EX-11 Develop customized UI for an Application

CODE

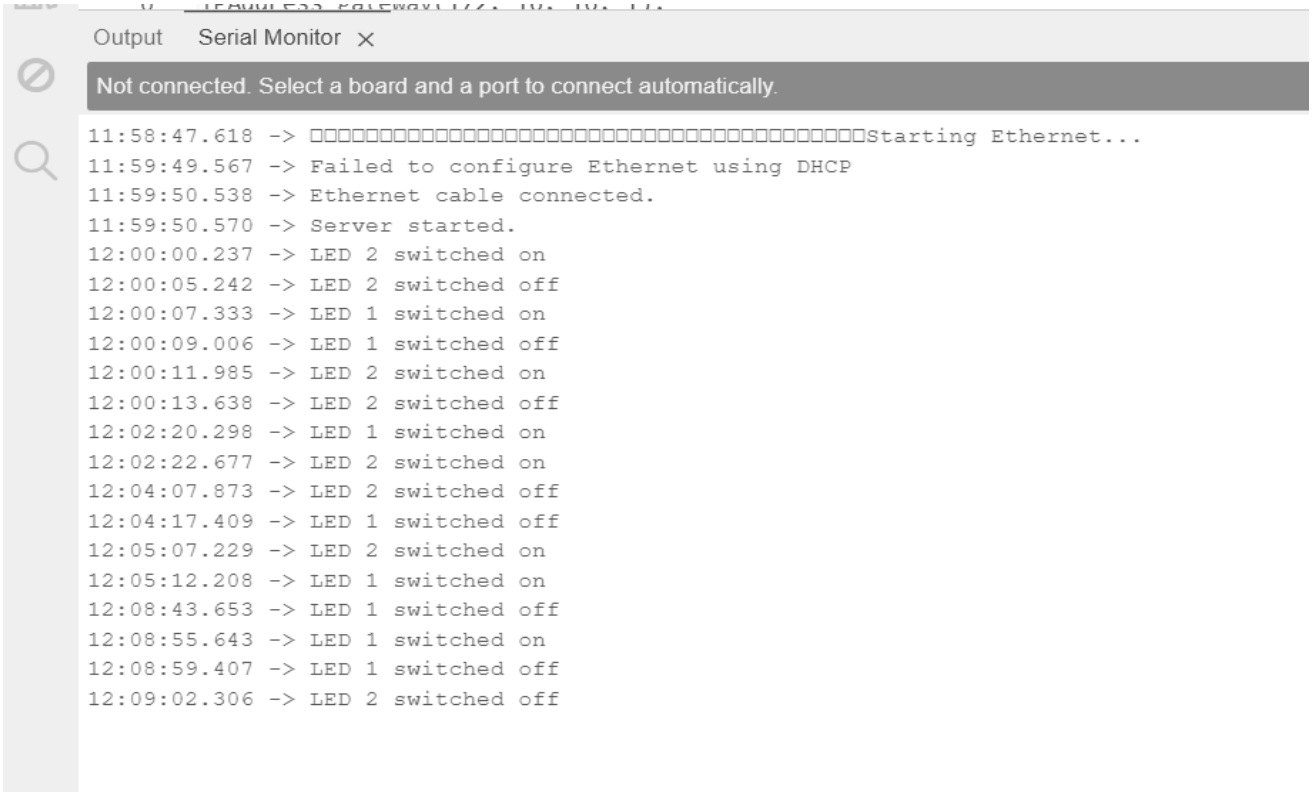
```
#include <SPI.h>
#include <Ethernet.h>
byte mac[] = { 0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED };
IPAddress ip(172, 16, 31, 238);
IPAddress gateway(172, 16, 16, 1);
IPAddress subnet(255, 255, 224, 0);
EthernetServer server(80);
String read = "";

void setup() {
  Serial.begin(9600);
  // Start Ethernet and check for connection
  Serial.println("Starting Ethernet...");
  if (Ethernet.begin(mac) == 0) {
    Serial.println("Failed to configure Ethernet using DHCP");
    // Try a manual IP configuration as fallback
    Ethernet.begin(mac, ip, gateway, subnet);
  } else {
    Serial.println("Ethernet configured using DHCP");
  }
  // Wait for the Ethernet connection to establish
  delay(1000);
  // Check the Ethernet link status
  if (Ethernet.linkStatus() == LinkOFF) {
    Serial.println("Ethernet cable not connected.");
  } else {
    Serial.println("Ethernet cable connected.");
```

