



# Building a Custom Search Engine with Google Programmable Search API

Hands-on Lab | Digital Summit 2024



## Goal

In this OpenLab, you will learn how to create a custom search engine. You will start by understanding how Google's Custom Search Engine works and how to use the Programmable Search API to connect with it. Then, you will build your own search engine and integrate it into a web application using JavaScript. By the end of the lab, you will have a fully functional custom search engine app that performs searches using Google's API.

## Pre-Requisites

To complete this lab successfully, ensure the following are installed and set up,

- Google Account
- Google Cloud Console API Setup with Custom Search enabled
- Node JS and NPM
- React Framework
- Any Text Editor (VS Code Studio/Notepad++/Notepad)

## Technologies Involved

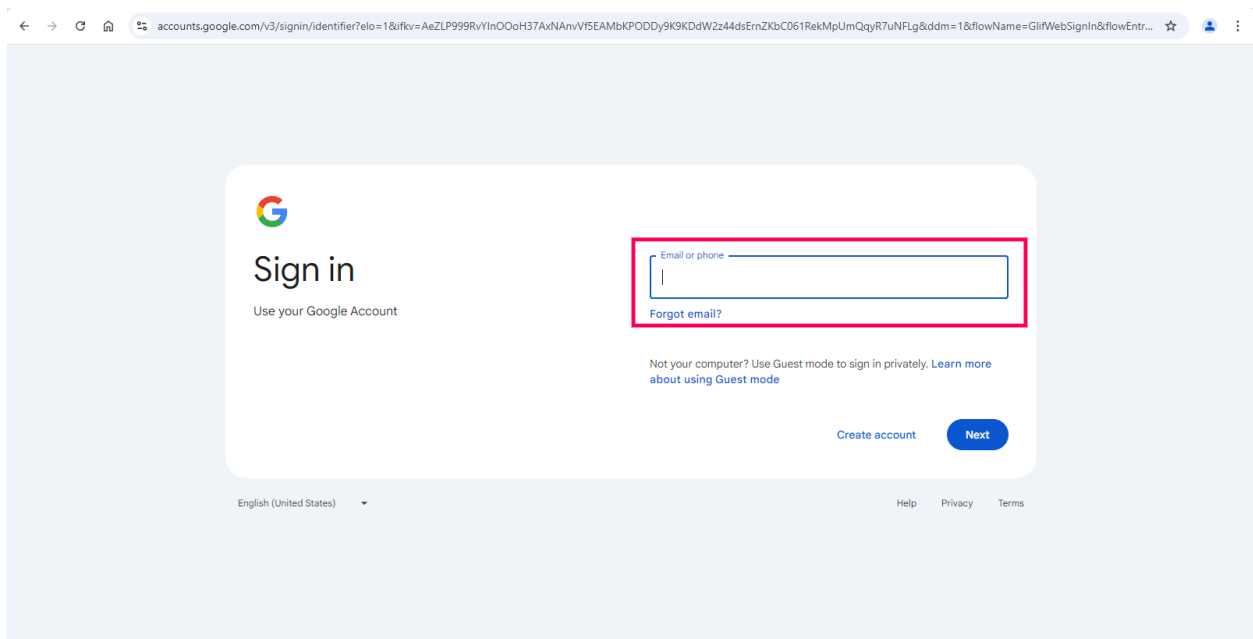
- React
- Node JS
- Google Custom Search JSON API

