

Good Morning!



50°

Mostly cloudy

10:00



INTERNET OF THINGS

LINE OFFICIAL ACCOUNT



Why PlatformIO ?

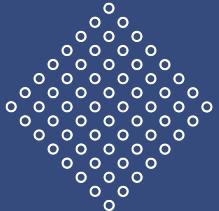


- จัดการโปรเจคใหญ่ๆ ได้ดี
- มีฟีเจอร์เยอะ
- ควบคุม enviroment เองได้

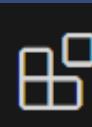
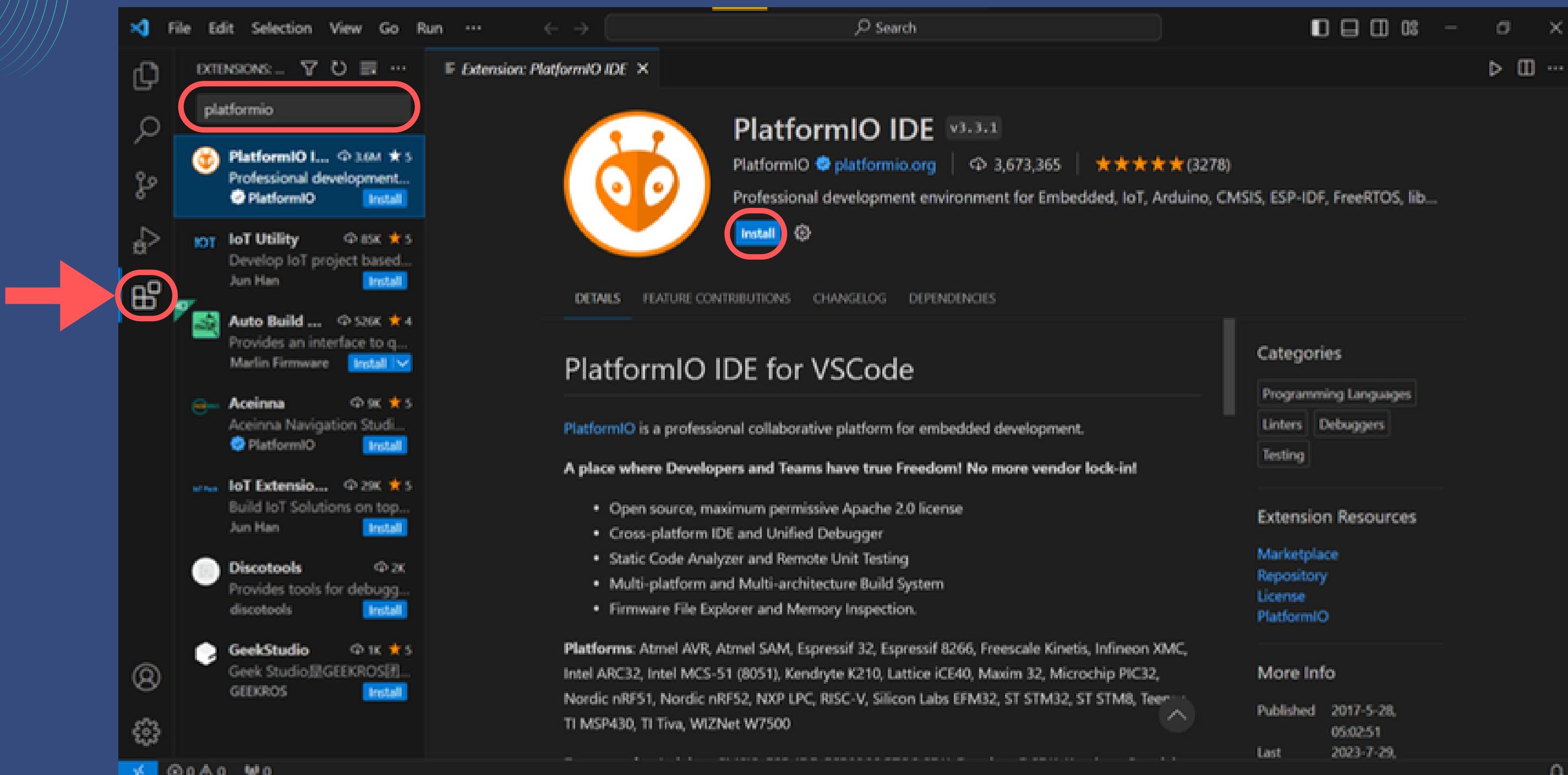
ດារបົນໄກສາດ Visual Studio Code



>ດារບົນໄກສາດ<



ຕາວນິກາດ PlatformIO



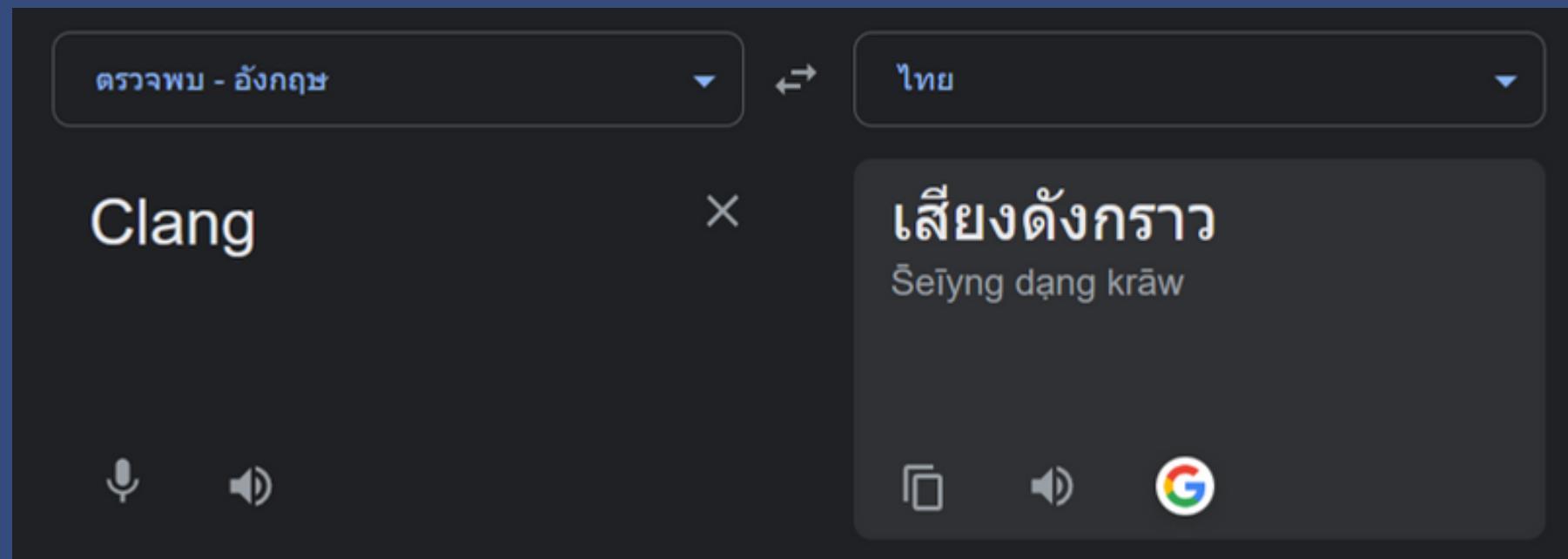
Extension → “PlatformIO IDE” → Install



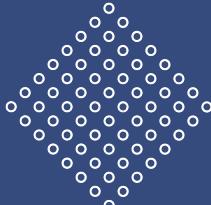
LLVM

LLVM = Low Level Virtual Machine

เป็นคอมไพล์เม้นท์แปลงโค้ดภาษาระดับสูงเป็น intermediate code หรือ machine code (ภาษาที่คอมพิวเตอร์เข้าใจได้)



PlatformIO ใช้ LLVM เป็น Clang เพื่อ
ทำให้การคอมไพล์ได้รวดเร็วมากขึ้น



Canva

ຕັດຕັ້ງ LLVM

The screenshot shows the LLVM website at https://llvm.org. On the left, there's a sidebar with a 'Site Map' containing links like Overview, Features, Documentation, Command Guide, FAQ, Publications, LLVM Projects, Open Projects, LLVM Users, Bug tracker, LLVM Logo, Blog, Meetings, and LLVM Foundation. Below that is a 'Download!' section with a red arrow pointing to the 'LLVM 16.0.6' link, which is highlighted with a red box. Other download options include All Releases, APT Packages, Fedora Snapshot Packages, and Pre-releases. At the bottom, there's a link to View the open-source code.

The screenshot shows the LLVM Download Page. It starts with a 'License' section stating that LLVM releases are under Apache-2.0 with LLVM-exception license, with a note about previous releases. A black arrow points from the LLVM 16.0.6 link on the homepage to this section. Below it is a 'Download' section with a table showing the latest release (17.0.1) with a red box around the 'download' link. The table includes columns for Date, Version, Download, Release Notes, and Documentation.

Date	Version	Download	Release Notes	Documentation
Current 9 Sep 2023	Git 17.0.1	via Git download	release notes llvm clang lld clang-extra libc++ polly flang	docs llvm clang lld clang-extra libc++ polly flang

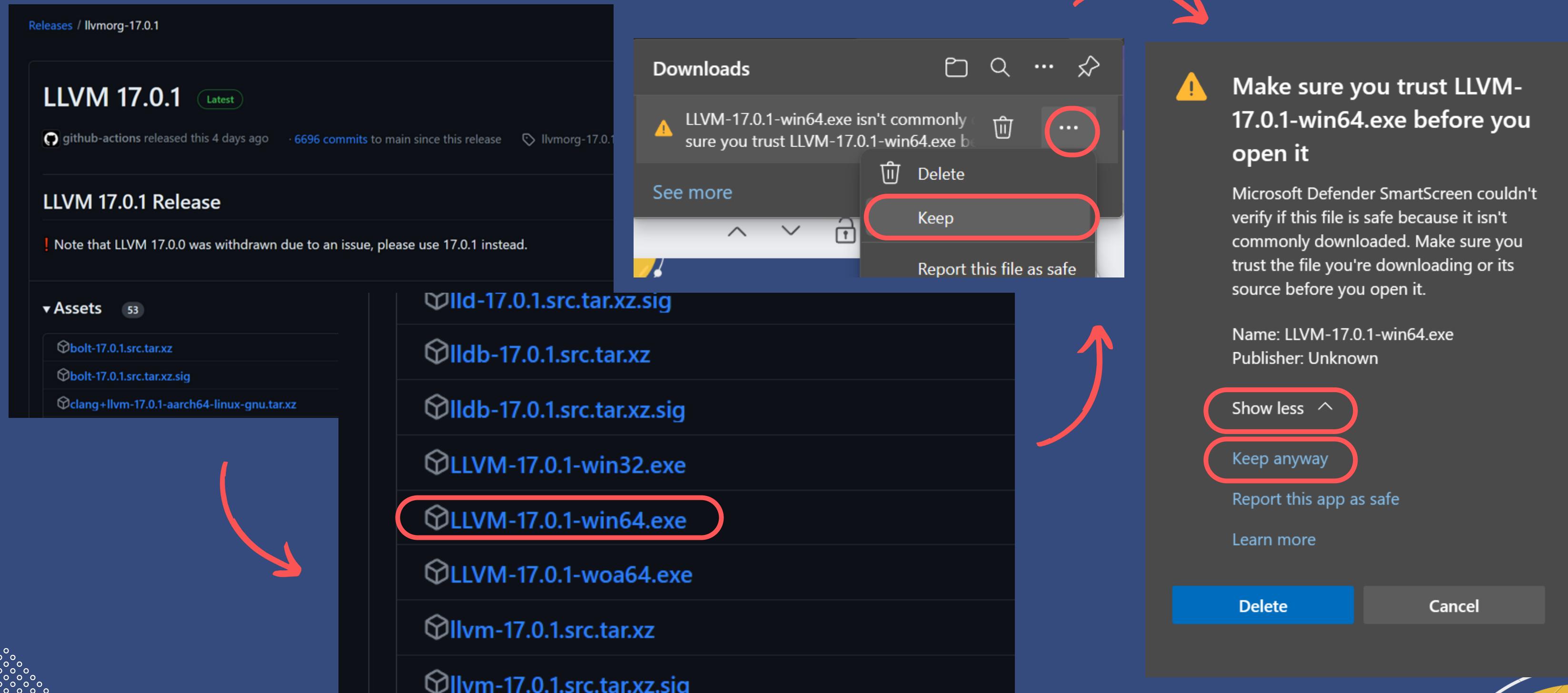
Platformio ໃຊ້ LLVM ເປີ Clang ເພື່ອກໍາໄຂການຄອມໄປສິໄດ້ຮັດເຮືວນັກຂຶ້ນ

