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 An Ultrasonic Sensor changes the color of an Adafruit WS2813 LED Strip and oscillates a servo motor.

The ultrasonic sensor measures the distance to an object.

 - The servo motor's angle is controlled based on the distance:

 - If the distance is greater than 20cm, the servo motor oscillates

 between 0 and 180 degrees.

 - If the distance is less than or equal to 20cm, the servo motor remains still.

 - The Adafruit WS2813 LED strip's color is controlled based on the distance:

 - If the distance is greater than 20cm, the LED strip lights up in blue.

 - If the distance is less than or equal to 20cm, the LED strip turns off in green.

 Hardware Setup:

 - Ultrasonic sensor connected to pins TRIGGER\_PIN (D2) and ECHO\_PIN (D2)

 - Servo motor connected to pin SERVO\_PIN (D7)

 - Adafruit WS2813 LED strip connected to pin LED\_PIN (D5)

 This code integrates the control of the servo motor and the LED strip to

 provide visual feedback based on the detected distance. The system responds

 dynamically to changes in the environment, creating an interactive display.

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#include <NewPing.h> // Include the NewPing library

#include <Servo.h> // Include the Servo library

#include <Adafruit\_NeoPixel.h> // Include the Adafruit NeoPixel library

#define TRIGGER\_PIN 2 // Use the physical pin number for D2

#define ECHO\_PIN 2 // Use the same pin for echo as trigger

#define MAX\_DISTANCE 200 // Maximum distance we want to ping for (in centimeters)

#define DISTANCE\_THRESHOLD 20 // Distance threshold for LED and motor control

#define SERVO\_PIN 7

Servo myservo;

NewPing sonar(TRIGGER\_PIN, ECHO\_PIN, MAX\_DISTANCE); // Create a NewPing object

#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);

 strip.begin();

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

}

void loop() {

 delay(50);

 unsigned int distance = sonar.ping\_cm(); // Get distance in centimeters

 if (distance == 0 || distance >= MAX\_DISTANCE) {

 Serial.println("Out of range");

 } else {

 Serial.print(distance);

 Serial.println(" cm");

 }

 if (distance > DISTANCE\_THRESHOLD) {

 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 blue

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

 strip.show();

 } else {

 myservo.write(90);

 // Turn off LED strip (green)

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

 strip.show();

 }

 delay(500);

}