IS216
Web Application Development 2

Google Maps API
Building a CarPark Web Application
Introduction

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Google Maps API

With Google Maps API, we can do…

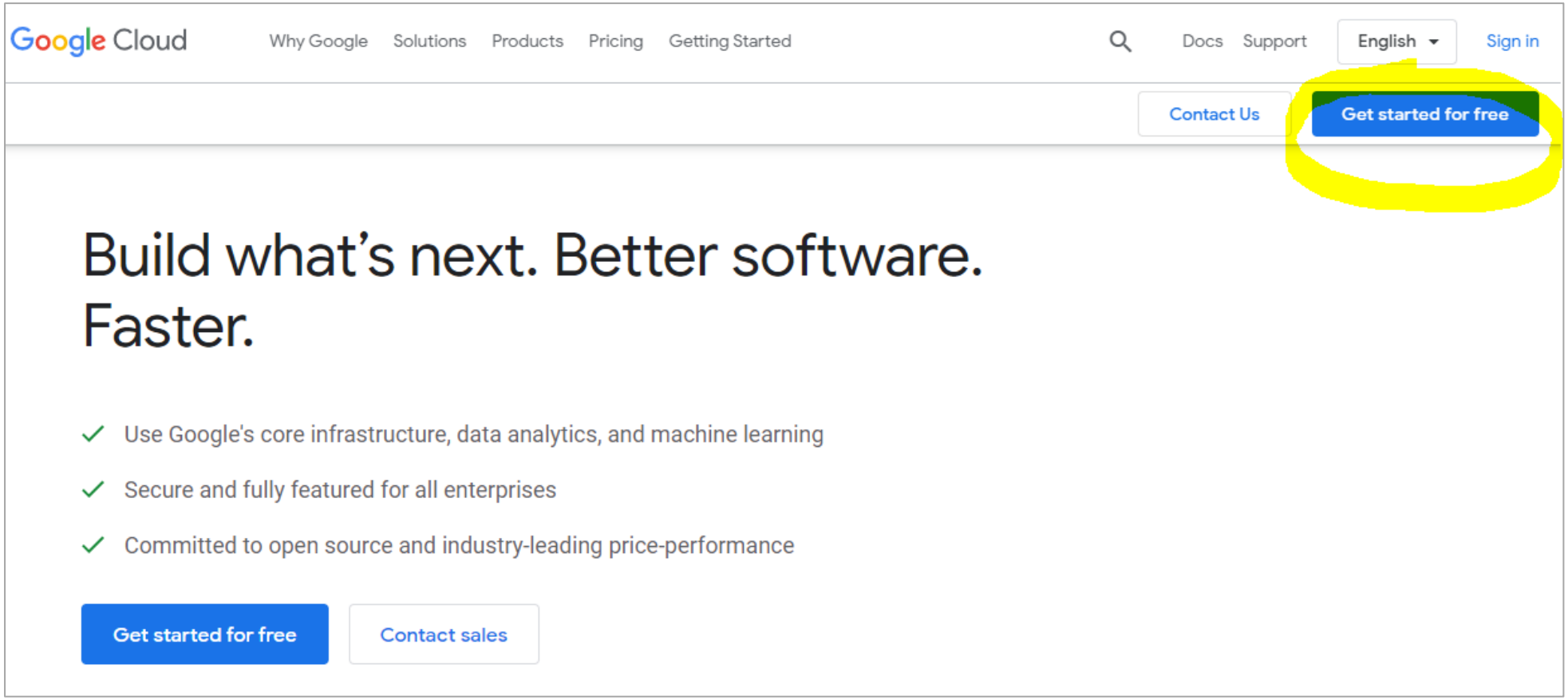
- Implement basic features of what we can do with Google maps APIs

  - Get **direction**
  - Get **traffic information**
  - Get **distance information from Point A to Point B**
  - *And others…*

Sign up with GCP

https://cloud.google.com/gcp

Click **Get started for free**



Sign Up (Step 1)

Try Google Cloud for free

Step 1 of 3 Account Information

K Shm
kjshim.github.demo1@gmail.com
SWITCH ACCOUNT

Country

Singapore

What best describes your organization or needs?

Please select
Personal project

Terms of Service

I have read and agree to the Google Cloud Platform Terms of Service, Supplemental Free Trial Terms of Service, and the terms of service of any applicable services and APIs.

Required to continue

Email updates

I would like to receive periodic emails on news, product updates and special offers from Google Cloud and Google Cloud Partners.

CONTINUE

Access to all Cloud Platform Products

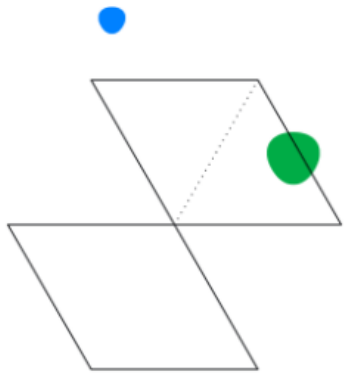
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

$300 credit for free

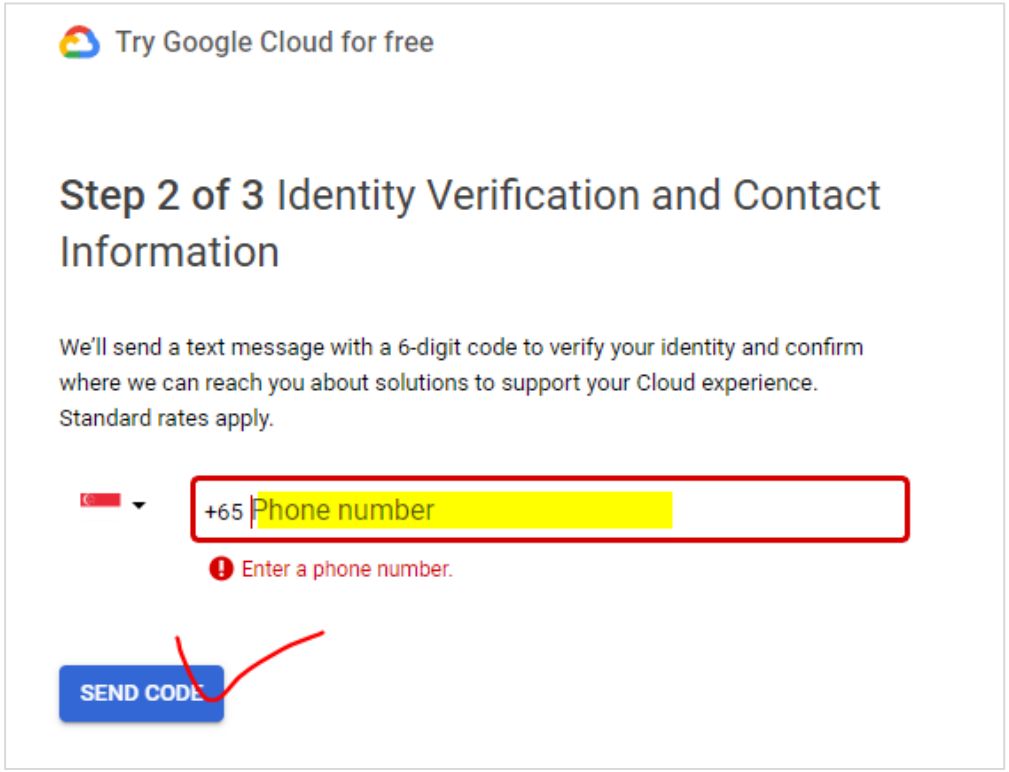
Put Google Cloud to work with $300 in credit to spend over the next 90 days.

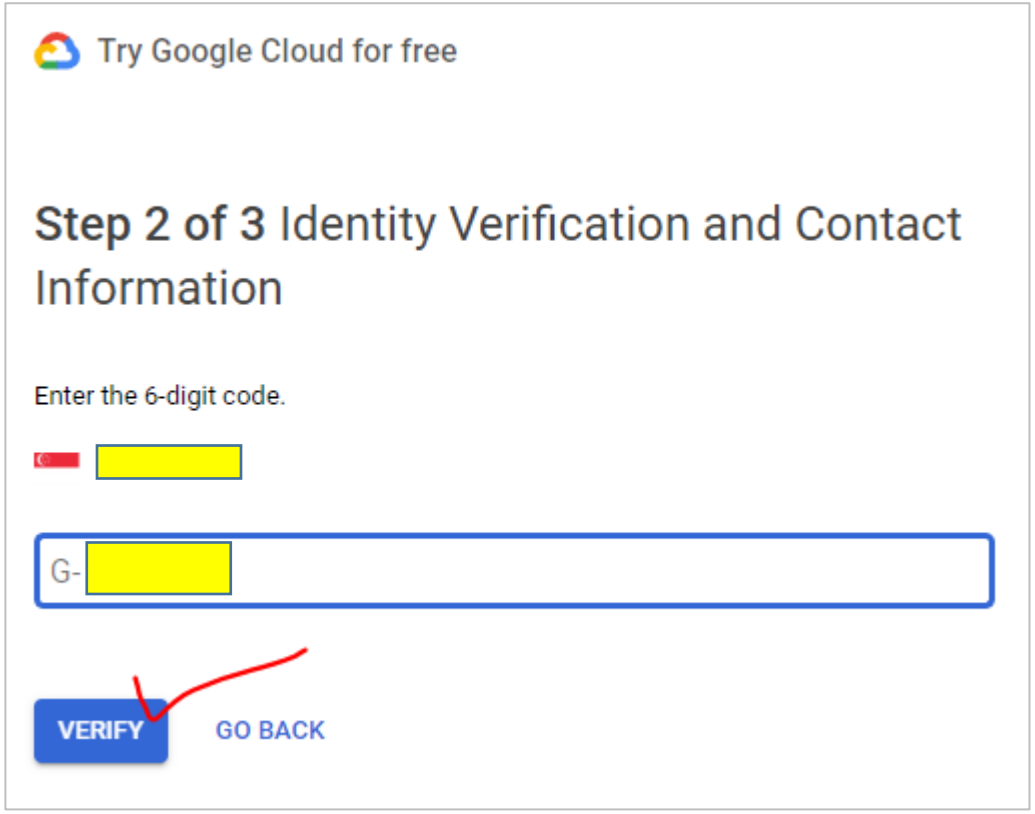
No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. You won't be charged unless you manually upgrade to a paid account.