- ໃກ້ຄຸນເປີດບຣາວເຊອຣໄປກໍ່ <http://llvm.org> ຄັກ LLVM 3.9.0
- ຈາກນັ້ນຄັກ Clang for Windows (64-bit) ເພື່ອດາວໂຫລດໄປສ LLVM-3.9.0-win64.exe

>ດາວໂຫລດ<

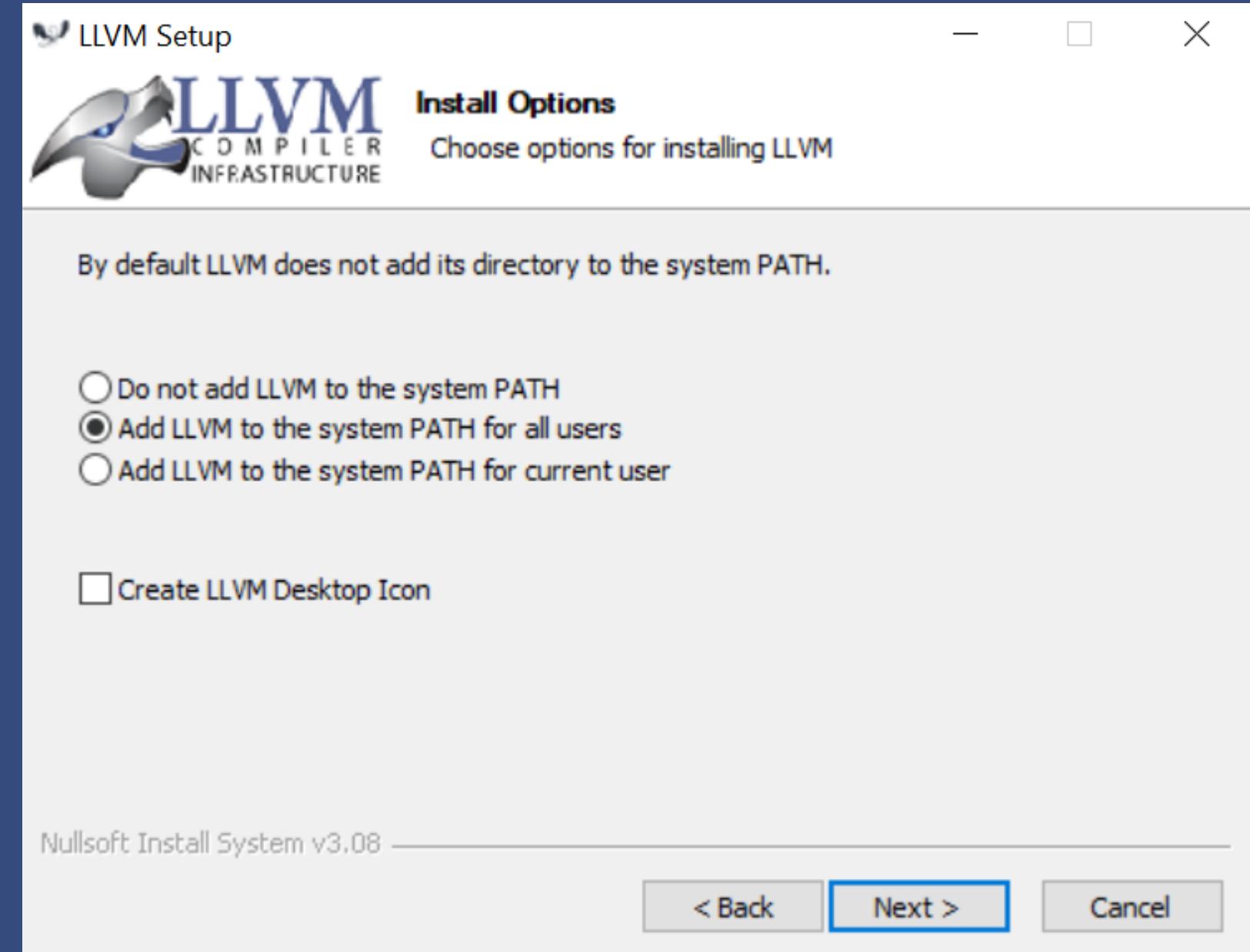
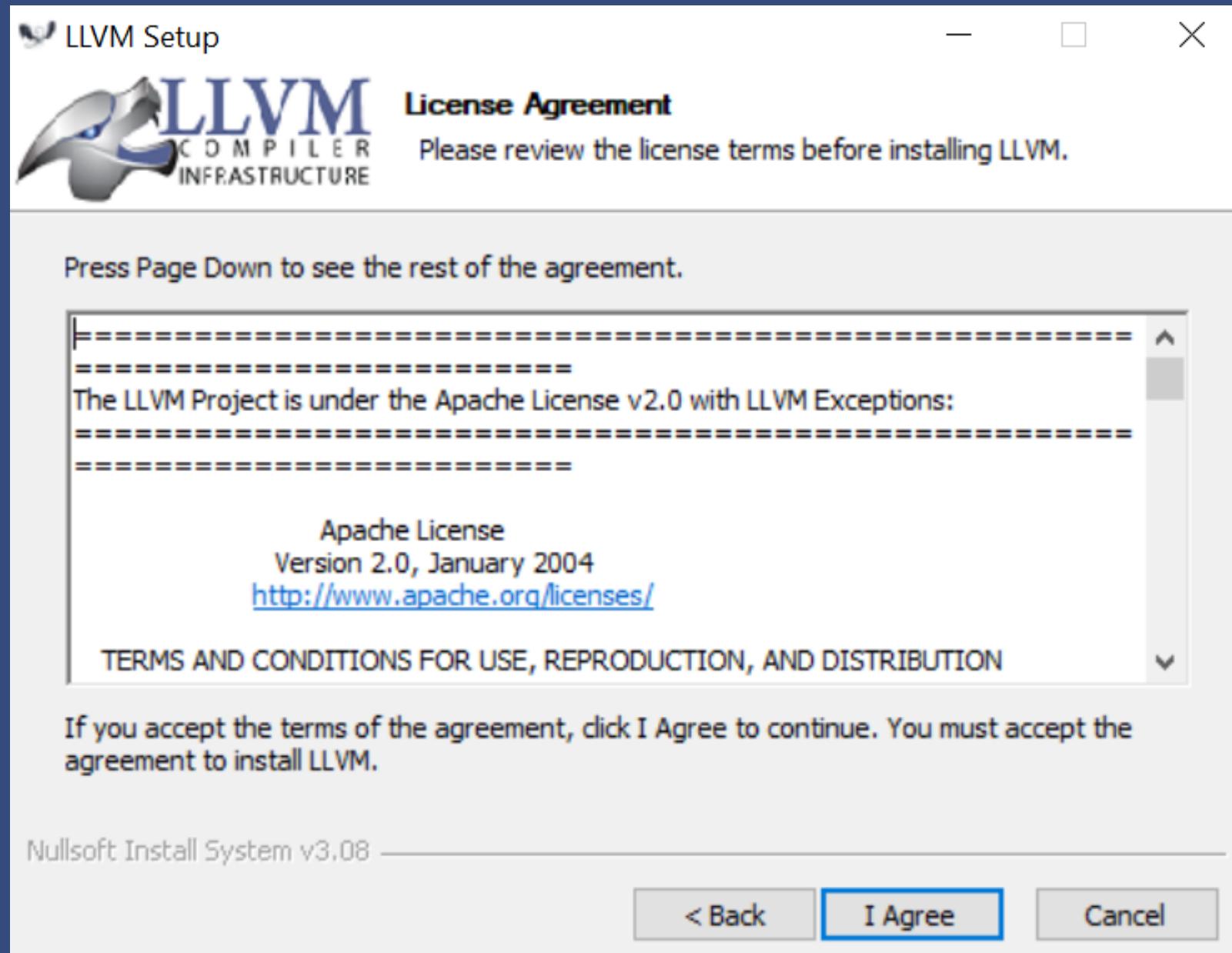
LLVM → download

ຕັດຕັ້ງ LLVM



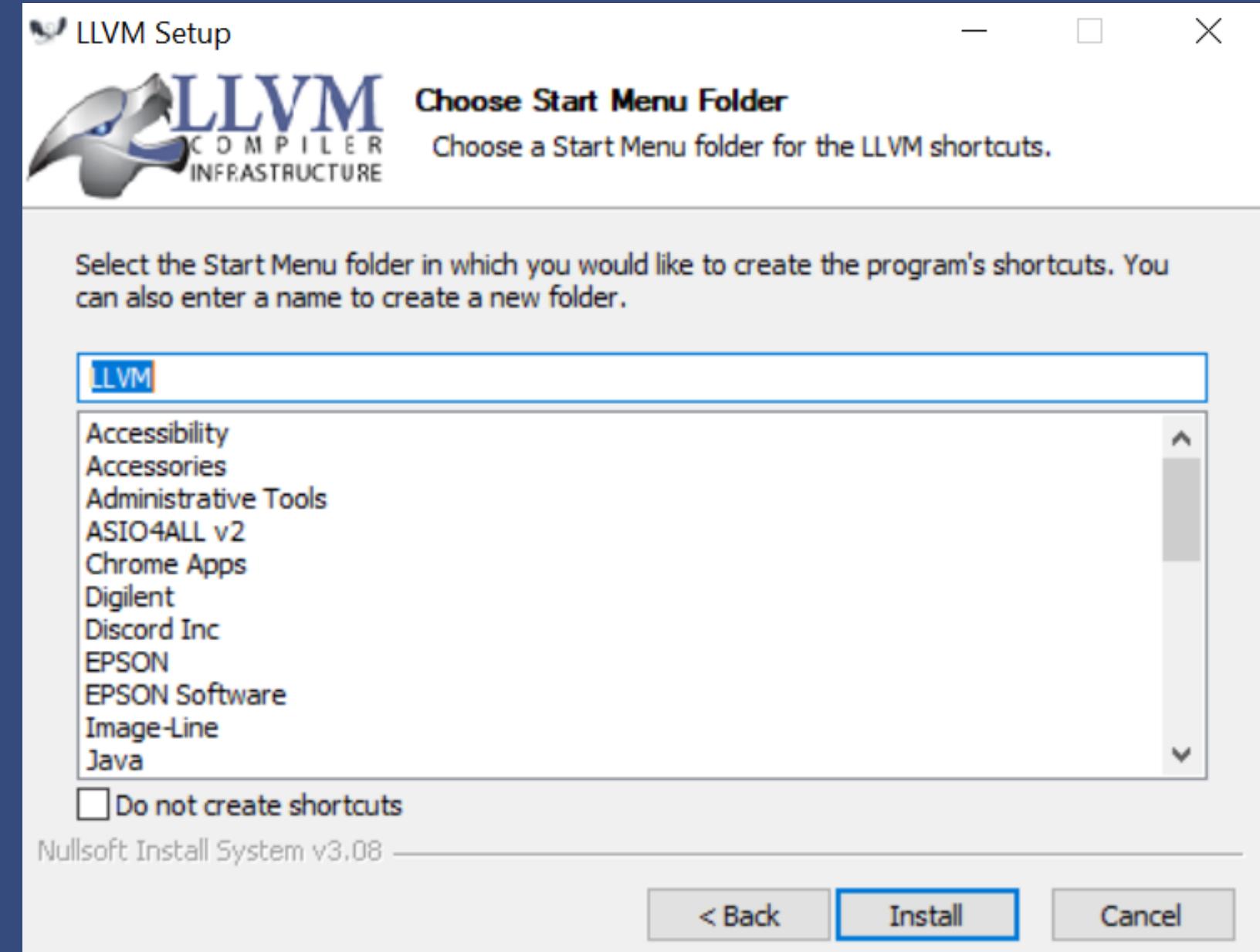
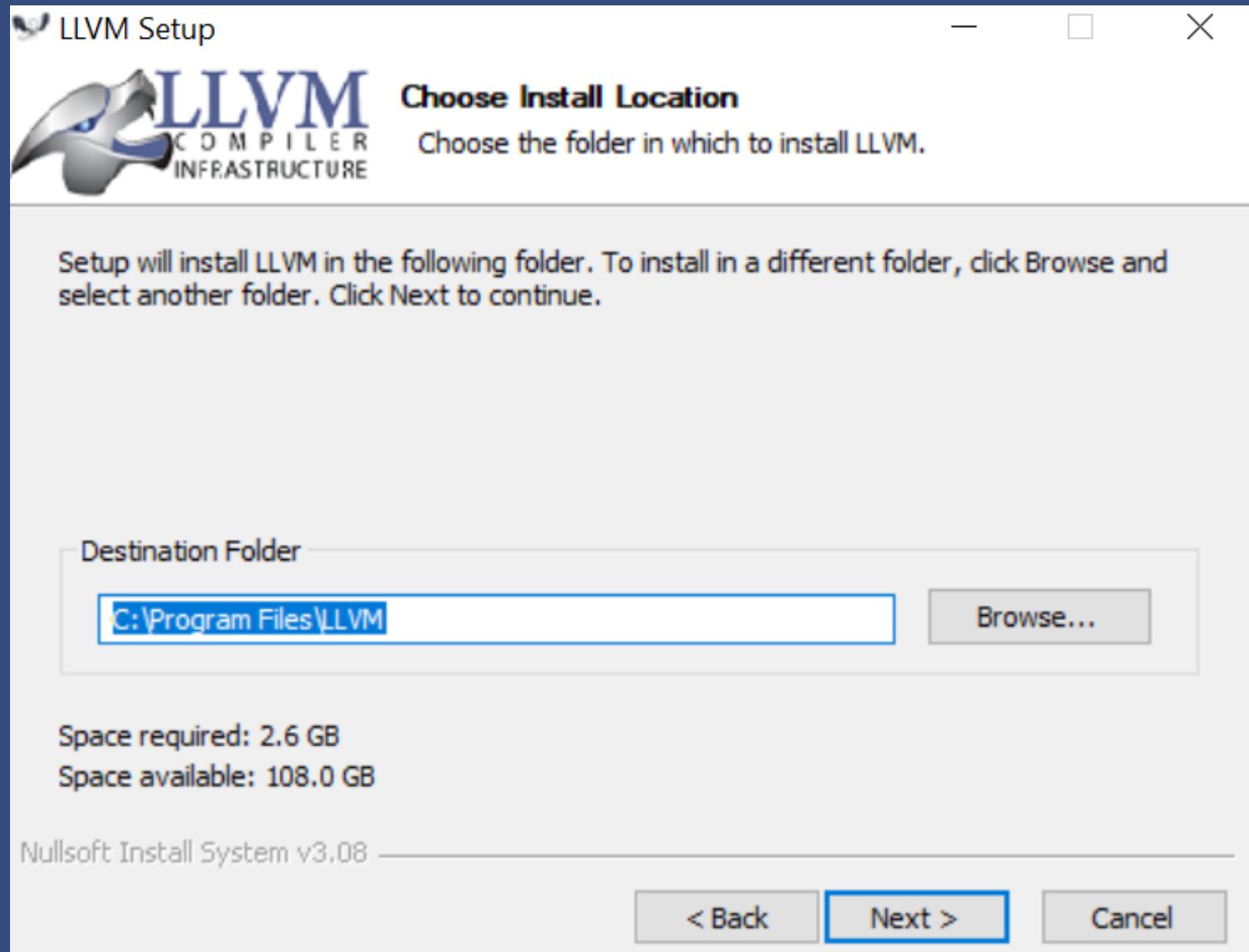
download → Show more → Keep anyway

