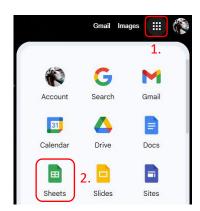
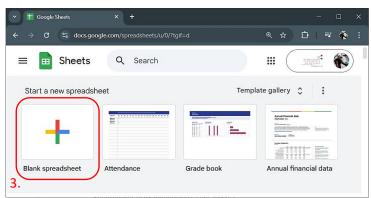
## ESP8266 to Google sheet with Apps script

1. Create Data Form เพื่อบันทึกข้อมูลสำคัญสำหรับการใช้งานส่วนต่าง ๆ ด้วย Text editor เช่น Notepad โดยมีหัวข้อดังนี้

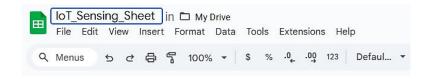
a. File Name of Google Sheets:				
--------------------------------	--	--	--	--

- b. Spreadsheet ID:
- c. Sheet Name :
- d. Project Name of Script :
- e. Script Name :
- f. Deployment ID :
- g. Web app URL:
- h. Web app URL Test Write:
- 2. Create Google sheet มีขั้นตอนดังนี้
  - a. เตรียม Google Account และ Login เข้าใช้งานผ่าน Browser ต่าง ๆ เช่น Google Chrome
  - b. สร้าง Google sheet ผ่าน Google apps

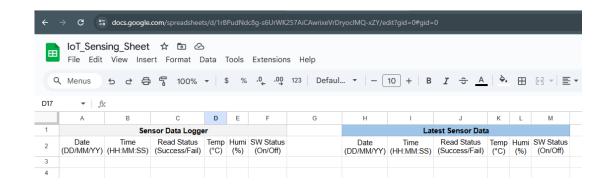




c. ตั้งชื่อ File Name of Google Sheets: IoT\_Sensing\_Sheet และจดบันทึก



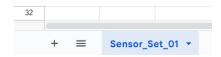
d. ตั้งชื่อกลุ่มข้อมูลแนว Colum ต่าง ๆ ดังนี้



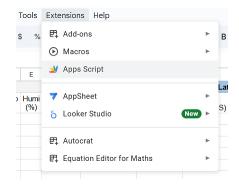
e. จดบันทึก Spreadsheet\_ID จาก URL โดยข้อมูลอยู่ระหว่าง /spreadsheets/d/ และ /edit? เช่น



f. ตั้งชื่อ Sheet\_Name: Sensor\_Set\_01 และจดบันทึก



- 3. Create Apps script มีขั้นตอนดังนี้
  - a. เลือก Extensions > Apps Script



b. ตั้งชื่อ Project Name of Script: IoT\_Sensing\_Script และจดบันทึก



c. เปลี่ยนชื่อ Script Name จาก Code.gs เป็น IoT\_Sensing\_GS.gs และจดบันทึก



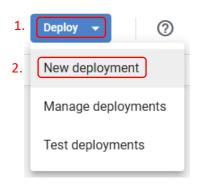
d. เขียน Function: doGet() ดังนี้

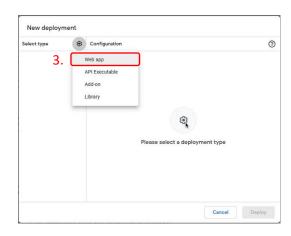
```
function doGet(e) {
 Logger.log(JSON.stringify(e));
 var result = 'Ok';
 if (e.parameter == 'undefined') {
   result = 'No Parameters';
 }
 else {
   var sheet_id = '____';
                                              // Spreadsheet ID.
   var sheet_name = "____?___";
                                               // Sheet Name in Google Sheets.
   var sheet_open = SpreadsheetApp.openById(sheet_id);
   var sheet_target = sheet_open.getSheetByName(sheet_name);
   var newRow = sheet_target.getLastRow() + 1;
   var rowDataLog = [];
   var Data_for_H3;
   var Data_for_I3;
   var Data_for_J3;
   var Data_for_K3;
   var Data_for_L3;
   var Data_for_M3;
```

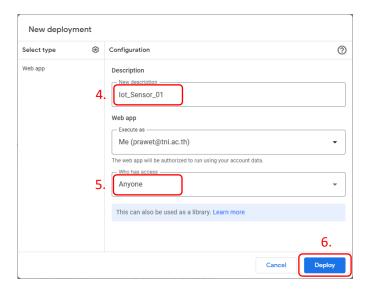
```
var Curr_Date = Utilities.formatDate(new Date(), "Asia/Jakarta", 'dd/MM/yyyy');
rowDataLog[0] = Curr_Date; // Date will be written in column A.
Data_for_H3 = Curr_Date;
                            // Date will be written in column H3.
var Curr_Time = Utilities.formatDate(new Date(), "Asia/Jakarta", 'HH:mm:ss');
rowDataLog[1] = Curr_Time; // Time will be written in column B.
Data_for_I3 = Curr_Time;
                            // Time will be written in column I3.
var sts_val = '';
for (var param in e.parameter) {
  Logger.log('In for loop, param=' + param);
  var value = stripQuotes(e.parameter[param]);
  Logger.log(param + ':' + e.parameter[param]);
  switch (param) {
    case 'sts':
     sts_val = value;
     break;
    case 'srs':
      rowDataLog[2] = value; // Sensor Reading Status will be written in column C.
     Data_for_J3 = value; // Sensor Reading Status will be written in column J3.
      result += ', Reading Status Written on column C';
      break;
    case 'temp':
      rowDataLog[3] = value; // The temperature value will be written in column D.
     Data_for_K3 = value; // The temperature value will be written in column K3.
      result += ', Temperature Written on column D';
      break;
    case 'humd':
      rowDataLog[4] = value; // The humidity value will be written in column E.
      Data_for_L3 = value; // The humidity value will be written in column L3.
      result += ', Humidity Written on column E';
      break;
    case 'swtc':
      rowDataLog[5] = value; // The state of Switch_1 will be written in column F.
     Data_for_M3 = value; // The state of Switch_1 will be written in column M3.
      result += ', Switch Written on column F';
      break;
    default:
      result += ", unsupported parameter";
 }
}
```

