



NTU Academy for Professional
and Continuing Education

(SCTP) Advanced
Professional Certificate

Data Science and AI



1. Setting up GCP

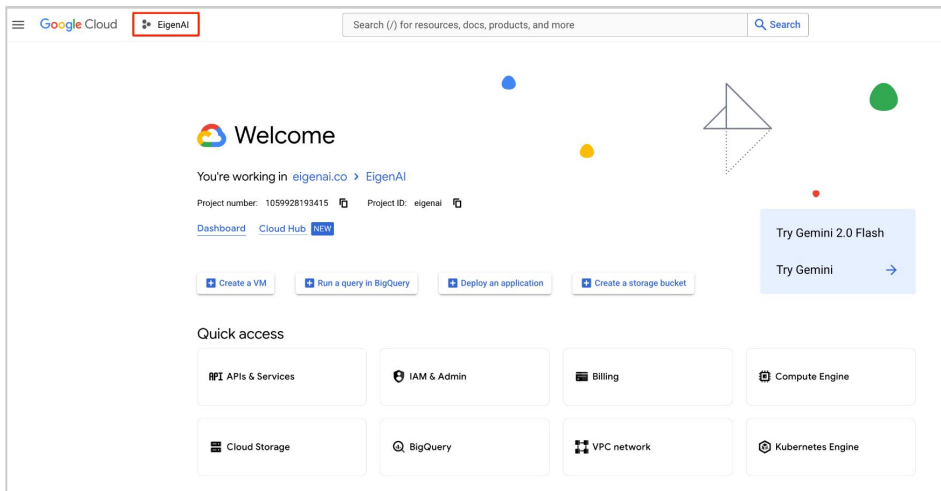
Set up an account here:

<https://console.cloud.google.com/>

- Use any email account to sign up
- Choose a name for your GCP Project

Note: GCP project ID has to be globally unique across all GCP users

- You can retrieve your Project ID by clicking the button shown (in the red box)



1. Setting up GCP

You might be prompted to create a billing account by entering your credit card details*.

Failure to do so may result in errors in subsequent lessons:

- **Lesson 2.2:** When downloading a file from GCS, you may encounter a "403 error: Billing account not set up."
- **Lesson 2.5:** A similar error may occur when creating tables in BigQuery.
- Use the following link to ensure that your billing account is linked to your project: [Verify Billing](#)



Google requires a valid credit card to create a billing account, even when you are on [GCP Free Tier](#). Previous cohorts have successfully used certain prepaid cards available in SG.

2. Install gcloud CLI

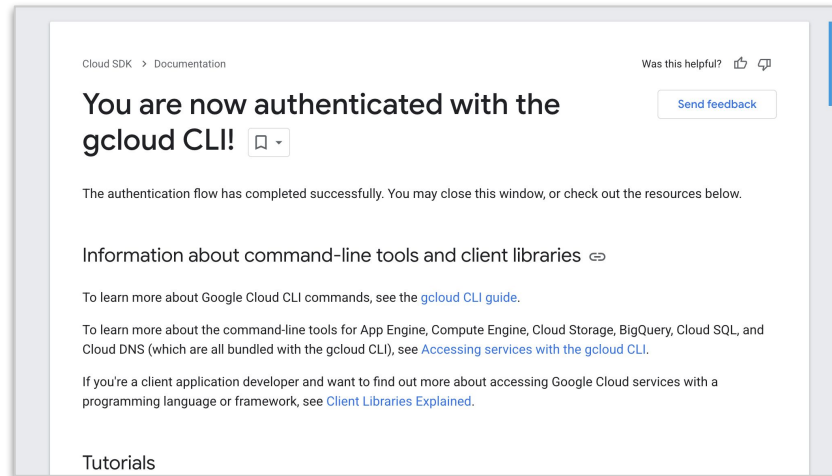
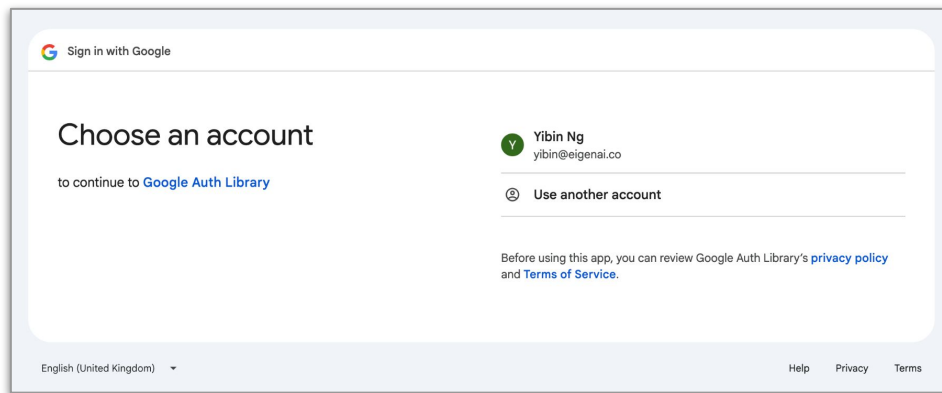
- Mac users, follow instructions here: <https://cloud.google.com/sdk/docs/install>
- Windows WSL users, please follow here: <https://cloud.google.com/sdk/docs/downloads-snap>
- Once `gcloud init` is done, to authenticate your computer to your GCP account, run:
 - WSL users: `gcloud auth application-default login`
 - Mac users: `./google-cloud-sdk/bin/gcloud auth application-default login`
 - Copy and paste the link provided into a browser

```
ngyibin@Ngs-MacBook-Pro Programs % ./google-cloud-sdk/bin/gcloud auth application-default login
Your browser has been opened to visit:

  https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=764086051850-6qr4p6gpi6hn506pt8ejuq83di341hur.apps.googleusercontent.
  085%2F&scope=openid+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fuserinfo.email+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcloud-platform+https%3A%2
  Flogin&state=nSjR3VNjk0bhfCDNATCbe3a1Sws7LP&access_type=offline&code_challenge=XUq26U7TrUC2E-hhA2XwHjZKvpl8xfOTztYP80VxLEq&code_challenge_method=
```

