**USE ESP8266 TO SEND DATA TO FIREBASE**

1. **Requirements**

* Read the light intensity via a photoresistor
* Use Wemos D1 or NodeMCU (ESP8266) to send this data to firebase as time series data

1. **Create Circuit**

**A picture containing electronics

Description automatically generated**

Description:

* One pin of photoresistor will be connected to 3.3v pin on ESP8266 board
* A resistor will be connected to photoresistor and GND pin on ESP8266 board
* The signal will be collected at the connection point between photoresistor and resistor, then send it to the A0 pin on ESP8266 board

1. **Setup your Google firebase**

* Sign in the firebase with your Google account

Graphical user interface, application

Description automatically generated

* Go to Project setting to get the API key

Graphical user interface, text, application, email

Description automatically generated

* Go to the RealtimeDatabase to create a database and you can see the URL of your database

1. **Code the SKETCH**

#include <WiFiManager.h>

#include <ESP8266WiFi.h>

#include <Firebase\_ESP\_Client.h>

#include <NTPClient.h>

#include <WiFiUdp.h>

#include <BlynkSimpleEsp8266.h>

#include "addons/TokenHelper.h"

#include "addons/RTDBHelper.h"

// Define the API key and URL for Firebase database

// Notice: replace your API key and database URL

#define API\_KEY "AIzaSyBZ2sEAVvTYjuGgUTQGrn3UfTL6dE1c0mI"

#define DATABASE\_URL <https://lab8-70260-default-rtdb.asiasoutheast1.firebasedatabase.app/>

# Use the NTP (Network Time Protocol) to get the time and date

WiFiUDP ntpUDP;

NTPClient timeClient(ntpUDP, "pool.ntp.org");

# declare firebase database, authentication, and configuration objects

FirebaseData fbdo;

FirebaseAuth auth;

FirebaseConfig config;

FirebaseJson json;

# declare WiFiManager Object

WiFiManager wifiManager;

bool signupOK = false;

//define the pin of the photoresistor

int photoresistor = A0;

//define the function to get the datetime

String getDatetime(){

timeClient.update();

time\_t epochTime = timeClient.getEpochTime();

struct tm \*ptm = gmtime ((time\_t \*)&epochTime);

int monthDay = ptm->tm\_mday;

int currentMonth = ptm->tm\_mon+1;

int currentYear = ptm->tm\_year+1900;

String formattedTime = timeClient.getFormattedTime();

return String(monthDay) + "-" + String(currentMonth) + "-" +

String(currentYear) + " " + formattedTime;

}

void setup() {

Serial.begin(115200);

timeClient.begin();

timeClient.setTimeOffset(25200);

pinMode(photoresistor, INPUT);

bool res = wifiManager.autoConnect("NamAP");

if (!res) Serial.println("Failed to connect");

else Serial.println("Connected...yay ");

Serial.println("Connecting to Wi-Fi");

Serial.println("Connected with IP: ");

// Assign the api key (required)

config.api\_key = API\_KEY;

// Assign the RTDB URL (required)

config.database\_url = DATABASE\_URL;

/\*

Sign up on Firebase

In this lab, the database is opened for anonymous

For a better security, you need to setup username and password

And fill it in the statement Firebase.signUp

\*/

if (Firebase.signUp(&config, &auth, "", "")){

Serial.println("ok");

signupOK = true;

}

else{

Serial.printf("%s\n", config.signer.signupError.message.c\_str());

}

//Assign the callback function for the long running token generation task

config.token\_status\_callback = tokenStatusCallback;

Firebase.begin(&config, &auth);

Firebase.reconnectWiFi(true);

}

//define path in the database

String prPath = "/photoresistor";

String timePath = "/photoresistor";

String databasePath = "/Lab8";

String parentPath;

void loop() {

int pr\_value = analogRead(photoresistor);

Serial.print("Photoresistor value: ");

Serial.println(pr\_value);

if (Firebase.ready() && signupOK){

delay(5000);

String datetime = getDatetime();

Serial.print ("time: ");

parentPath= databasePath + "/" + datetime;

//set the JSON string

json.set(timePath.c\_str(), pr\_value);

//send data to the real-time database

if (Firebase.RTDB.setJSON(&fbdo, parentPath.c\_str(), &json)){

Serial.println("PASSED");

Serial.println("PATH: " + fbdo.dataPath());

Serial.println("TYPE: " + fbdo.dataType());

}

else {

Serial.println("FAILED");

Serial.println("REASON: " + fbdo.errorReason());

}

}

}

1. Test your sketch

* Use your smartphone or laptop to connect to the WiFi signal “NamAP”. You can see the screen of WiFiManager as below

Graphical user interface, application

Description automatically generated

* Select the Configure WiFi to setup WiFi network for your device

A picture containing table

Description automatically generated

* After successfully connect to WiFi network, If the data is successfully saved to Firebase, it will display the following message on the Serial Monitor:

Graphical user interface, text, application, email

Description automatically generated

* And check your time series data on Firebase, like this:

Graphical user interface, text, application

Description automatically generated