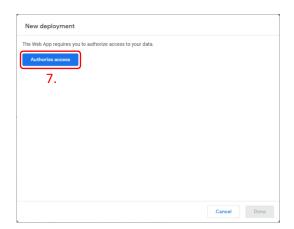
```
// Conditions for writing data received from NodeMCU to Google Sheets.
    if (sts_val == 'write') {
      // Writes data to the "Sensor Data Logger" section.
      Logger.log(JSON.stringify(rowDataLog));
      var newRangeDataLog = sheet_target.getRange(newRow, 1, 1, rowDataLog.length);
      newRangeDataLog.setValues([rowDataLog]);
      // Write the data to the "Latest Sensor Data" section.
      var RangeDataLatest = sheet_target.getRange('H3:M3');
      RangeDataLatest.setValues([[Data_for_H3, Data_for_I3, Data_for_J3,
                                  Data_for_K3, Data_for_L3, Data_for_M3]]);
      return ContentService.createTextOutput(result);
   }
   // Conditions for sending data to NodeMCU when NodeMCU reads data from Google Sheets.
   if (sts_val == 'read') {
      // Use the line of code below if you want NodeMCU to read data from columns K3-M3.
      // var all_Data = sheet_target.getRange('K3:M3').getDisplayValues();
      // Use the line of code below if you want ESP32 to read data from columns K3-M3.
      var all_Data = sheet_target.getRange('K3:M3').getValues();
      return ContentService.createTextOutput(all_Data);
  }
function stripQuotes( value ) {
  return value.replace(/^["']|['"]$/g, "");
```

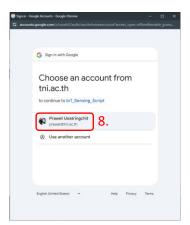
e. บันทึก File Script และ Deploy เพื่อใช้งาน โดยมีขั้นตอนดังนี้

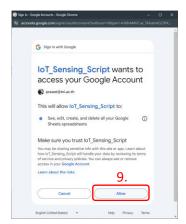




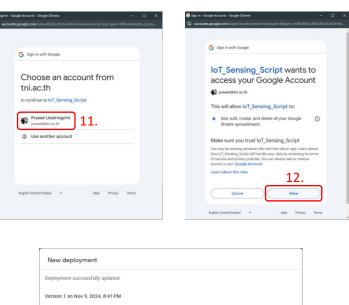


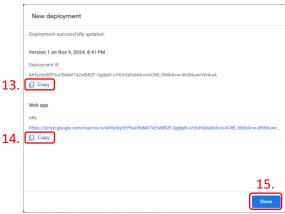




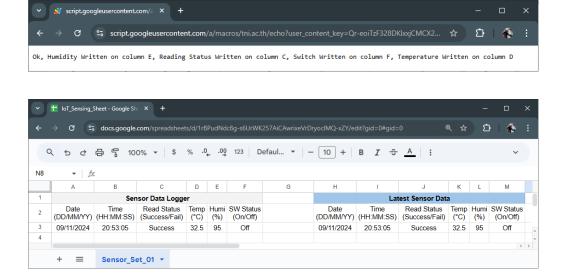




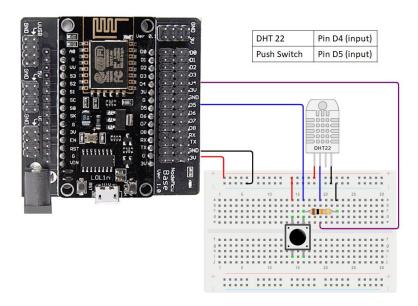




- f. จดบันทึก Deployment ID และ Web app URL
- g. ทดสอบด้วย Web app URL + ?sts=write&srs=Success&temp=32.5&humd=95&swtc=Off บน Browser และจดบันทึก Web app URL Test Write โดยผลลัพธ์ที่ได้ดังแสดงในภาพ



