

NTU GDSC 專案組

2024/11/25 社課（預先準備）

Database

昌維

```
... filterByOrg ? study.lead_organization === filterByOrg : true  
... status = filterByStatus ? study.status === filterByStatus : true  
... matchStatus) {
```

```
function filterStudies({ studies, filterByOrg, filterByStatus }) {  
  return studies.filter(study => {  
    return filterByOrg ? study.lead_organization === filterByOrg : true  
    return filterByStatus ? study.status === filterByStatus : true  
    return true  
  })  
}
```

Outline

- Supabase 介紹
- Supabase VS Firebase
- 匯入資料



Who am I?

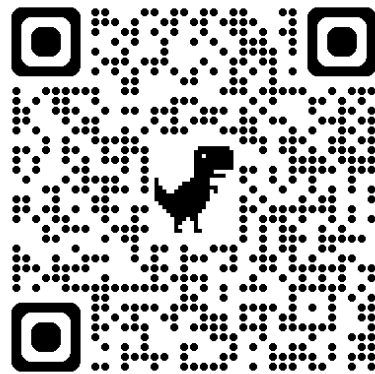
昌維 Chang Wei

- Experience:

- National Taiwan University of Science and Technology
 - ECE (Electrical and Computer Engineering)
 - Bachelor degree & Master degree
- Frontend Intern, PingCAP (分散式資料庫研發公司)
- Frontend Intern, RisingWave Labs (流式資料庫研發公司)
- 教學幹部, NTUST GDSC (台科大開源社)
- 教學幹部, NTU GDSC (台大谷歌學生開發者社)
- 財務長, NTUST SA 16th (台科大學生會)

- Research in:

- Web & UI(User Interface)/UX(User Experience)
- Cybersecurity
- Embedded development (MCU, FPGA, PCB Layout & Electronics DIY)



Supabase介紹

<https://supabase.com/>

- Supabase 是一個 Firebase 的開源版替代品。
- 可以作為基於 Postgres 的雲端資料庫平台
- <https://xguihxuzqibwxjnimxev.supabase.co/storage/v1/object/public/videos/marketing/website/supabase-table-editor-light.webm>



Supabase VS Firebase

- 這兩者都是雲端資料庫平台，用戶無需在地端自建伺服器即可存取資料庫
- 但是他們的應用場域不同，能夠解決的問題也不同
- 區別如下

Supabase	Firebase
關係型資料庫，基於表格的正規化資料庫	NoSQL（基於JSON的樹狀文檔型資料庫）
查詢出來的內容是表格	查詢出來的內容是JSON
開源，用戶可以下載該平台的原始碼自建（意味著用戶僅需架設一台伺服器之後，就可以在本地免費使用，無需向supabase公司付費）	閉源，為Google提供的平台，超出免費的配額之後，需要付費才能使用
基於PostgreSQL資料庫引擎	基於MongoDB資料庫引擎



註冊supabase帳號

- 打開 <https://supabase.com/dashboard/sign-up>
- 使用Email註冊，然後登入

Supabase

Get started

Create a new account

Continue with GitHub

or

Email

changwei1006@gmail.com

Password

••••••••••

- Uppercase letter
- Lowercase letter
- Number
- Special character (e.g. !?<@#%)
- 8 characters or more

Sign Up

Have an account? [Sign In Now](#)

We use first-party cookies to improve our services. [Learn more](#)

By continuing, you agree to Supabase's [Privacy Policy](#), and to receive periodic emails with updates.

Accept Opt out Privacy settings

supabase

Get started

Create a new account

Continue with GitHub

or

Check your email to confirm

You've successfully signed up. Please check your email to confirm your account before signing in to the Supabase dashboard. The confirmation link expires in 10 minutes.

Confirm Email Address

Have an account? [Sign In Now](#)

By continuing, you agree to Supabase's [Terms of Service](#) and [Privacy Policy](#), and to receive periodic emails with updates.

From: Supabase
welcome@supabase.com

To: M11002815@ 雄雄

Reply to: support@supabase.com

Subject: Confirm your email and launch your projects on Supabase!

Date: Fri, 15 Nov 2024 19:16:09 +0000

Message ID: <fadac65a-2abe-4c82-8f30-b789b3e44b02@mtasv.net>

Confirm your email address to start building with Supabase

You can start building with Supabase right away once you've confirmed that m11002815@mail.ntust.edu.tw is your email. Click the button below to confirm.