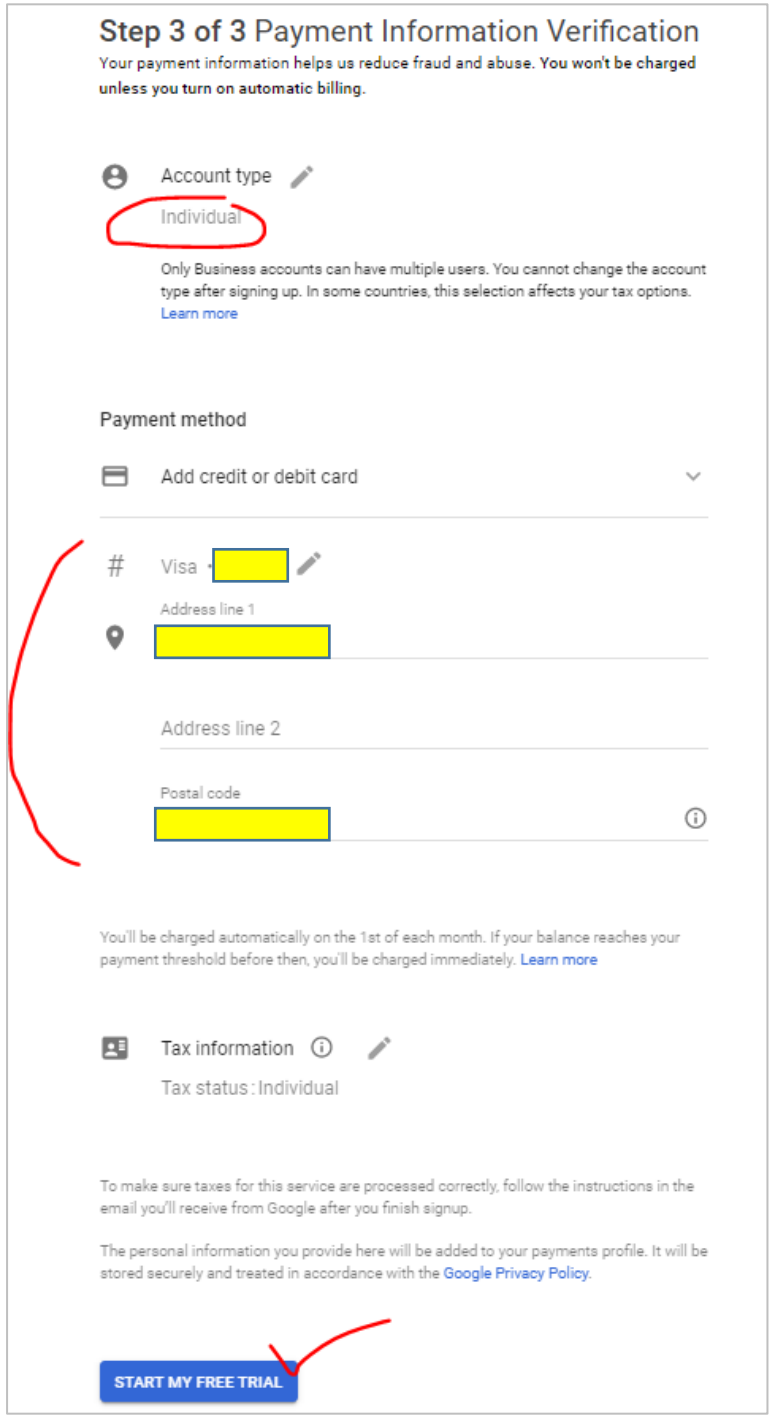


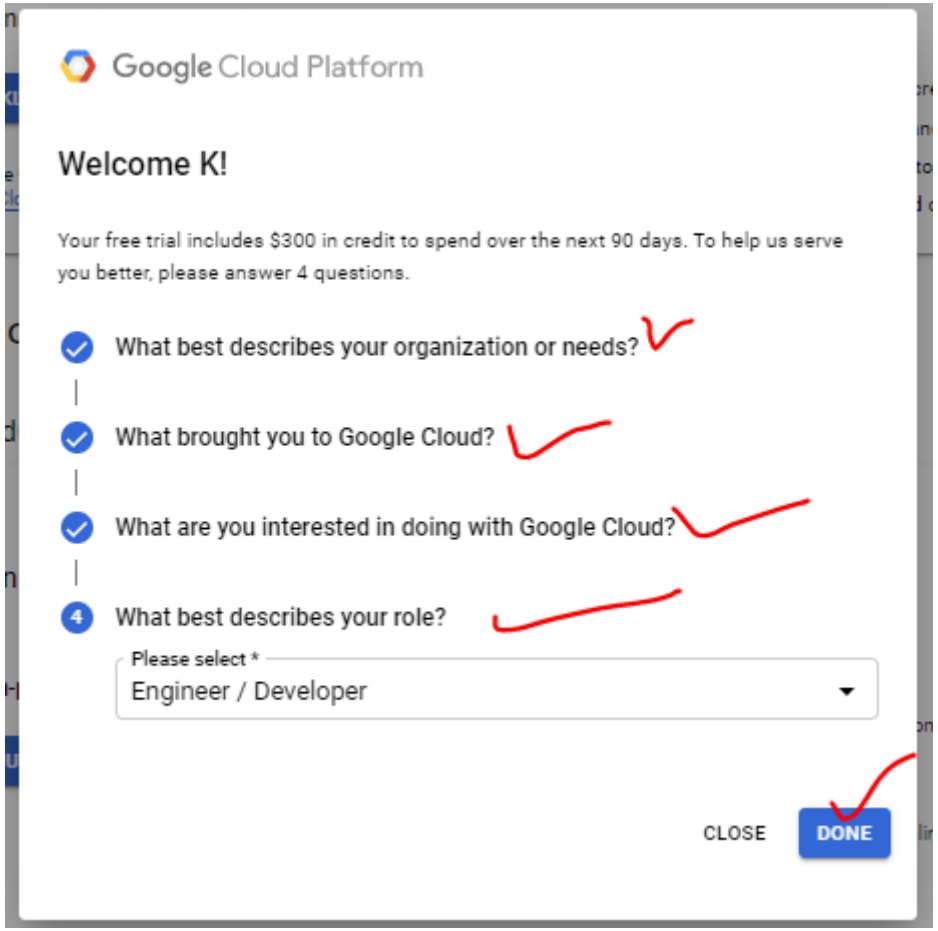
Sign Up (Step 2)



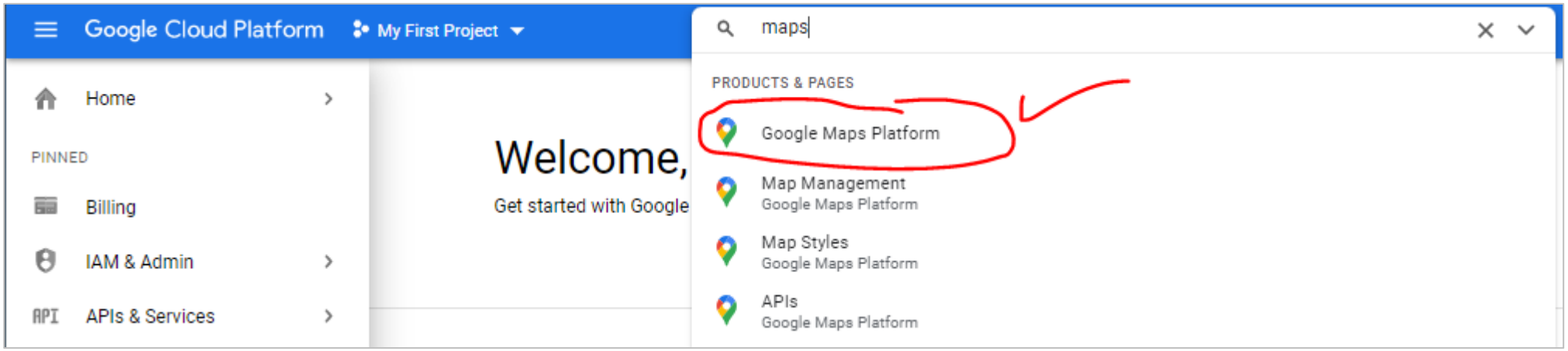


Sign Up (Step 3)

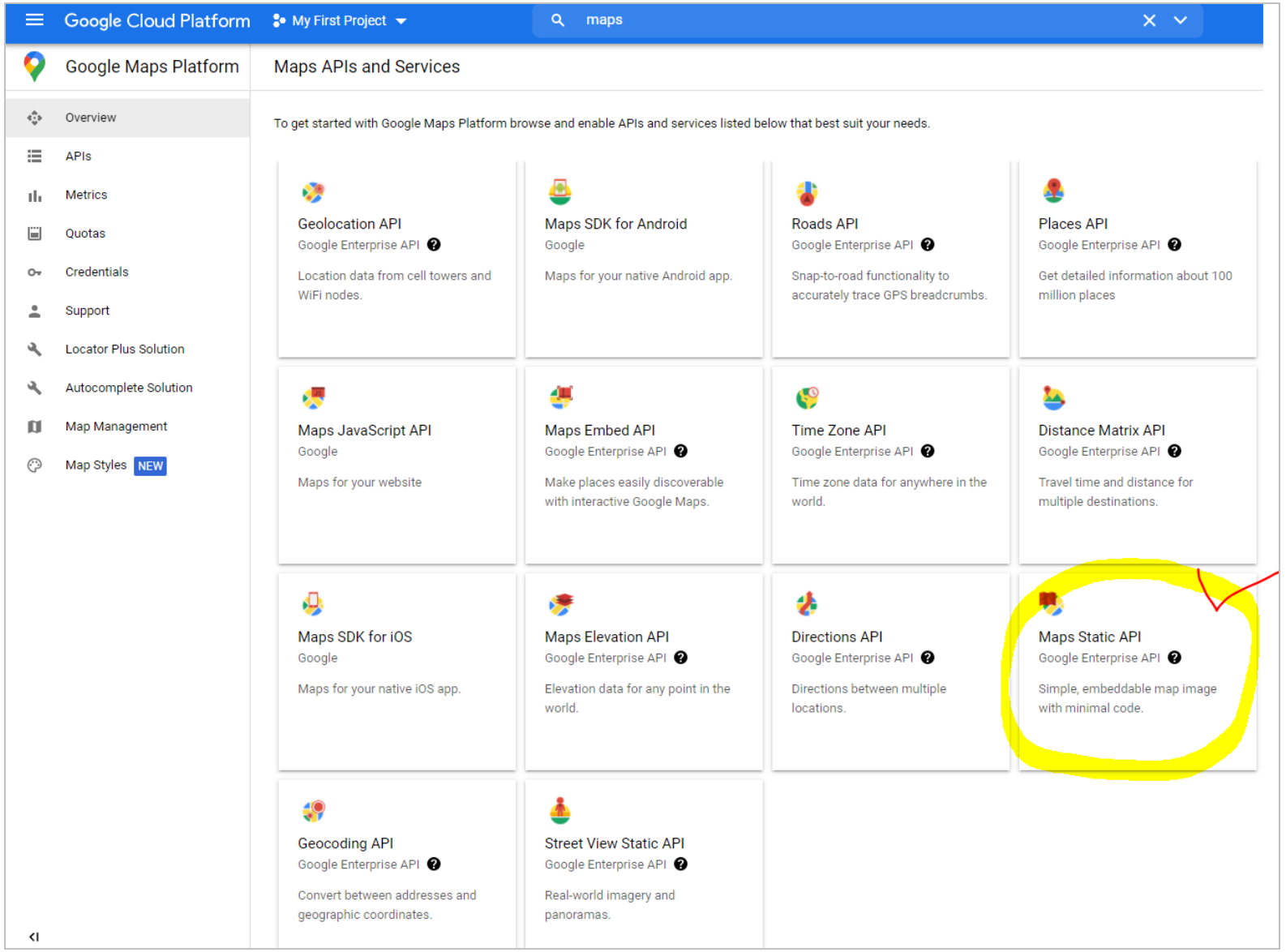




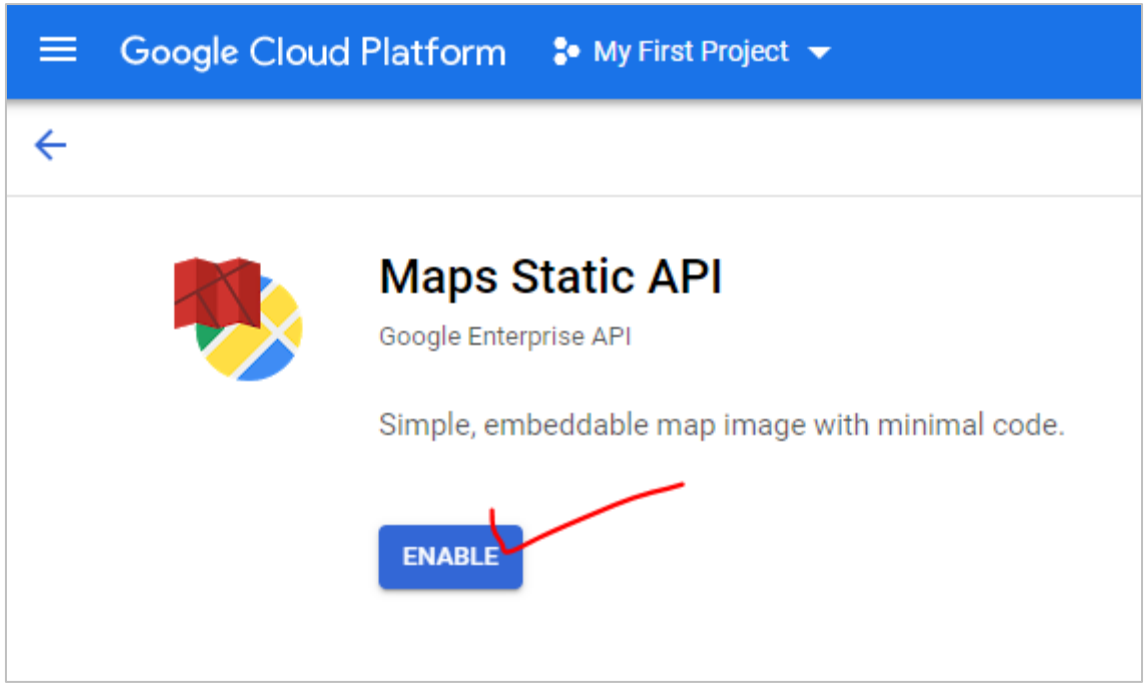
Go to “Google Maps Platform”