## 4. ต่อวงจรสำหรับทดสอบดังนี้



5. ใช้ Code ที่กำหนดให้และแก้ไขข้อมูล ssid, password และ Script\_ID ให้เหมาะสม

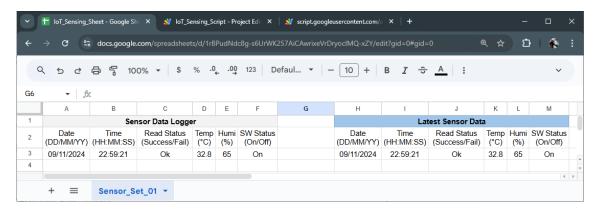
```
// ----- Including the libraries.
#include <ESP8266WiFi.h>
#include <WiFiClientSecure.h>
#include <DHT.h>
// ----- Defining LED and SW PINs on the ESP8266 Board.
#define On_Board_LED_PIN D2
#define SW D5
// ----- Defining DHT22 PINs on the ESP8266 Board.
#define DHTPIN D4
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);
// ----- SSID and PASSWORD of your WiFi network.
// Google script ID.
String Script_ID = "_
// Host & HttpsPort
const char* host = "script.google.com";
const int httpsPort = 443;
WiFiClientSecure client;
String Switch_State = "On";
String Status_Read_Sensor = "Ok";
```

```
// ----- VOID SETUP()
// put your setup code here, to run once:
void setup() {
 pinMode(On_Board_LED_PIN, OUTPUT);
 pinMode(SW, INPUT_PULLUP);
 dht.begin();
 Serial.begin(115200);
 delay(1000);
  // ----- Set Wifi to STA mode
 Serial.println();
 Serial.println("----");
  Serial.println("WIFI mode : STA");
 WiFi.mode(WIFI_STA);
 Serial.println("-----");
 // ----- Connect to Wi-Fi (STA).
 Serial.println();
 Serial.println("----");
 Serial.print("Connecting to ");
 Serial.println(ssid);
 WiFi.begin(ssid, password);
  int connecting_process_timed_out = 40; // 40 seconds.
 while (WiFi.status() != WL_CONNECTED) {
   Serial.print(".");
   digitalWrite(On_Board_LED_PIN, HIGH);
   delay(250);
   digitalWrite(On_Board_LED_PIN, LOW);
   delay(250);
   if (connecting_process_timed_out > 0) connecting_process_timed_out--;
   if (connecting_process_timed_out == 0) {
     delay(1000);
     ESP.restart();
   }
 }
 digitalWrite(On_Board_LED_PIN, LOW);
 Serial.println();
 Serial.println("WiFi connected");
Serial.println("-----");
 Serial.print("SSID: ");
 Serial.println(ssid);
 Serial.print("IP: ");
 Serial.println(WiFi.localIP());
 client.setInsecure();
 delay(2000);
```

```
// ----- VOID LOOP()
// put your main code here, to run repeatedly:
void loop() {
 float Temp = dht.readTemperature();
 float Humd = dht.readHumidity();
 if(isnan(Temp) || isnan(Humd)){
   Serial.println("Failed!");
  } else {
   Serial.print("Temperature : ");
   Serial.print(Temp);
   Serial.println("*C");
   Serial.print("Humidity : ");
   Serial.print(Humd);
   Serial.println("%");
   Serial.println("----");
 if(digitalRead(SW) == HIGH){
   Switch_State = "On";
  } else {
   Switch_State = "Off";
 // ----- Conditions that are executed when WiFi is connected.
 // This condition is the condition for sending or writing data to Google Sheets.
 if (!client.connect(host, httpsPort)) {
   Serial.println("connection failed");
   return;
 }
  digitalWrite(On_Board_LED_PIN, HIGH);
  // Create a URL for sending or writing data to Google Sheets.
  String Send_Data_URL = "/macros/s/" + Script_ID + "/exec?sts=write";
  Send_Data_URL += "&srs=" + Status_Read_Sensor;
  Send_Data_URL += "&temp=" + String(Temp);
  Send_Data_URL += "&humd=" + String(Humd);
  Send_Data_URL += "&swtc=" + Switch_State;
  Serial.println();
  Serial.println("----");
  Serial.println("Send data to Google Spreadsheet...");
  Serial.print("URL : https://");
  Serial.print(host);
 Serial.println(Send_Data_URL);
  client.print(String("GET ") + Send_Data_URL + " HTTP/1.1\r\n"
                            + "Host: " + host + "\r\n"
                            + "User-Agent: BuildFailureDetectorESP8266\r\n"
                            + "Connection: close\r\n\r\n");
 Serial.println("closing connection");
 Serial.println("----");
 Serial.println();
 delay(10000);
  digitalWrite(On_Board_LED_PIN, LOW);
}
```