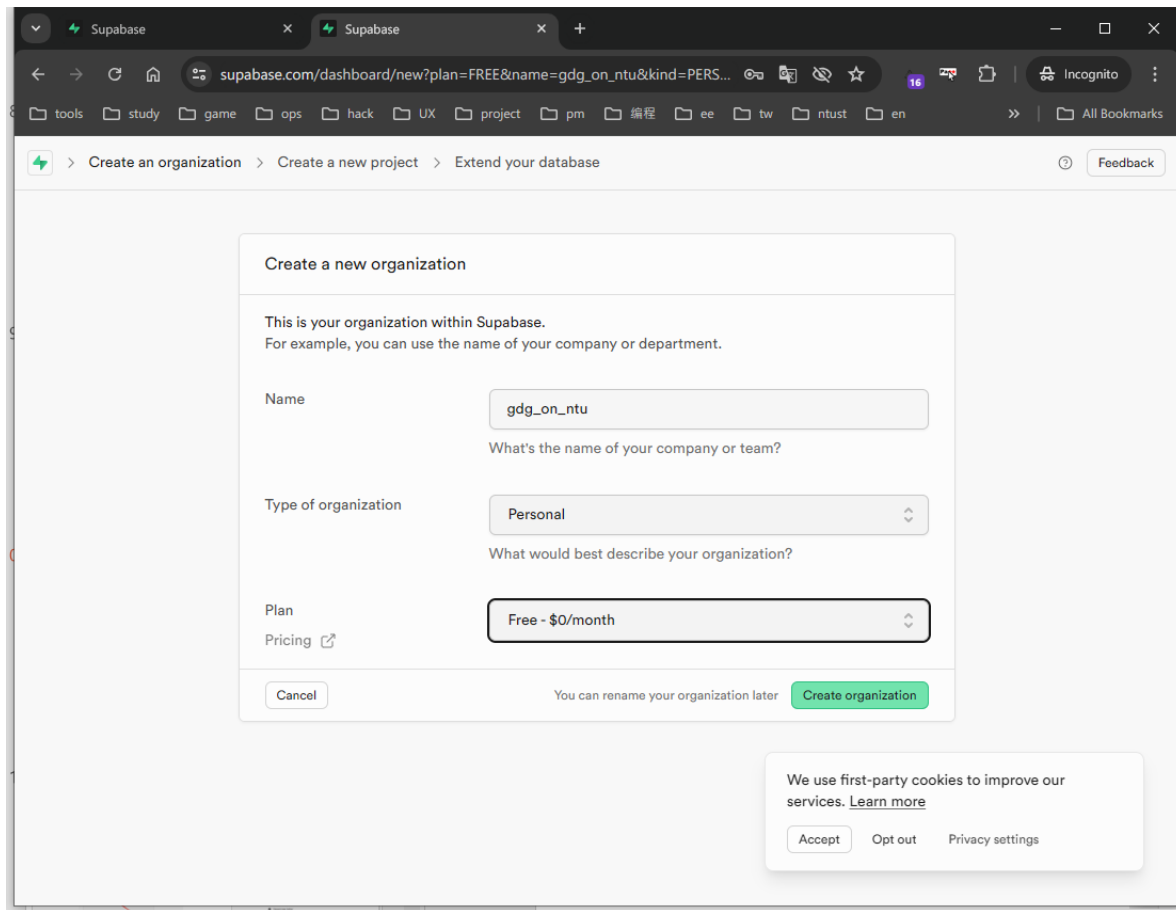
Confirm Email Address

If you didn't request for this, you can safely ignore this email.

Supabase Inc, 3500 S. DuPont Highway, Kent 19901, Dover, Delaware, USA

新建organization

- name使用[gdg_on_ntu]



The screenshot shows the Supabase dashboard with the 'Create a new organization' form. The browser address bar shows the URL: `supabase.com/dashboard/new?plan=FREE&name=gdg_on_ntu&kind=PERS...`. The breadcrumb navigation is: `Create an organization > Create a new project > Extend your database`. The form fields are:

- Name:** `gdg_on_ntu` (with a hint: 'What's the name of your company or team?')
- Type of organization:** `Personal` (with a hint: 'What would best describe your organization?')
- Plan:** `Free - $0/month` (with a link to 'Pricing')

At the bottom of the form, there is a 'Cancel' button, a note 'You can rename your organization later', and a green 'Create organization' button.

A cookie consent banner at the bottom right states: 'We use first-party cookies to improve our services. [Learn more](#)'. It includes buttons for 'Accept', 'Opt out', and 'Privacy settings'.

新建project

- Project name使用[learn-database]
- 密碼點[Generate a password], 然後按copy, 並且自己找個地方記下！
- Region選擇日本, 因為離我們最近, 速度快
- 然後點按下方按鈕【Create new project】

Organization: gdg_on_ntu > Create a new project > Extend your database

Create a new project

Your project will have its own dedicated instance and full Postgres database.
An API will be set up so you can easily interact with your new database.

Organization:

Project name:

Database Password: [Copied](#)

This password is strong. [Generate a password](#)

Region:

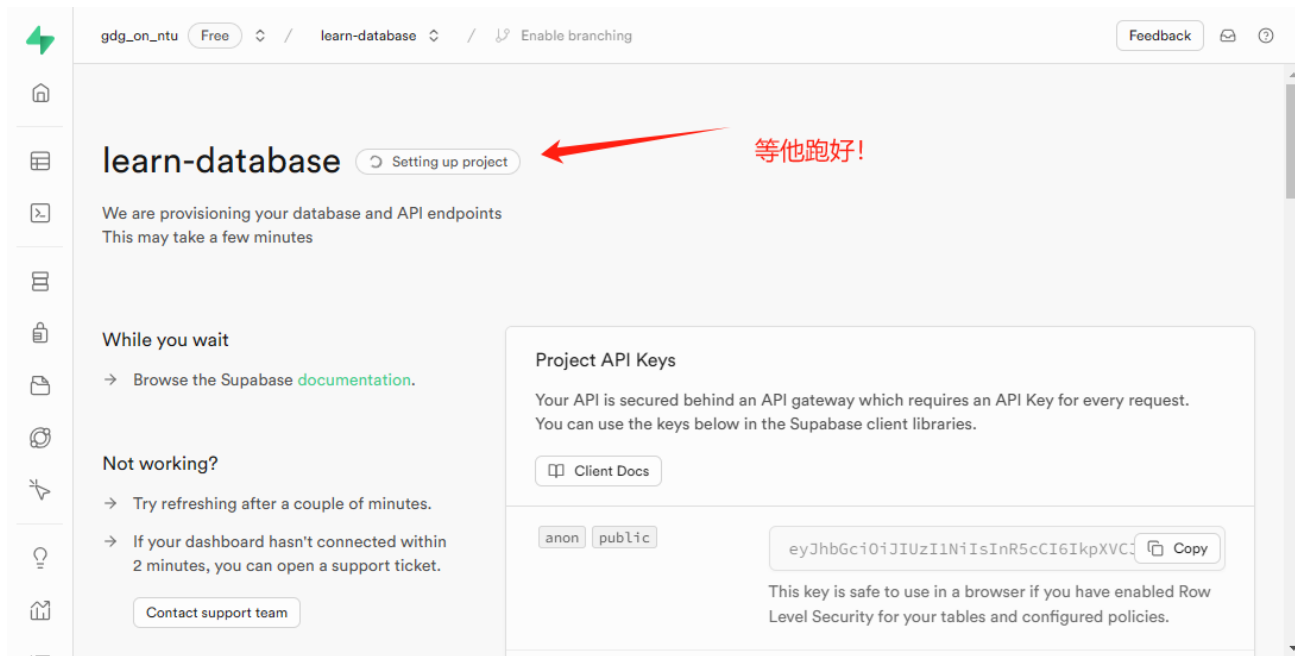
Select the region closest to your users for the best performance.

