

list4.txt

入力: 上記のコードを先ほどのプログラムに統合してください。先ほどのプログラムを再掲します。

```
#include <Wire.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_BME280.h>
#include <WiFi.h>
#include <WiFiClient.h>
#include <WebServer.h>
#include <LEAmDNS.h>

#ifndef STASSID
#define STASSID "your-ssid"
#define STAPSK "your-password"
#endif

const char* ssid = STASSID;
const char* password = STAPSK;

WebServer server(80);

Adafruit_BME280 bme;

void setup() {
  Serial.begin(115200);
  while (!Serial);

  Wire.begin();
  if (!bme.begin(0x76)) {
    Serial.println("Could not find a valid BME280 sensor, check wiring!");
    while (1);
  }

  WiFi.mode(WIFI_STA);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.print("Connected to ");
  Serial.println(ssid);
  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());

  if (MDNS.begin("picow")) {
    Serial.println("MDNS responder started");
  }

  server.on("/", handleRoot);
  server.onNotFound(handleNotFound);

  server.begin();
  Serial.println("HTTP server started");
}
```

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```
}

void loop() {
  server.handleClient();
  MDNS.update();
}

void handleRoot() {
  String temperature = String(bme.readTemperature());
  String pressure = String(bme.readPressure() / 100.0F);
  String humidity = String(bme.readHumidity());

  String html = "<html>\n"
               "<head>\n"
               "  <title>Sensor Data</title>\n"
               "</head>\n"
               "<body>\n"
               "  <h2>BME280 Sensor Data</h2>\n"
               "  <p>Temperature: " + temperature + " *C</p>\n"
               "  <p>Pressure: " + pressure + " hPa</p>\n"
               "  <p>Humidity: " + humidity + " %</p>\n"
               "</body>\n"
               "</html>";
  server.send(200, "text/html", html);
}

void handleNotFound() {
  String message = "File Not Found\n\n";
  message += "URI: ";
  message += server.uri();
  message += "\nMethod: ";
  message += (server.method() == HTTP_GET) ? "GET" : "POST";
  message += "\nArguments: ";
  message += server.args();
  message += "\n";
  for (uint8_t i = 0; i < server.args(); i++) {
    message += " " + server.argName(i) + ": " + server.arg(i) + "\n";
  }
  server.send(404, "text/plain", message);
}
```

GPT: 了解しました。以下は、先ほどのプログラムにNTP時刻取得の機能を統合したコードです。

```
#include <Wire.h>
#include <Adafruit_Sensor.h>
#include <Adafruit_BME280.h>
#include <WiFi.h>
#include <WiFiClient.h>
#include <WebServer.h>
#include <LEAmDNS.h>
#include <WiFiUdp.h>
#include <NTPClient.h>
```

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```
#ifndef STASSID
#define STASSID "your-ssid"
#define STAPSK "your-password"
#endif

const char* ssid = STASSID;
const char* password = STAPSK;

WebServer server(80);
Adafruit_BME280 bme;

// NTPクライアントの設定
WiFiUDP ntpUDP;
NTPClient timeClient(ntpUDP, "pool.ntp.org");

void setup() {
  Serial.begin(115200);

  Wire.begin();
  if (!bme.begin(0x76)) {
    Serial.println("Could not find a valid BME280 sensor, check wiring!");
    while (1);
  }

  WiFi.mode(WIFI_STA);
  WiFi.begin(ssid, password);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.print("Connected to ");
  Serial.println(ssid);
  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());

  if (MDNS.begin("picow")) {
    Serial.println("MDNS responder started");
  }

  timeClient.begin();
  timeClient.setTimeOffset(9 * 3600); // タイムゾーンをJSTに設定 (例: UTC+9)

  server.on("/", handleRoot);
  server.onNotFound(handleNotFound);

  server.begin();
  Serial.println("HTTP server started");
}

void loop() {
  server.handleClient();
}
```

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```
MDNS.update();
timeClient.update(); // 時刻を更新
}

void handleRoot() {
  String temperature = String(bme.readTemperature());
  String pressure = String(bme.readPressure() / 100.0F);
  String humidity = String(bme.readHumidity());
  String currentTime = timeClient.getFormattedTime(); // HH:MM:SS 形式で時刻を取得

  String html = "<html>\n"
    "<head>\n"
    "  <title>Sensor Data</title>\n"
    "</head>\n"
    "<body>\n"
    "  <h2>BME280 Sensor Data</h2>\n"
    "  <p>Temperature: " + temperature + " *C</p>\n"
    "  <p>Pressure: " + pressure + " hPa</p>\n"
    "  <p>Humidity: " + humidity + " %</p>\n"
    "  <p>Current Time: " + currentTime + "</p>\n"
    "</body>\n"
    "</html>";
  server.send(200, "text/html", html);
}

void handleNotFound() {
  String message = "File Not Found\n\n";
  message += "URI: ";
  message += server.uri();
  message += "\nMethod: ";
  message += (server.method() == HTTP_GET) ? "GET" : "POST";
  message += "\nArguments: ";
  message += server.args();
  message += "\n";
  for (uint8_t i = 0; i < server.args(); i++) {
    message += " " + server.argName(i) + ": " + server.arg(i) + "\n";
  }
  server.send(404, "text/plain", message);
}
```

このコードでは、NTPから取得した現在時刻とBME280センサからの温度、湿度、気圧のデータをブラウザ上に表示します。