## Lab Steps

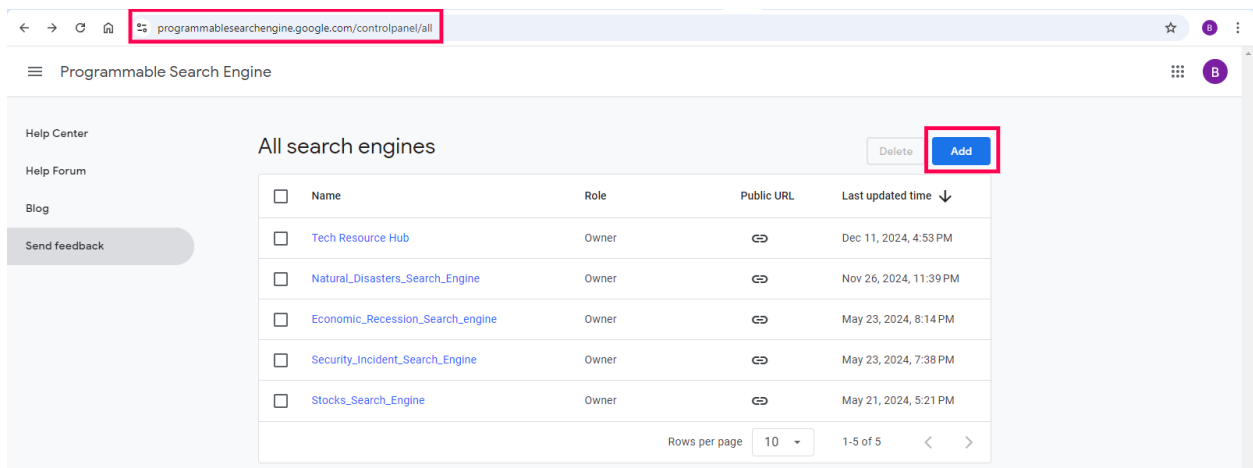
Let's get started with the lab!

### Step #1 | Set Up Google Custom Search

Visit the Google Programmable Search Engine Console. Login with your Gmail and Password.



Here is the home page of the Programmable search engine.



Create a new search engine,

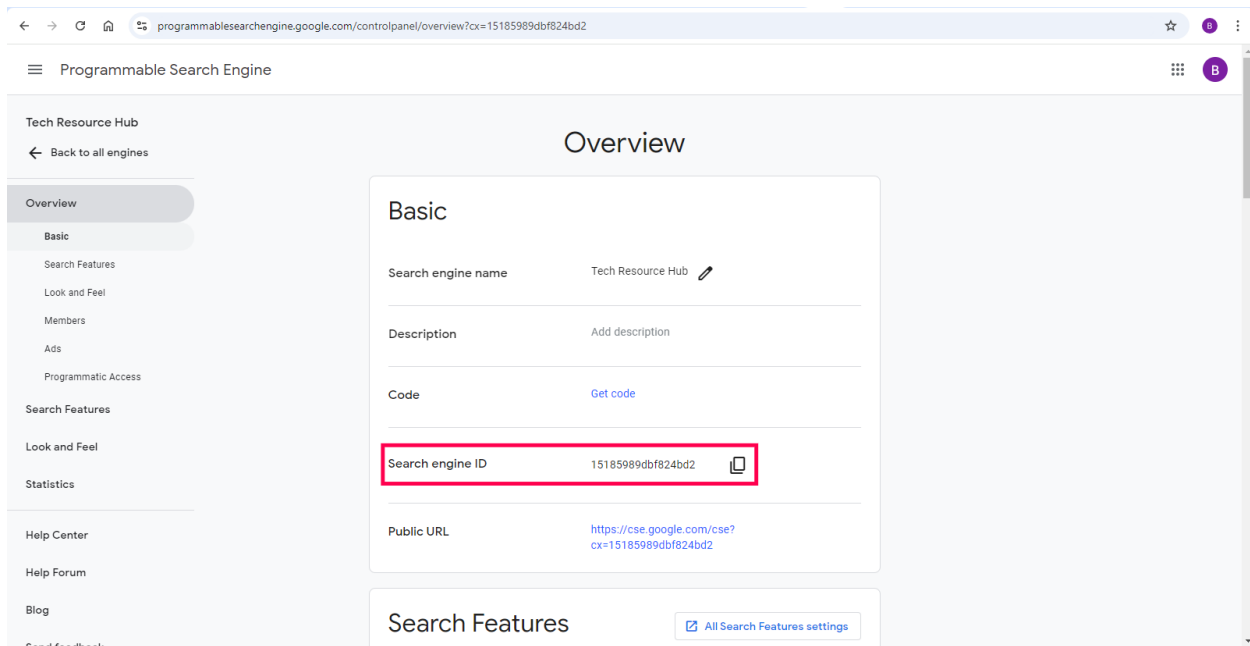
- Here are the few example websites you can include,
  - [www.careerlauncher.com](http://www.careerlauncher.com)
  - [www.embibe.com](http://www.embibe.com)
  - [gate.iitk.ac.in](http://gate.iitk.ac.in)
  - [\\*.stackoverflow.com](http://*.stackoverflow.com)
  - [docs.python.org](http://docs.python.org)
  - [developer.mozilla.org](http://developer.mozilla.org)
  - [www.geeksforgeeks.org](http://www.geeksforgeeks.org)

Name your engine as per your requirement.