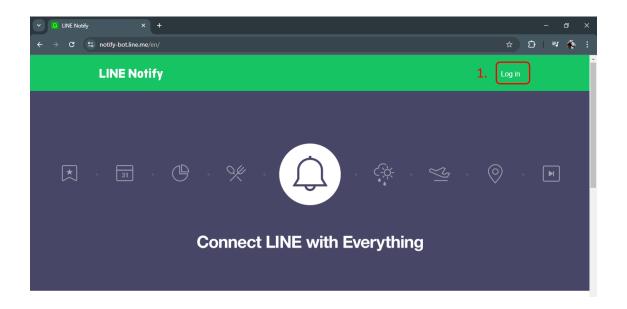
# a. ผลลัพธ์ที่ได้มีดังนี้

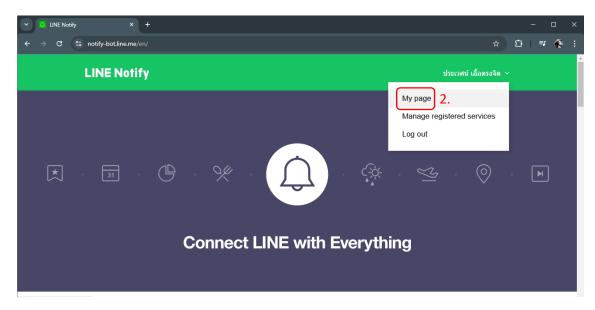


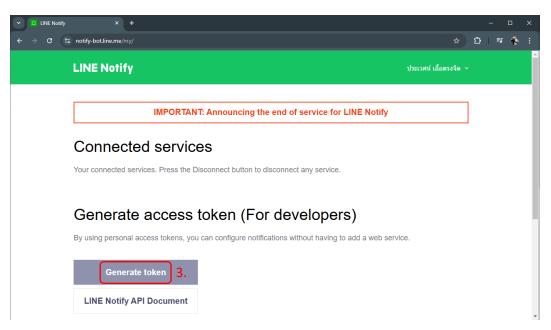


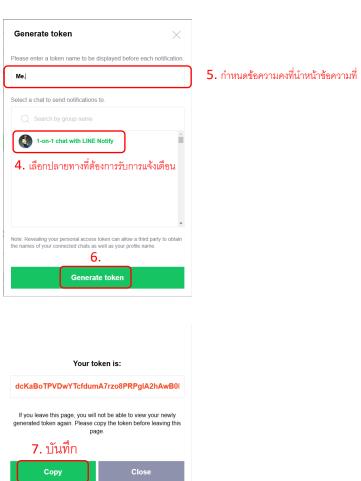
## Line Notify by Apps script

- 1. Create Line Notify Tocken มีขั้นตอนดังนี้
  - a. ไปที่ URL: https://notify-bot.line.me/my/ ทำตามขั้นตอนดังนี้









b. จดบันทึก Token ที่ได้ไว้ใช้ส่งข้อความ

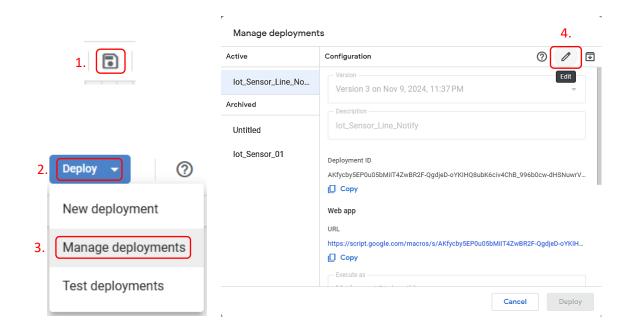
2. เติม Function: sendLineNotify() ลงใน Script Name: IoT\_Sensing\_GS.gs และแก้ไข Token พร้อม เติมข้อความ "Test" ในตัวแปร message เพื่อใช้ทดสอบการทำงาน

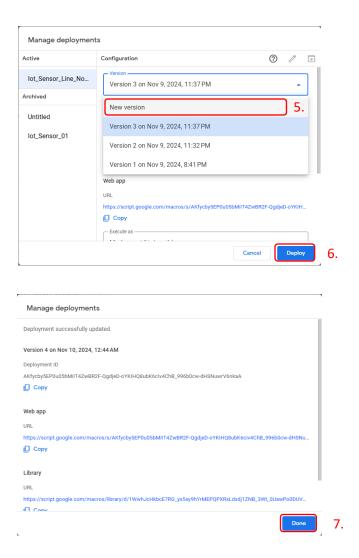
```
function sendLineNotify() {
  var url = "https://notify-api.line.me/api/notify";
  var token = "___?__";
  var message = "Test";

  var payload = {"message": message};
  var options = {
    "method": "post",
    "headers": {
        "Authorization": "Bearer " + token
      },
      "payload": payload
    };

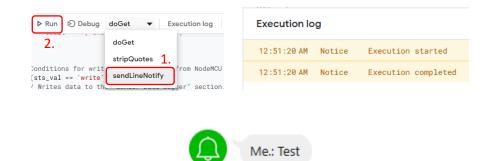
  UrlFetchApp.fetch(url, options);
}
```

- 3. ทดสอบการทำงานตามขั้นตอนดังนี้
  - a. หลังจากการเติม Function: sendLineNotify() ให้ทำการ Save New Version ดังนี้





b. ทดสอบด้วยการเลือก Run Function: sendLineNotify() โดยมีขั้นตอนดังนี้



4. แก้ไข Function: doGet() โดยเพิ่มคำสั่งเรียกใช้ sendLineNotify() ตามต้องการดังตัวอย่างต่อไปนี้

```
70
           var lineMessage = "Temperature : " + rowDataLog[3] + "\nHumidity : " + rowDataLog[4];
sendLineNotify(lineMessage);
71
                                                                                                                       1. เพิ่มเติม
 72
73
74
           // Conditions for writing data received from \ensuremath{\mathsf{NodeMCU}} to Google Sheets.
75 >
           if (sts_val == 'write') \{\cdots
           // Conditions for sending data to NodeMCU when NodeMCU reads data from Google Sheets.
88
89 >
          if (sts_val == 'read') {...
96
         }
97
98
99
100 > function stripQuotes( value ) { ···
                                                                                                                       2. แก้ไขจากข้อ 2.
102
103
      function sendLineNotify(message) {
104
        var url = "https://notify-api.line.me/api/notify";
105
106
        var token = "dcKaBoTPVDwYTcfdumA7rzo8PRPgIA2hAwB0EzjOnTF"; //แก้ใช Token
107
        // var message = "Test"; //แก้ไข ข้อความ
109
        var payload = {"message": message};
        var options = {
110
           "method": "post",
"headers": {
             "Authorization": "Bearer " + token
113
114
115
           "payload": payload
116
117
118
        UrlFetchApp.fetch(url, options);
119
120
```

