

```
#include <Servo.h>
```

```
const int soilMoisturePin = A0;  
const int potentiometerPin = A1;  
const int pumpPin = 9;  
const int buzzerPin = 8;  
const int ledPin = 7;  
const int buttonPin = 2;  
Servo servoMotor;
```

```
int threshold = 300;  
int soilMoisture = 0;  
int potValue = 0;  
bool systemActive = true;
```

```
void setup() {  
  pinMode(soilMoisturePin, INPUT);  
  pinMode(potentiometerPin, INPUT);  
  pinMode(pumpPin, OUTPUT);  
  pinMode(buzzerPin, OUTPUT);  
  pinMode(ledPin, OUTPUT);  
  pinMode(buttonPin, INPUT_PULLUP);  
  servoMotor.attach(10);  
  
  servoMotor.write(0);  
  digitalWrite(pumpPin, LOW);  
  digitalWrite(buzzerPin, LOW);  
  digitalWrite(ledPin, LOW);  
}
```

```
void loop() {  
  if (systemActive) {  
    soilMoisture = analogRead(soilMoisturePin);  
    potValue = analogRead(potentiometerPin);
```

```
threshold = map(potValue, 0, 1023, 100, 700);

if (soilMoisture < threshold) {
  digitalWrite(pumpPin, HIGH);
  servoMotor.write(90);
  digitalWrite(buzzerPin, HIGH);
  digitalWrite(ledPin, HIGH);
  delay(100);
  digitalWrite(buzzerPin, LOW);
  digitalWrite(ledPin, LOW);
  delay(4900);
  digitalWrite(pumpPin, LOW);
  servoMotor.write(0);
  digitalWrite(buzzerPin, HIGH);
  digitalWrite(ledPin, HIGH);
  delay(100);
  digitalWrite(buzzerPin, LOW);
  digitalWrite(ledPin, LOW);
}
} else {
  digitalWrite(pumpPin, LOW);
  servoMotor.write(0);
  digitalWrite(buzzerPin, LOW);
  digitalWrite(ledPin, LOW);
  delay(50);

  while (digitalRead(buttonPin) == HIGH) {
    delay(100);
  }
  delay(50);
  systemActive = true;
}
}
```

Explanation :

Add Componets :

Button(`buttonPin = 2`):

- This button lets you turn the smart irrigation system on or off manually.
- When you press the button, it switches the system between working mode (checking soil moisture and watering) and sleep mode (saving power by not doing anything).

Dynamic Threshold Adjustment:

- Potentiometer (`potentiometerPin = A1`):
 - It's like a knob that you can turn to change when the system starts watering your plants.
 - Depending on how you set the knob, the system will decide at what point the soil is dry enough to water your plants.

System Activation Control:

- Boolean Flag (`systemActive`):
 - This flag decides whether the system is working or resting.
 - When `systemActive` is `true`, the system is on, checking soil moisture and watering when needed.
 - When `systemActive` is `false`, it's off (sleep mode), saving power until you press the button to turn it back on.

Its actually a sleep mode to less poweer consumption only when need (in one line)