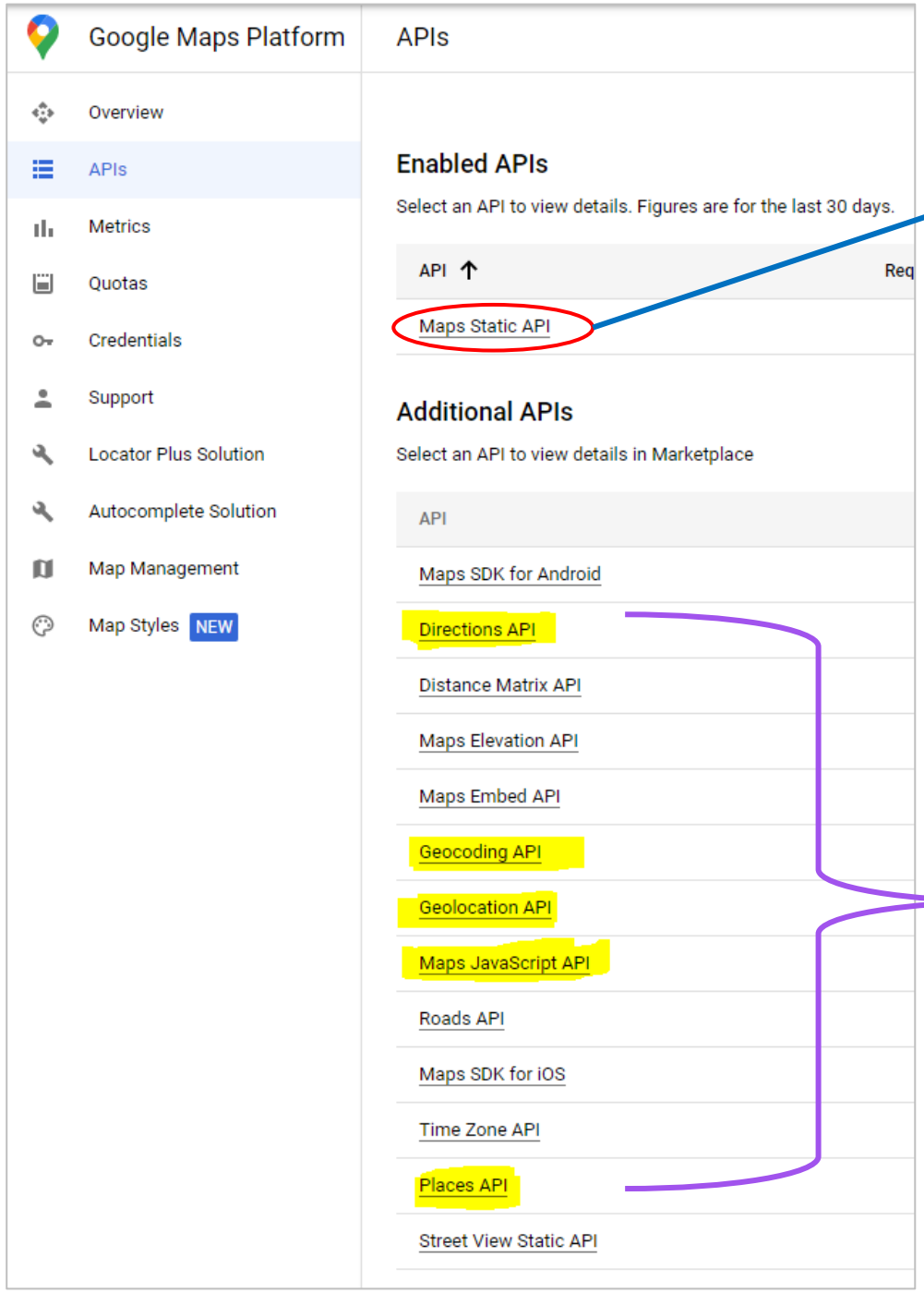
Select “Maps Static API”



Enable “Maps Static API”



Enable “Maps Static API”

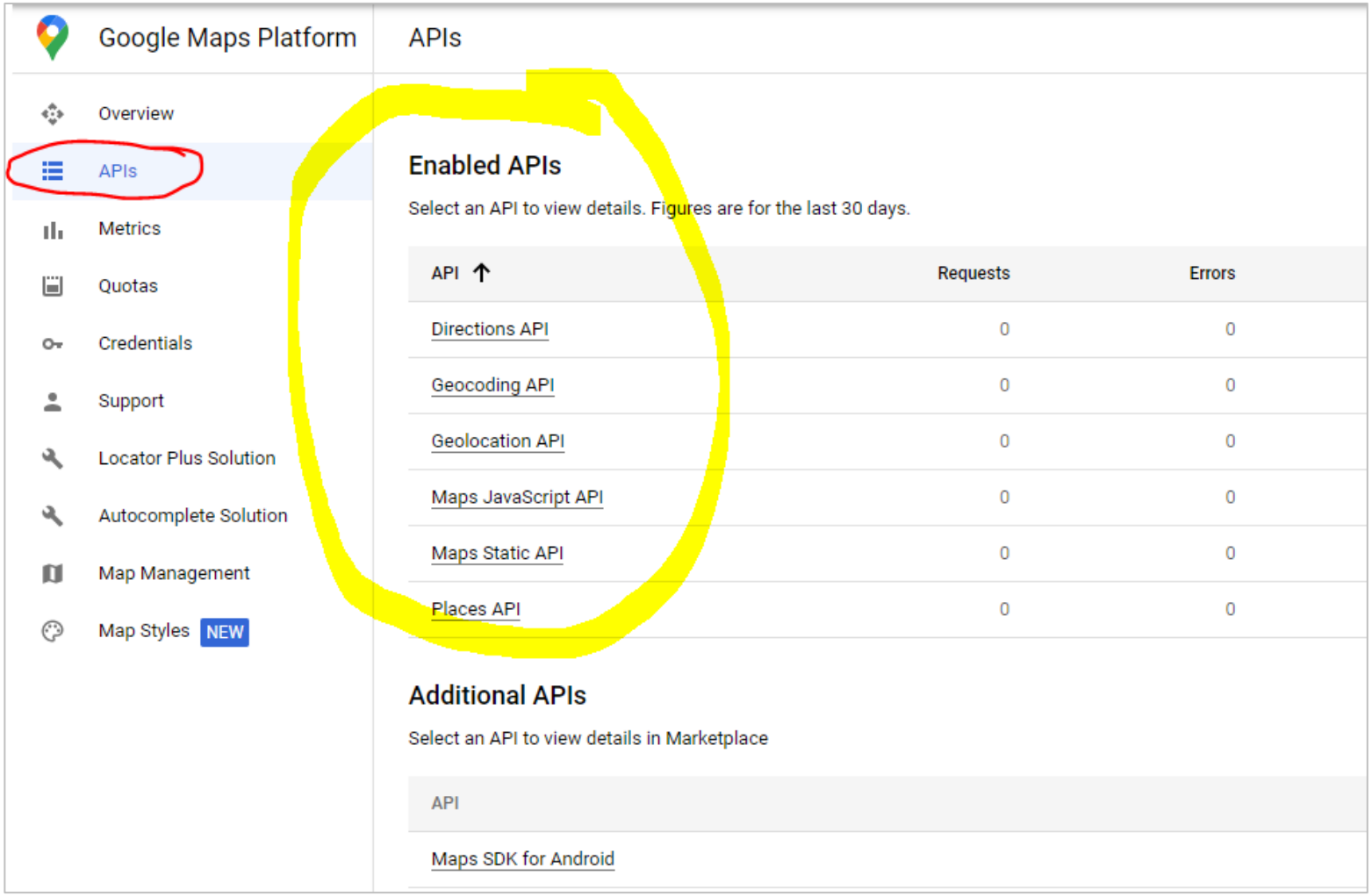


This API access is **enabled**.

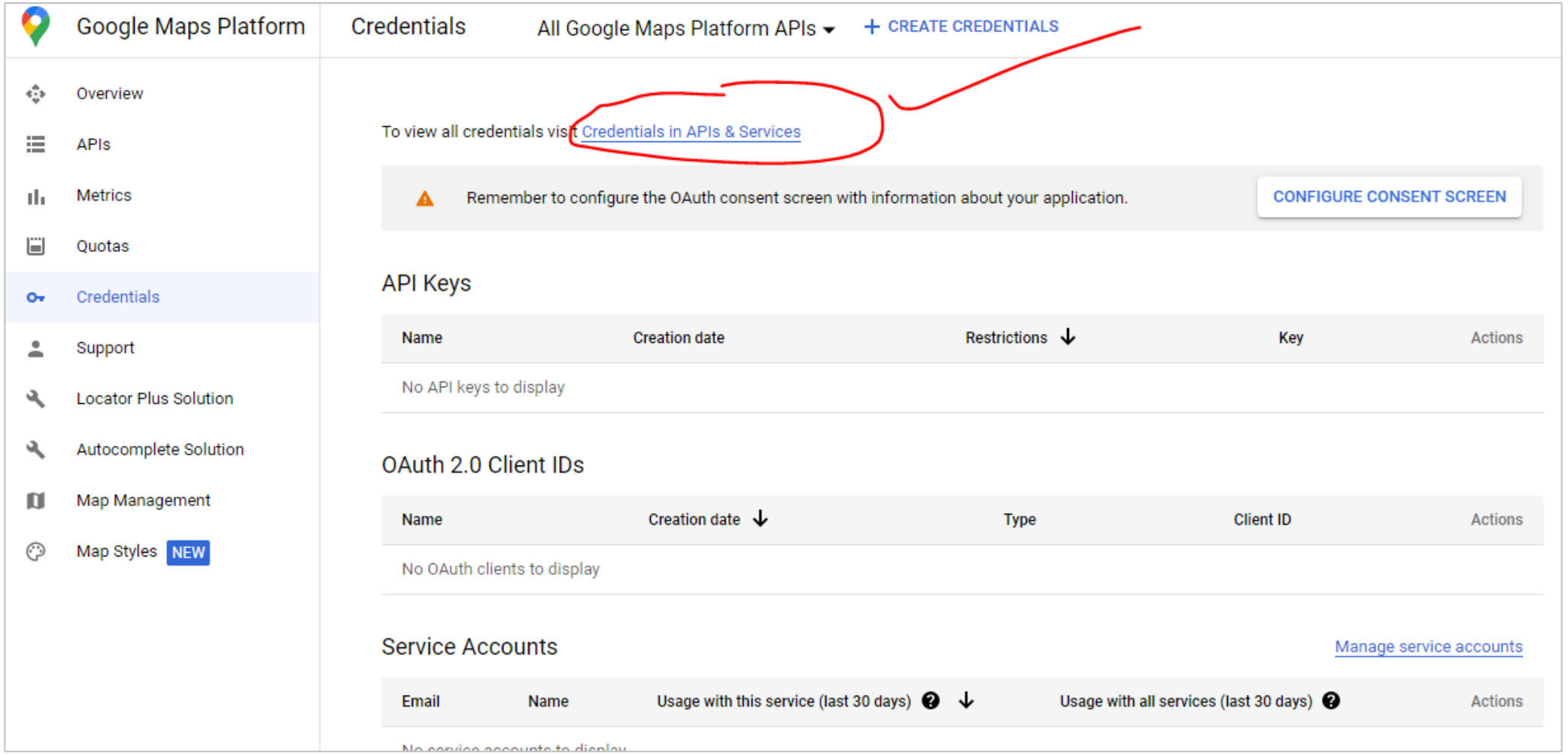
Click on each highlighted API and **enable** access