ຕັດຕັ້ງ LLVM



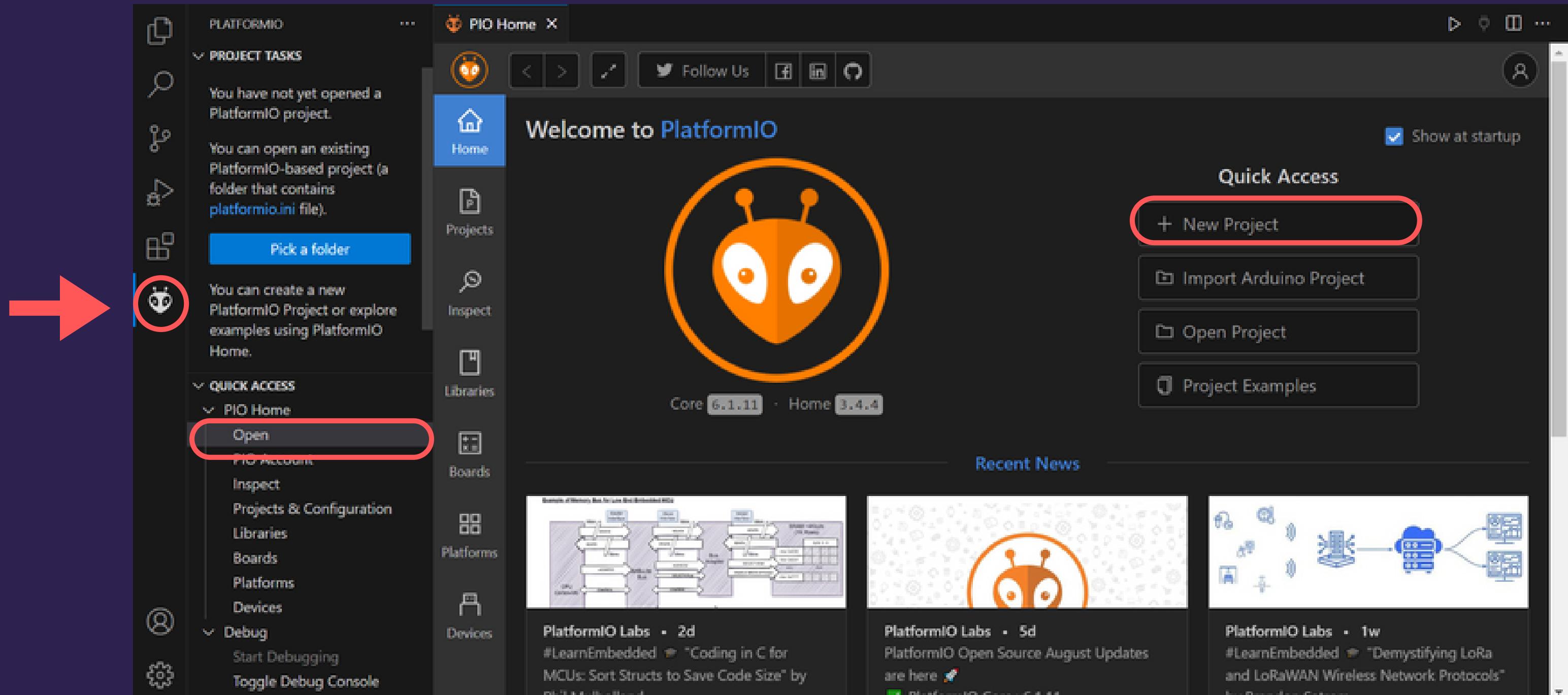
Next → I Agree → select → Next

ຕັດຕັ້ງ LLVM



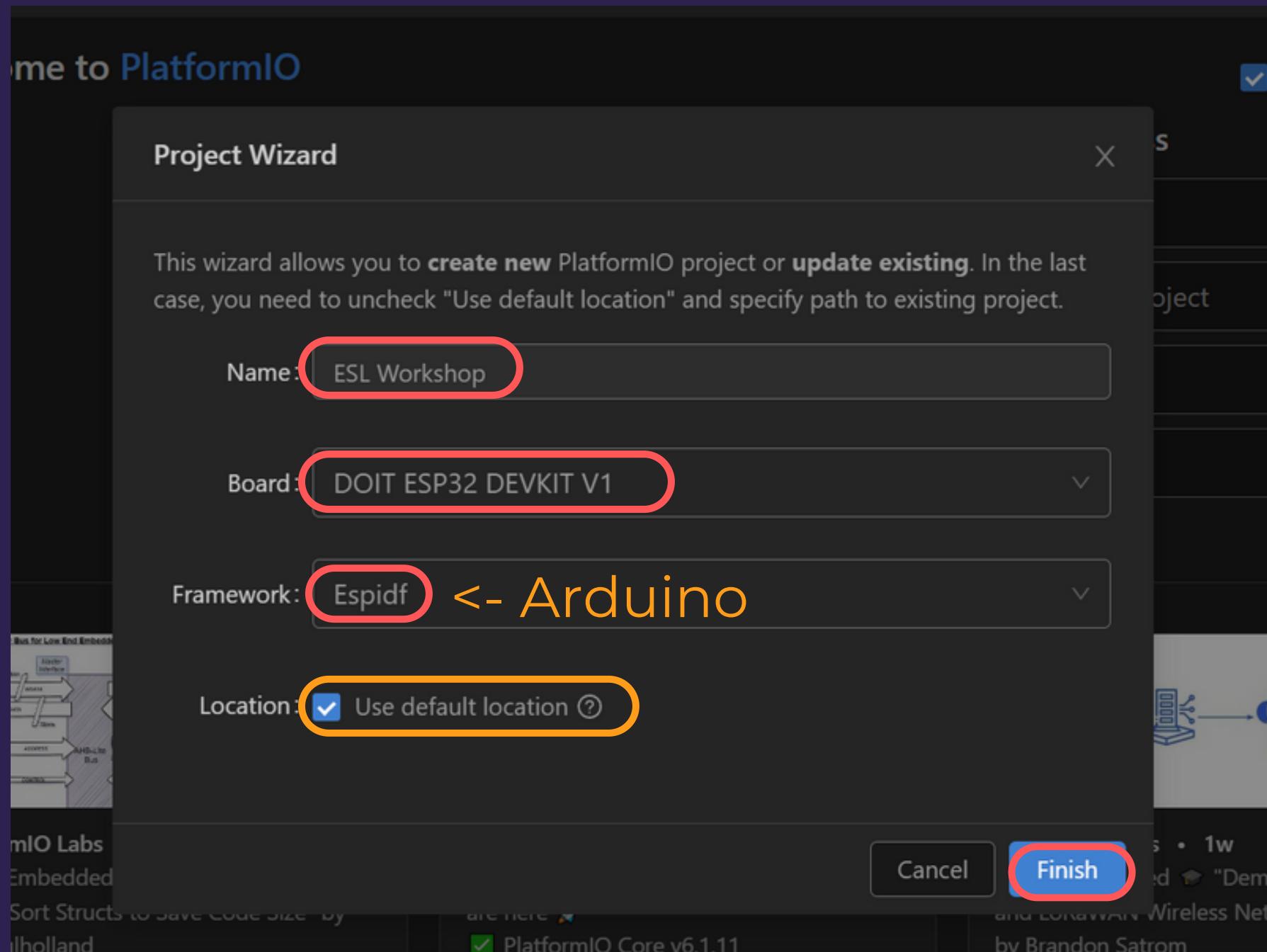
Next → Install

សារិក PlatformIO



 **Open → “+ New Project”**

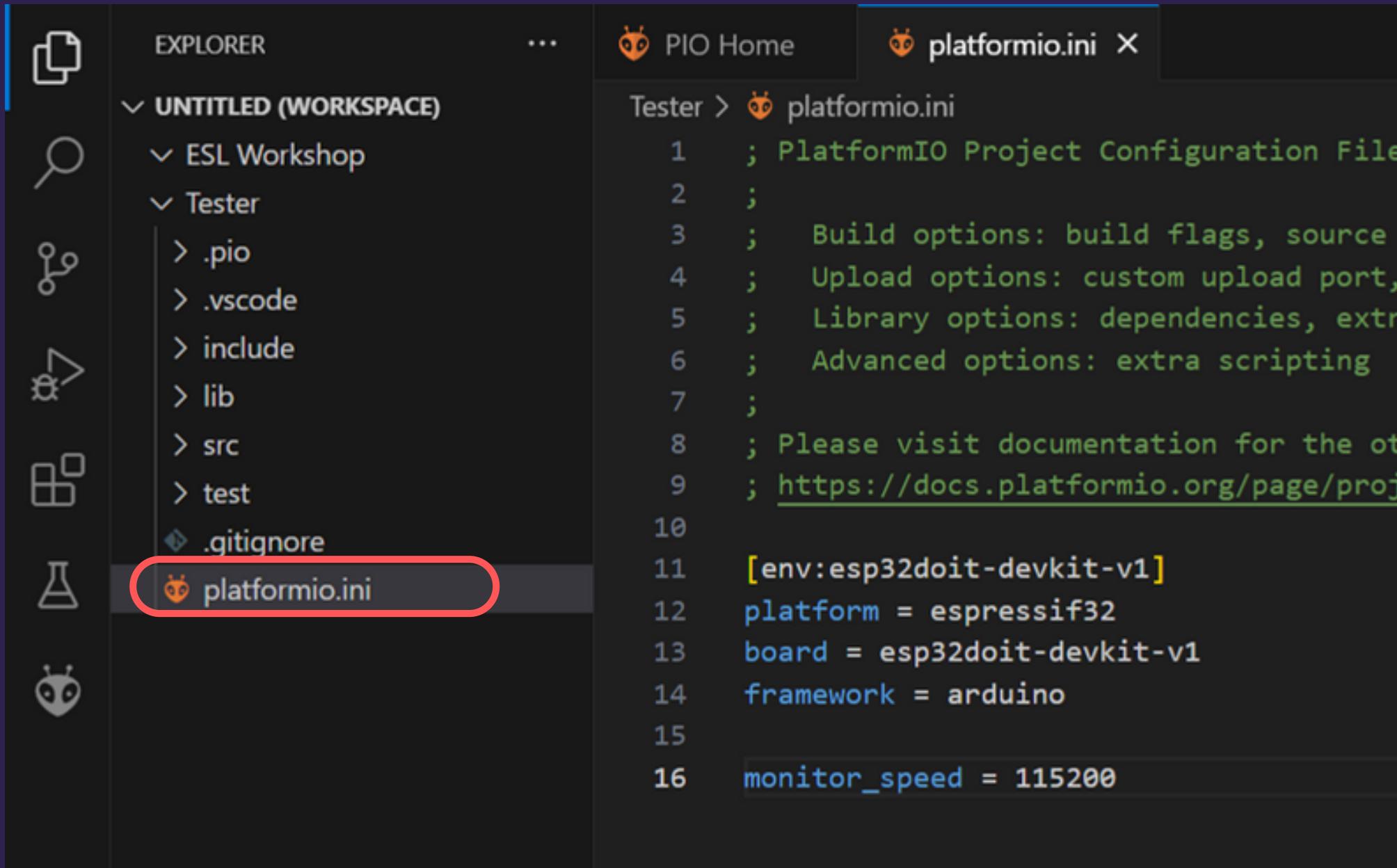
สอนใช้ PlatformIO



- ตั้งชื่อโปรเจค
 - เลือกบอร์ด
DOIT ESP32 DEVKIT V1
 - เลือก Arduino
- Finish

** path: Documents > PlatformIO > Projects **

platformio.ini



The screenshot shows the VS Code interface with the following details:

- EXPLORER** sidebar: UNTITLED (WORKSPACE) folder containing ESL Workshop, Tester (with .pio, .vscode, include, lib, src, test), and .gitignore.
- platformio.ini** file is selected in the Explorer and highlighted with a red oval.
- EDITOR**: The title bar says "platformio.ini". The content of the file is displayed:

```
1 ; PlatformIO Project Configuration File
2 ;
3 ; Build options: build flags, source files, includes
4 ; Upload options: custom upload port, extra upload protocols
5 ; Library options: dependencies, extra libraries
6 ; Advanced options: extra scripting
7 ;
8 ; Please visit documentation for the other options:
9 ; https://docs.platformio.org/page/projectconf.html
10
11 [env:esp32doit-devkit-v1]
12 platform = espressif32
13 board = esp32doit-devkit-v1
14 framework = arduino
15
16 monitor_speed = 115200
```

- board
- framework
- monitor_speed

แก้ไขแล้ว Ctrl + S ด้วย

>ปรับแต่งเพิ่มเติม<

ใช้คุณบคุณ Environment ของโปรเจคได้