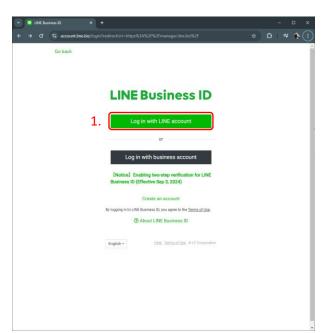


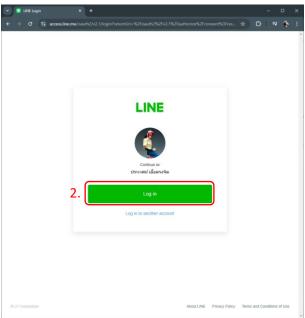
Me.:

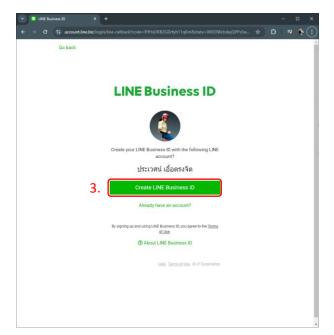
Temperature : 32.30 Humidity : 66.00

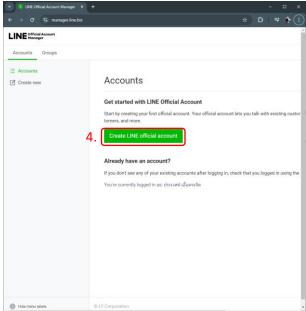
## Line Message API by Apps script

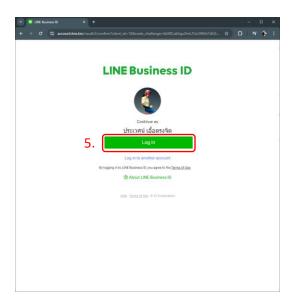
- 1. Create Line Official Account มีขั้นตอนดังนี้
  - a. ไปที่ URL: https://manager.line.biz/ ทำตามขั้นตอนดังนี้

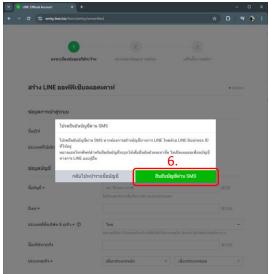








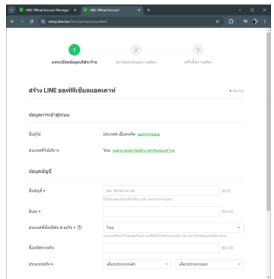


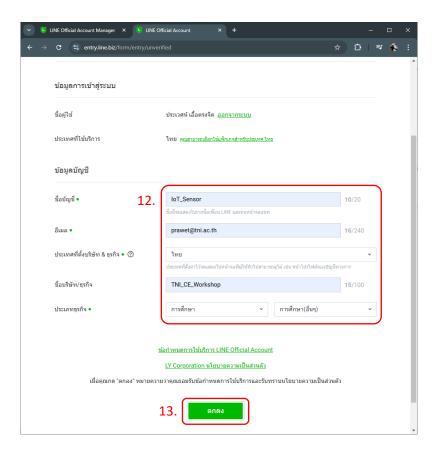


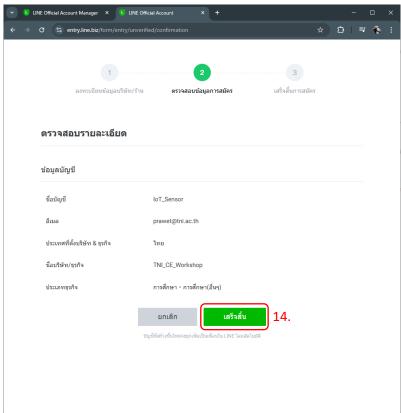








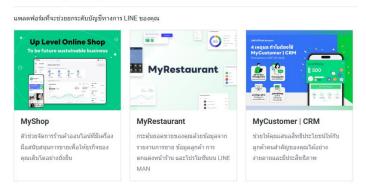






### สร้าง LINE ออฟฟิเชียลแอคเคาท์แล้ว

#### บริการต่างๆ ของ LINE OA Plus



#### ข้อมูลบัญชื



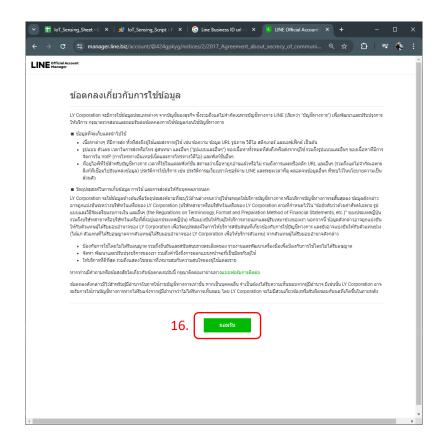
#### ใช้งานได้สะดวกยิ่งขึ้นด้วยฟีเจอร์ต่างๆ ของบัญชีรับรอง

