**#include <ESP32Servo.h> // Include the ESP32Servo library**

**#include <Wire.h> // Include the Wire library for I2C communication**

**#include <LiquidCrystal\_I2C.h> // Include the LiquidCrystal\_I2C library**

**// Constants**

**const int YellowbuttonPin = 4; // Pin connected to the first push button**

**const int GreenbuttonPin = 5; // Pin connected to the second push button**

**const int YellowledPin = 2; // Pin connected to the first LED**

**const int GreenledPin = 15; // Pin connected to the second LED**

**#define SERVO\_PIN1 27 // Pin number for the base servo**

**#define SERVO\_PIN2 14 // Pin number for the left servo**

**#define SERVO\_PIN3 19 // Pin number for the right servo**

**#define SERVO\_PIN4 25 // Pin number for the End effector servo**

**Servo servo1; // Base servo with angles 90, 180, 0**

**Servo servo2; // Left servo with angles 5, 0**

**Servo servo3; // Right servo with angles 50, 0**

**Servo servo4; // End effector servo with angles 90, 0**

**LiquidCrystal\_I2C lcd(0x27, 16, 2); // Initialize the LCD module with its I2C address**

**// Variables**

**int buttonState1 = 0; // Current state of the first button**

**int previousButtonState1 = 0; // Previous state of the first button**

**int buttonState2 = 0; // Current state of the second button**

**int previousButtonState2 = 0; // Previous state of the second button**

**void setup()**

**{**

**// Set the button pins as inputs**

**pinMode(YellowbuttonPin, INPUT);**

**pinMode(GreenbuttonPin, INPUT);**

**// Set the LED pins as outputs**

**pinMode(YellowledPin, OUTPUT);**

**pinMode(GreenledPin, OUTPUT);**

**// Attach the servo motors to the respective pins**

**servo1.attach(SERVO\_PIN1);**

**servo2.attach(SERVO\_PIN2);**

**servo3.attach(SERVO\_PIN3);**

**servo4.attach(SERVO\_PIN4);**

**// Set the initial servo positions**

**servo1.write(0);**

**servo2.write(0);**

**servo3.write(0);**

**servo4.write(0);**

**// Initialize the LCD module**

**lcd.begin(16, 2); // Set the LCD module to 16x2 characters**

**lcd.init(); // Initialize the LCD module**

**lcd.backlight(); // Turn on the backlight**

**// Display initial message**

**lcd.setCursor(0, 0); // Set the cursor to the first column of the first row**

**lcd.print("Initializing"); // Print "Initializing" on the LCD**

**delay(2000); // Wait for two seconds**

**lcd.clear(); // Clear the LCD display**

**lcd.setCursor(0, 0); // Set the cursor to the first column of the first row**

**lcd.print("System is On"); // Print "Initializing" on the LCD**

**delay(2000); // Wait for two seconds**

**}**

**void loop()**

**{**

**// Read the button states**

**buttonState1 = digitalRead(YellowbuttonPin);**

**buttonState2 = digitalRead(GreenbuttonPin);**

**// Check if the first button state has changed**

**if (buttonState1 != previousButtonState1)**

**{**

**// If the first button is pressed**

**if (buttonState1 == HIGH)**

**{**

**// Display the color information on the LCD**

**lcd.clear(); // Clear the LCD display**

**lcd.setCursor(0, 0); // cursor to the first column of the first row**

**lcd.print("Ripeness: RIPE"); // Print "Color: YELLOW" on the LCD**

**delay(100); // Wait for one millisecond**

**// Toggle the first LED state**

**digitalWrite(YellowledPin, HIGH);**

**// Perform servo movements for yellow button press**

**servo2.write(25); // Move the servo to 25 degrees**

**delay(1000); // wait for one second**

**servo4.write(90); // Move the servo to 90 degrees**

**delay(1000); // wait for one second**

**servo3.write(50); // Move the servo to 50 degrees**

**delay(1000); // Wait for one second**

**servo4.write(5); // Move the servo to 5 degrees**

**delay(1000); // Wait for one second**

**servo3.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo1.write(180); // Rotate the servo to 180 degrees**

**delay(1000); // Wait for one second**

**servo2.write(25); // Move the servo to 25 degrees**

**delay(1000); // Wait for one second**

**servo3.write(50); // Move the servo to 50 degrees**

**delay(1000); // Wait for one second**

**servo4.write(90); // Move the servo to 90 degrees**

**delay(1000); // Wait for one second**

**servo4.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo3.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo2.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo1.write(0); // Rotate the servo to its initial position 0 degrees**

**delay(1000); // Wait for one second**

**lcd.clear(); // Clear the LCD display**

**}**

**} else{**

**digitalWrite(GreenledPin, LOW);**

**delay(100); // Wait for one millisecond**

**}**

**// Check if the second button state has changed**

**if (buttonState2 != previousButtonState2)**

**{**

**// If the second button is pressed**

**if (buttonState2 == HIGH)**

**{**

**lcd.clear(); // Clear the LCD display**

**lcd.setCursor(0, 0); // Set the cursor to the first column of the first row**

**lcd.print("Ripeness: UNRIPE"); // Print "Color: GREEN" on the LCD**

**delay(100); // Wait for one millisecond**

**// Toggle the second LED state**

**digitalWrite(GreenledPin, HIGH);**

**// Perform servo movements for green button press**

**servo2.write(25); // Move the servo to 25 degrees**

**delay(1000); // Wait for one second**

**servo4.write(90); // Move the servo to 90 degrees**

**delay(1000); // Wait for one second**

**servo3.write(50); // Move the servo to 50 degrees**

**delay(1000); // Wait for one second**

**servo4.write(5); // Move the servo to 5 degrees**

**delay(1000); // Wait for one second**

**servo3.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo1.write(90); // Rotate the servo to 90 degrees**

**delay(1000); // Wait for one second**

**servo2.write(25); // Move the servo to 25 degrees**

**delay(1000); // Wait for one second**

**servo3.write(50); // Move the servo to 50 degrees**

**delay(1000); // Wait for one second**

**servo4.write(90); // Move the servo to 90 degrees**

**delay(1000); // Wait for one second**

**servo4.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo3.write(0); // Move the servo to 0 degrees**

**delay(1000); // Wait for one second**

**servo1.write(0); // Rotate the servo to its initial position 0 degrees**

**delay(1000); // Wait for one second**

**lcd.clear(); // Clear the LCD display**

**}**

**} else{**

**digitalWrite(YellowledPin, LOW);**

**delay(100); // Wait for one millisecond**

**}**

**// Save the current button states for the next iteration**

**previousButtonState1 = buttonState1;**

**previousButtonState2 = buttonState2;**

**}**