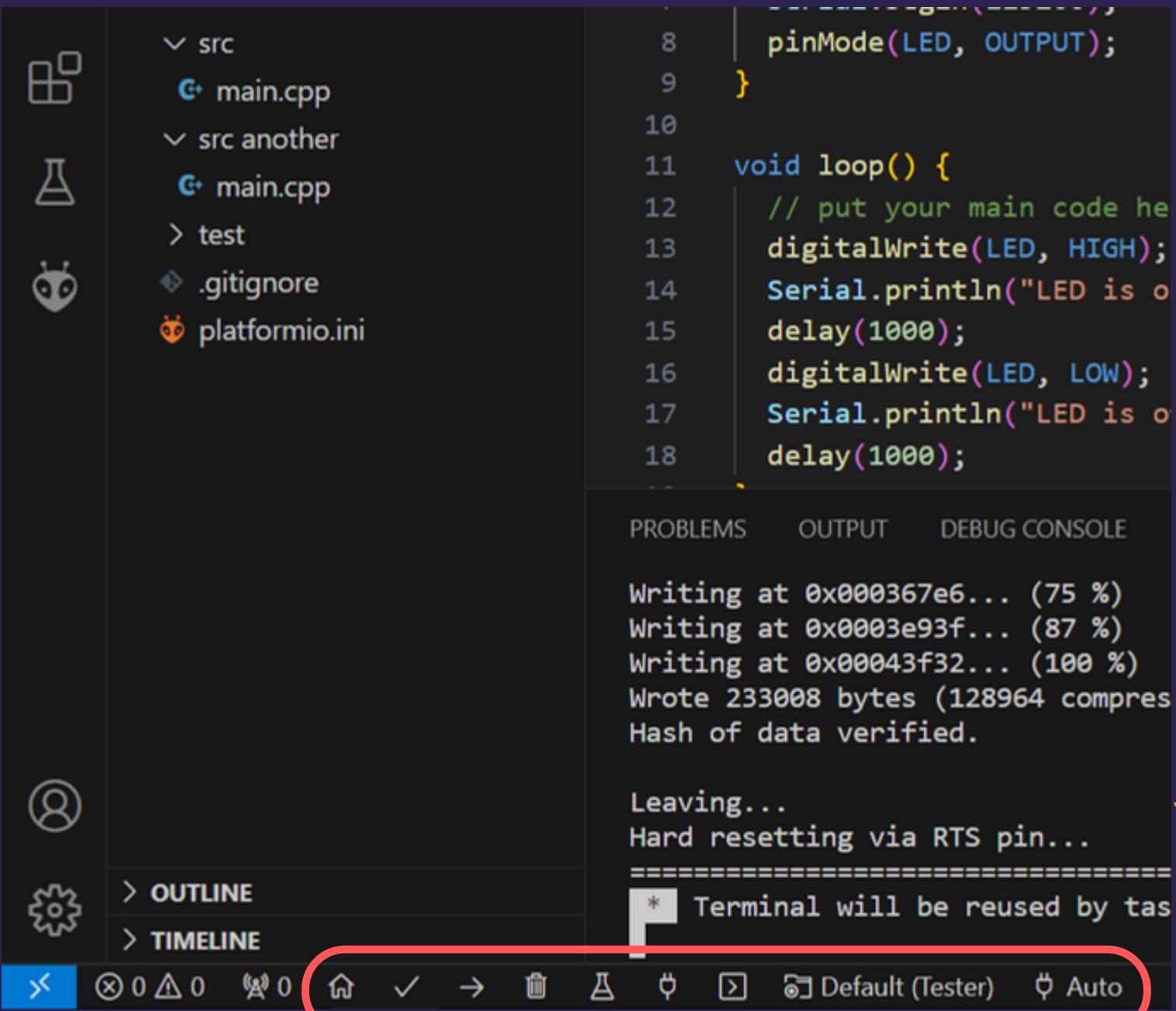
src (main code runner)

```
Tester > src > main.cpp > ...
1 #include <Arduino.h>
2
3 void setup() {
4
5 }
6
7 void loop() {
8
9 }
```

ต้อง `#include <Arduino.h>` เสมอ
จึงจะเริ่มใช้งานได้

ใช้เขียนโค้ดของโปรเจค

src (main code runner)



```
8 |     pinMode(LED, OUTPUT);  
9 | }  
10|  
11| void loop() {  
12| // put your main code here  
13|     digitalWrite(LED, HIGH);  
14|     Serial.println("LED is on");  
15|     delay(1000);  
16|     digitalWrite(LED, LOW);  
17|     Serial.println("LED is off");  
18|     delay(1000);
```

PROBLEMS OUTPUT DEBUG CONSOLE

```
Writing at 0x000367e6... (75 %)  
Writing at 0x0003e93f... (87 %)  
Writing at 0x00043f32... (100 %)  
Wrote 233008 bytes (128964 compressed)  
Hash of data verified.
```

Leaving...
Hard resetting via RTS pin...

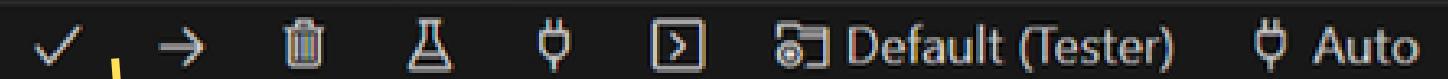
```
=====
```

* Terminal will be reused by tasks

หน้า Home ล้าง monitor

เลือก Com

Port



Build,
Upload

Serial
Monitor

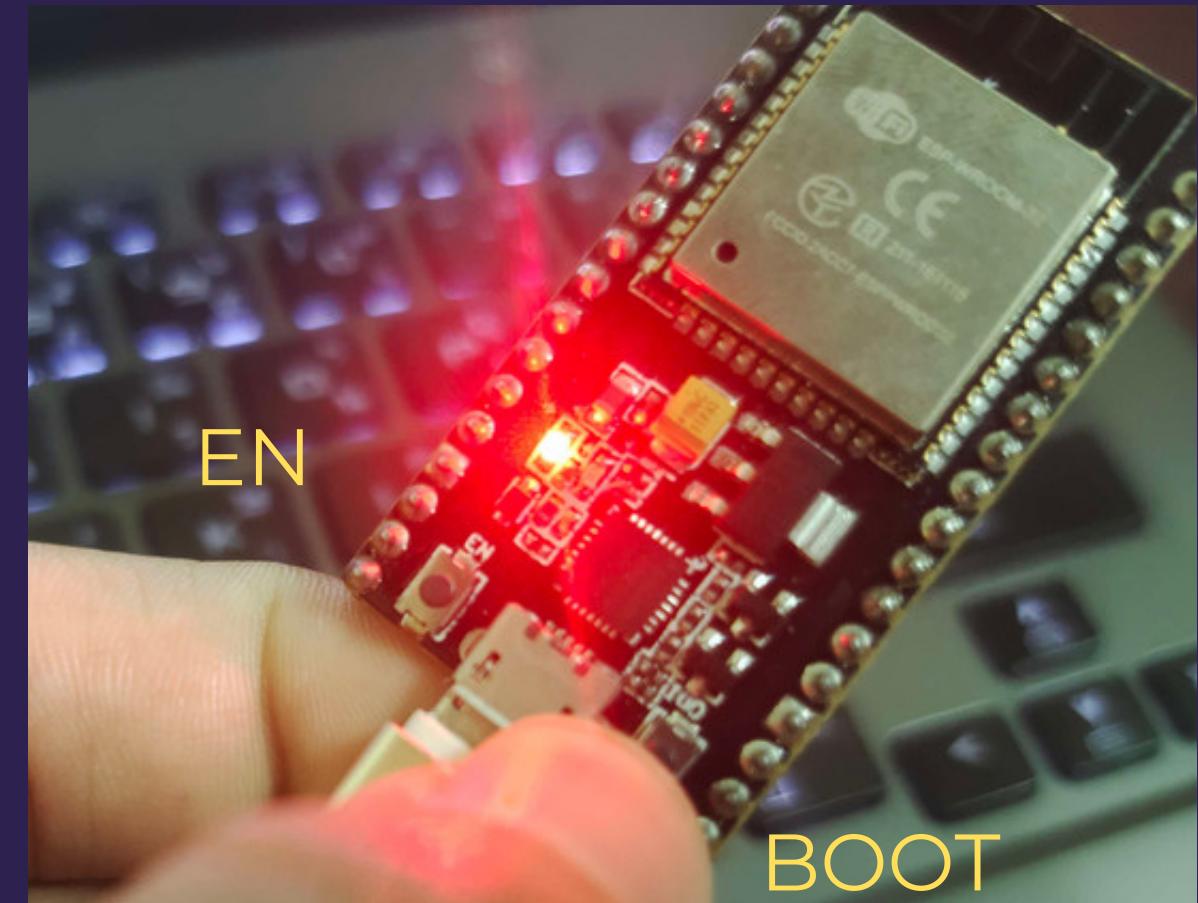
เลือก
Workspace

Upload Code

```
CURRENTLY upload_protocol = esp32
Looking for upload port...
Auto-detected: COM8
Uploading .pio\build\esp32doit-devkit-v1\firmware
esptool.py v4.5.1
Serial port COM8
Connecting.....
Boot
Hash of data verified.

Leaving...
Hard resetting via RTS pin...
===== [SUCCESS] Took 19.23 seconds =====
* Terminal will be reused by tasks, press any key to close it.
Ln 14, Col 2
```

Finish!