2. Install gcloud CLI

Please log in using the same email account you used to set up your GCP account.



2. Install gcloud CLI

[Optional] Now that you are authenticated, test your setup by typing the commands:

WSL users:

```
bq query --use_legacy_sql=false "SELECT name FROM  
bigquery-public-data.usa_names.usa_1910_current LIMIT 10"
```

MAC users:

```
./google-cloud-sdk/bin/bq query --use_legacy_sql=false "SELECT name  
FROM bigquery-public-data.usa_names.usa_1910_current LIMIT 10"
```

A terminal window with a black background and white text. It displays the output of a SQL query. The output is a table with a single column named 'name'. The table is enclosed in a box with dashed lines at the top and bottom, and vertical lines on the sides. The names listed are Mary, Annie, Anna, Margaret, Helen, Elsie, Lucy, Dorothy, Mary, and Margaret.

name
Mary
Annie
Anna
Margaret
Helen
Elsie
Lucy
Dorothy
Mary
Margaret

You should see the following screen output.

3. Give yourself 'BigQuery Admin' rights

- This is in preparation for the lesson on DBT (Lesson 2.5)
- Search for '**IAM**' in the top search bar
 - **IAM**: Identity and Access Management
 - Click on the 'Edit principal' button next to your email



3. Give yourself 'BigQuery Admin' rights

- Click '+ **Add another role**' - search for '**BigQuery Admin**'
- Click '**Save**'
- You should see this:

IAM

[Allow](#) [Deny](#) [Recommendations history](#)

Permissions for project "My First Project"

These permissions affect this project and all of its resources. [Learn more](#)

[View by principals](#) [View by roles](#)

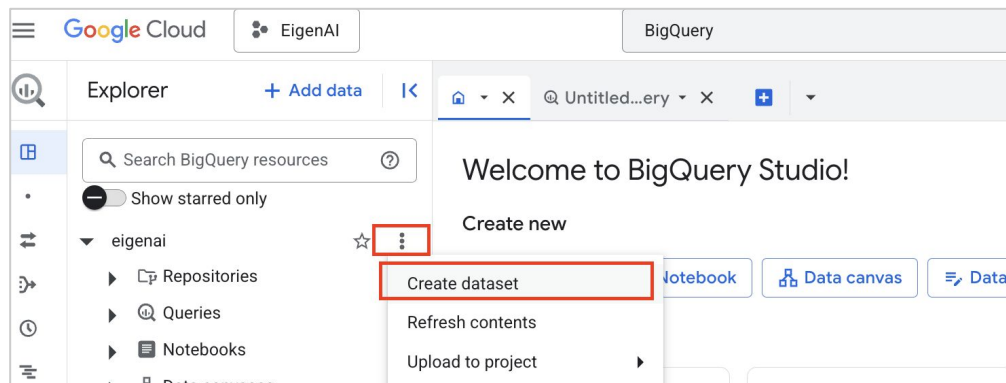
[+ Grant access](#) [- Remove access](#)

