#include <LiquidCrystal.h>  
  
  
LiquidCrystal lcd(12, 11, 10, 9, 8, 7);  
const int AirValue = 600;  
const int WaterValue = 310;  
const int ThresholdValue = 484;  
int soilMoistureValue = 0;  
const int RelayPin = 2;  
  
  
void setup()  
{  
  Serial.begin(9600);  
  lcd.begin(16, 2);  
  pinMode(RelayPin, OUTPUT);  
  digitalWrite(RelayPin, HIGH);  
}  
  
  
void loop()  
{  
  soilMoistureValue = analogRead(A0);  
  Serial.println(soilMoistureValue);  
  
  
  lcd.setCursor(0, 0);  
  lcd.print("Moisture: ");  
  float moisturePercentage = map(soilMoistureValue, AirValue, WaterValue, 0, 100);  
  lcd.print(moisturePercentage, 0);  
  lcd.print("%");  
  
  
  int upperLimit = ThresholdValue + 0.1 \* (AirValue - WaterValue);  
  int lowerLimit = ThresholdValue - 0.1 \* (AirValue - WaterValue);  
  
  
  if (moisturePercentage < 30.0)  
  {  
    digitalWrite(RelayPin, LOW);  
    lcd.setCursor(0, 1);  
    lcd.print("Pump: ON ");  
  }  
  else if (moisturePercentage > 70.0)  
  {  
    digitalWrite(RelayPin, HIGH);  
    lcd.setCursor(0, 1);  
    lcd.print("Pump: OFF");  
  }  
  else  
  {  
    lcd.setCursor(0, 1);  
    lcd.print("Pump: ");  
    if (digitalRead(RelayPin) == LOW)  
    {  
      lcd.print("ON");  
    }  
    else  
    {  
      lcd.print("OFF");  
    }  
  }  
  
  
  delay(250);  
  lcd.clear();  
}