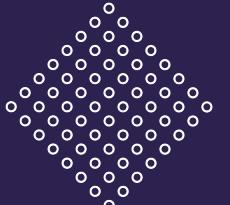


ESP32 ต้องกด Boot ค้างเวลา Upload

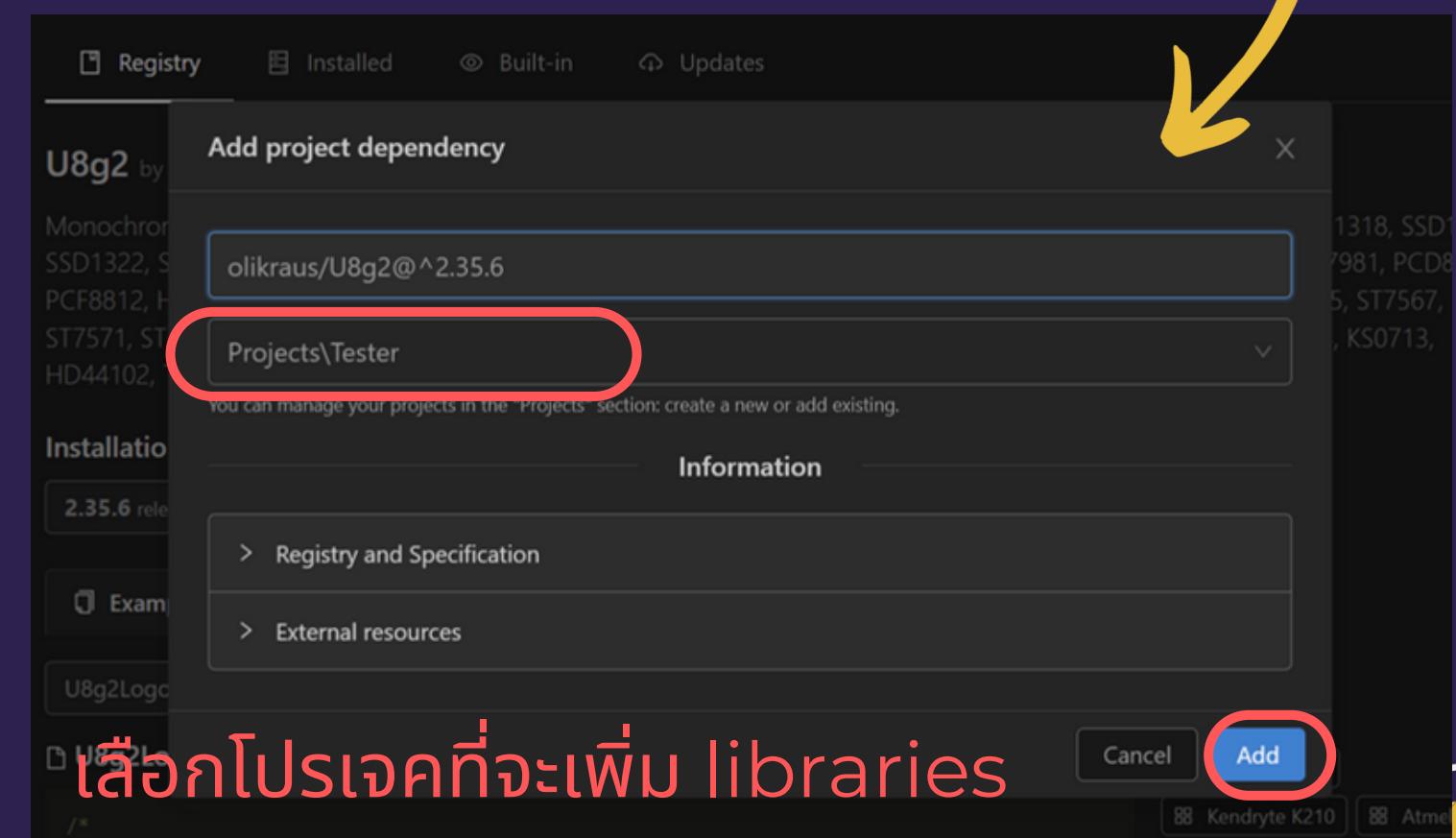
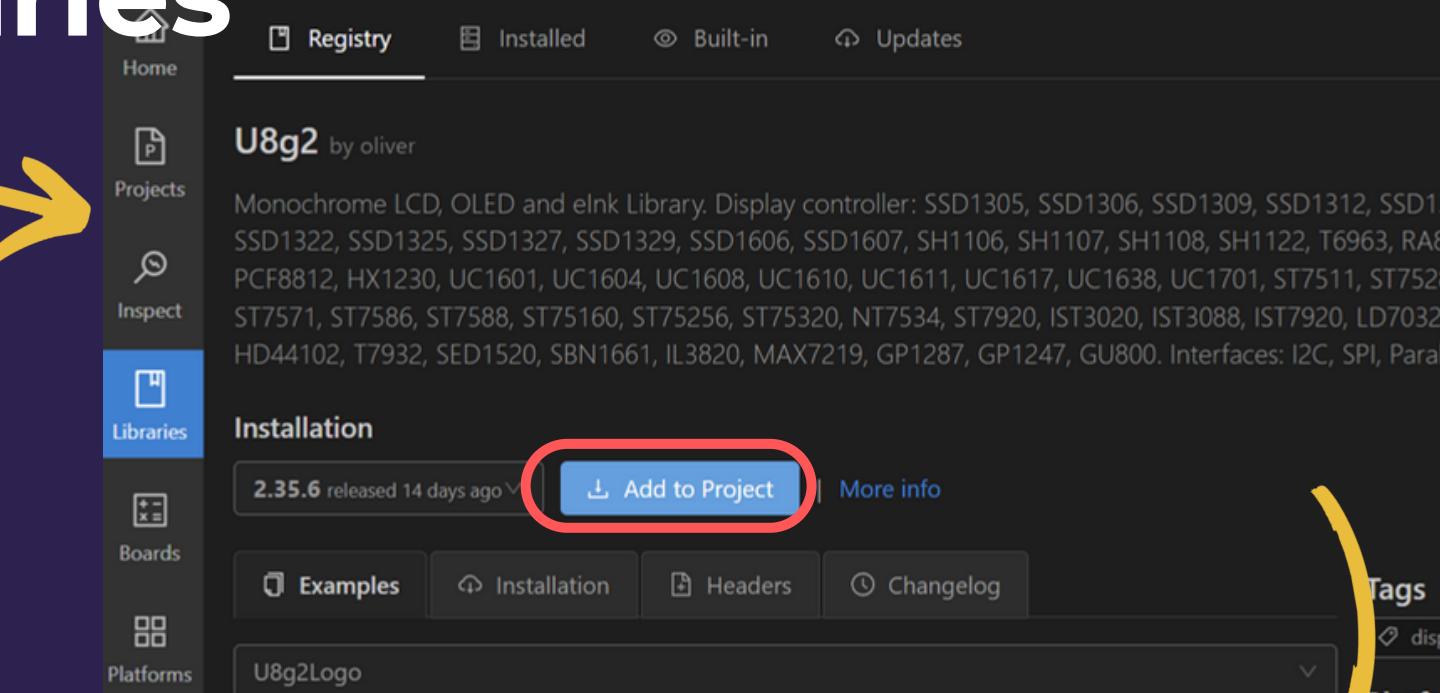
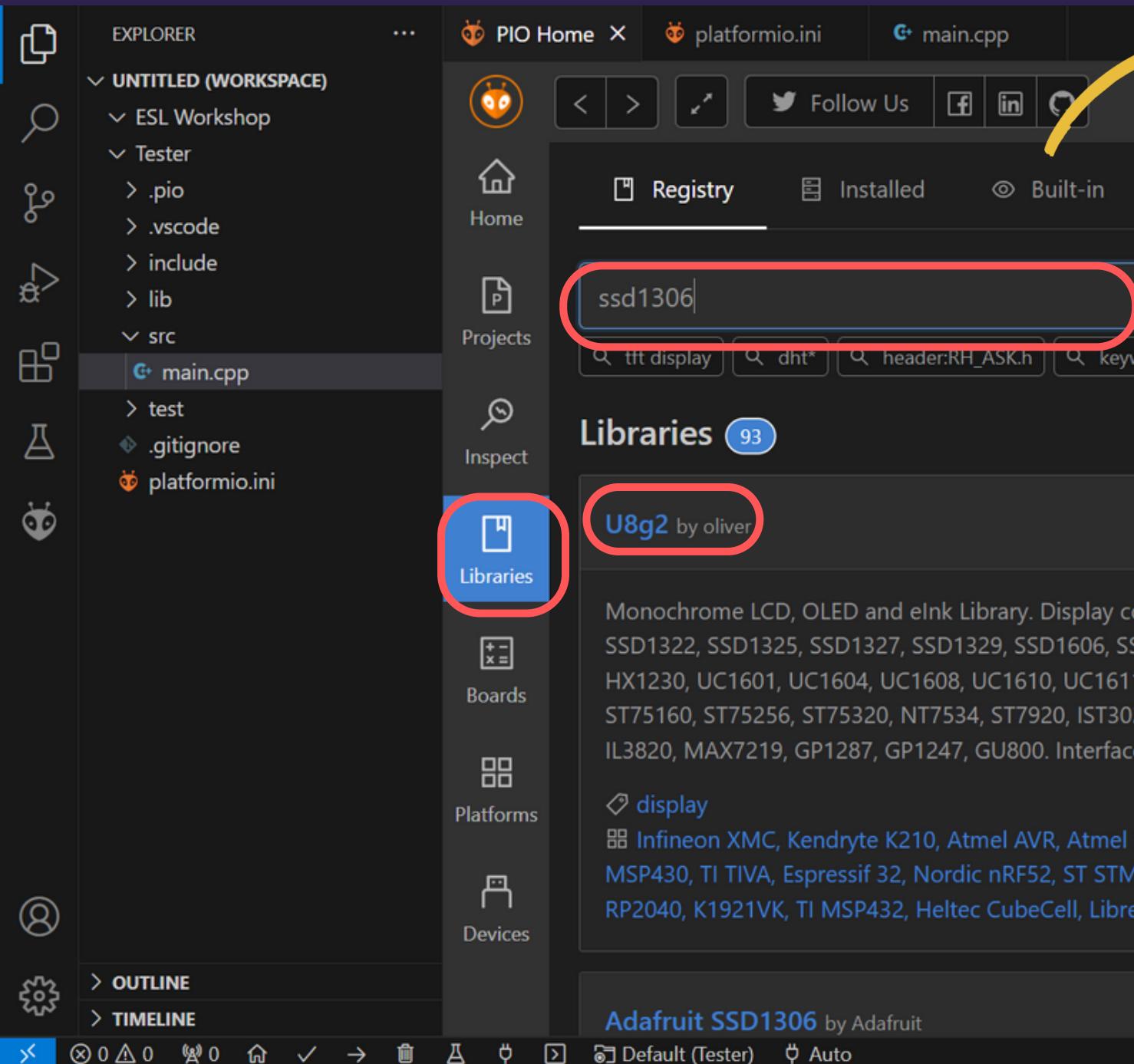
Activity 1: Upload Code

```
Tester > src > C++ main.cpp > ...
1  #include <Arduino.h>
2
3  #define LED 2
4
5  void setup() {
6      // put your setup code here, to run once:
7      Serial.begin(115200);
8      pinMode(LED, OUTPUT);
9  }
10
11 void loop() {
12     // put your main code here, to run repeatedly:
13     digitalWrite(LED, HIGH);
14     Serial.println("LED is on");
15     delay(1000);
16     digitalWrite(LED, LOW);
17     Serial.println("LED is off");
18     delay(1000);
19 }
20
```