SECURITY OPTIONS >

[Cancel](#) [Create new project](#)

You can rename your project later

等待setting up project



gdg_on_ntu Free / learn-database / Enable branching Feedback

learn-database

Setting up project

We are provisioning your database and API endpoints
This may take a few minutes

While you wait

- Browse the Supabase [documentation](#).

Not working?

- Try refreshing after a couple of minutes.
- If your dashboard hasn't connected within 2 minutes, you can open a support ticket.

Contact support team

Project API Keys

Your API is secured behind an API gateway which requires an API Key for every request. You can use the keys below in the Supabase client libraries.

Client Docs

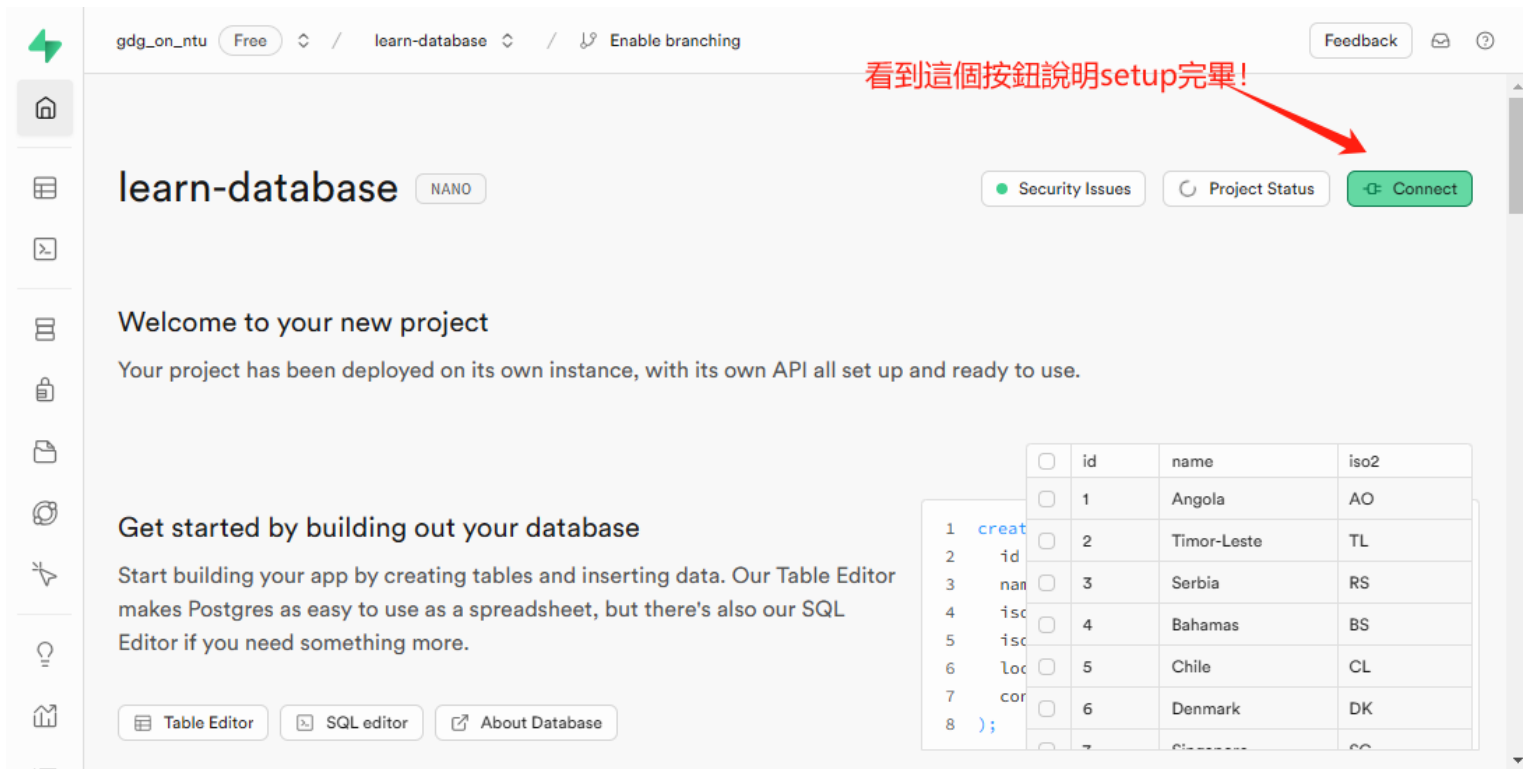
anon public

eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9

Copy

This key is safe to use in a browser if you have enabled Row Level Security for your tables and configured policies.