The screenshot shows a web browser window with the URL `programmablesearchengine.google.com/controlpanel/create`. The page title is "Programmable Search Engine". On the left, there is a sidebar with links: "Back to all engines", "Help Center", "Help Forum", "Blog", and "Send feedback". The main content area is titled "Create a new search engine" and contains the following fields and options:

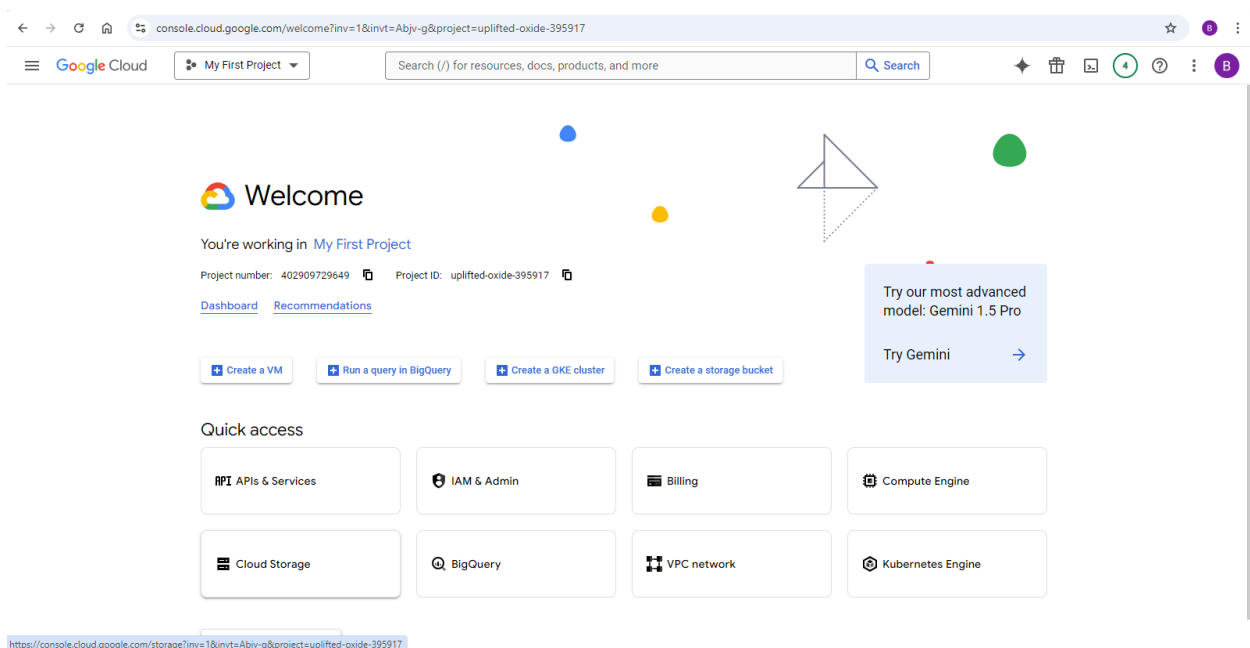
- Name your search engine:** A text input field with the placeholder "Search engine name".
- What to search?:** A section with two radio buttons:
  - ☒ Search specific sites or pages: This option is selected. Below it, there is a list of examples: "Individual pages: `www.example.com/page.html`", "Entire site: `www.mysite.com/*`", "Parts of site: `www.example.com/docs/*` or `www.example.com/docs/`", and "Entire domain: `*.example.com`". Below this list is a text input field with the placeholder "Enter a site or pages" and a blue "Add" button.
  - ☐ Search the entire web
- Search settings:** A section with two toggle switches:
  - ☒ Image search
  - ☒ SafeSearch

Make a note of your **Search Engine ID**.