Result: จะได้ไฟกะพริบพร้อม Serial



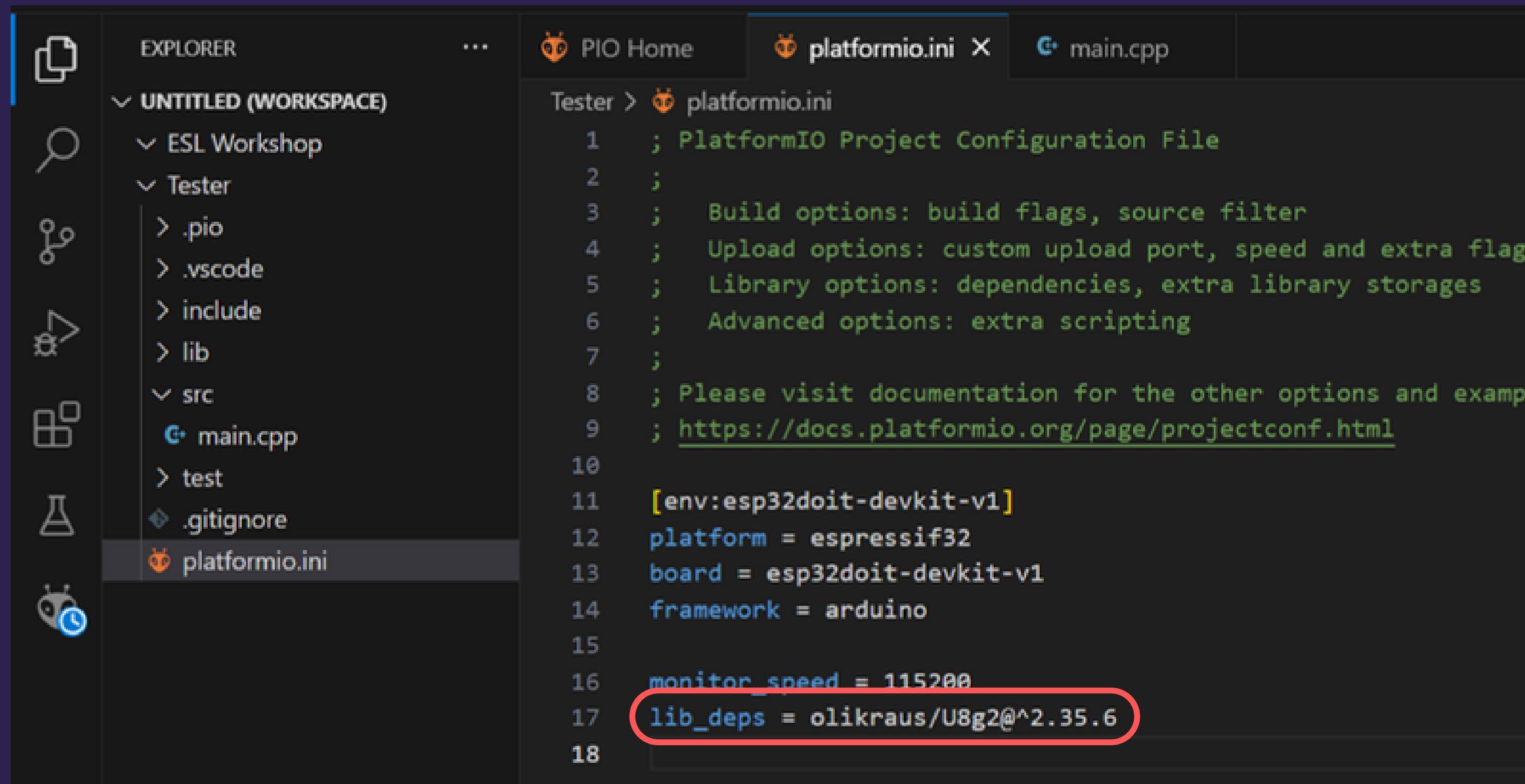
ເພີ່ມ Libraries



ເລືອກໂປຣເຈກກີ່ຈະເພີ່ມ libraries

PIO Home → Libraries → Search...

Activity 2: Add libraries



```
1 ; PlatformIO Project Configuration File
2 ;
3 ; Build options: build flags, source filter
4 ; Upload options: custom upload port, speed and extra flags
5 ; Library options: dependencies, extra library storages
6 ; Advanced options: extra scripting
7 ;
8 ; Please visit documentation for the other options and examples
9 ; https://docs.platformio.org/page/projectconf.html
10
11 [env:esp32doit-devkit-v1]
12 platform = espressif32
13 board = esp32doit-devkit-v1
14 framework = arduino
15
16 monitor_speed = 115200
17 lib_deps = olikraus/U8g2@^2.35.6
18
```

เพิ่ม 3 libraries สำหรับ Smart Farm

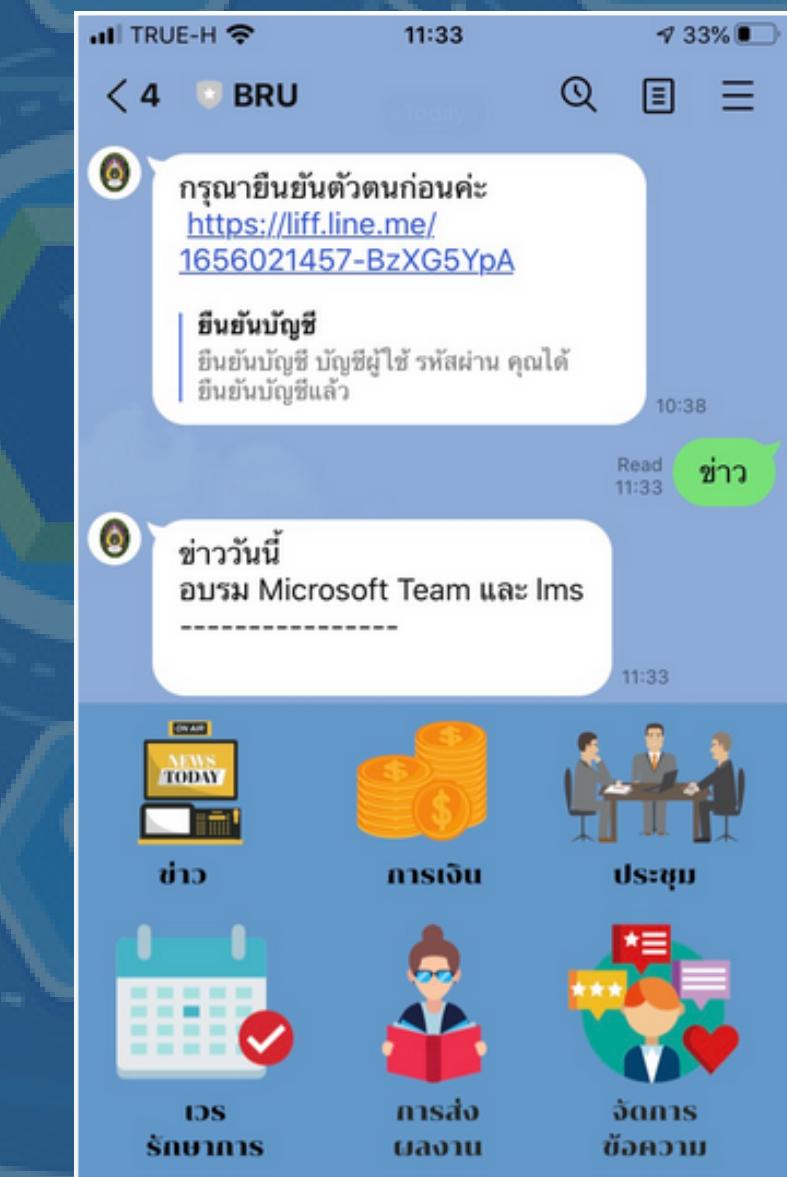
LINE OFFICIAL ACCOUNT



Line Manage, Right?

Let's get to Know ?

How important is it when we have a LINE chatbot?



Connect with {/LINE Login}!

/ Start Console >

WHAT IS LINE OFFICIAL ACCOUNT

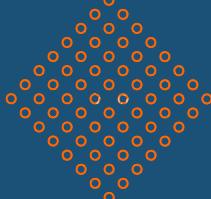
บัญชีทางการของ LINE สำหรับธุรกิจที่ช่วยให้ร้านค้าสามารถสร้างฐานผู้ติดตาม สื่อสารและส่งข้อมูลกิจกรรมการขายและการตลาด หรือโปรโมชั่นพิเศษไปยังลูกค้าผ่านทางไลน์ ตอบโจทย์ธุรกิจด้วยฟีเจอร์ที่หลากหลายที่จะช่วยสร้างประสบการณ์ที่ดีให้แก่ลูกค้าของร้านค้า รวมทั้งช่วยให้ร้านค้าสามารถบริหารจัดการการขายได้อย่างมีประสิทธิภาพ เช่น การสร้างข้อความต้อนรับ (Greeting message) , ข้อความตอบกลับอัตโนมัติ (Reply message) คุปองและบัตรสะสมแต้ม ChatBot 1-1 , (Broadcast) หากผู้ติดตามกังวล



LINE Official Account

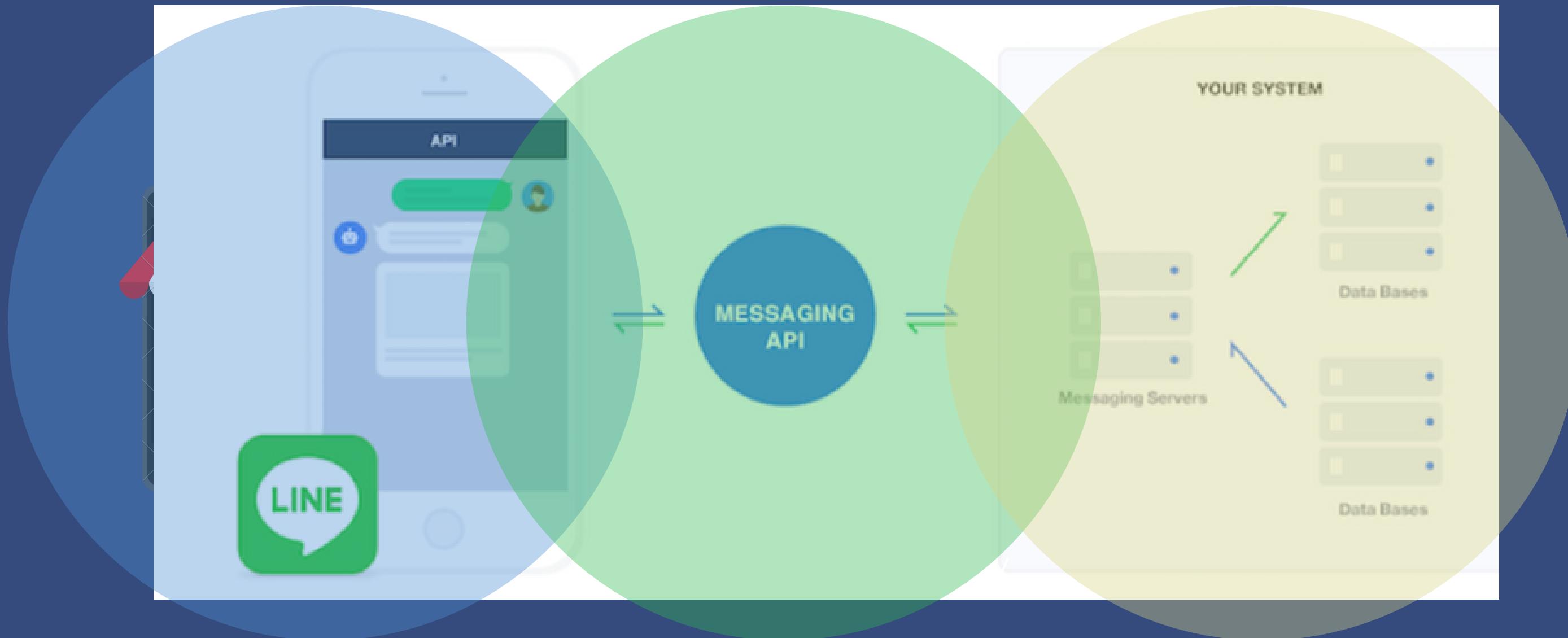
โซลูชันสำหรับธุรกิจหรือบริษัทเพื่อสื่อสารกับลูกค้าอย่างใกล้ชิด เพื่อส่งเสริมกิจกรรมทางธุรกิจหรือการส่งข่าวสารข้อมูลต่างๆ

E-Commerce Presentation



RoadMap Chart

► Line ChatBot



Three Easy Steps



STEP 1

SYSTEM DATA COLLECT





IFTTT

Service Sending Data To another Platform

IFTTT

<https://ifttt.com> :

IFTTT - Automate business & home

Get started with **IFTTT**, the easiest way to automate your favorite apps and devices for free.

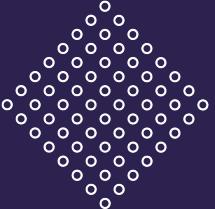
Make your home more relaxing. Make your work more productive.

LOGIN And Create Applet

Developers ▾

Create

Try Pro free





IFTTT

Service Sending Data To another Platform

Create your own

Go beyond if this then that with queries, conditional logic, multiple actions, and more! [Start free trial](#)

You're using 1 of 3 Applets

If This Add

Then That

This section shows the IFTTT interface for creating custom applets. It features a large 'Create your own' button at the top. Below it is a promotional banner for advanced features like queries and conditional logic. A message indicates the user is using one of three available applets. The main area is divided into two sections: 'If This' (trigger) and 'Then That' (action). The 'If This' section has an 'Add' button. The 'Then That' section is currently empty.