確認 setup 完畢



gdg_on_ntu Free / learn-database / Enable branching

Feedback

learn-database NANO

Security Issues Project Status **Connect**

Welcome to your new project

Your project has been deployed on its own instance, with its own API all set up and ready to use.

Get started by building out your database

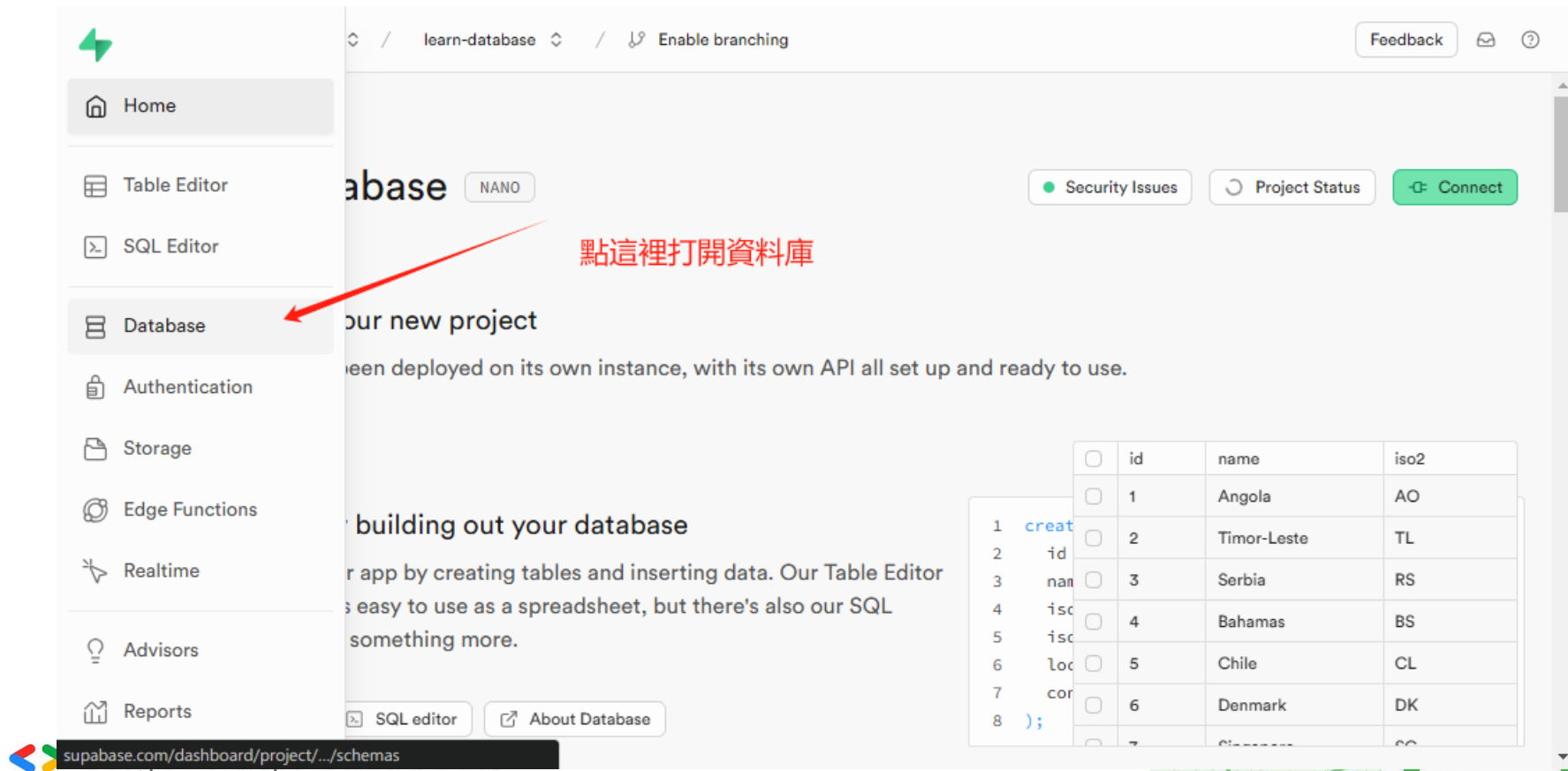
Start building your app by creating tables and inserting data. Our Table Editor makes Postgres as easy to use as a spreadsheet, but there's also our SQL Editor if you need something more.

Table Editor SQL editor About Database

<input type="checkbox"/>	id	name	iso2
<input type="checkbox"/>	1	Angola	AO
<input type="checkbox"/>	2	Timor-Leste	TL
<input type="checkbox"/>	3	Serbia	RS
<input type="checkbox"/>	4	Bahamas	BS
<input type="checkbox"/>	5	Chile	CL
<input type="checkbox"/>	6	Denmark	DK
<input type="checkbox"/>	7	Singapore	SG

```
1 create
2 id
3 name
4 iso2
5 iso2
6 loc
7 cor
8 );
```

打開database



The screenshot shows the Supabase dashboard interface. On the left, a sidebar menu contains several options: Home, Table Editor, SQL Editor, Database, Authentication, Storage, Edge Functions, Realtime, Advisors, and Reports. The 'Database' option is highlighted with a red arrow, and a red text label '點這裡打開資料庫' (Click here to open the database) points to it. The main content area displays the 'Database' section for a project named 'learn-database'. It includes a 'NANO' badge, buttons for 'Security Issues', 'Project Status', and 'Connect', and a section titled 'building out your database' with a description of the Table Editor and SQL Editor. A table with columns 'id', 'name', and 'iso2' is visible, containing data for various countries. The bottom of the screen shows the URL 'supabase.com/dashboard/project/.../schemas'.