Finding Enabled APIs

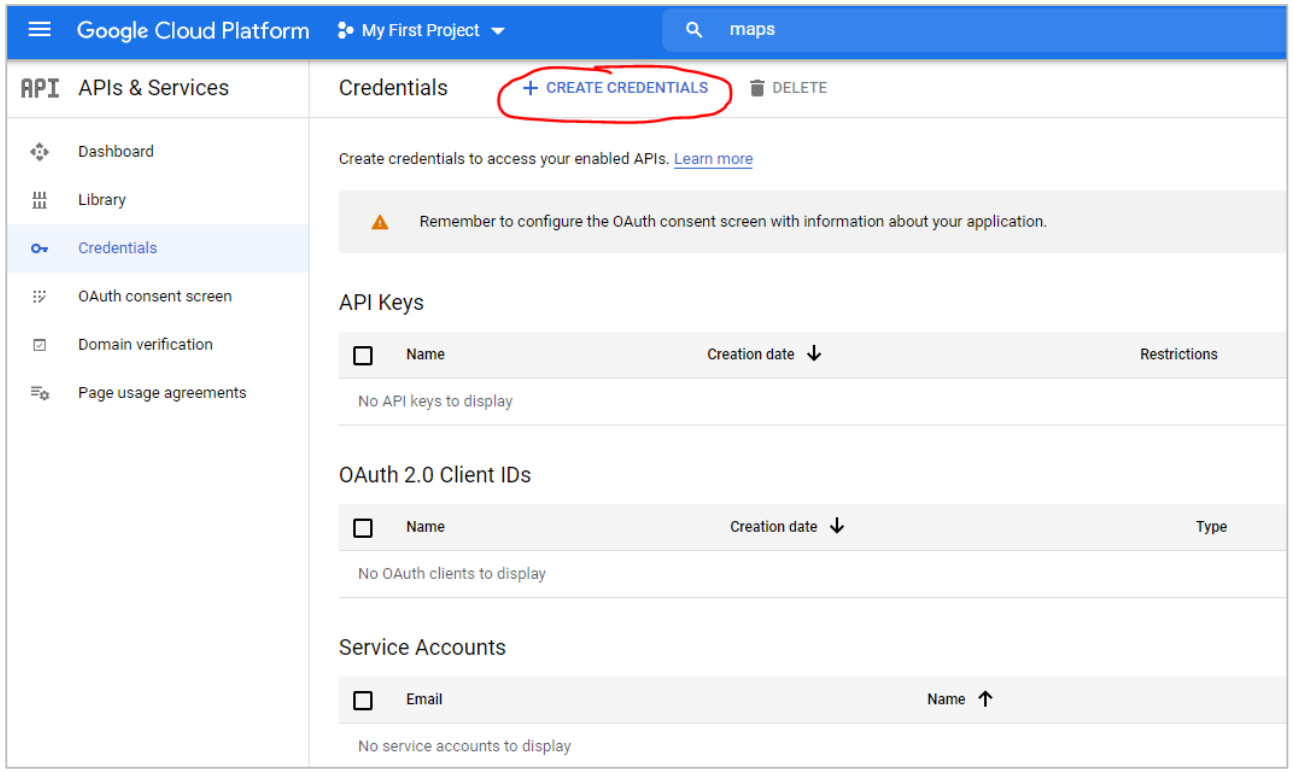
Menu (on the left) → APIs

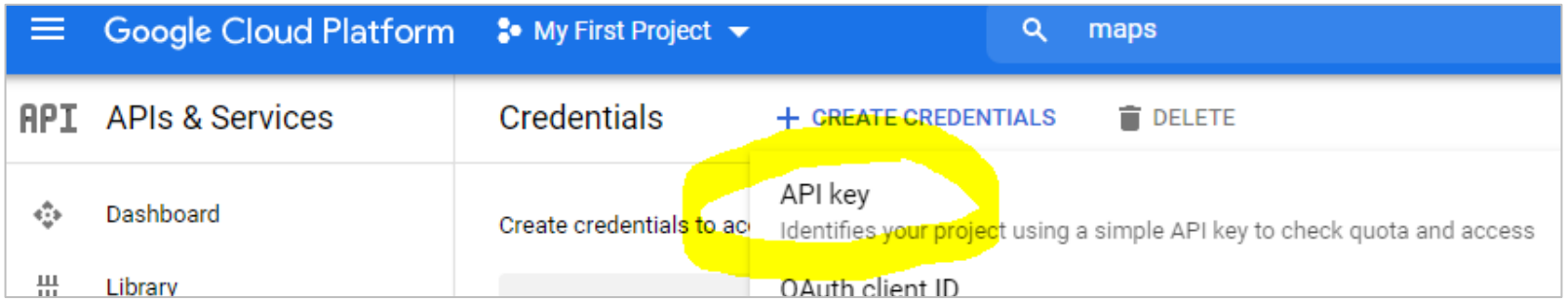


Getting API Key (Step 1)

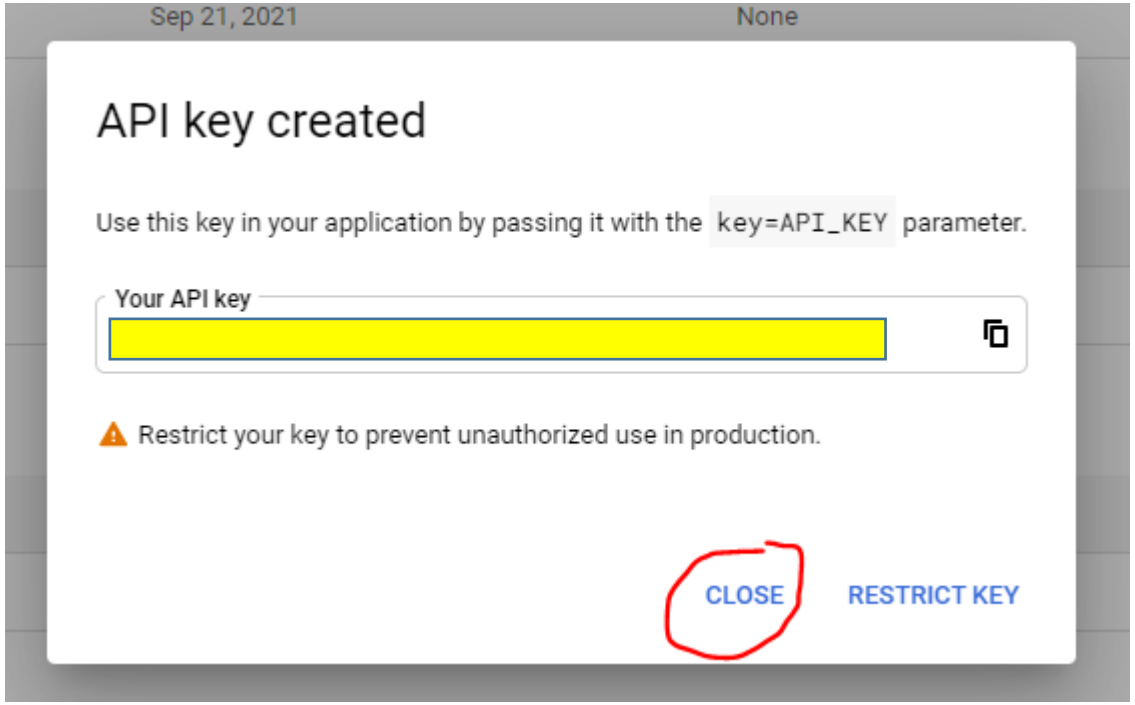


Getting API Key (Step 2)





Getting API Key (Step 3)



IMPORTANT

Your new GCP account comes with **$300 USD Free Credits** available for the first **90 days** only.

Your **API Key** is tied to your **billing credit card** – which will be **billed *beyond* $300**.

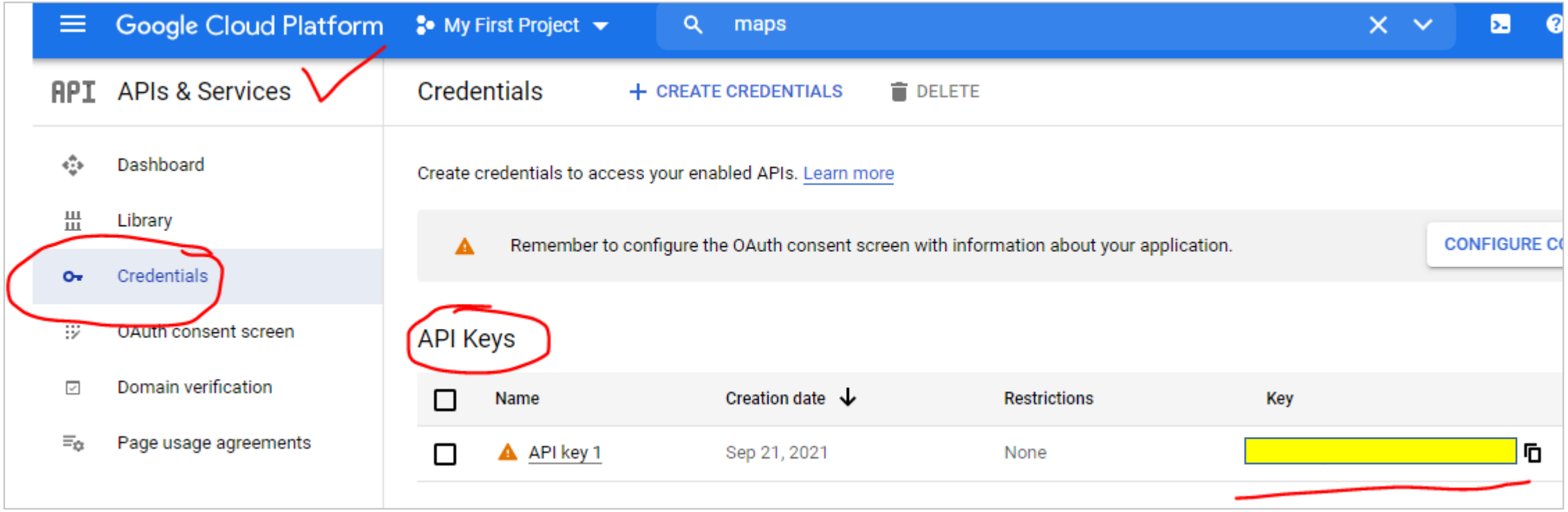
Please **DO NOT SHARE** your API Key with others – as you may exhaust $300 USD Free Credits fast.

Keep it safe – don't push to public GitHub repos by mistake!!!

Please **track usage** actively – especially if you choose to share your **API Key** with IS216 group members.

Finding API Key(s)

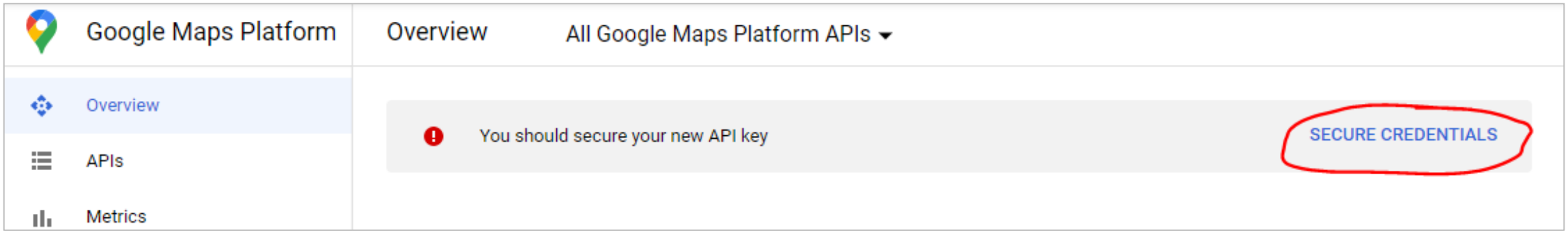
Menu (on the left) → Credentials



Secure your new API key (Step 1)

Go to Google Maps Platform https://console.cloud.google.com/google/maps-apis

Click **SECURE CREDENTIALS**

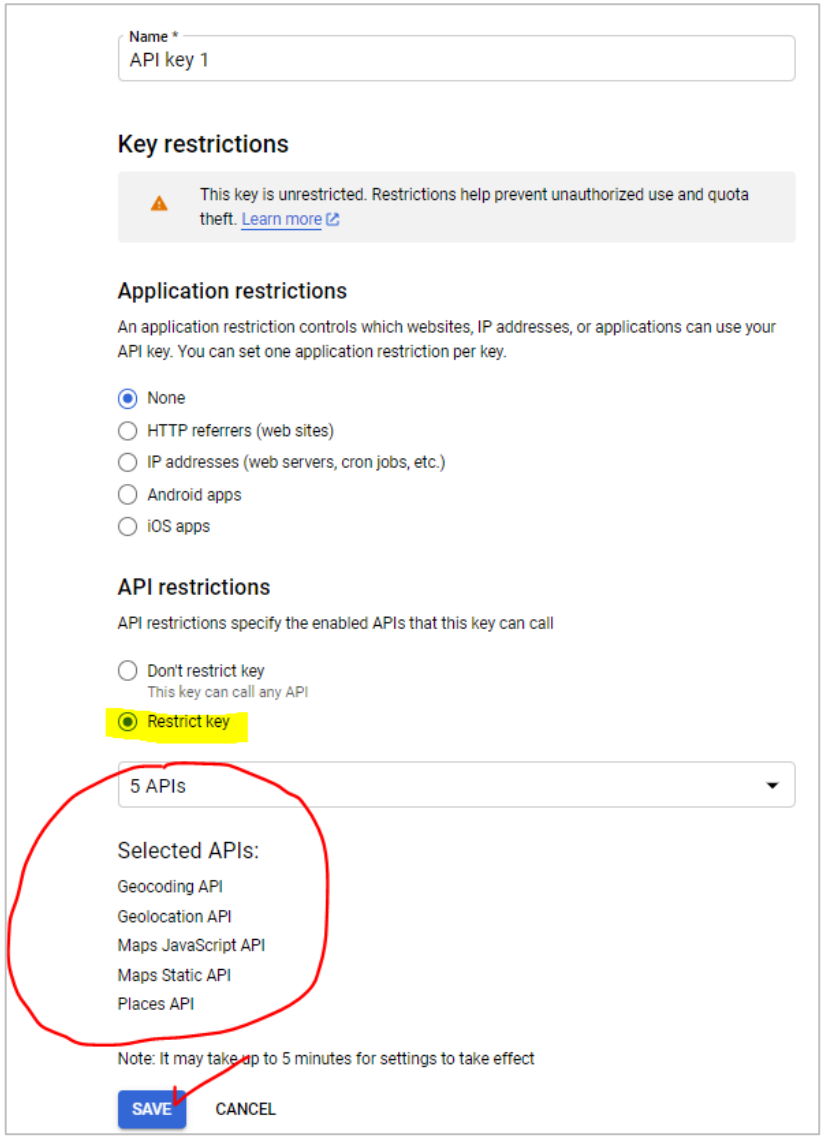


Secure your new API key (Step 2)