[Filter](#) Enter property name or value

<input type="checkbox"/> Type	Principal ↑	Name	Role	Security insights ?	
<input type="checkbox"/>	wongchenpang@gmail.com	Chen Pang Wong	BigQuery Admin		
			Owner		

4. Create 'snapshots' folder in BQ

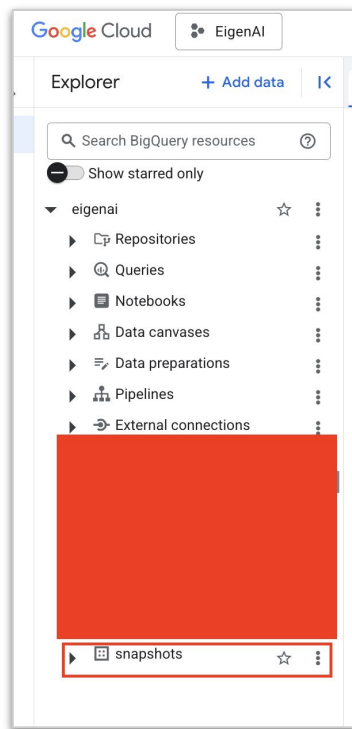
- This is in preparation for the lesson on DBT (Lesson 2.5)
- Go to BigQuery, click on the 3 dots next to your project ID, click '**Create dataset**':



- Enter '**snapshots**' as the Dataset ID
- Use the default location type ('Multi-region' - 'US')
- Click '**Create dataset**'

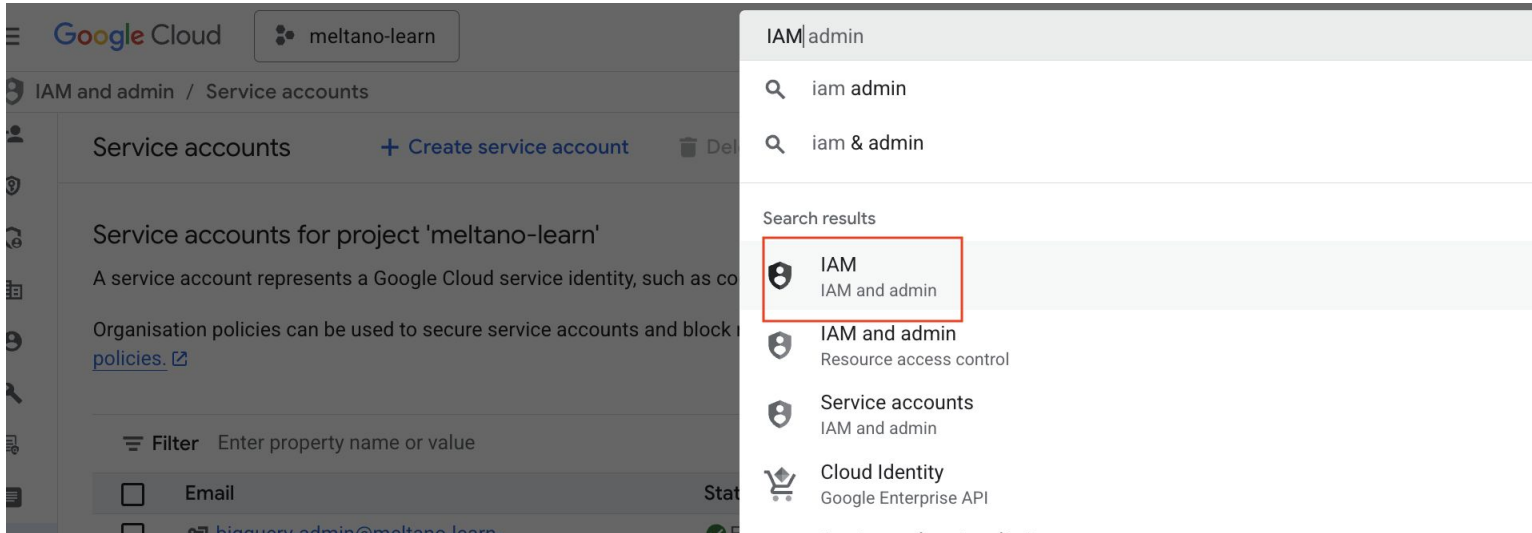
4. Create 'snapshots' folder in BQ

'snapshots' folder created
in your BigQuery:



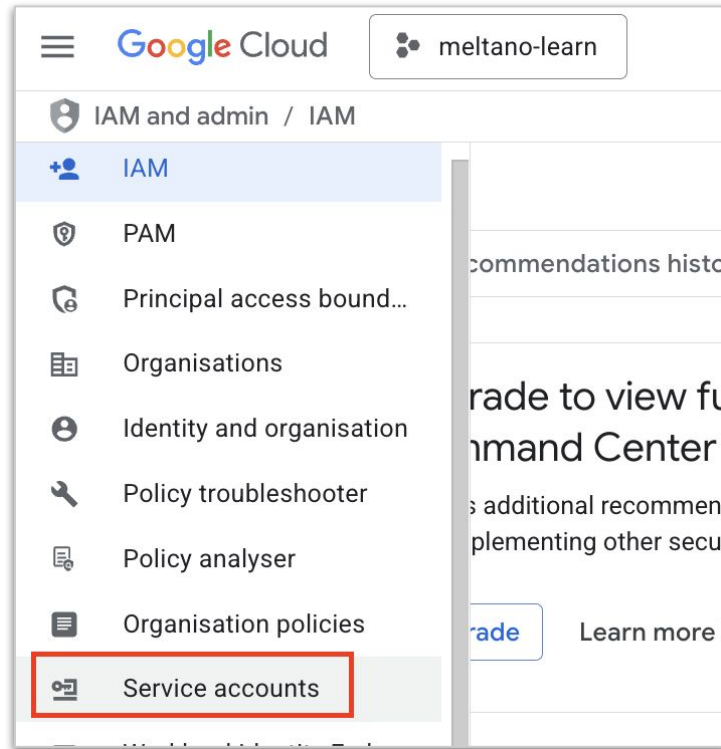
5. Setting up a service account

- This is in preparation for the lesson on Meltano (Lesson 2.6)
- In your Google Cloud project, search for '**IAM**' and click the result:



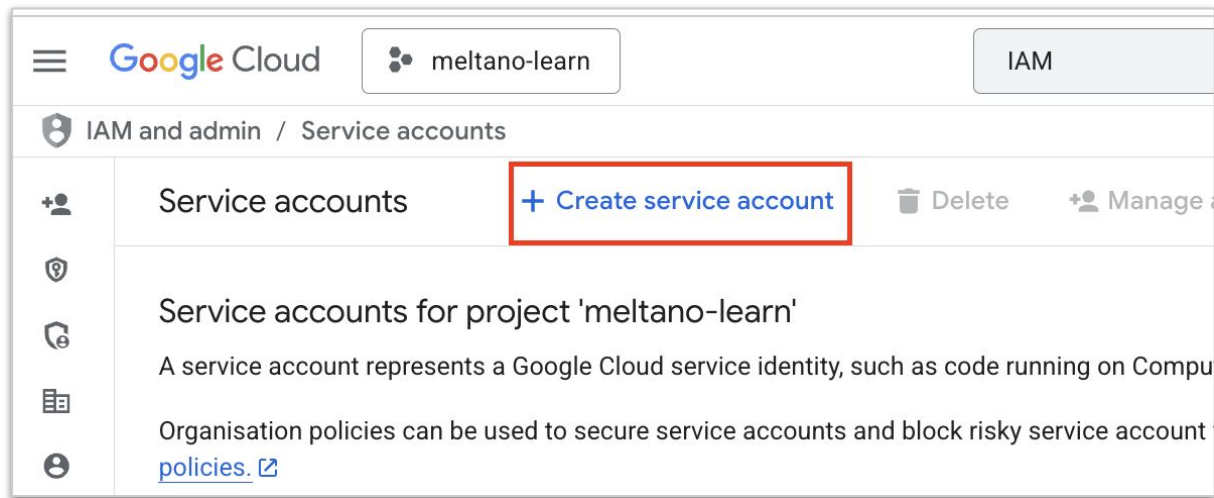
5. Setting up a service account

In IAM, click on '**Service accounts**':