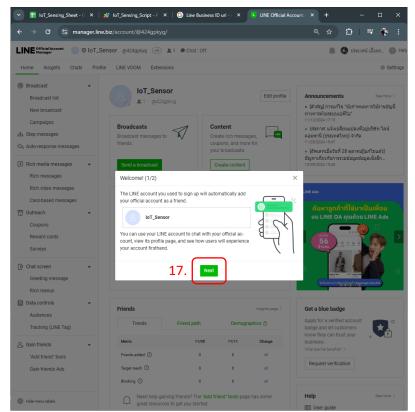
เพียงขอรับรองบัญชี คุณก็จะได้ใช้ฟีเจอร์พิเศษต่างๆ ที่เต็มไปด้วยความสะดวกสำหรับบัญชีทางการของบริษัทและธุรกิจส่วนตัว

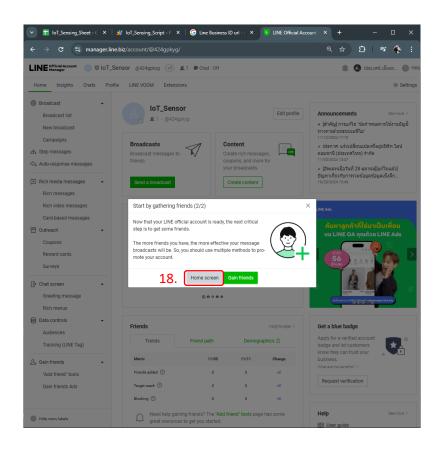


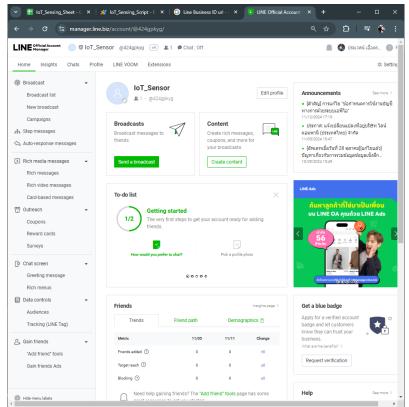






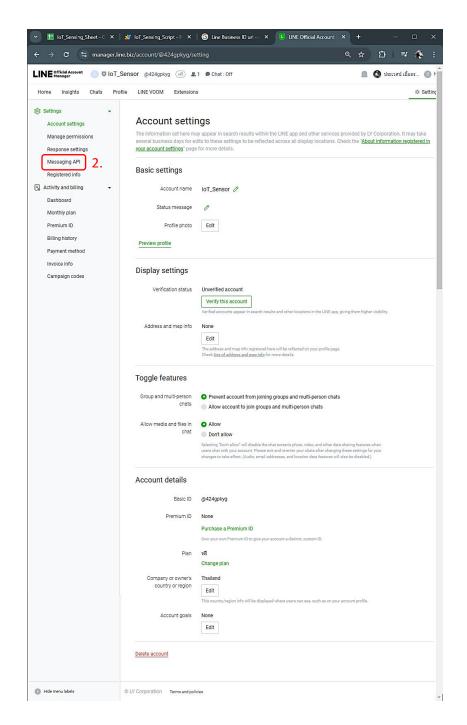


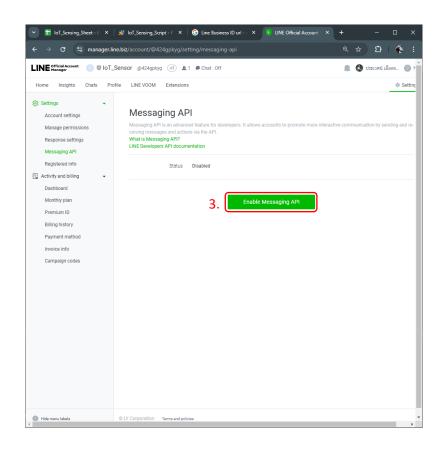


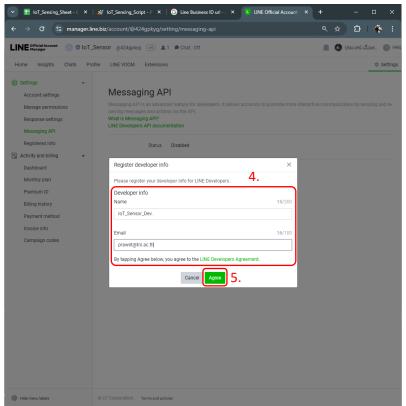


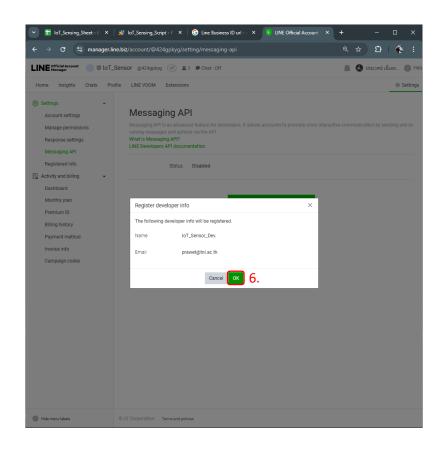
# b. เปิดใช้งาน Message API ทำตามขั้นตอนดังนี้