Under **API restrictions**, select **Restrict key**

Select the 5 **APIs** which you just enabled access for earlier

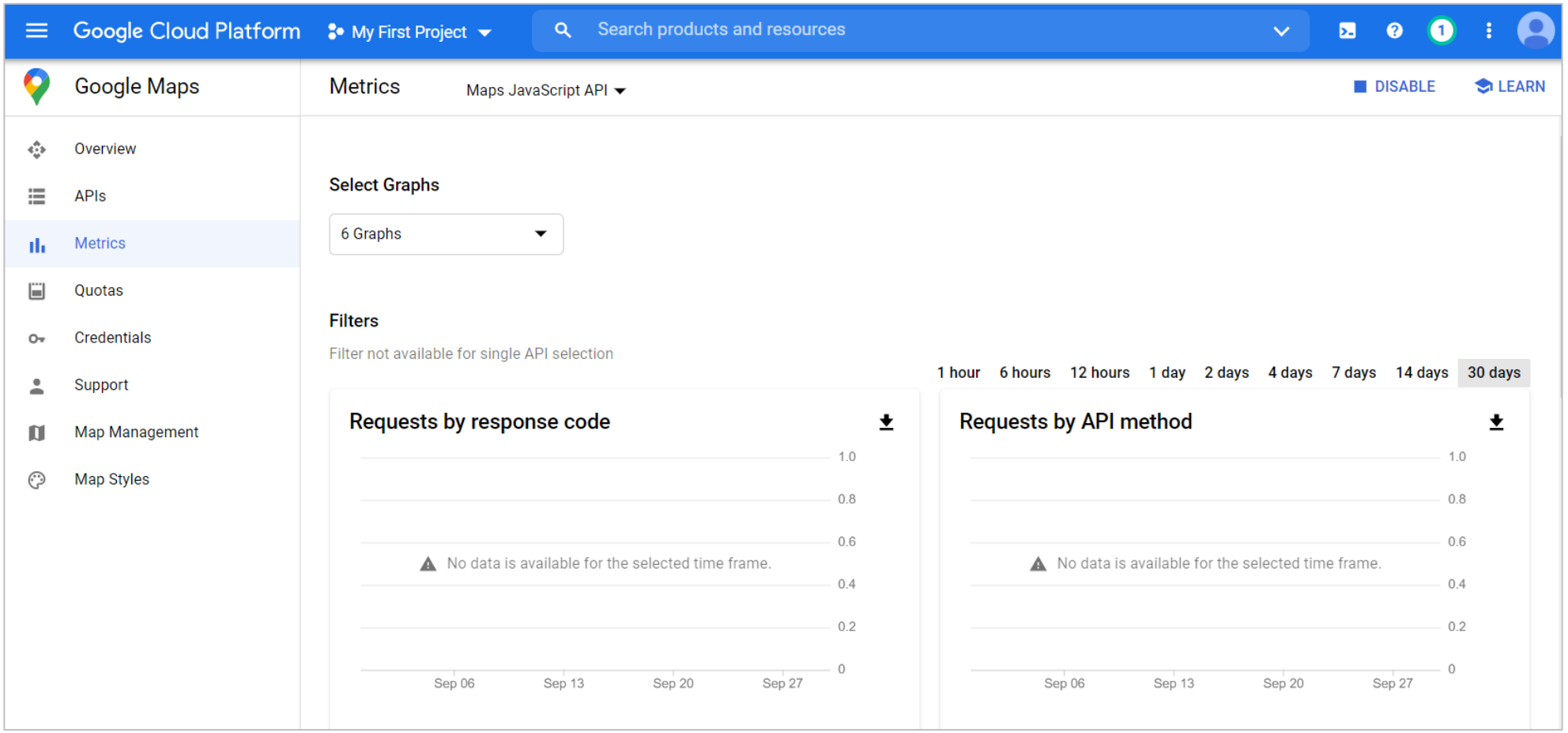
Click **Save**



Tracking API Key Usage

Go to Google Maps Platform https://console.cloud.google.com/google/maps-apis

(Left menu) Click **Metrics** and you can see the usage

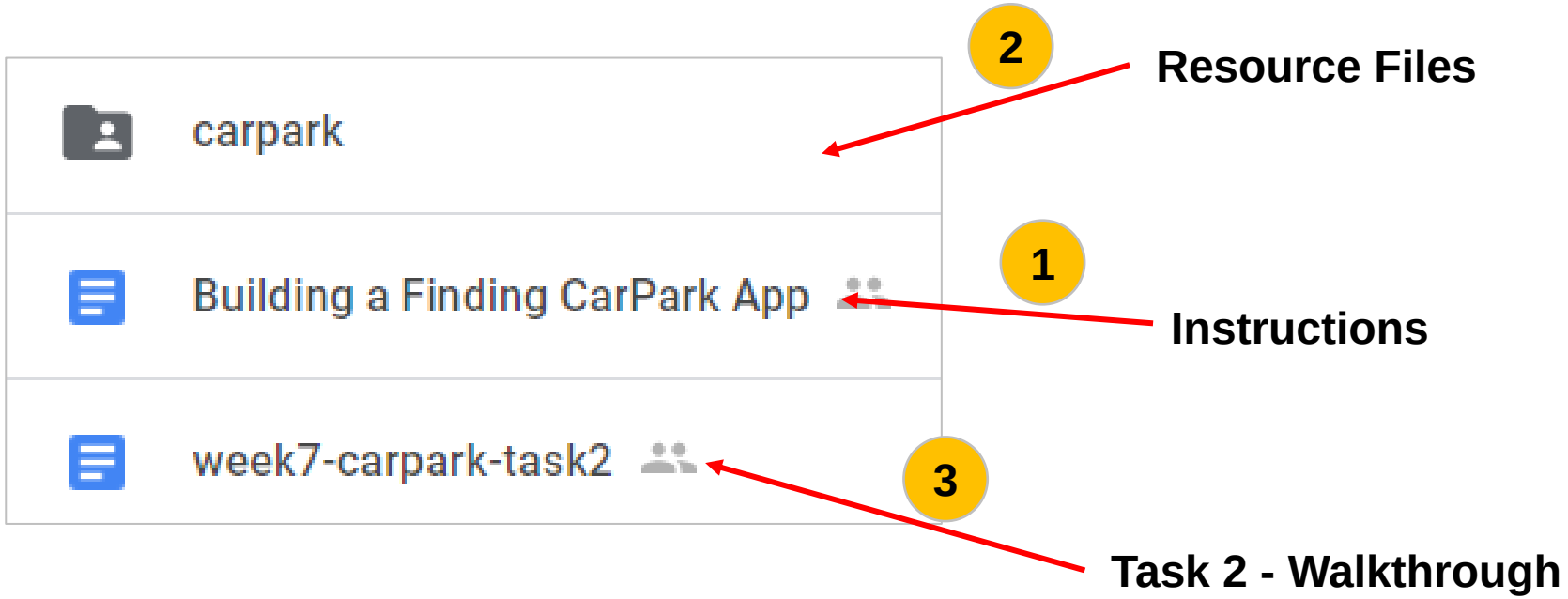


CarPark Web App

Using Google Maps API

CarPark App – Instructions & Resource Files

Go to: https://smu.sg/is216-session7-maps

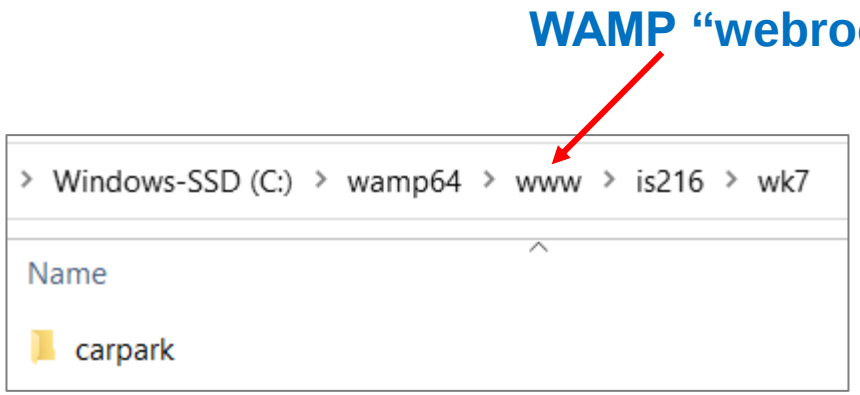


** Courtesy of Shar & Layfoo for generously providing CarPark App source code and documentation*

Setting Up Development Environment

On your local machine (e.g. laptop):

1. Download & unzip **carpark** in **<webroot>/is216/wk7/**



2. Start **WAMP** (or **MAMP**)

3. In **Google Chrome web browser**, go to: http://localhost/is216/wk7/carpark/app.html

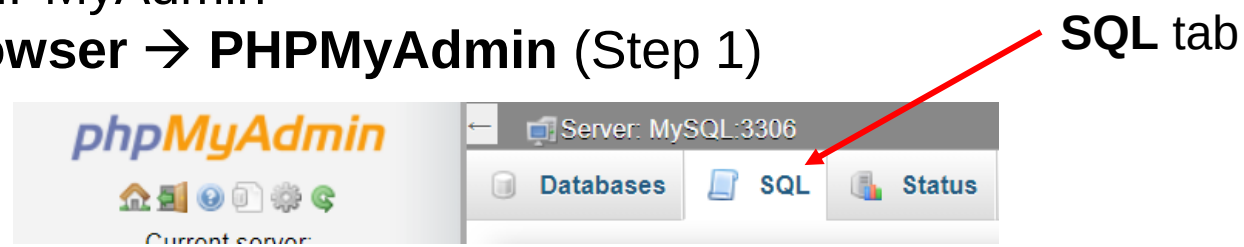
Import Carpark Database

1. In **Google Chrome web browser**, go to http://localhost/phpmyadmin/
   - WAMP
     - Username: **root**
     - Password: <empty>
   - MAMP
     - Username: **root**
     - Password: **root**

2. In **Visual Studio Code**, open **carpark** folder (e.g. C:\wamp64\www\is216\wk7\carpark)

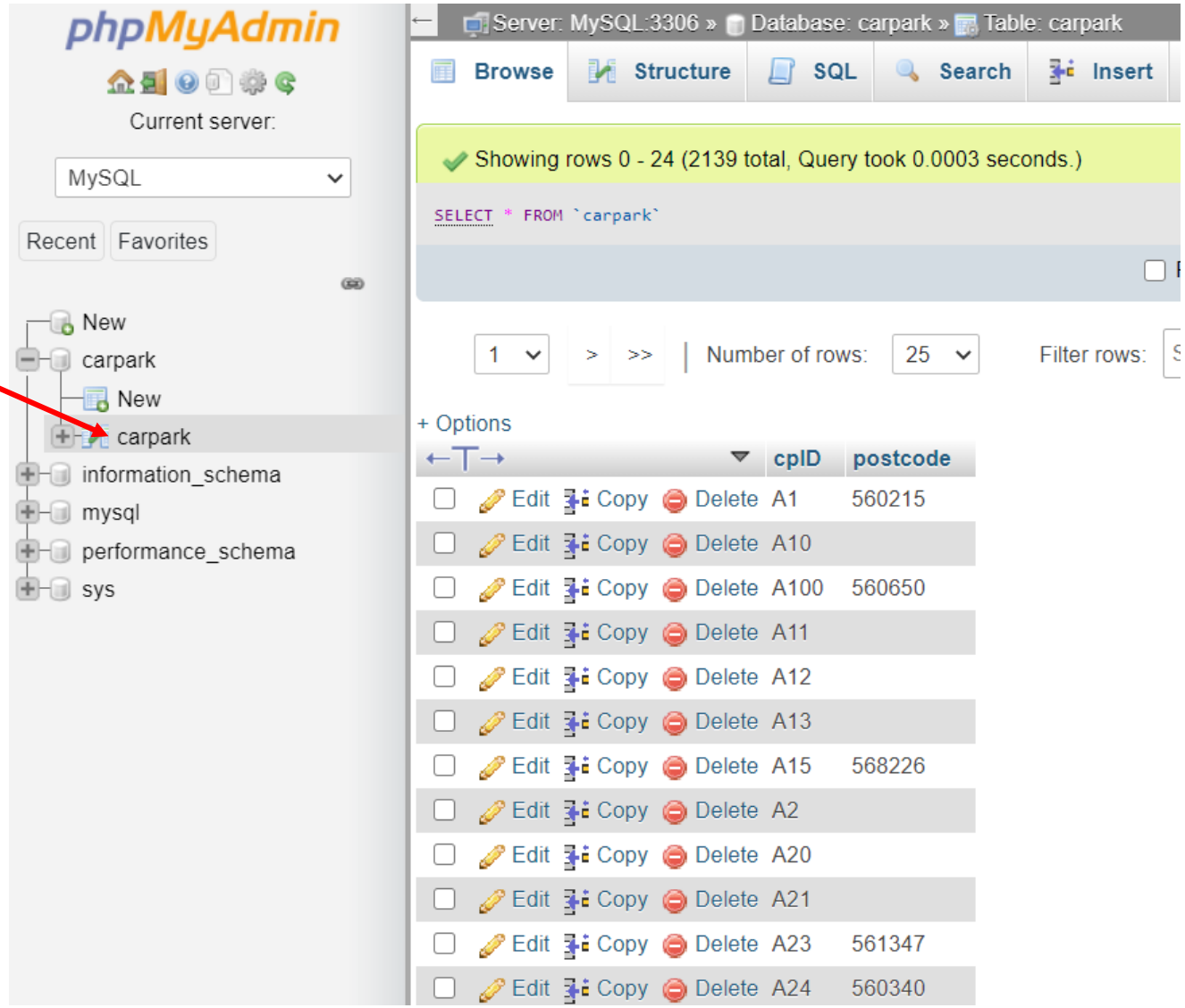
3. Go to **carpark → REST → model** (folder)