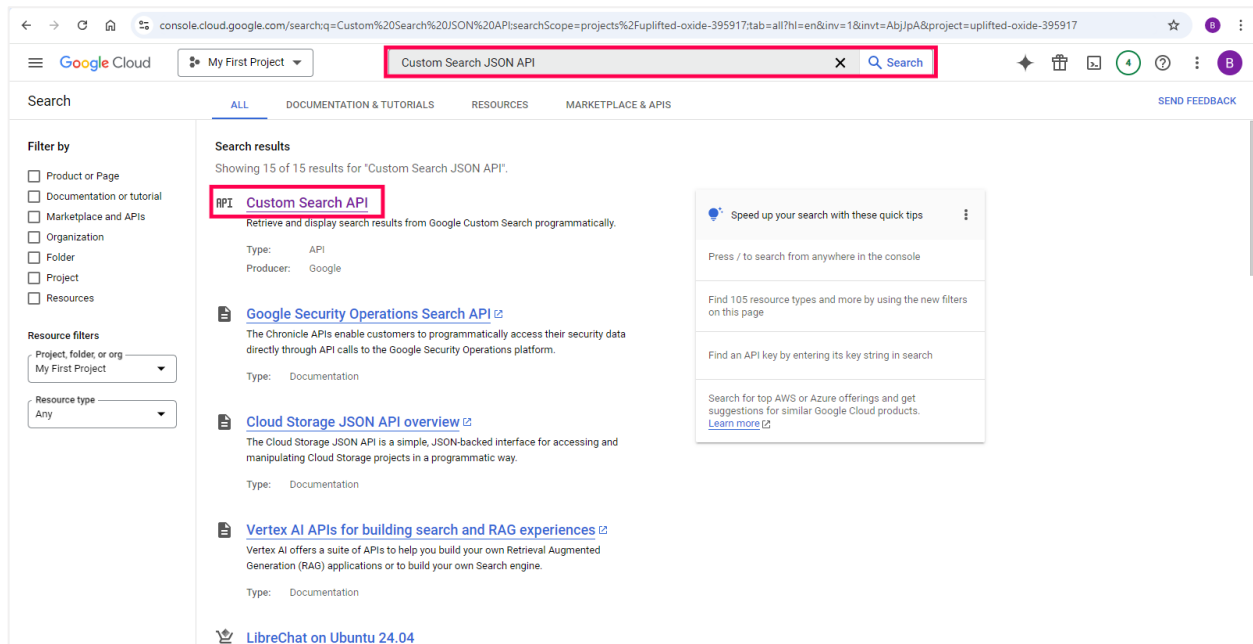


Enable the Custom Search JSON API in the Google Cloud Console,

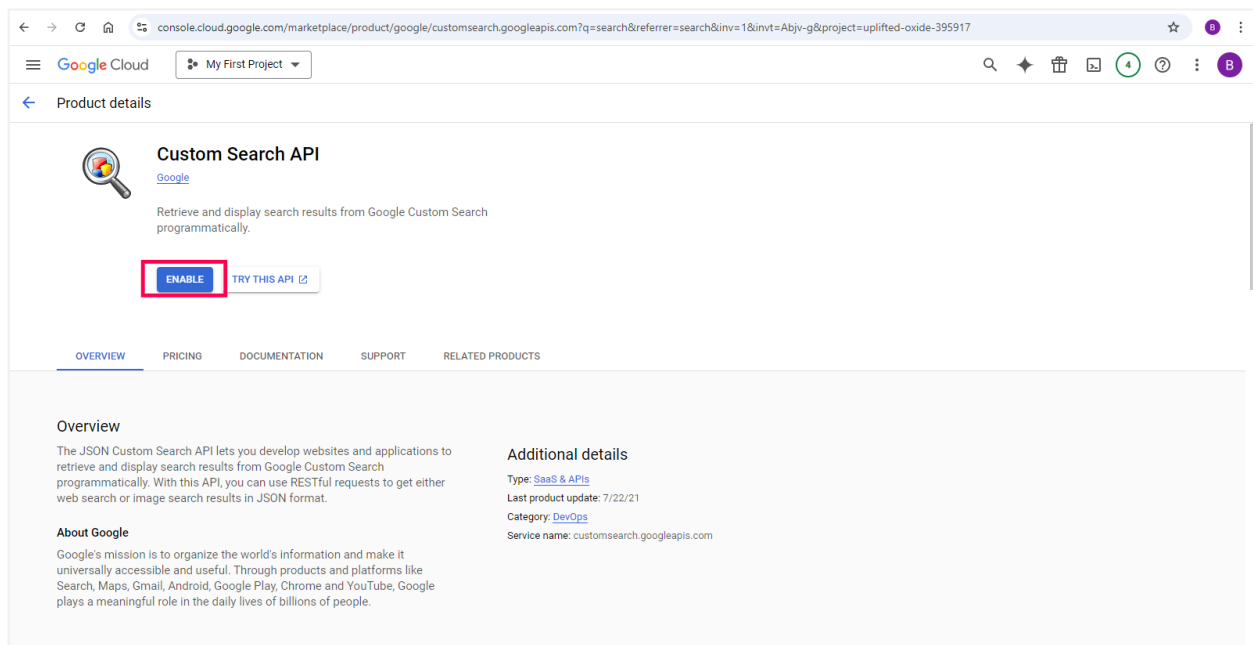