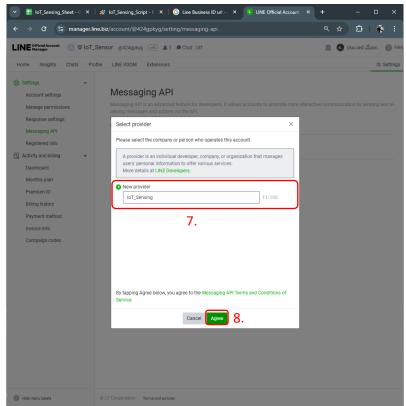


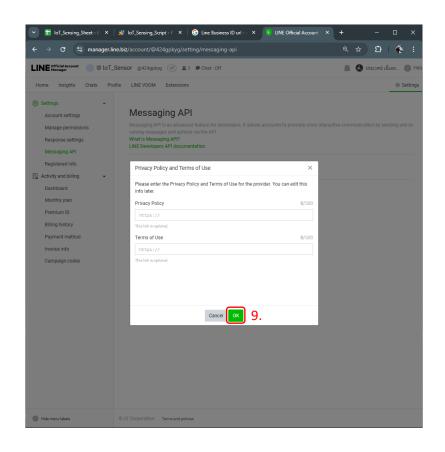


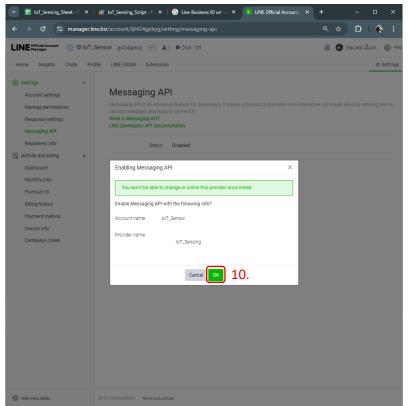


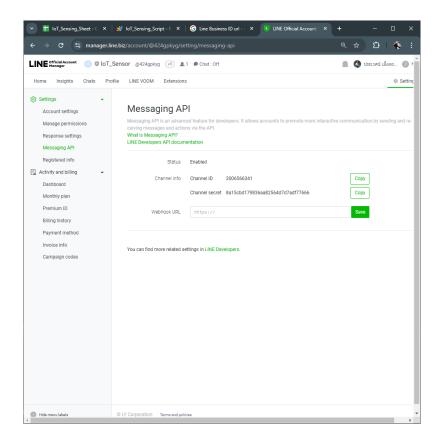






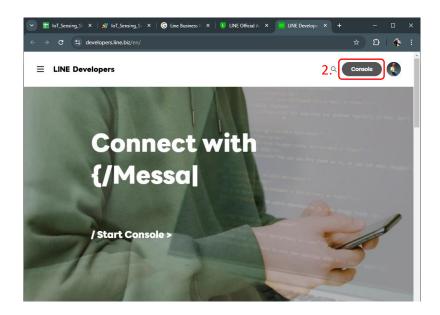


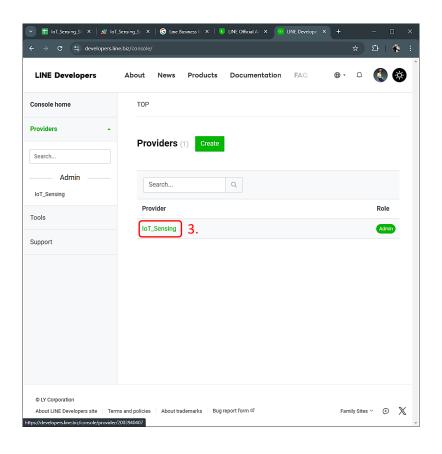


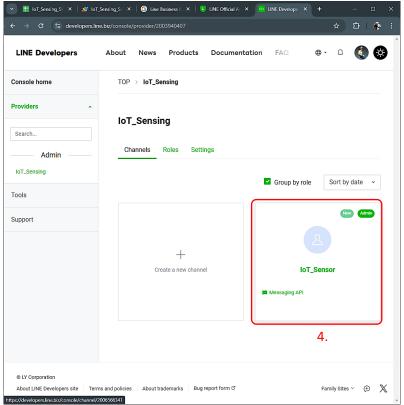


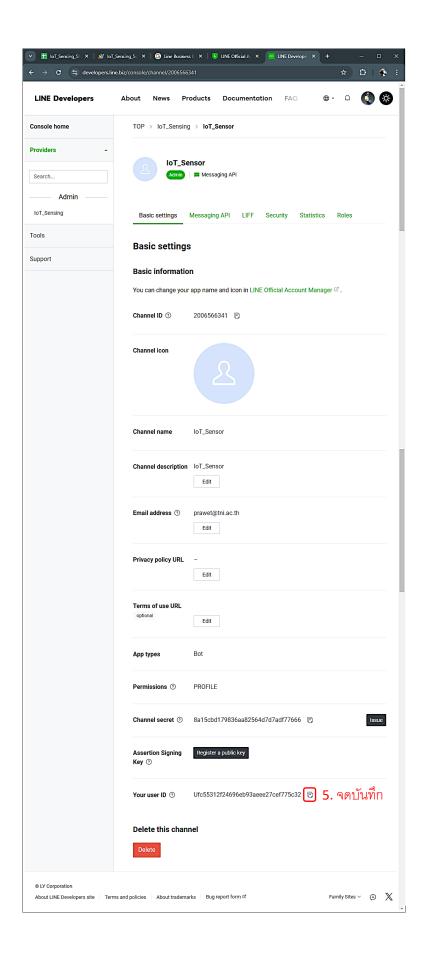
2. จดบันทึก User ID และ Channel access token มีขั้นตอนดังนี้