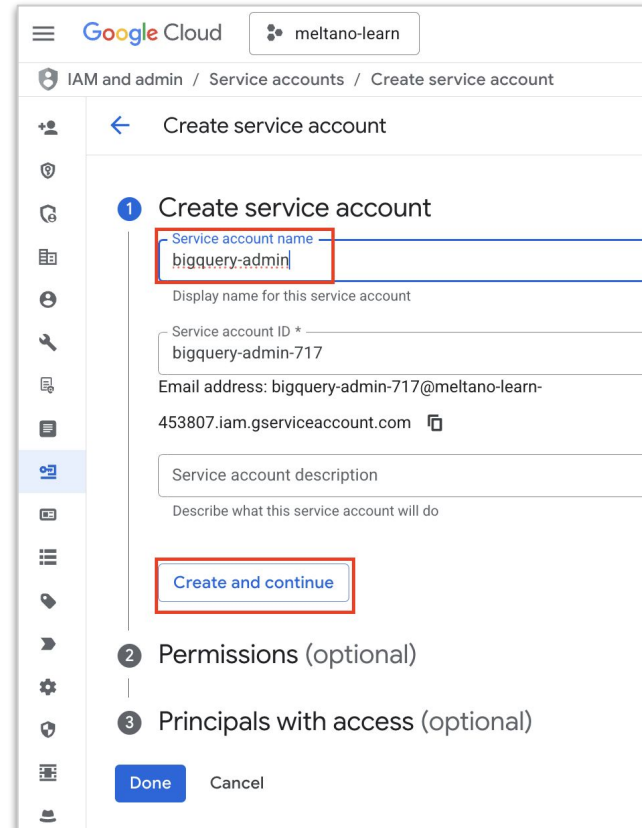
5. Setting up a service account

In IAM, click '**Create service account**':



5. Setting up a service account

Input as shown and click
'Create and continue'



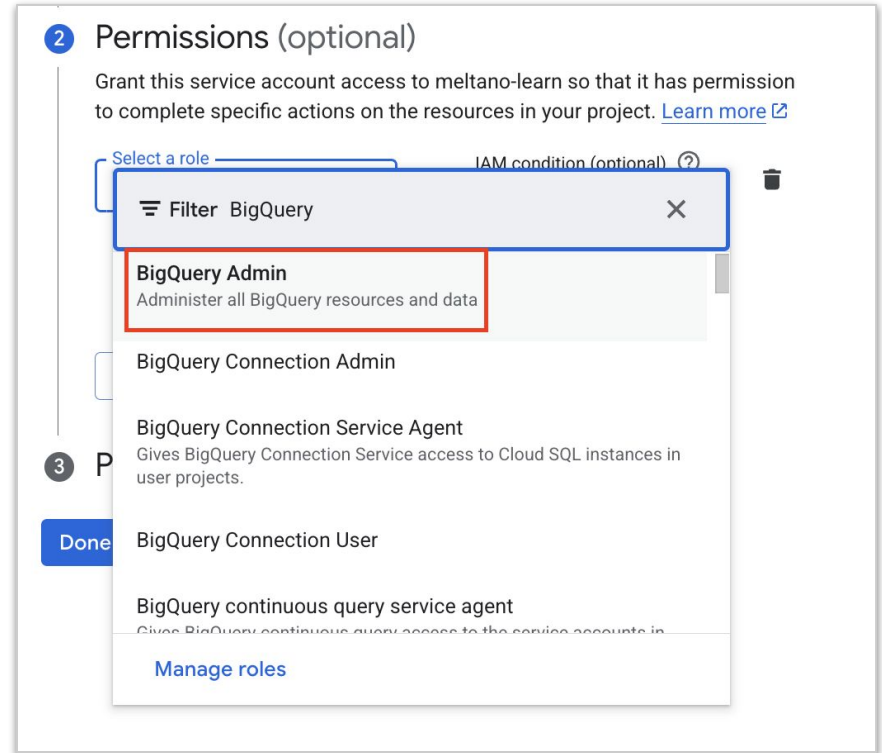
The screenshot displays the Google Cloud IAM and admin console interface. The breadcrumb navigation at the top reads 'IAM and admin / Service accounts / Create service account'. The main heading is 'Create service account'. The first step, '1 Create service account', contains the following fields:

- Service account name:** A text input field containing 'bigquery-admin', which is highlighted with a red rectangular box.
- Display name for this service account:** A text input field that is currently empty.
- Service account ID *:** A text input field containing 'bigquery-admin-717'.
- Email address:** A text input field containing 'bigquery-admin-717@meltano-learn-453807.iam.gserviceaccount.com'.
- Service account description:** A text input field containing the placeholder text 'Describe what this service account will do'.