- Login to the Google Cloud Console



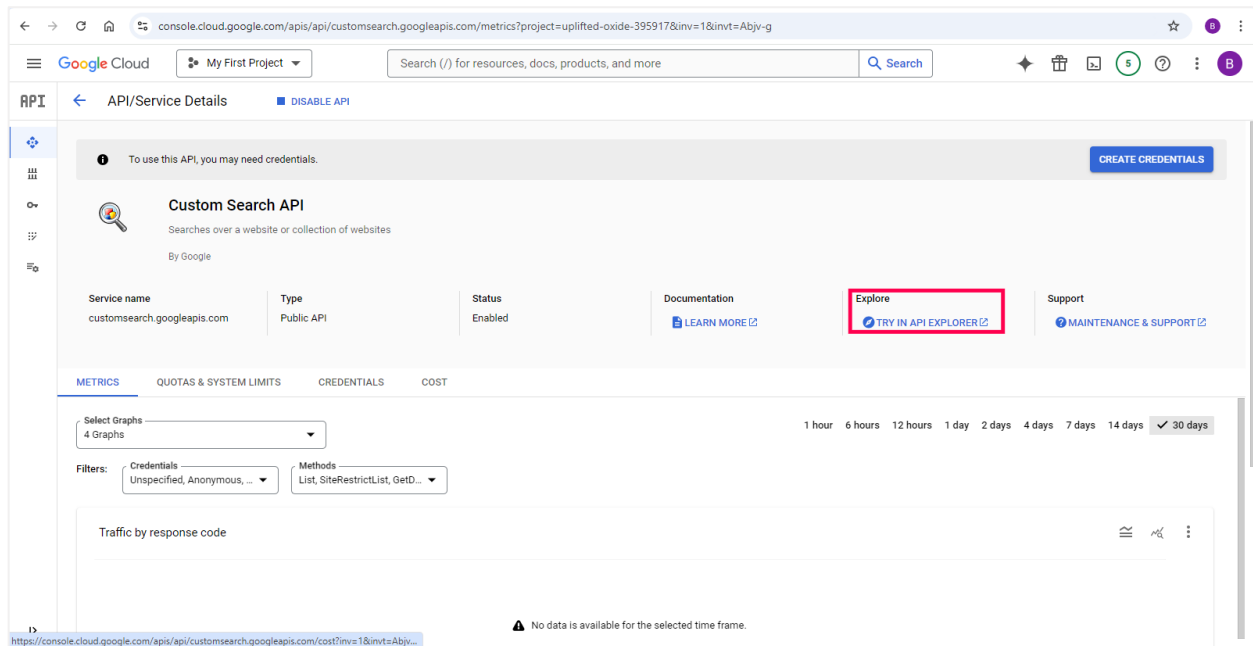
Search for **Custom Search JSON API**



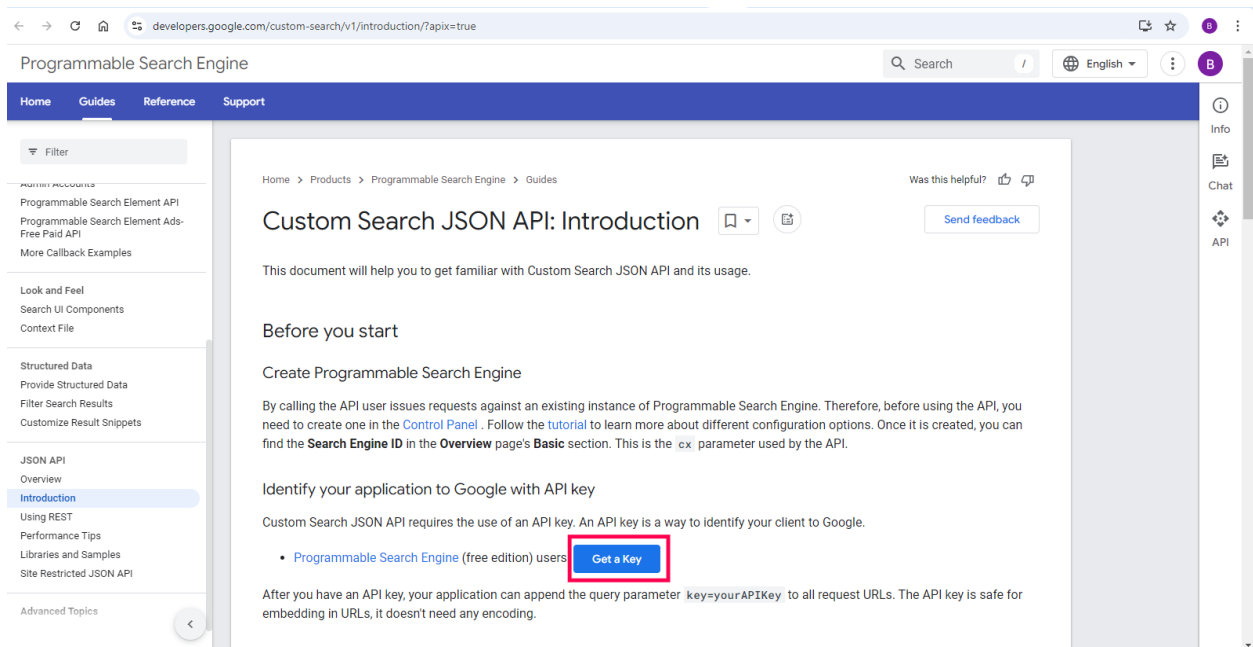