Database NANO

Security Issues Project Status Connect

our new project

been deployed on its own instance, with its own API all set up and ready to use.

building out your database

r app by creating tables and inserting data. Our Table Editor
s easy to use as a spreadsheet, but there's also our SQL
something more.

SQL editor About Database

	id	name	iso2
	1	Angola	AO
	2	Timor-Leste	TL
	3	Serbia	RS
	4	Bahamas	BS
	5	Chile	CL
	6	Denmark	DK
	7	Sierra Leone	SL

supabase.com/dashboard/project/.../schemas

打開tables

Database

gdg_on_ntu Free / learn-database / Enable branching

Feedback

schema: public

Auto layout

DATABASE MANAGEMENT

Schema Visualizer

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PLATFORM

點這裡打開tables

Primary key # Identity Unique Nullable Non-Nullable

準備新增資料表

The screenshot shows the Google Cloud SQL console interface. On the left is a sidebar with navigation icons and a menu. The main area displays the 'Database Tables' page for the 'gdg_on_ntu' database. At the top of the main area, there are tabs for 'Free' and 'learn-database', and a link to 'Enable branching'. Below this, the 'Database Tables' section shows a dropdown for 'schema: public', a filter icon, and a search bar labeled 'Search for a table'. A green '+ New table' button is located to the right of the search bar. A red arrow points from the bottom right towards this button. Below the button, there is a table with two columns: 'Name' and 'Description'. The table is currently empty, with the text 'No tables created yet' and 'There are no tables found in the schema "public"'. At the bottom right of the main area, there is a red text label '按這裡新增資料表' (Click here to add a new table).

Database

gdg_on_ntu Free / learn-database / Enable branching

Feedback

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Database Tables

schema: public

Search for a table

+ New table

Name	Description
No tables created yet There are no tables found in the schema "public"	

按這裡新增資料表

選擇匯入

- 點按鈕 Import data via spreadsheet

The screenshot shows the Google Cloud SQL console interface. On the left is a sidebar menu with categories: Database, ACCESS CONTROL, PLATFORM, and TOOLS. The 'Database' section is expanded, showing options like Schema Visualizer, Tables, Functions, Triggers, etc. The main panel displays the 'Create a new table under public' dialog. The 'Name' field is 'NPA_OP1' and the 'Description' is '警察機關失物招領網路公告數位批次檔案'. The 'Enable Row Level Security (RLS)' checkbox is checked. A warning box states that policies are required to query data. The 'Columns' section shows two columns: 'id' (int8) and 'created_at' (timestamp). The 'Import data via spreadsheet' button is highlighted with a red arrow and the text '按這裡選擇匯入檔案'.

Create a new table under **public**

Name: NPA_OP1

Description: 警察機關失物招領網路公告數位批次檔案

☒ Enable Row Level Security (RLS) **Recommended**
Restrict access to your table by enabling RLS and writing Postgres policies.

Policies are required to query data
You need to create an access policy before you can query data from this table. Without a policy, querying this table will return an empty array of results. You can create policies after saving this table.
[Documentation](#)

☐ Enable Realtime
Broadcast changes on this table to authorized subscribers

Columns [About data types](#) **Import data via spreadsheet**

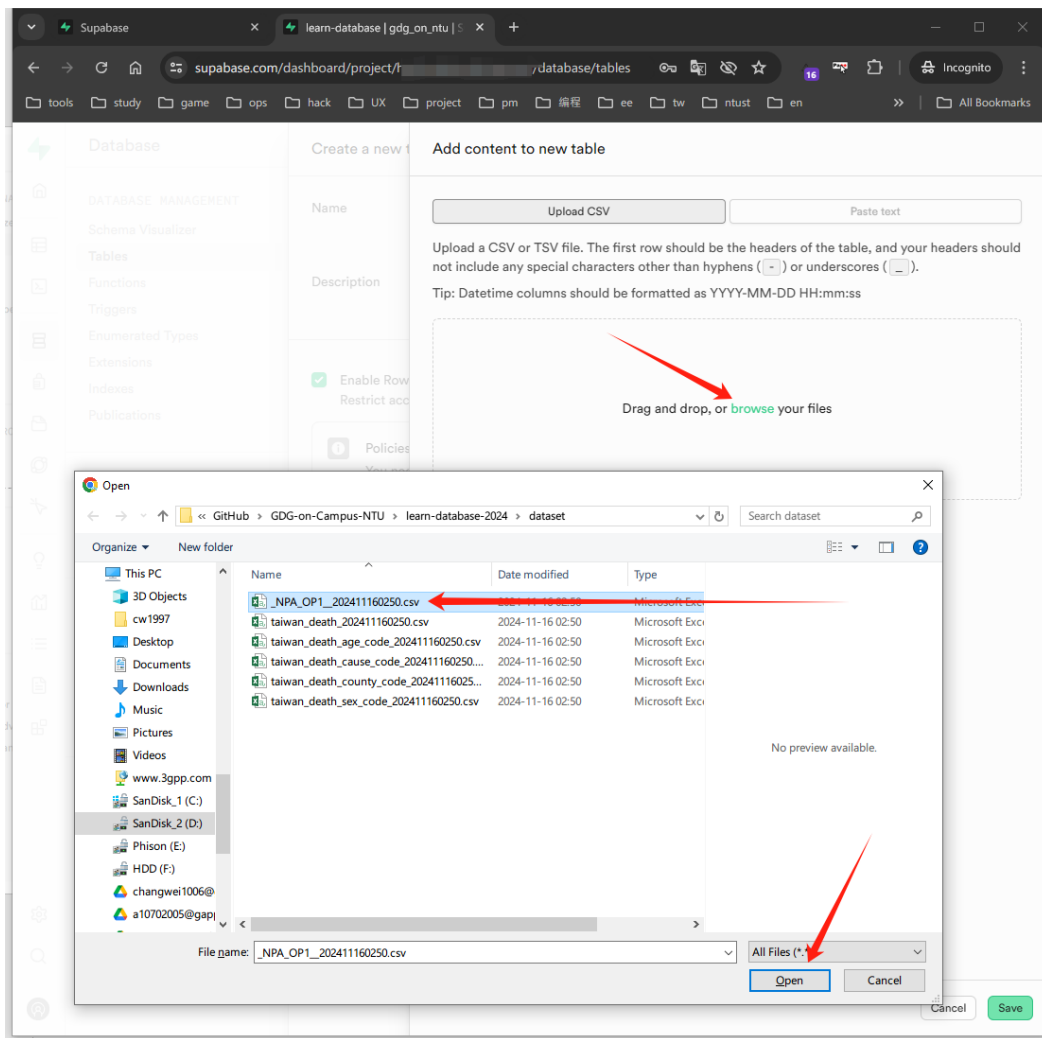
Name	Type	Default Value	Primary
id	# int8	NULL	<input checked="" type="checkbox"/>
created_at	timestamp	now()	<input type="checkbox"/>