4. Open **carpark_full.sql**
   - Import the entire content into PHPMyAdmin
   - Go to **Google Chrome web browser → PHPMyAdmin** (Step 1)
   - Go to **SQL** tab
   - Paste and run SQL statements



Verify Carpark Database

Click **carpark** table
(inside carpark schema)



Configure ConnectionManager.php

1. Go to **carpark → REST → model** (folder)

2. Open **ConnectionManager.php**
   - Change $username, $password, $port *(if necessary)*

3. Go to **carpark** and open **app.html**

4. Look for `googleAPIKey` variable and assign **your own Google Maps API key** as a String value.

```
<script>
    // APIs that we are going to use
    var googleAPIKey = ""; // Change to your own
```

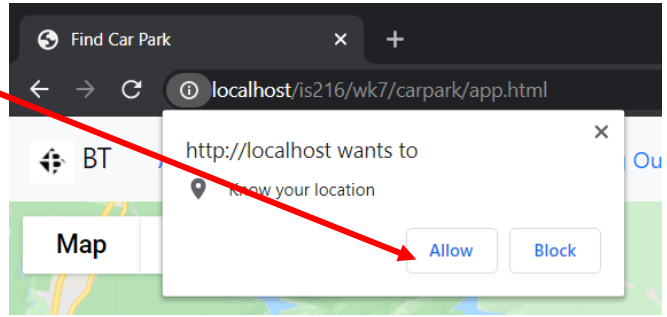
5. Scroll to the bottom of **app.html** and look for the below segment and replace the yellow portion with **your own Google Maps API key**

```
<!-- load the map asynchronously, i.e., load data soon as it becomes available -->
<script async defer
    src="https://maps.googleapis.com/maps/api/js?key=                    &callback=initMap">
</script>
```

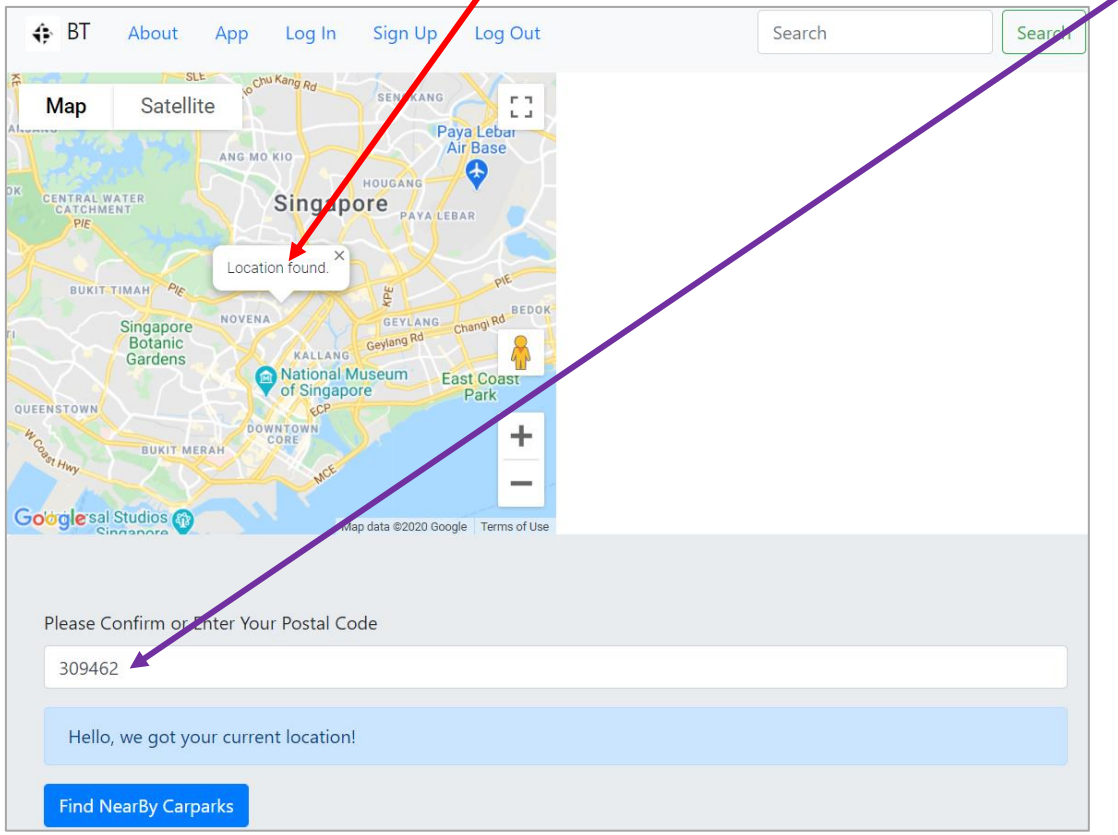
CarPark Web Application

1. In **Google Chrome web browser**, go to http://localhost/is216/wk7/carpark/app.html

2. When prompted for **“Know your location”**, press **Allow**



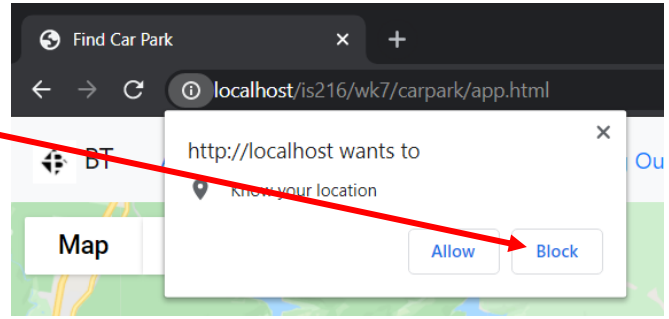
3. You will see **Location found** popup and **Postal Code**

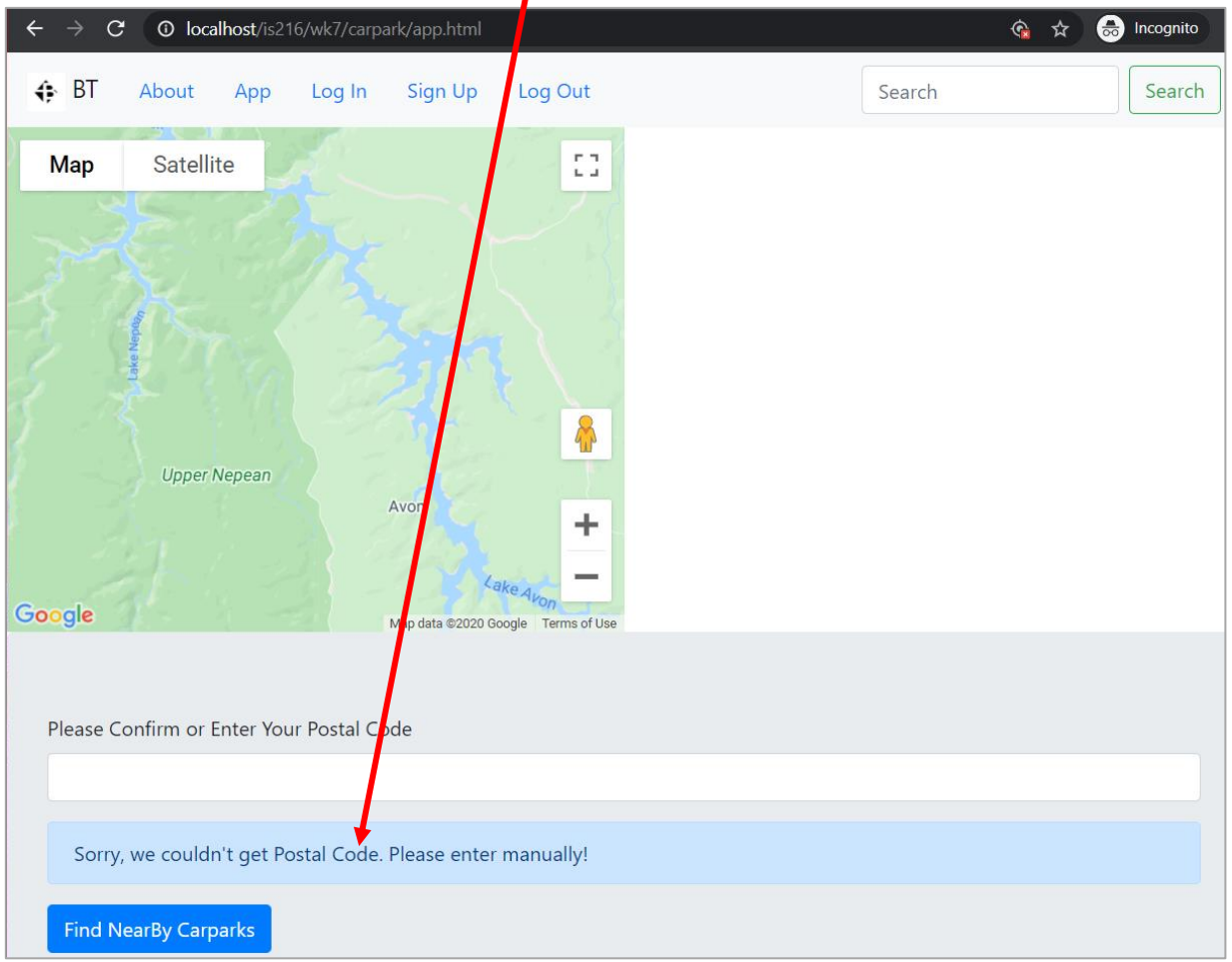


CarPark Web Application

1. What happens if you press **Block**?

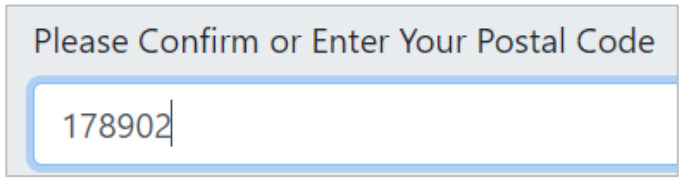
2. You will see **this message** at the bottom

