**Day 5 Notes**

**Astrid and Gear**

A person working on a robot

Description automatically generated

Example Circuit

A circuit board with wires connected to it

Description automatically generated

220Ω Resister for LED

10KΩ Resistor for Photoresistor

My Circuit

A circuit board with wires

Description automatically generated

**My Circuit Works with their Code → Review My Code**

**AS Specified = Good**

**As Modified = Bad**

**Code to Trace**

const int switchPin1 = 2;    // switc1 1 is connected to pin 2

const int switchPin3 = 3;    // Switch 3 is connected to pin 3

const int ledPin1 = 8;       // Led 1 is connected to pin 8

const int ledPin2 = 9;       // Led 2 is connected to pin 9

int switchState1 = 0;        // Variable to hold the state of switch 1

int lastSwitchState1 = 0;    // Previous state of switch 1

int switchState3 = 0;        // Variable to hold the state of switch 3

int lastSwitchState3 = 0;    // Previous state of switch 3

int ledState1 = LOW;         // Current state of LED 1 (initially off)

int ledState2 = LOW;         // Current state of LED 2 (initially off)

void setup() {

  pinMode(switchPin1, INPUT);

  pinMode(switchPin3, INPUT);

  pinMode(ledPin1, OUTPUT);

  pinMode(ledPin2, OUTPUT);

}

void loop() {

  // Read the state of switch 1

  switchState1 = digitalRead(switchPin1);

  // Toggle LED 1 on/off when switch goes to on

  if (switchState1 != lastSwitchState1)  {

    if (switchState1 == HIGH)  {

      ledState1 == !ledState1;  // Toggle LED state

      digitalWrite(ledPin1, ledState1);  //Set LED state

    }

    delay(50);  // Debounce delay

  }

  lastSwitchState1 = switchState1;  // Save the current state for the next iteration

    // Read the state of switch 3

  switchState3 = digitalRead(switchPin3);

  // Toggle LED 2 on/off when switch goes to on

  if (switchState3 != lastSwitchState3)  {

    if (switchState3 == HIGH)  {

      ledState2 == !ledState2;  // Toggle LED state

      digitalWrite(ledPin2, ledState2);  //Set LED state

    }

    delay(50);  // Debounce delay

  }

  lastSwitchState3 = switchState3;  // Save the current state for the next iteration

}

**Chat GPT Code Review**

Thank you for providing both versions of the code! Here's a detailed comparison and analysis:

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### Key Observations

1. \*\*Pin Naming and Comments\*\*:

- The \*\*working code\*\* uses `buttonPin1` and `buttonPin2`.

- The \*\*non-working code\*\* uses `switchPin1` and `switchPin3`.

- This difference is purely cosmetic and does not affect functionality.

2. \*\*Pin Assignments\*\*:

- The \*\*working code\*\* assigns pin `2` to `buttonPin1` and pin `3` to `buttonPin2`.

- The \*\*non-working code\*\* assigns pin `2` to `switchPin1` and pin `3` to `switchPin3`.

- The assignments match, so this isn’t the issue.

3. \*\*Logic Errors in the Non-Working Code\*\*:

- \*\*Line 29\*\*: In the non-working code, the statement `ledState1 == !ledState1` should be \*\*`ledState1 = !ledState1`\*\*. The double equals (`==`) is a comparison operator, not an assignment.

- \*\*Line 41\*\*: Similarly, `ledState2 == !ledState2` should be \*\*`ledState2 = !ledState2`\*\*.

4. \*\*Behavioral Differences\*\*:

- The functional code toggles the LEDs based on button presses.

- The non-working code has this intended behavior but fails due to the incorrect assignment operator (`=` vs. `==`).

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### Fixed Code

Here's the corrected version of the non-working code:

```cpp

const int switchPin1 = 2; // Switch 1 is connected to pin 2

const int switchPin3 = 3; // Switch 3 is connected to pin 3

const int ledPin1 = 8; // LED 1 is connected to pin 8

const int ledPin2 = 9; // LED 2 is connected to pin 9

int switchState1 = 0; // Variable to hold the state of switch 1

int lastSwitchState1 = 0; // Previous state of switch 1

int switchState3 = 0; // Variable to hold the state of switch 3

int lastSwitchState3 = 0; // Previous state of switch 3

int ledState1 = LOW; // Current state of LED 1 (initially off)

int ledState2 = LOW; // Current state of LED 2 (initially off)

void setup() {

pinMode(switchPin1, INPUT);

pinMode(switchPin3, INPUT);

pinMode(ledPin1, OUTPUT);

pinMode(ledPin2, OUTPUT);

}

void loop() {

// Read the state of switch 1

switchState1 = digitalRead(switchPin1);

// Toggle LED 1 on/off when switch goes to on

if (switchState1 != lastSwitchState1) {

if (switchState1 == HIGH) {

ledState1 = !ledState1; // Toggle LED state (corrected assignment operator)

digitalWrite(ledPin1, ledState1); // Set LED state

}

delay(50); // Debounce delay

}

lastSwitchState1 = switchState1; // Save the current state for the next iteration

// Read the state of switch 3

switchState3 = digitalRead(switchPin3);

// Toggle LED 2 on/off when switch goes to on

if (switchState3 != lastSwitchState3) {

if (switchState3 == HIGH) {

ledState2 = !ledState2; // Toggle LED state (corrected assignment operator)

digitalWrite(ledPin2, ledState2); // Set LED state

}

delay(50); // Debounce delay

}

lastSwitchState3 = switchState3; // Save the current state for the next iteration

}

```

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### Changes Made

1. \*\*Corrected `ledState1 == !ledState1` to `ledState1 = !ledState1`\*\*.

2. \*\*Corrected `ledState2 == !ledState2` to `ledState2 = !ledState2`\*\*.

3. General formatting and comment updates for clarity.

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### Testing Plan

1. \*\*Upload the Fixed Code\*\*:

- Verify that the LEDs toggle as expected when the switches are activated.

2. \*\*Verify Behavior\*\*:

- Ensure that LED 1 toggles with `switchPin1` and LED 2 toggles with `switchPin3`.

Let me know how it works after testing!