[Add column](#)

[Cancel](#) [Save](#)

選擇匯入

- 選擇CSV檔案



- 展開【Configure import data】

Database

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Security Advisor

Performance Advisor

Query Performance

Create a new table

Name

Description

☒ Enable Row Restrict access

?

Policies

You need to create a policy without create policy

?

Columns

id

created

Add content to new table

Upload CSV

Paste text

Upload a CSV or TSV file. The first row should be the headers of the table, and your headers should not include any special characters other than hyphens (-) or underscores (_).

Tip: Datetime columns should be formatted as YYYY-MM-DD HH:mm:ss

_NPA_OP1__202411160250.csv

Remove File

Configure import data

Preview data to be imported

Your table will have 68,521 rows and the following 8 columns.
Here is a preview of the data that will be added (up to the first 20 columns and first 20 rows).

OP_AC_RCNO	OP_AC_UNIT_NM1	OP_AC_UNIT_NM2	OP_AC_UNIT_NM3
OP11310A239A00067	航空警察局	航空警察局保安警察	航空警察局保安警察大隊
OP11310AWES100002	臺北市政府警察局	臺北市政府警察局萬華分局	臺北市政府警察局萬華分局
OP11310ACDV100004	臺南市政府警察局	臺南市政府警察局新營分局	臺南市政府警察局新營分局
OP11310AV7N100001	高雄市政府警察局	高雄市政府警察局苓雅分局	高雄市政府警察局苓雅分局
OP11310AD4S100004	新北市政府警察局	新北市政府警察局三重分局	新北市政府警察局三重分局
OP11310AB4M100003	臺中市政府警察局	臺中市政府警察局第四分局	臺中市政府警察局第四分局
OP11310ADIO100006	新北市政府警察局	新北市政府警察局林口分局	新北市政府警察局林口分局
OP11310BT4T100003	宜蘭縣政府警察局	宜蘭縣政府警察局羅東分局	宜蘭縣政府警察局羅東分局
OP11310BT4T100004	宜蘭縣政府警察局	宜蘭縣政府警察局羅東分局	宜蘭縣政府警察局羅東分局

Cancel

Save

- 點按OP_PU_DATE, 取消匯入該欄位
(因為他不是標準的timestamp格式的欄位, 不便於使用SQL進行查詢, 因此我們不要匯入它)
- 然後按右下角的Save按鈕

Database

CREATE A NEW TABLE

Name

Description

Enable Row Restrict access

Policies

Configure import data

Select which columns to import

By default, all columns are selected to be imported from your CSV

OP_AC_RCNO OP_AC_UNIT_NM1 OP_AC_UNIT_NM2 OP_AC_UNIT_NM3

OP_PU_DATE OP_PU_PLACE OP_AN_CONTENT pickup_datetime

Preview data to be imported

Your table will have 68,521 rows and the following 8 columns.

Here is a preview of the data that will be added (up to the first 20 columns and first 20 rows).

OP_AC_RCNO	OP_AC_UNIT_NM1	OP_AC_UNIT_NM2	OP_AC_UNIT_NM3
OP11310A239A00067	航空警察局	航空警察局保安警察	航空警察局保安警察
OP11310AWES100002	臺北市府警察局	臺北市府警察局萬	臺北市府警察局萬
OP11310ACDV100004	臺南市政府警察局	臺南市政府警察局新	臺南市政府警察局新
OP11310AV7N100001	高雄市政府警察局	高雄市政府警察局等	高雄市政府警察局等
OP11310AD4S100004	新北市政府警察局	新北市政府警察局三	新北市政府警察局三
OP11310AB4M100003	臺中市政府警察局	臺中市政府警察局第	臺中市政府警察局第
OP11310ADIO100006	新北市政府警察局	新北市政府警察局林	新北市政府警察局林