## Enable the Custom Search JSON API.



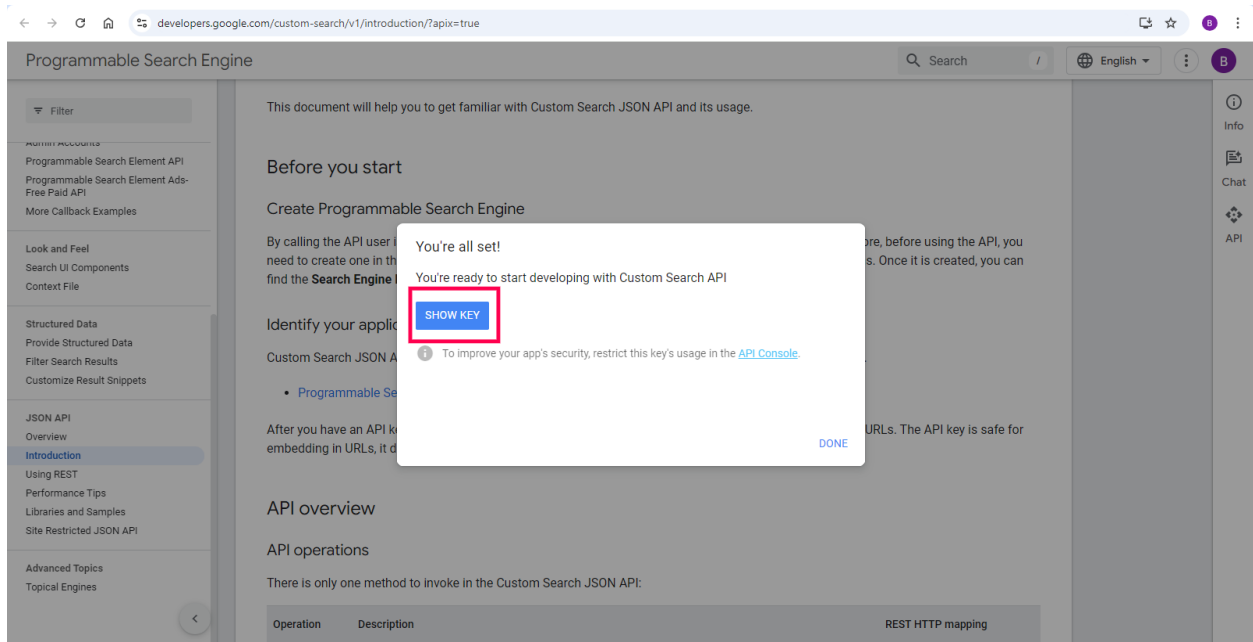
Identify the Google API Key by clicking on "TRY IN API EXPLORER."