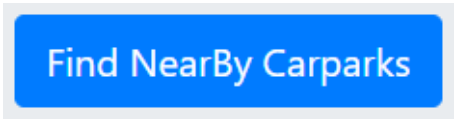




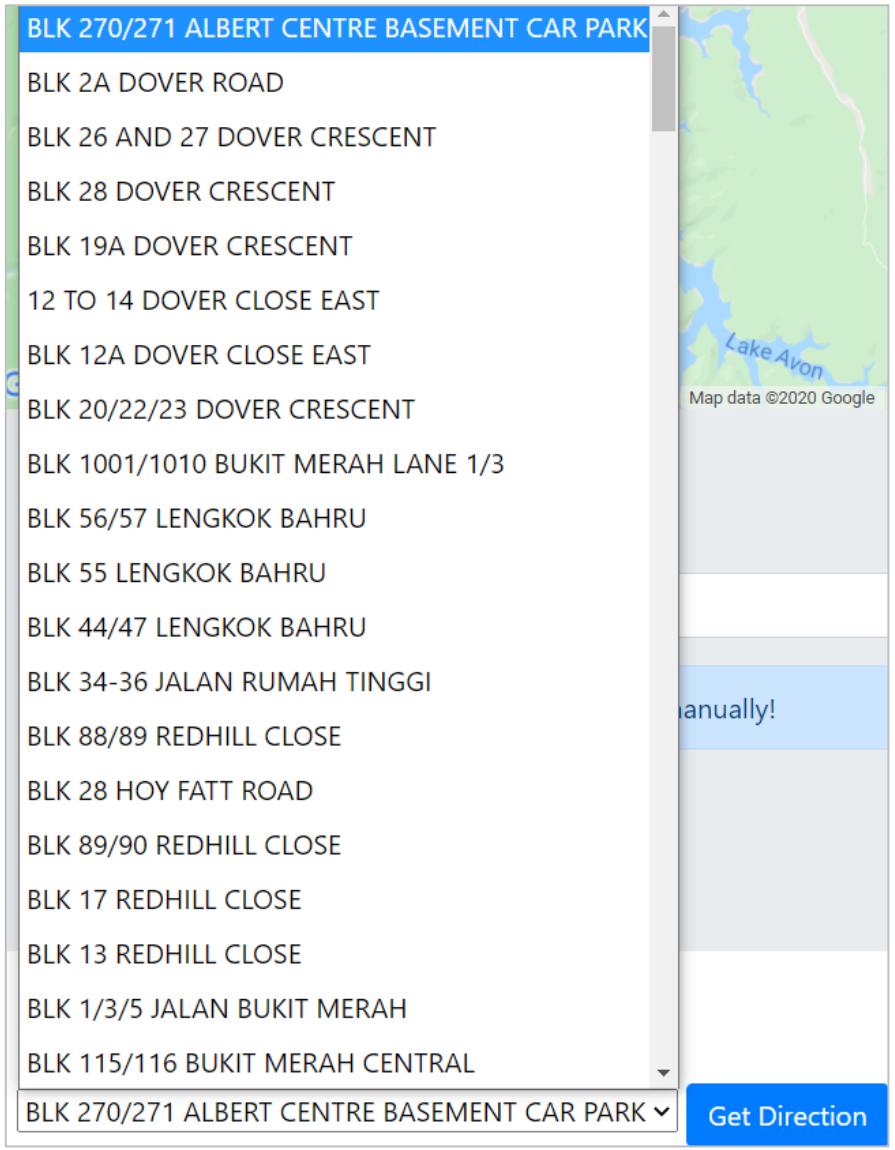
CarPark Web Application

1. Enter **Postal Code 178902**



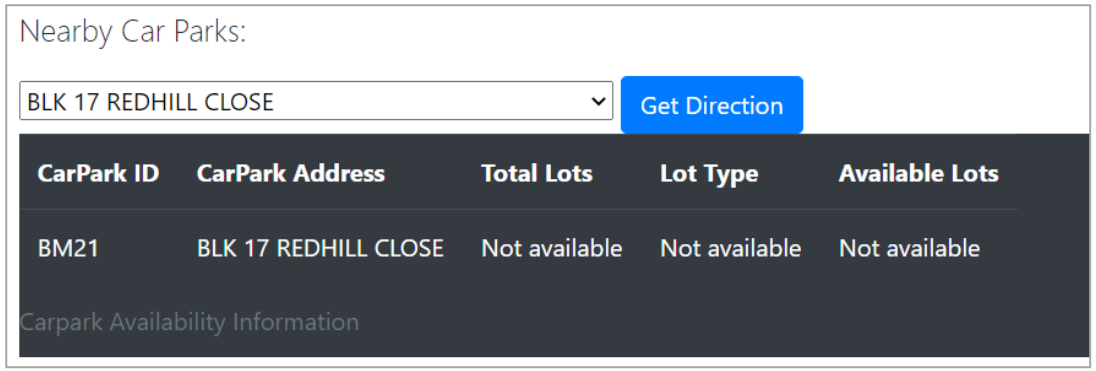
2. Press 

3. At the **bottom of the webpage**, you should see a **dropdown menu** with **nearby carpark names**

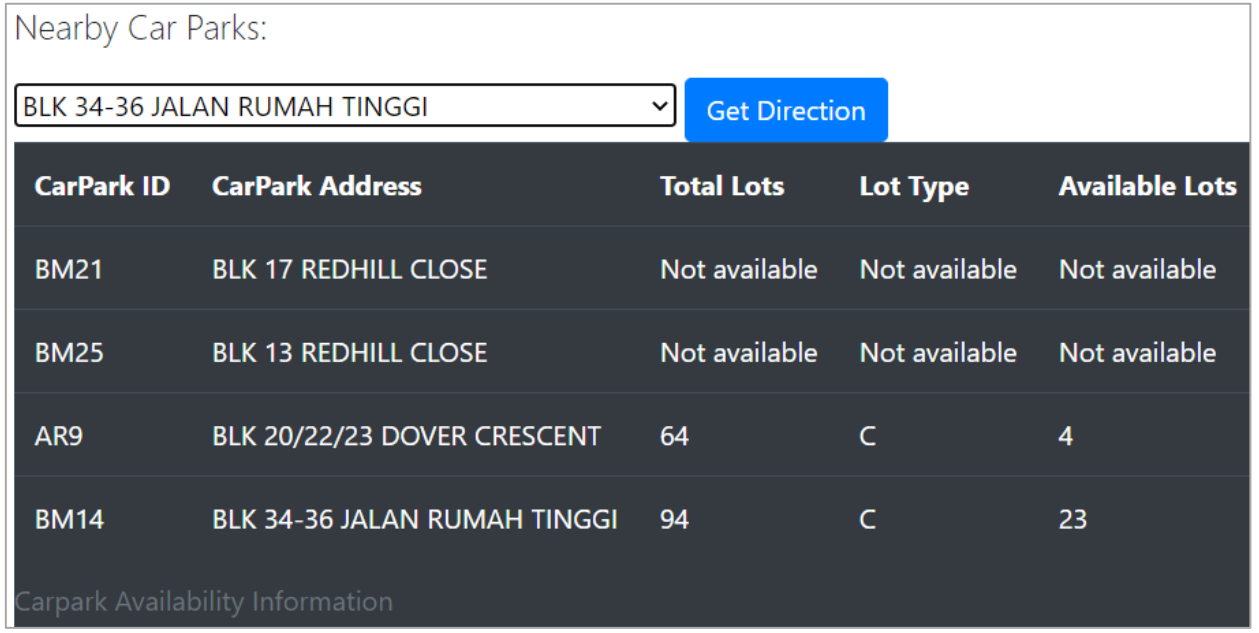


CarPark Web Application

1. Select any **carpark** option and scroll down
2. You should see **carpark availability**



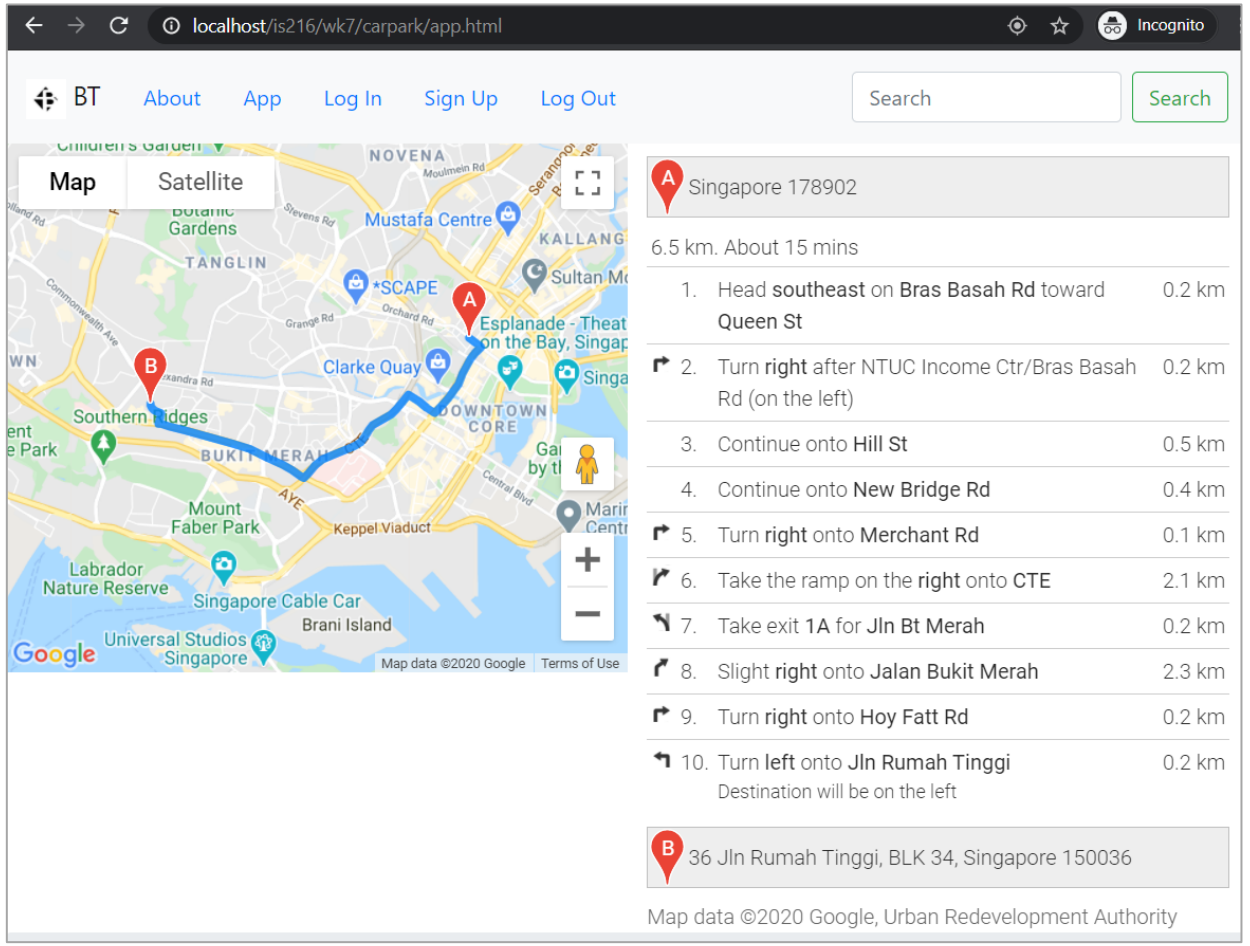
3. Select another **carpark** option. The **carpark availability** information section should auto-update to display this carpark's info.



CarPark Web Application

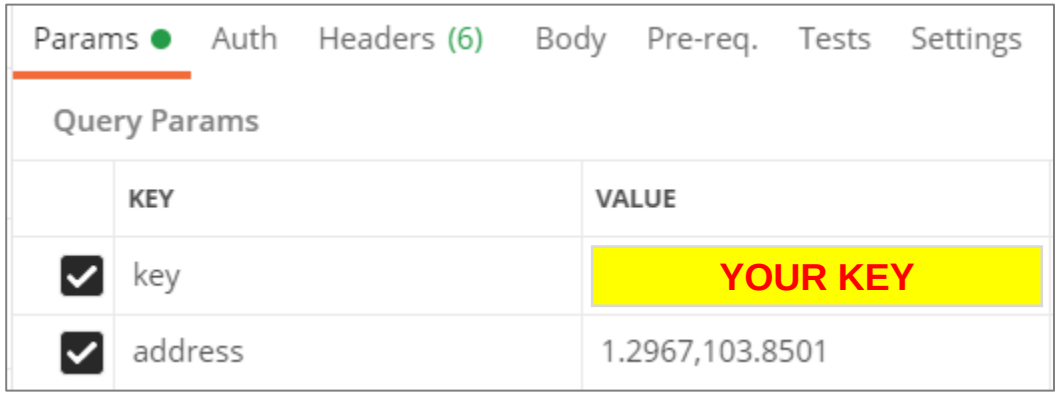
1. Select any **carpark** option and press **Get Direction**

2. Scroll up and you should be able to see **directions** from **your location** to the selected **carpark**



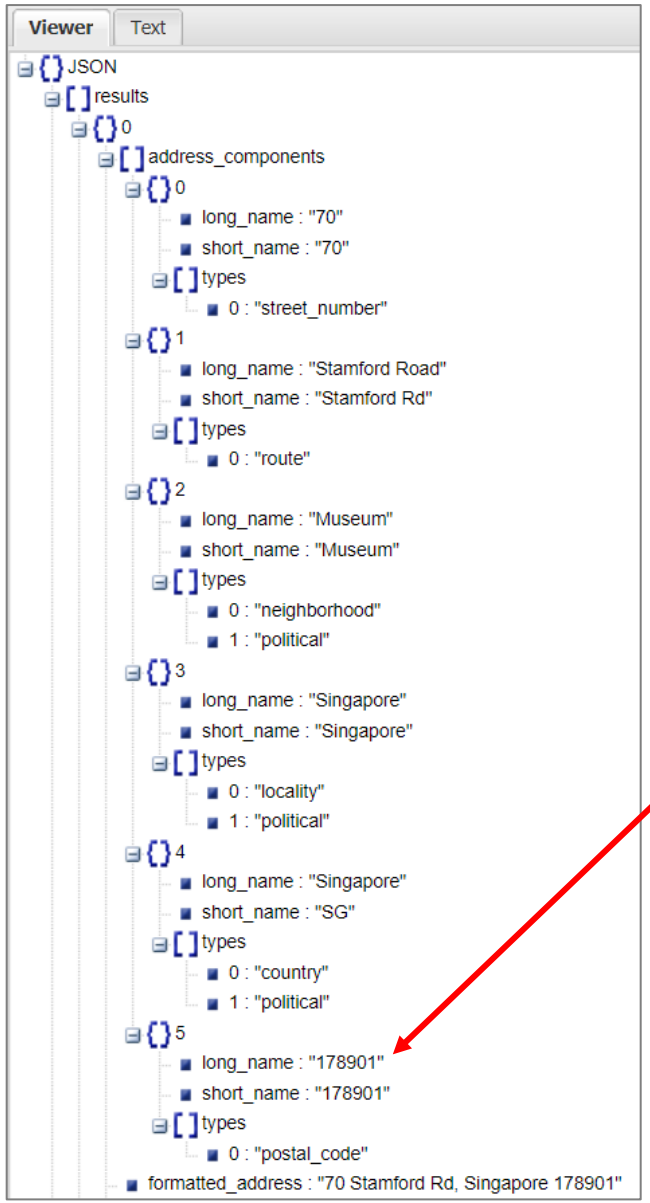
[Postman] Long/Lat → Postal Code

- **Base URL**: https://maps.googleapis.com/maps/api/geocode/json
- **Parameters**



- **address** is a combination of:
  - **Latitude:** 1.2967
  - **Longitude**: 103.8501

