit (isFahrenheit = true)
  float temperature = dht.readTemperature(true);
  if (isnan(temperature)) {
    Serial.println("Failed to read from DHT sensor!");
  }
  return temperature;
}

float getHumidity() {
  float humidity = dht.readHumidity();
  if (isnan(humidity)) {
    Serial.println("Failed to read from DHT sensor!");
  }
  return humidity;
}

void waterPumpOn()
  { Serial.println("Water pump
  on");
  digitalWrite(WATER_PUMP_PIN, LOW);
}

void waterPumpOff()
  { Serial.println("Water pump
  off");
  digitalWrite(WATER_PUMP_PIN, HIGH);
}
```

OUTPUT :


MOSFET
AOSONG DHT22
DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN
sparkfun
Soil Moisture Sensor