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Light Sensor Controls Servo and LED Strip; system turns on-off with Grove Switch.

This code integrates a Grove light sensor (photocell) and a Grove switch to control

a servo motor and an Adafruit NeoPixel LED strip. The servo motor oscillates between

0 and 180 degrees, and the LED strip changes color based on the light level detected

by the light sensor.

A Grove switch is used to control the entire system:

- When the switch is set to HIGH, the system operates as described below.

- When the switch is set to LOW, the servo motor stops at 90 degrees, and the LED strip turns off.

Hardware Setup:

- Grove light sensor connected to analog pin A0

- Grove switch connected to digital pin D3

- Servo motor connected to pin D7

- Adafruit NeoPixel LED strip connected to pin D5

The system operates as follows:

- When the light sensor detects a light level above a threshold (adjustable with the value 100), and the switch is set to HIGH, the servo motor oscillates between 0 and 180 degrees to create a sweeping motion. The LED strip lights up in green, providing visual feedback.

- When the light level falls below the threshold, and the switch is set to HIGH, the servo motor remains still at 90 degrees, and the LED strip turns off in blue.

- When the switch is set to LOW, regardless of the light level, the servo motor stops at 90 degrees, and the LED strip turns off.

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#include <Servo.h>

#include <Adafruit\_NeoPixel.h>

#define LIGHT\_SENSOR\_PIN A0 // Use analog pin A0 for the light sensor

#define SWITCH\_PIN 3 // Use digital pin D3 for the Grove switch

#define SERVO\_PIN 7

Servo myservo;

#define LED\_PIN 5 // Use the physical pin number for D5

#define NUM\_LEDS 15 // Number of LEDs in the strip

Adafruit\_NeoPixel strip = Adafruit\_NeoPixel(NUM\_LEDS, LED\_PIN, NEO\_GRB + NEO\_KHZ800);

void setup() {

Serial.begin(9600);

myservo.attach(SERVO\_PIN);

pinMode(SWITCH\_PIN, INPUT\_PULLUP); // Set the switch pin as an input with internal pull-up resistor

strip.begin();

strip.show(); // Initialize all pixels to 'off'

}

void loop() {

// Read the state of the switch

int switchState = digitalRead(SWITCH\_PIN);

if (switchState == HIGH) {

int lightValue = analogRead(LIGHT\_SENSOR\_PIN);

Serial.print("Light Sensor Value: ");

Serial.println(lightValue);

if (lightValue > 100) {

for (int angle = 0; angle <= 180; angle += 5) {

myservo.write(angle);

delay(50);

}

for (int angle = 180; angle >= 0; angle -= 5) {

myservo.write(angle);

delay(50);

}

// Set LED strip to green

strip.fill(strip.Color(0, 255, 0)); // Green color

strip.show();

} else {

myservo.write(90);

// Set LED strip to blue

strip.fill(strip.Color(0, 0, 255)); // Blue color

strip.show();

}

} else {

myservo.write(90);

// Turn off LED strip (blue)

strip.fill(strip.Color(0, 0, 0)); // Turn off LEDs

strip.show();

}

delay(500);

}