Choose a service

Q **webhooks** X

Webhooks

This section shows the IFTTT interface for selecting services. It features a large 'Choose a service' button at the top. Below it is a search bar with the query 'webhooks'. A single service card for 'Webhooks' is displayed, featuring its logo (a white three-way connector icon on a blue background) and the word 'Webhooks'.





IFTTT

Service Sending Data To another Platform

Choose a trigger



Webhooks

Receive a web request

This trigger fires every time the Maker service receives a web request to notify it of an event. For information on triggering events, go to your Maker service settings and then the listed URL (web) or tap your username (mobile)

Receive a web request with a JSON payload

This trigger fires every time the Maker service receives a web request to notify it of an event. For information on triggering events, go to your Maker service settings and then the listed URL (web) or tap your username (mobile)

Complete trigger fields



Receive a web request

This trigger fires every time the Maker service receives a web request to notify it of an event. For information on triggering events, go to your Maker service settings and then the listed URL (web) or tap your username (mobile)

Event Name

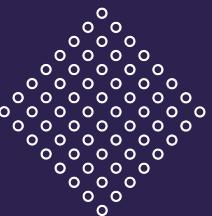


The name of the event, like "button_pressed" or "front_door_opened". Use only letters, numbers, and underscores

Create trigger



THE ENGINEERING
PROJECTS





IFTTT

Service Sending Data To another Platform

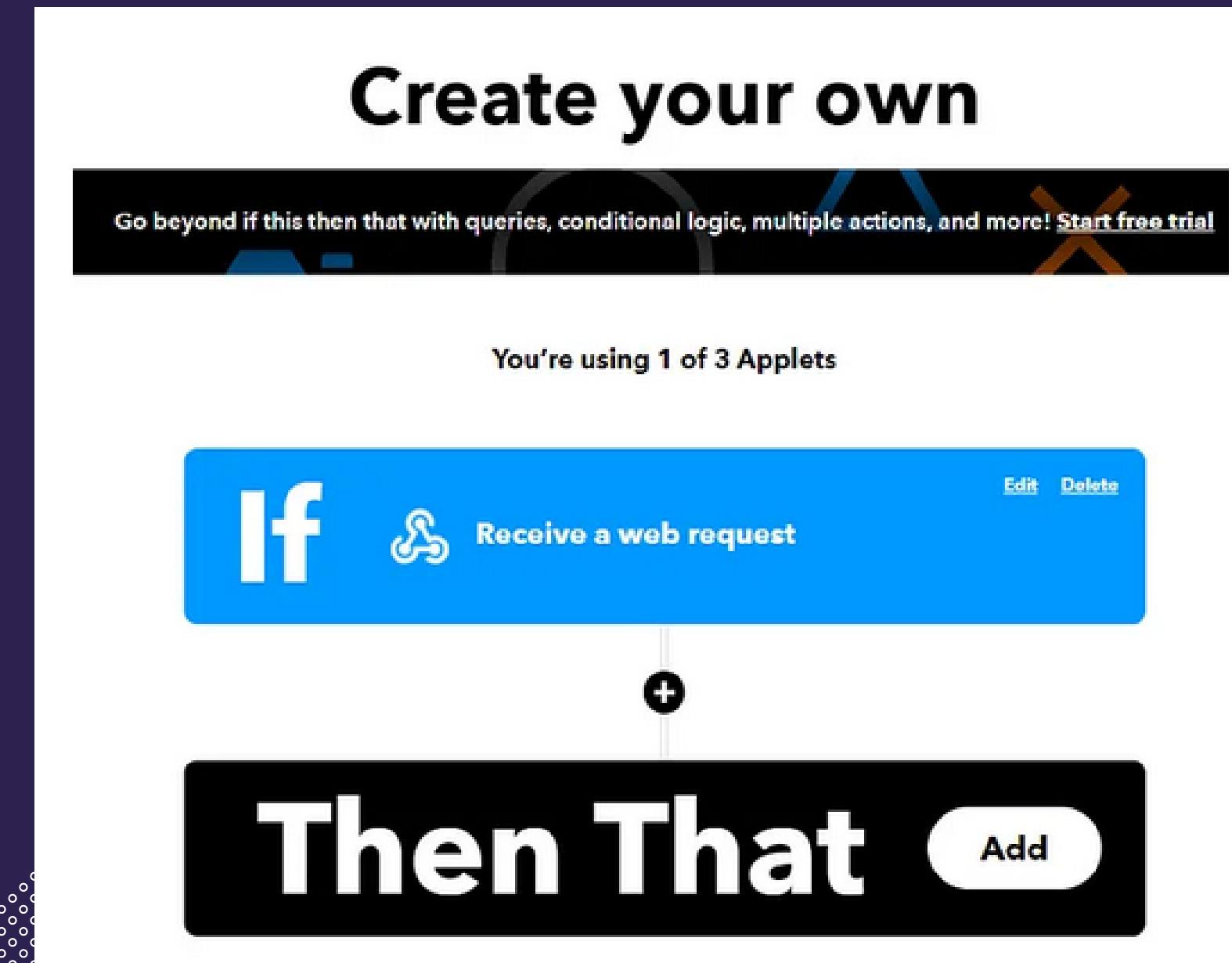
Create your own

Go beyond if this then that with queries, conditional logic, multiple actions, and more! [Start free trial](#)

You're using 1 of 3 Applets

If  Receive a web request Edit Delete

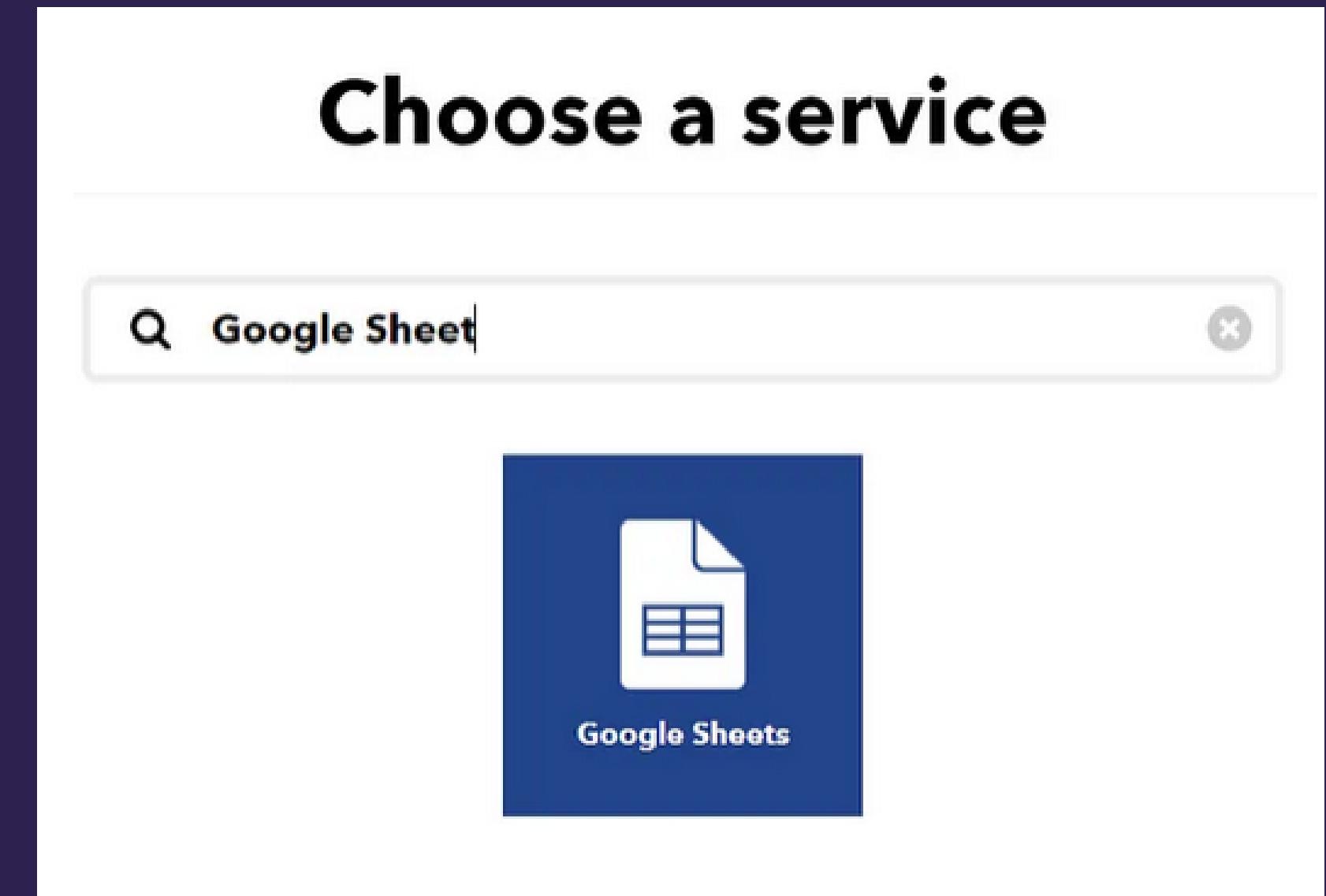
+ Then That Add



Choose a service

Q Google Sheet X

 Google Sheets



จำกัดมาหน้าเลือก Channel



Canva



IFTTT

Service Sending Data To another Platform

Choose an action



Google Sheets

Add row to spreadsheet

This action will add a single row to the bottom of the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created after 2000 rows.

Update cell in spreadsheet

This action will update a single cell in the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created if the file doesn't exist.

Complete action fields



Add row to spreadsheet

This action will add a single row to the bottom of the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created after 2000 rows.

Spreadsheet name

IoTlog

Will create a new spreadsheet if one with this title doesn't exist

Add ingredient

Formatted row

OccurredAt ||| EventName
Value1 ||| Value2 ||| Value3

Use "|||" to separate cells

Add ingredient

Drive folder path

IFTTT/MakerWebooks/
EventName

Format: some/folder/path (defaults to "IFTTT")

Add ingredient

Create action



IFTTT

Service Sending Data To another Platform

Choose an action



Google Sheets

Add row to spreadsheet
This action will add a single row to the bottom of the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created after 2000 rows.

Update cell in spreadsheet
This action will update a single cell in the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created if the file doesn't exist.

Update cell in spreadsheet

Google Sheets account

smatgen13@gmail.com



Add new account

Drive folder path

ESL/Training Esl
Innovation/IOT_Line Official
Account

Format: some/folder/path (defaults to "IFTTT")

Add ingredient

Spreadsheet name

update_Thermometer 2023

A new spreadsheet will be created if one doesn't exist.

Add ingredient

Which cell?

B2

Use A1 range notation e.g. A2, B10

Add ingredient

Value

Special Air Quality มีค่าเป็น

Value1

Value to be filled in the cell

Add ingredient



IFTTT

Service Sending Data To another Platform

Choose an action



Google Sheets

Add row to spreadsheet
This action will add a single row to the bottom of the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created after 2000 rows.

Update cell in spreadsheet
This action will update a single cell in the first worksheet of a spreadsheet you specify. Note: a new spreadsheet is created if the file doesn't exist.

Update cell in spreadsheet

Google Sheets account

smatgen13@gmail.com



Add new account

Drive folder path

ESL/Training Esl
Innovation/IOT_Line Official
Account

Format: some/folder/path (defaults to "IFTTT")

Add ingredient

Spreadsheet name

update_Thermometer 2023

A new spreadsheet will be created if one doesn't exist.

Add ingredient

Which cell?

B2

Use A1 range notation e.g. A2, B10

Add ingredient

Value

Special Air Quality มีค่าเป็น
Value1

Value to be filled in the cell

Add ingredient



IFTTT

Service Sending Data To another Platform

Review and finish

Applet Title

If Maker Event "IoTlog", then Add row to Siwaphon Viwatpinyo's Google Drive spreadsheet

by [cetidtrmutr](#) 87/140

Receive notifications when this Applet runs

Finish

บันทึกค่า ESP32 Data ลง updates Google Sheet [1]

[Edit title](#)

by **thedboy**

ตั้งชื่อ Applet



Canva



IFTTT

Service Sending Data To another Platform

If Maker Event "IoTlog", then Add row to Siwaphon Viwatpinyo's Google Drive spreadsheet

by cetidtrmutr [Edit title](#)

Connected

Get notifications when this Applet is active

• Connected Aug 30, 2021 [View activity](#)
• Never run

Realtime Applets usually run within 10 seconds [Check now](#)

[Archive](#)

บันทึกค่า ESP32 Data ลง updates Google Sheet [1]

by thedboy [Edit title](#)

ตั้งกดที่รูปไอคอน webhook



Canva



IFTTT

Service Sending Data To another Platform

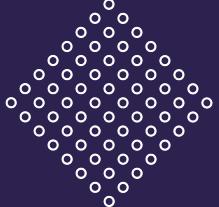


Webhooks

Integrate other services on IFTTT with your DIY projects. You can create Applets that work with any device or app that can make or receive a web request. If you'd like to build your own service and Applets, check out the [IFTTT platform](#).