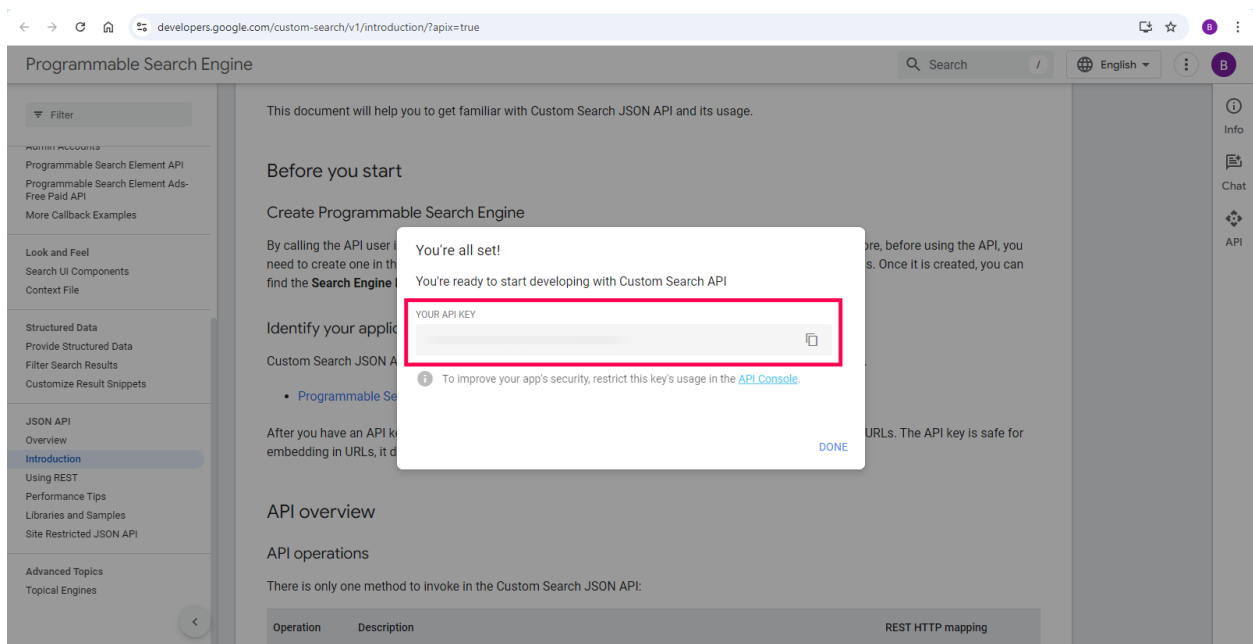
Click on the **Get a key** and select the **First Project** to get the **API KEY**.







Save the **API KEY** for later use.