然後按save

Save

點按OC_PU_DATE,
取消匯入這個欄位
因為他不是標準的timestamp格式
所以我們不要匯入它

解決掉warning

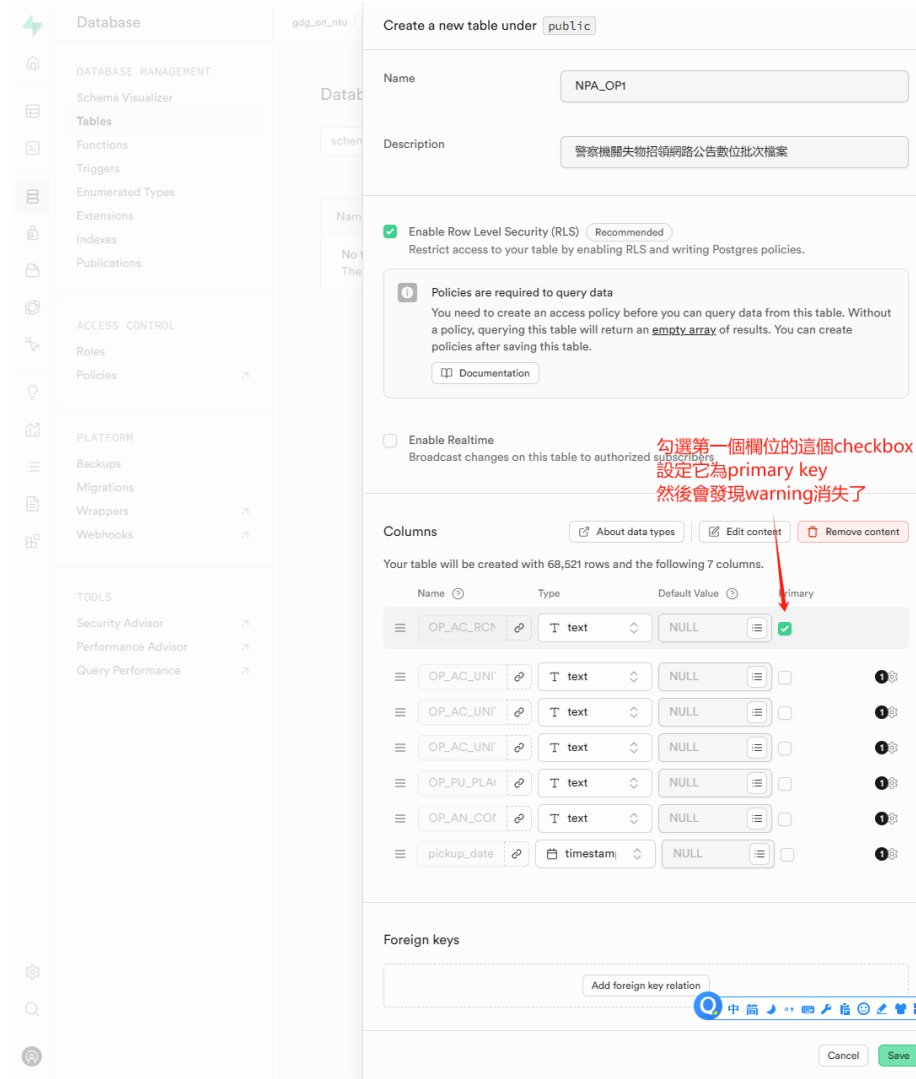
- 我們可以看到有一個warning提示
- 他說的是這張表沒有primary key，也就是缺少一個能夠唯一區分這筆資料的 Identification code

The screenshot shows the PostgreSQL database management interface. On the left, a sidebar lists various database management tools. The main area displays the 'Create a new table under public' dialog. The table name is 'NPA_OP1' and the description is '警察機關失物招領網路公告數位批次檔案'. The 'Enable Row Level Security (RLS)' checkbox is checked. A warning message is displayed: 'Warning: No primary keys selected. Tables should have at least one column as the primary key to identify each row. Without a primary key, you will not be able to update or delete rows from the table.' A red arrow points from the text '這裡有warning' to the warning message. Below the warning, a table lists the columns to be created:

Name	Type	Default Value	Primary
OP_AC_RCI	T text	NULL	
OP_AC_UN	T text	NULL	
OP_AC_UN	T text	NULL	
OP_AC_UN	T text	NULL	
OP_PU_PLA	T text	NULL	
OP_AN_CO	T text	NULL	
pickup_date	timestam	NULL	

At the bottom, there is a 'Foreign keys' section and 'Cancel' and 'Save' buttons.

設定primary key



Database

Database Management

- Schema Visualizer
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ACCESS CONTROL

- Roles
- Policies

PLATFORM

- Backups
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- Wrappers
- Webhooks

TOOLS

- Security Advisor
- Performance Advisor
- Query Performance

Create a new table under public

Name: NPA_OP1

Description: 警察機關失物招領網路公告數位批次檔案

☒ Enable Row Level Security (RLS) (Recommended)
Restrict access to your table by enabling RLS and writing Postgres policies.

Policies are required to query data
You need to create an access policy before you can query data from this table. Without a policy, querying this table will return an **empty array** of results. You can create policies after saving this table.
[Documentation](#)

☐ Enable Realtime
Broadcast changes on this table to authorized subscribers

Columns [About data types](#) [Edit content](#) [Remove content](#)

Your table will be created with 68,521 rows and the following 7 columns.

Name	Type	Default Value	Primary
OP_AC_RCN	text	NULL	<input checked="" type="checkbox"/>
OP_AC_UNI	text	NULL	<input type="checkbox"/>
OP_AC_UNI	text	NULL	<input type="checkbox"/>
OP_AC_UNI	text	NULL	<input type="checkbox"/>
OP_PU_PLAI	text	NULL	<input type="checkbox"/>
OP_AN_COI	text	NULL	<input type="checkbox"/>
pickup_date	timestamp	NULL	<input type="checkbox"/>

Foreign keys [Add foreign key relation](#)

Cancel Save

勾選第一個欄位的這個checkbox
設定它為primary key
然後會發現warning消失了

開始匯入

- 輸入name為[NPA_OP1]
- 輸入description為[警察機關失物招領網路公告數位批次檔案]
- 記住勾選第一個column為Primary
- 確認所有設定是否和右圖一致
- 按右下角Save按鈕匯入
- 等待左上角匯入進度變為100% (根據網路狀況不同, 這一步通常需要等待至少10mins)
- 最後確認資料是否為68521筆