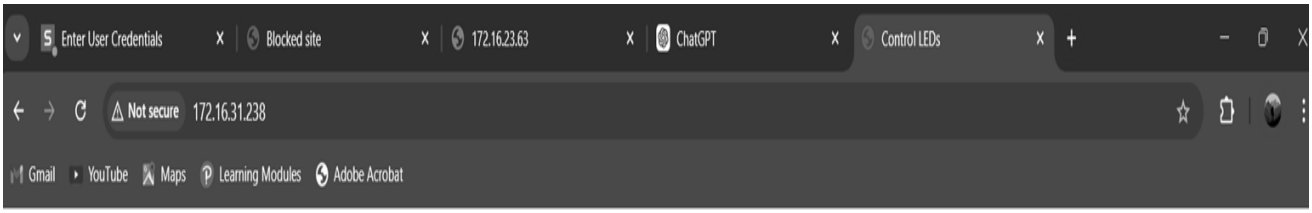
```
  }

  server.begin();
  Serial.println("Server started.");
  // Set pins for the two LEDs
  pinMode(8, OUTPUT); // LED 1
  pinMode(9, OUTPUT); // LED 2
}

void loop() {
  EthernetClient client = server.available();
  if (client) {
    boolean currentLine = true;
    while (client.connected()) {
      if (client.available()) {
        char c = (char)client.read();
        read = read + c;
        if (c == '\n' && currentLine) {
          client.println("HTTP/1.1 200 OK");
          client.println("Content-Type: text/html");
          client.println();
          client.println("<!DOCTYPE>");
          client.println("<html>");
          client.println("<head>");
          client.println("<title>Control LEDs</title>");
          client.println("</head>");
          client.println("<body>");
          client.println("<h1>Welcome to Arduino LED Control</h1>");
          client.println("<table style=\"width:100%; border-collapse:collapse;\">");
          client.println("<tr>");
```

```
client.println("<th style=\"border: 1px solid black; padding: 10px;\">LED 1</th>");
client.println("<th style=\"border: 1px solid black; padding: 10px;\">LED 2</th>");
client.println("</tr>");
client.println("<tr>");
client.println("<td style=\"border: 1px solid black; text-align:center;\">");
client.println("<a href=\"/?led1on\" style=\"color:green;\">Turn On</a><br />");
client.println("<a href=\"/?led1off\" style=\"color:red;\">Turn Off</a>");
client.println("</td>");
client.println("<td style=\"border: 1px solid black; text-align:center;\">");
client.println("<a href=\"/?led2on\" style=\"color:green;\">Turn On</a><br />");
client.println("<a href=\"/?led2off\" style=\"color:red;\">Turn Off</a>");
client.println("</td>");
client.println("</tr>");
client.println("</table>");

// LED Control logic
if (read.indexOf(" /?led1on") > 0) {
  Serial.println("LED 1 switched on");
  digitalWrite(8, HIGH); // Turn on LED 1
}
if (read.indexOf(" /?led1off") > 0) {
  Serial.println("LED 1 switched off");
  digitalWrite(8, LOW); // Turn off LED 1
}
if (read.indexOf(" /?led2on") > 0) {
  Serial.println("LED 2 switched on");
  digitalWrite(9, HIGH); // Turn on LED 2
}
if (read.indexOf(" /?led2off") > 0) {
  Serial.println("LED 2 switched off");
```

```
          digitalWrite(9, LOW); // Turn off LED 2
        }
        read = "";
        break;
      }
      if (c == '\n') {
        currentLine = true;
      } else if (c != '\r') {
        currentLine = false;
      }
    }
  }
  delay(1000);
  client.stop();
 }
}
```

OUTPUT





Welcome to Arduino LED Control

LED 1	LED 2
Turn On Turn Off	Turn On Turn Off