Below the description field, the 'Create and continue' button is highlighted with a red rectangular box. The subsequent steps in the wizard are '2 Permissions (optional)' and '3 Principals with access (optional)'. At the bottom of the form, there are 'Done' and 'Cancel' buttons.

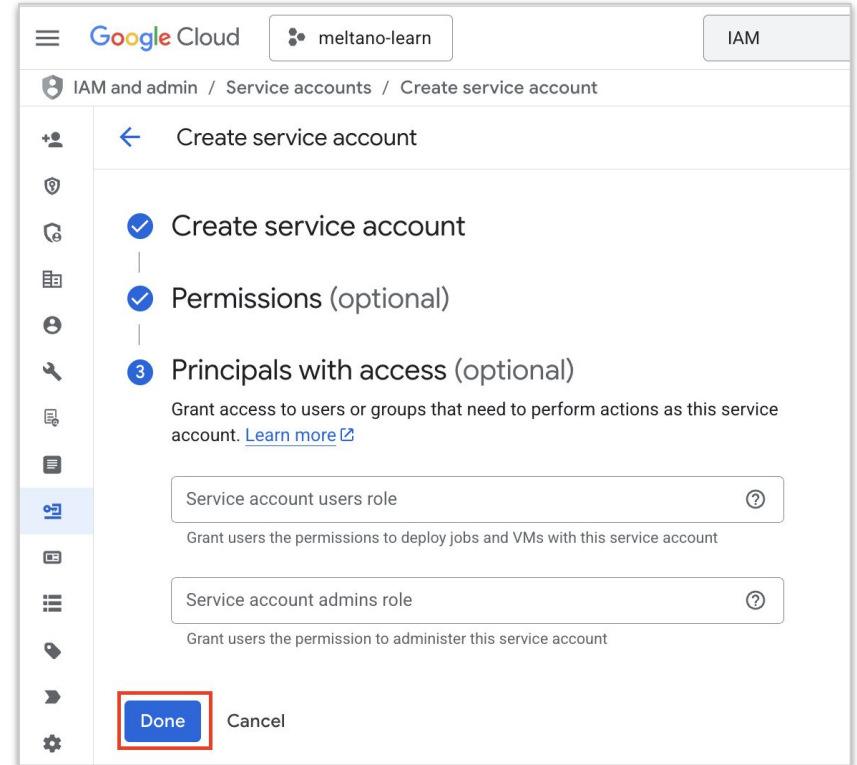
5. Setting up a service account

Under Permissions, search for
'BigQuery Admin' and click
'Continue':





5. Setting up a service account

Skip 'Principals with access'
and click '**Done**':