Database

gdg_on_ntu Free / learn-database / Enable branching

Database Management

Schema Visualizer

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Database Tables

schema: public

Search for a table

+ New table

Name	Description	Rows (Estimated)	Size (Estimated)	Realtime Enabled
NPA_OP1	警察機關失物招領網路公告...	68,521	27 MB	X

確認資料是否為68521筆

Google Developer Student Clubs

Database

Schema Visualizer

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Column Privileges

Policies

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TOOLS

Security Advisor

Performance Advisor

Create a new table under public

Adding 68,521 rows to NPA_OP1 92.86%

Name

NPA_OP1

Description

警察機關失物招領網路公告數位批次檔案

☒ Enable Row Level Security (RLS) Recommended

Restrict access to your table by enabling RLS and writing Postgres policies.

Policies are required to query data

You need to create an access policy before you can query data from this table. Without a policy, querying this table will return an empty array of results. You can create policies after saving this table.

☐ Enable Realtime

Broadcast changes on this table to authorized subscribers

Columns

About data types Edit content Remove content

Your table will be created with 68,521 rows and the following 7 columns.

Name	Type	Default Value	Primary
OP_AC_RCM	T text	NULL	<input checked="" type="checkbox"/>
OP_AC_UNI	T text	NULL	<input type="checkbox"/>
OP_AC_UNI	T text	NULL	<input type="checkbox"/>
OP_AC_UNI	T text	NULL	<input type="checkbox"/>
OP_PU_PLAI	T text	NULL	<input type="checkbox"/>
OP_AN_COI	T text	NULL	<input type="checkbox"/>
pickup_date	t timestamp	NULL	<input type="checkbox"/>

Foreign keys

Add foreign key relation

Cancel Save

檢視資料




Database Tables

schema: public



Search for a table

+ New table

Name	Description	Rows (Estimated)	Size (Estimated)	Realtime Enabled	
 NPA_OP1	警察機關失物招領網路公告...	68,521	27 MB	×	7 columns  

檢視資料



 View in Table Editor

 Edit table

 Duplicate Table

 Delete table

有看到這些資料說明一切正確

Table Editor

schema: public

+ New table

Search tables...

NPA_OP1

gdg_on_ntu Free / learn-database / Enable branching

Feedback







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	OP_AC_RCNO text	OP_AC_UNIT_NM1 text	OP_AC_UNIT_NM2 text	OP_AC_UNIT_NM3 text
<input type="checkbox"/>	OP11310A23ZX00076	航空警察局	航空警察局臺北分局	航空警察局臺北分局金門分駐所
<input type="checkbox"/>	OP11310A23Z700483	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11305A2MS100059	警察廣播電臺	警察廣播電臺臺北分臺	警察廣播電臺臺北分臺
<input type="checkbox"/>	OP11305A23Z700397	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11305A2MS100106	警察廣播電臺	警察廣播電臺臺北分臺	警察廣播電臺臺北分臺
<input type="checkbox"/>	OP11305A23Z700493	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11305BJ7N100027	EMPTY	EMPTY	彰化縣警察局員林分局莒光派出所
<input type="checkbox"/>	OP11305A2MS100156	警察廣播電臺	警察廣播電臺臺北分臺	警察廣播電臺臺北分臺
<input type="checkbox"/>	OP11305A23Z700693	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11306BJ7S100001	EMPTY	EMPTY	彰化縣警察局員林分局村上派出所
<input type="checkbox"/>	OP11306A23Z700064	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11306A2MS100042	警察廣播電臺	警察廣播電臺臺北分臺	警察廣播電臺臺北分臺
<input type="checkbox"/>	OP11306A23Z500044	航空警察局	航空警察局臺北分局	航空警察局臺北分局安檢隊
<input type="checkbox"/>	OP11306A23Z700330	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊
<input type="checkbox"/>	OP11306A23Z700386	航空警察局	航空警察局臺北分局	航空警察局臺北分局警備隊

參照以上步驟把剩餘的五份資料集匯入

- 這五份資料集共同組成台灣死亡原因統計紀錄
- 該資料來自台灣政府官方的數據公開平台 <https://data.gov.tw>
- <https://data.gov.tw/dataset/5965>
- 我有對欄位型別做過預處理和資料正規化，所以實際資料欄位和 <https://data.gov.tw/dataset/5965> 並不一致，但是我未對數據本身做任何修改

<input type="checkbox"/> Name	Date modified	Type	Size
 _NPA_OP1_202411160250.csv	2024-11-16 02:50	Comma Separate...	23,379 KB
<input checked="" type="checkbox"/>  taiwan_death_202411160250.csv	2024-11-16 02:50	Comma Separate...	47,366 KB
<input checked="" type="checkbox"/>  taiwan_death_age_code_202411160250.csv	2024-11-16 02:50	Comma Separate...	1 KB
<input checked="" type="checkbox"/>  taiwan_death_cause_code_202411160250.csv	2024-11-16 02:50	Comma Separate...	6 KB
<input checked="" type="checkbox"/>  taiwan_death_county_code_202411160250.csv	2024-11-16 02:50	Comma Separate...	64 KB
<input checked="" type="checkbox"/>  taiwan_death_sex_code_202411160250.csv	2024-11-16 02:50	Comma Separate...	1 KB





如果有任何問題，
請在Discord的【問題】頻道詢問
或者帶上問題以及截圖寄送Email至
m11002815@mail.ntust.edu.tw