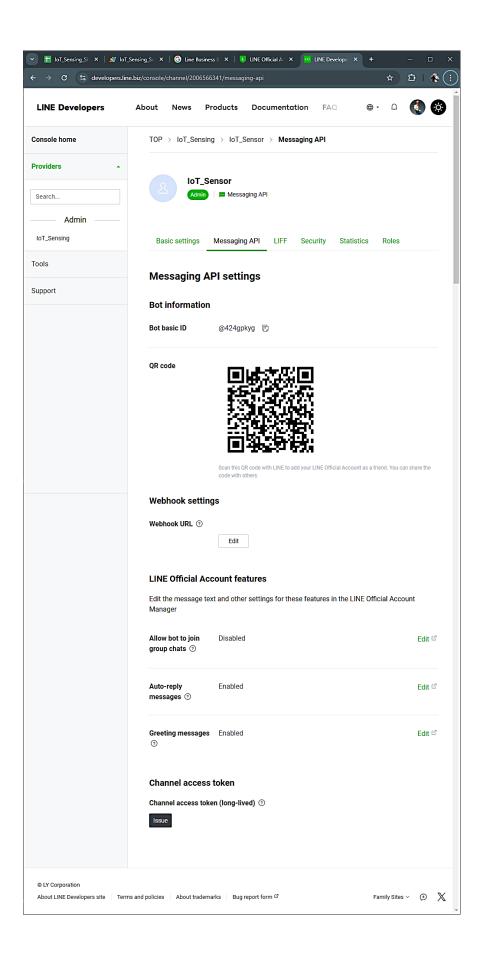
You can find more related settings in LINE Developers. 1.

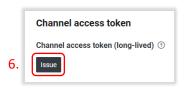














User ID: Ufc55312f24696eb93aeee27cef775c32

**Channel access token :** oW8ji6x6voU6W6GYvi/woR5dHliE6dOBvSlEHt5FErr9HN7PP/GWIKKp2LXE keK4AZc7V213f6qQX+ugvTPF2Ft3LbQpLvKvIjbFpL26RKfxHAsl63PRdJGyDl2SCVF5iavK2yXXGdEy38 L772fUxwdB04t89/10/w1cDnyilFU=

```
function sendLineMessage(messages) {
 var url = 'https://api.line.me/v2/bot/message/push';
 var user_id = '__?__';
var ch_access_token = '__?__';
  var payload = {
   to: user id,
   messages: [
        type: 'text',
        text: messages
    ]
  };
  var options = {
    'method': 'post',
    'headers': {
      'Authorization': 'Bearer ' + ch access token,
      'Content-Type': 'application/json'
    'payload': JSON.stringify(payload)
  } ;
  UrlFetchApp.fetch(url, options);
```

3. แก้ไข/เพิ่มเติม จากการเรียกใช้ Function: sendLineNotify() มาเป็น sendLineMessage() ด้วย User ID และ Channel access token มีขั้นตอนดังนี้

```
var lineMessage = "Temperature : " + rowDataLog[3] + "\nHumidity : " + rowDataLog[4];
          sendLineMessage(lineMessage);
                                                                                                                     1. แก้ไข
 72
 73
           // Conditions for writing data received from {\tt NodeMCU} to Google Sheets.
 74
 75 >
           if (sts_val == 'write') { ···
 86
 87
 88
           // Conditions for sending data to NodeMCU when NodeMCU reads data from Google Sheets.
 89 >
          if (sts_val == 'read') { ···
 96
 97
 98
      }
 99
100 > function stripQuotes( value ) { ···
102
103
104
      function sendLineMessage(messages) {
                                                                                                                      2. เพิ่มเติม
105
        var url = 'https://api.line.me/v2/bot/message/push';
106
        var user_id = 'Ufc55312f24696eb93aeee27cef775c32';
107
        var ch_access_token = 'vc3zhWr4IApvGjZqFjzjELMePYCYvhl/o/TCC6M7smPEI9MmyBdUH0hUMHZOb8hKAZc7V213f6qQX
        +ugvTPF2Ft3LbQpLvKvIjbFpL26RKdqRpChKWpcsi3wQMxim/GZ4Zu9AEL3ZNkwetS3A279AQdB04t89/10/w1cDnyi1FU=';
108
109
        var payload = {
          to: user_id,
110
111
          messages: [
112
               type: 'text',
113
114
               text: messages
115
          ]
116
117
118
119
         var options = {
120
           'method': 'post',
           'headers': {
121
             'Authorization': 'Bearer ' + ch_access_token,
'Content-Type': 'application/json'
123
124
125
           'payload': JSON.stringify(payload)
126
127
128
        UrlFetchApp.fetch(url, options);
129
```