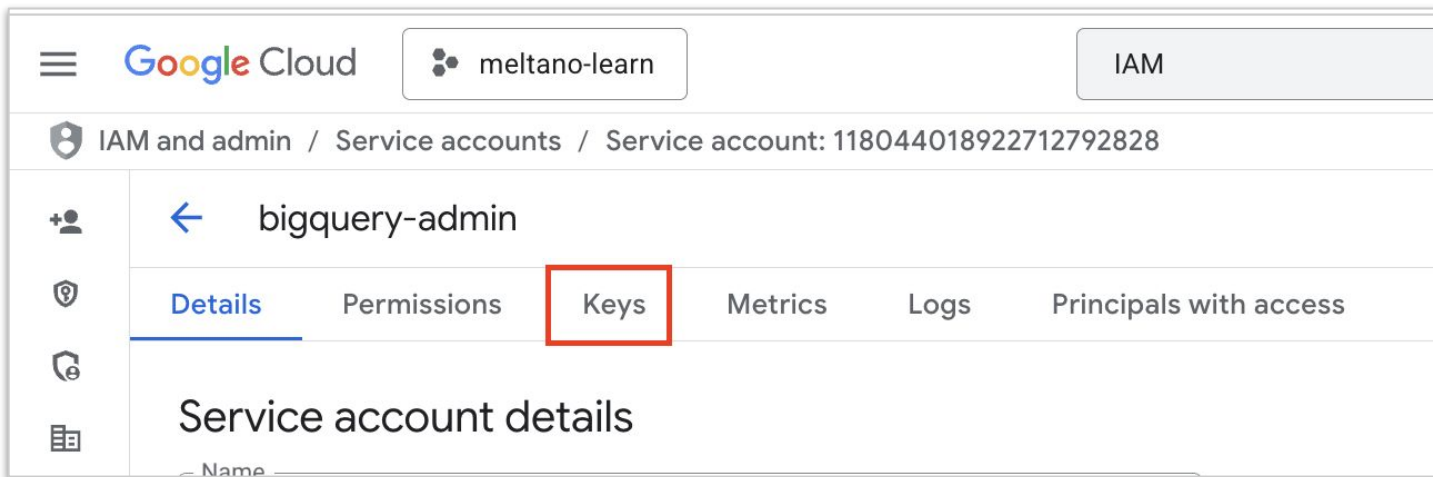
5. Setting up a service account

Click on the service account you just created:

<input type="checkbox"/>	 bigquery-admin-717@meltano-learn-453807.iam.gserviceaccount.com	 Enabled	bigquery-admin
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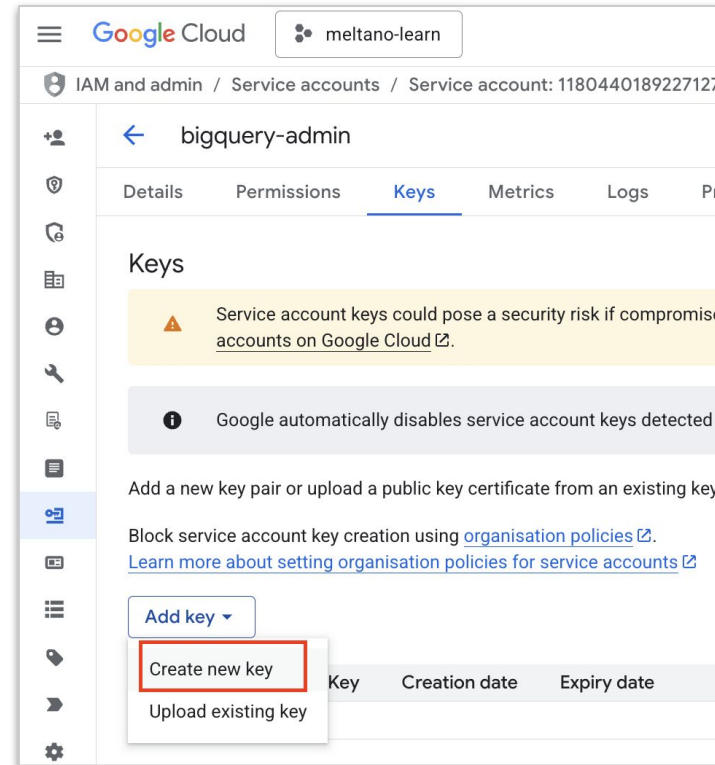
5. Setting up a service account

Click '**Keys**':



5. Setting up a service account

Click '**Create new key**'



5. Setting up a service account

- Select '**JSON**' and click '**Create**'
- A JSON file will be downloaded into your computer
- Put it into your meltano project folder (lesson 2.6)

Create private key for 'bigquery-admin'

Downloads a file that contains the private key. Store the file securely because this key cannot be recovered if lost.

Key type

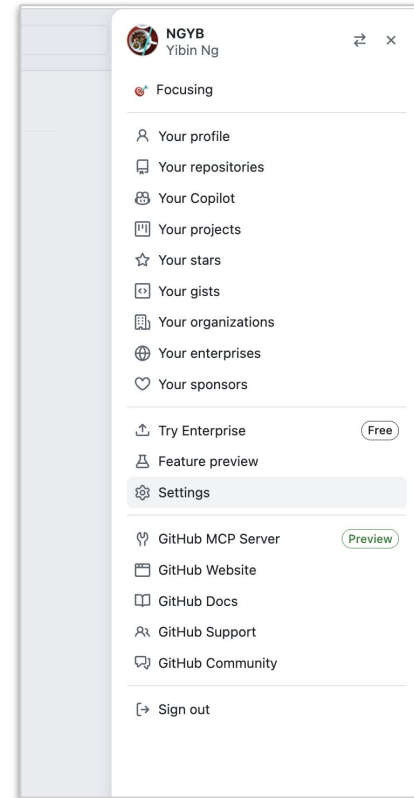
☒ JSON
Recommended

☐ P12
For backward compatibility with code using the P12 format

Cancel **Create**

6. Generating a Github personal access token (PAT)

- This is in preparation for the lesson data extraction (Lesson 2.4)
- Go to **GitHub Settings**
 - Sign in to your GitHub account.
 - Click your profile picture in the top-right corner → **Settings**.