[Create](#)

[Documentation](#)



เลือก documentation

Canva



IFTTT

Service Sending Data To another Platform



Your key is: **bQgk9VCoNfKy_xVjLwT7vG**

[« Back to service](#)

To trigger an Event

Make a POST or GET web request to:

```
https://maker.ifttt.com/trigger/IoTlog/with/key/bQgk9VCoNfKy_xVjLwT7vG
```

With an optional JSON body of:

```
{ "value1": "38", "value2": "72", "value3": "3446" }
```

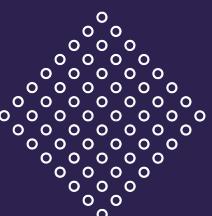
The data is completely optional, and you can also pass `value1`, `value2`, and `value3` as query parameters or form variables. This content will be passed on to the action in your Applet.

You can also try it with `curl` from a command line.

```
curl -X POST -H "Content-Type: application/json" -d '{"value1":"38","value2":"72","value3":"3446"}'  
https://maker.ifttt.com/trigger/IoTlog/with/key/bQgk9VCoNfKy_xVjLwT7vG
```

Please read our [FAQ](#) on using Webhooks for more info.

[Test It](#)





IFTTT

To trigger an Event with 3 JSON values

Make a POST or GET web request to:

```
https://maker.ifttt.com/trigger/ESP32_data/with/key/bUHSFwKSP1a1104rP35ea8
```

With an optional JSON body of:

```
{ "value1" : "12", "value2" : "  ", "value3" : "  " }
```

The data is completely optional, and you can also pass value1, value2, and value3 as query parameters or form variables. This content will be passed on to the action in your Applet.

You can also try it with `curl` from a command line.

```
curl -X POST -H "Content-Type: application/json" -d '{"value1":"12"}' https://maker.ifttt.com/trigger/ESP32_data/with/key/bUHSFwKSP1a1104rP35ea8
```

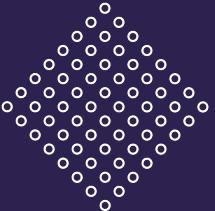
Please read our [FAQ](#) on using Webhooks for more info.

[Test It](#)



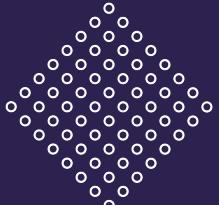
Try To Send Data
ส่งข้อมูลมากกว่า 1 cell

หรือ
เปลี่ยนวิธีการส่งค่าเป็น **Add row to spreadsheets**



Platform IO Introduce

```
1 #include <Arduino.h>
2 int counter = 1;
3
4 void setup()
5 {
6     | Serial.begin(115200);
7 }
8
9
10 void loop(){
11     | Serial.print("Thank For Run !! = ");
12     | Serial.println(counter);
13     | delay(1000);
14     | counter += 1;
15 }
```



Platform IO To Sending Data

```
1 #include <WiFi.h>
2 #include <HTTPClient.h>
3 #include <Arduino.h>
4
5 //-----Network Credentials
6 const char* ssid = "SSID";
7 const char* password = "Password";
8 const char* serverName = "http://maker.ifttt.com/trigger/ESP32_test/with/key/Enter you API key";
9
10 unsigned long lastTime = 0;
11 unsigned long timerDelay = 15000;
12
```

github code :

[https://github.com/TheBoyZ/
Training_Esl_IOT](https://github.com/TheBoyZ/Training_Esl_IOT)



Platform IO To Sending Data

```
10  unsigned long lastTime = 0;
11  unsigned long timerDelay = 15000;
12
13 void setup()
14 {
15     Serial.begin(115200);
16     WiFi.begin(ssid, password);
17     Serial.println("Connecting");
18     while(WiFi.status() != WL_CONNECTED)
19     {
20         delay(500);
21         Serial.print(".");
22     }
23     Serial.println("");
24     Serial.print("Connected to WiFi network with IP Address: ");
25     Serial.println(WiFi.localIP());
26
27     // Random seed is a number used to initialize a pseudorandom number generator
28     randomSeed(hallRead());
29 }
```

Platform IO To Sending Data

```
10  unsigned long lastTime = 0;
11  unsigned long timerDelay = 15000;
12
13 void setup()
14 {
15     Serial.begin(115200);
16     WiFi.begin(ssid, password);
17     Serial.println("Connecting");
18     while(WiFi.status() != WL_CONNECTED)
19     {
20         delay(500);
21         Serial.print(".");
22     }
23     Serial.println("");
24     Serial.print("Connected to WiFi network with IP Address: ");
25     Serial.println(WiFi.localIP());
26
27     // Random seed is a number used to initialize a pseudorandom number generator
28     randomSeed(hallRead());
29 }
```

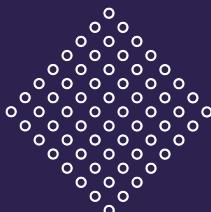
Platform IO To Sending Data

```
31 void loop()
32 {
33     //Send an HTTP POST request after every 15 seconds
34     if ((millis() - lastTime) > timerDelay)
35     {
36         //Check WiFi connection status
37
38         if(wiFi.status() == WL_CONNECTED){
39             WiFiClient client;
40             HTTPClient http;
41             // Your Domain name with URL path or IP address with path
42
43             http.begin(client, serverName);
44             // Specify content-type header
45             http.addHeader("Content-Type", "application/x-www-form-urlencoded");
46             // Data to send with HTTP POST
47             String httpRequestData = "value1=" + String(random(25)) + "&value2=" + String(random(25))+ "&value3=" + String(random(25));
48
49             // Send HTTP POST request
50             int httpResponseCode = http.POST(httpRequestData);
51             /*
52
53             // If you need an HTTP request with a content type: application/json, use the following:
```

Platform IO To Sending Data

```
/*
51
52
53 // If you need an HTTP request with a content type: application/json, use the following:
54
55 http.addHeader("Content-Type", "application/json");
56
57 // JSON data to send with HTTP POST
58
59 String httpRequestData = "{\"value1\":\\" + String(random(40)) + "\",\"value2\":\\" + String(random(40)) + "\",\"value3\":\\" + String(random(40)) + "}";
60
61 // Send HTTP POST request
62
63 int httpResponseCode = http.POST(httpRequestData);
64
65 */
```

ถ้าสมมติว่าเราใช้ JSON & Web Application



Platform IO To Sending Data

```
65      }
66      Serial.print("HTTP Response code: ");
67      Serial.println(httpResponseCode);
68      Serial.println("successfully conected to host");
69      // Free resources
70      http.end();
71    }
72  else
73  {
74    Serial.println("WiFi Disconnected");
75  }
76  lastTime = millis();
77}
78}
```

STEP 2

Create Script and Connect Dialog Flow



Google Sheets

The screenshot shows a Google Sheets document titled "update_Thermometer 2023". The spreadsheet contains a single sheet with data about air quality sensors. The columns represent Sensor ID, Sensor Value (in Thai), Latitude, Longitude, Location Name, URL, Location Description, and Location Link. The data rows are as follows:

	Sensor Value (ค่าคุณภาพอากาศ)	纬度	经度	สถานที่	ลิงก์	สถานที่คุณภาพอากาศ	location
sleepy	Special Air Quality มีค่าเป็น 163	16°26'45.3"N	100°19'36.8"E	มหาวิทยาลัย ECC	<Link>	มหาวิทยาลัย ECC	https://goo.gl/maps/A
U-u	October 1, 2021 at 04:57PM ค่าคือ 24 $\mu\text{g}/\text{m}^3$	16°26'47.6"N	100°19'38.6"E	สถานที่ไม่ระบุ	<Link>	สถานที่ไม่ระบุ	https://goo.gl/maps/Q
nonn	October 1, 2021 at 09:36PM ค่าคือ 35 $\mu\text{g}/\text{m}^3$	16°26'48.7"N	100°19'35.4"E	โรงงาน A	<Link>	โรงงาน A	https://goo.gl/maps/k

Apps Script

DialogFlow

Dialogflow Essentials Global

Air-Quality - +
on

Intents +

Entities +

Knowledge (beta)

Fulfillment

Integrations

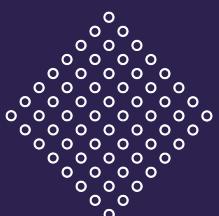
Triggers

Intents

Search intents Q T

- Default Fallback Intent
- Default Welcome Intent
- sleepy

CREATE INTENT ⋮ Try



Canva



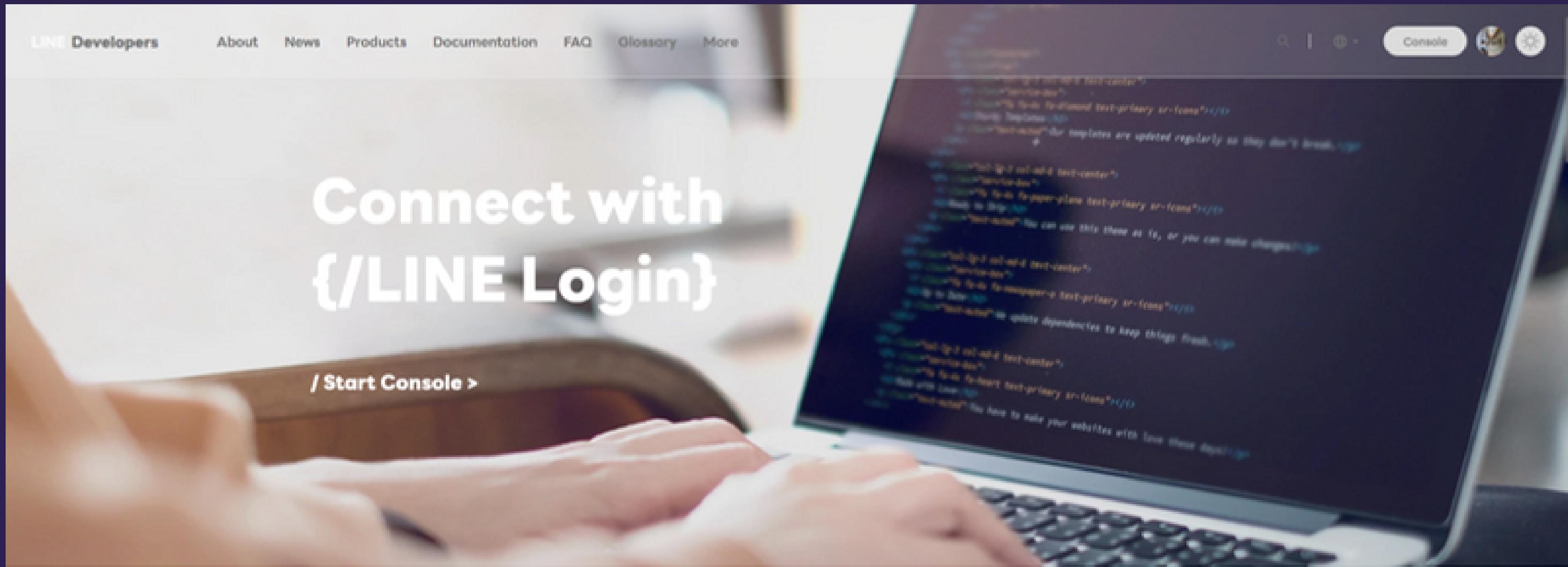
STEP 5

LINE OFFICIAL ACCOUNT : Chat BOT





LINE DEVELOPER



LINE Developers

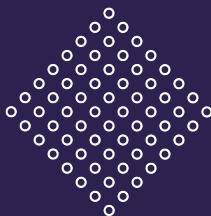
About News Products Documentation FAQ Glossary More

Connect with {/LINE Login}

/ Start Console >

Console

A blurred background image shows a person's hands typing on a laptop keyboard. In the background, a smartphone displays a code editor with several lines of code visible. The overall theme is developer tools and connectivity.



Canva

LINE DEVELOPER

Provider	Role
Air_Quality	Admin
Asia-Score	Admin
BOT-Score	Admin
botscore	Admin
PM	Admin
PM-BOTS	Admin