[Postman] Long/Lat → Postal Code



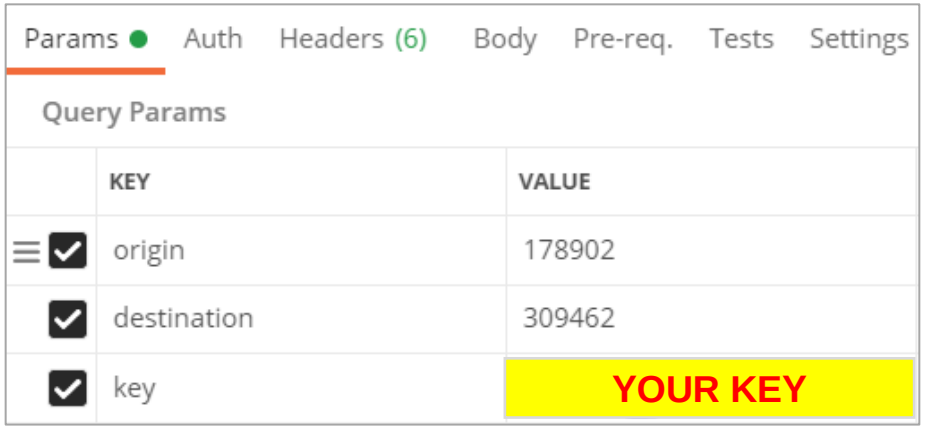
Postal Code

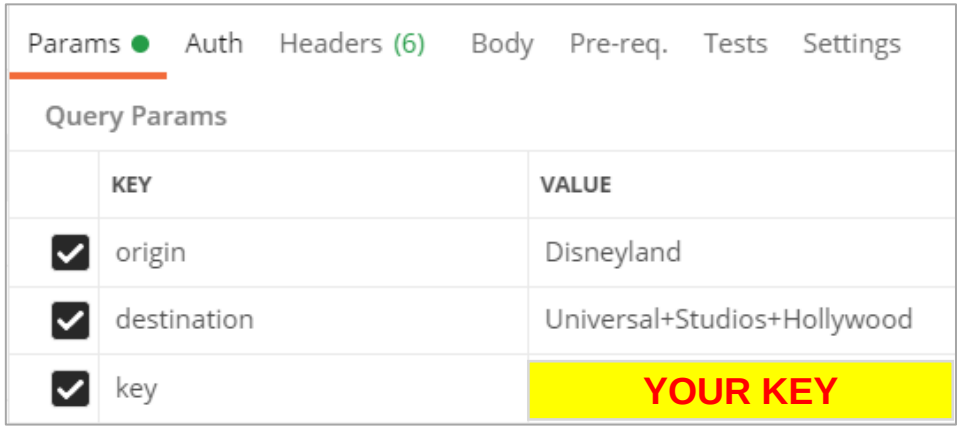
```
function getPostCode(data) {
    //console.log('in getPostCode')
    //console.log(data)
    var addrcomponents = data["results"][0]["address_components"];
    var postcode = addrcomponents.filter(postcodeHelper);
    // country is an array but there should be only one element
    console.log(postcode)
    return postcode[0]["long_name"];
}

function postcodeHelper(addr) {
    return addr["types"][0] == "postal_code" ;
}
```

[Postman] Directions API

- **Base URL**: https://maps.googleapis.com/maps/api/directions/json
- **Parameters**

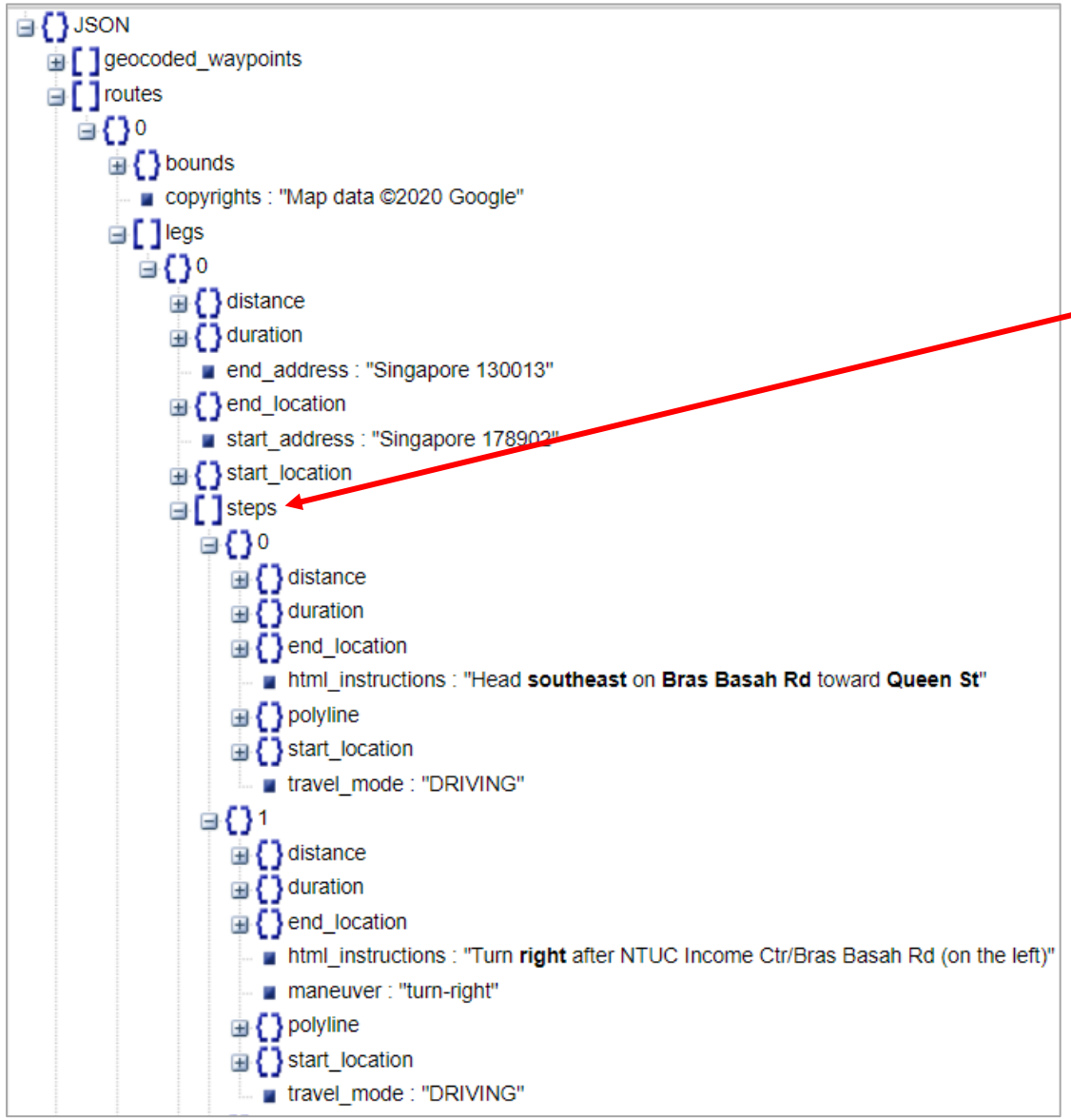




- **Origin/destination** can be
  - Landmark names
  - Postal codes
  - Etc.

- For more comprehensive info, visit **Google Maps "Directions" API documentation**
  - https://developers.google.com/maps/documentation/directions/overview

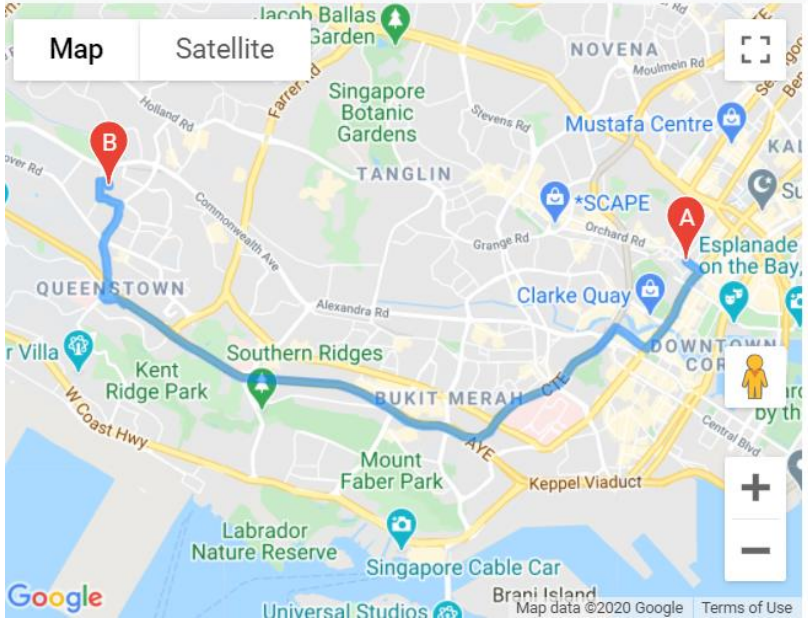
[Postman] Directions API



Steps
(see next slide for browser-rendered directions)

[Postman] Directions API

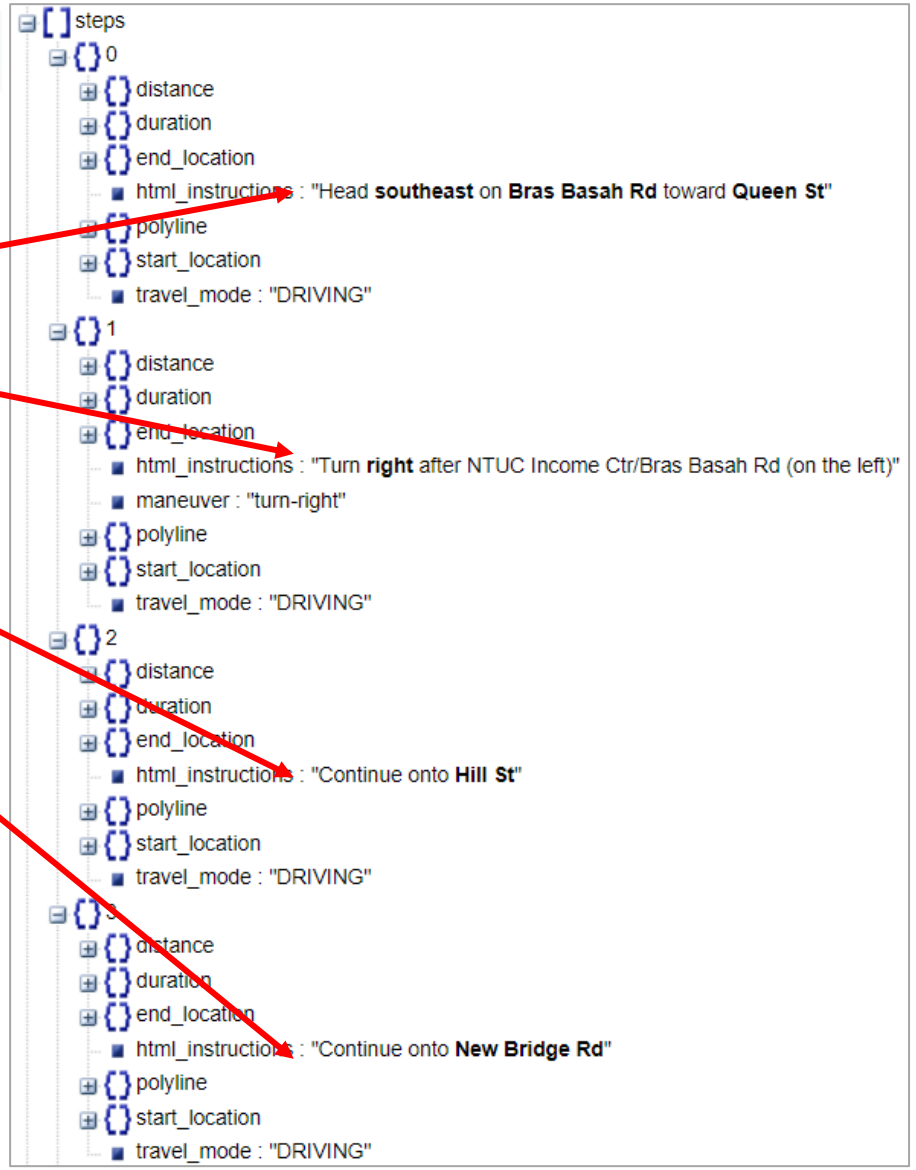
BT About App Log In Sign Up Log Out Search Search



A Singapore 178902

11.1 km. About 16 mins

1.	Head **southeast** on **Bras Basah Rd** toward **Queen St**	0.2 km
2.	Turn **right** after NTUC Income Ctr/Bras Basah Rd (on the left)	0.2 km
3.	Continue onto **Hill St**	0.5 km
4.	Continue onto **New Bridge Rd**	0.4 km
5.	Turn **right** onto **Merchant Rd**	0.1 km
6.	Take the ramp on the **right** onto **CTE**	2.9 km
7.	Merge onto **AYE** Toll road	4.5 km
8.	Take exit 8 toward North Buona Vista Rd	0.3 km



Questions? Need Help?

Join us in Slack
@
https://is216-oppa.slack.com

Thank You!