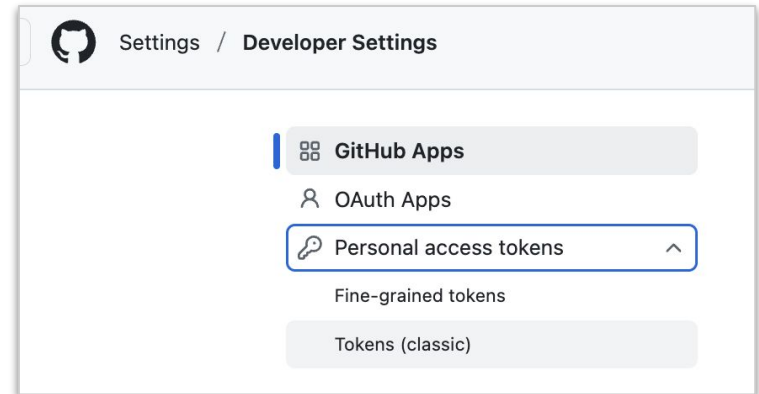
6. Generating a Github personal access token (PAT)

Access the Token Settings

In the left-hand menu, scroll down to **Developer Settings**.

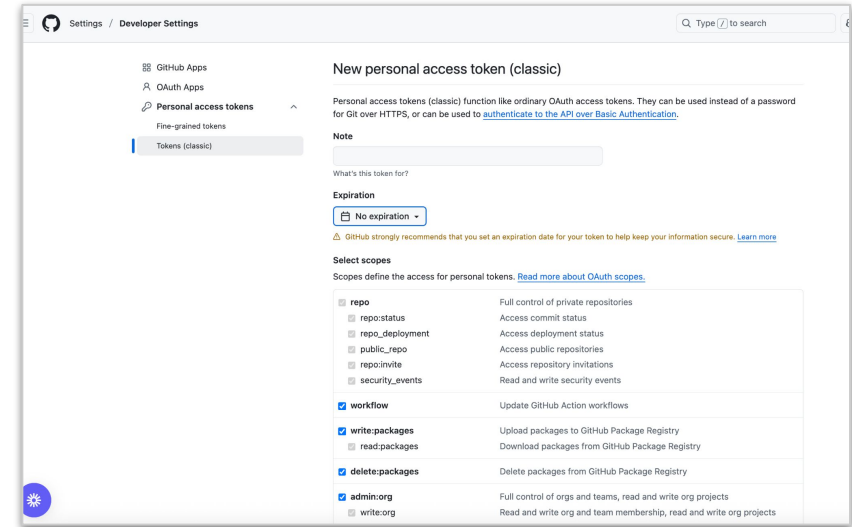
Click **Personal access tokens** → choose:

- **Tokens (classic)** — older method, works for most CLI and API tasks.



6. Generating a Github personal access token (PAT)

- Click **Generate new token** → Generate new token (classic).
- Give it a **note** (e.g., "My Laptop Git Access").
- Set **expiration** (recommended: 90 days).
- Select **scopes** (permissions):
 - You can tick all the boxes
- Click **Generate token**.



6. Generating a Github personal access token (PAT)

- Copy the Token

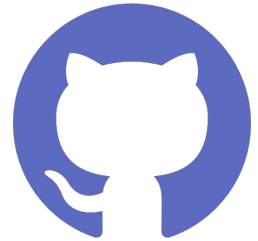
⚠ **Important:** GitHub shows it **only once**. ⚠

Copy it and store it securely (e.g., password manager).

- Use the Token

When Git asks for your password during `git push` or `git clone`, use:

- **Username:** your GitHub username
- **Password:** your token (paste it)



Credits

`Github icons created by Pixel perfect - Flaticon`