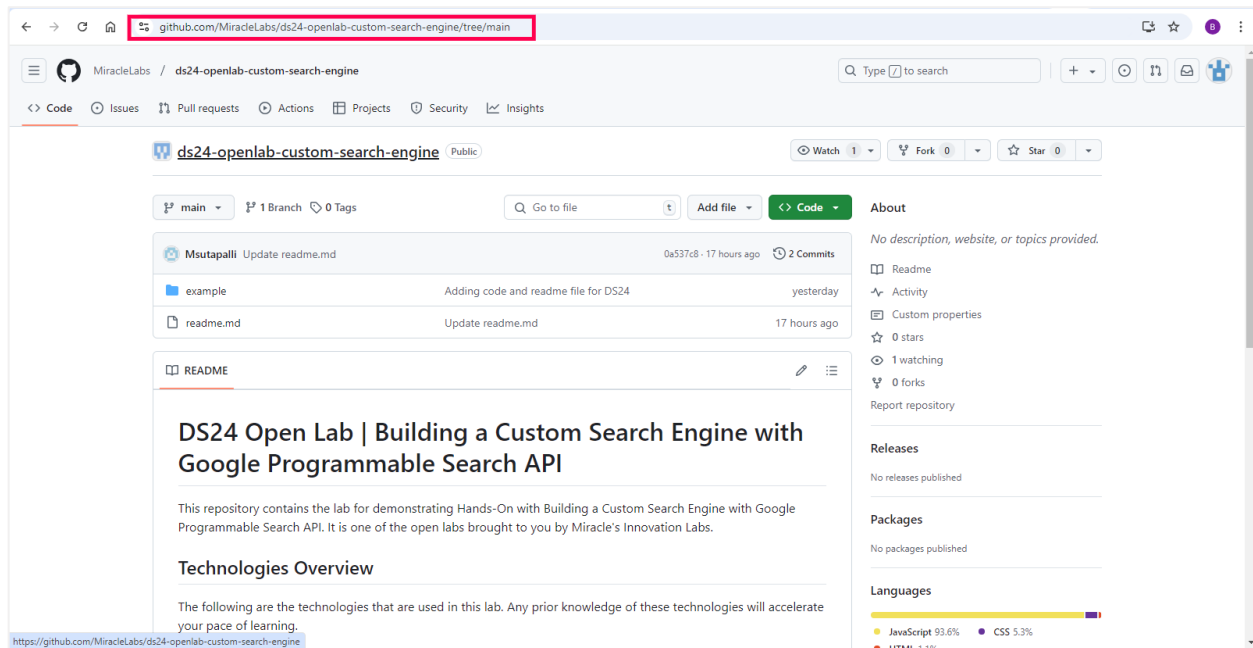


## Step #2 | Code Setup in Local Machine

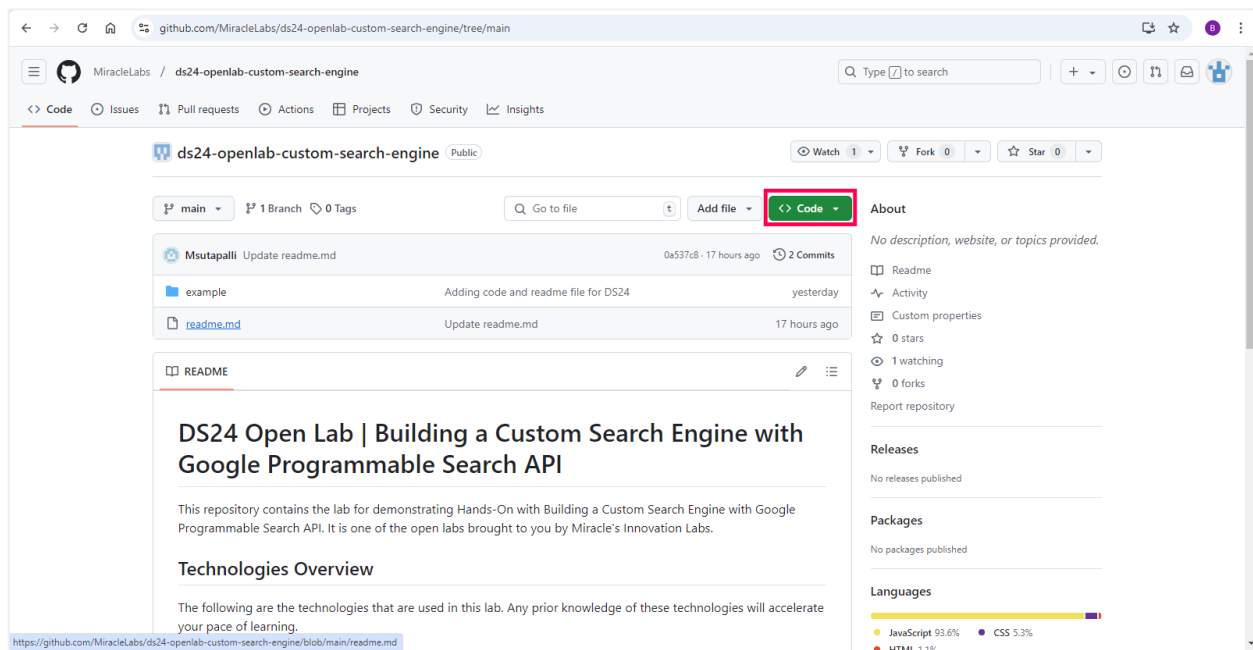
Download the code from Github from the following Git Repo link

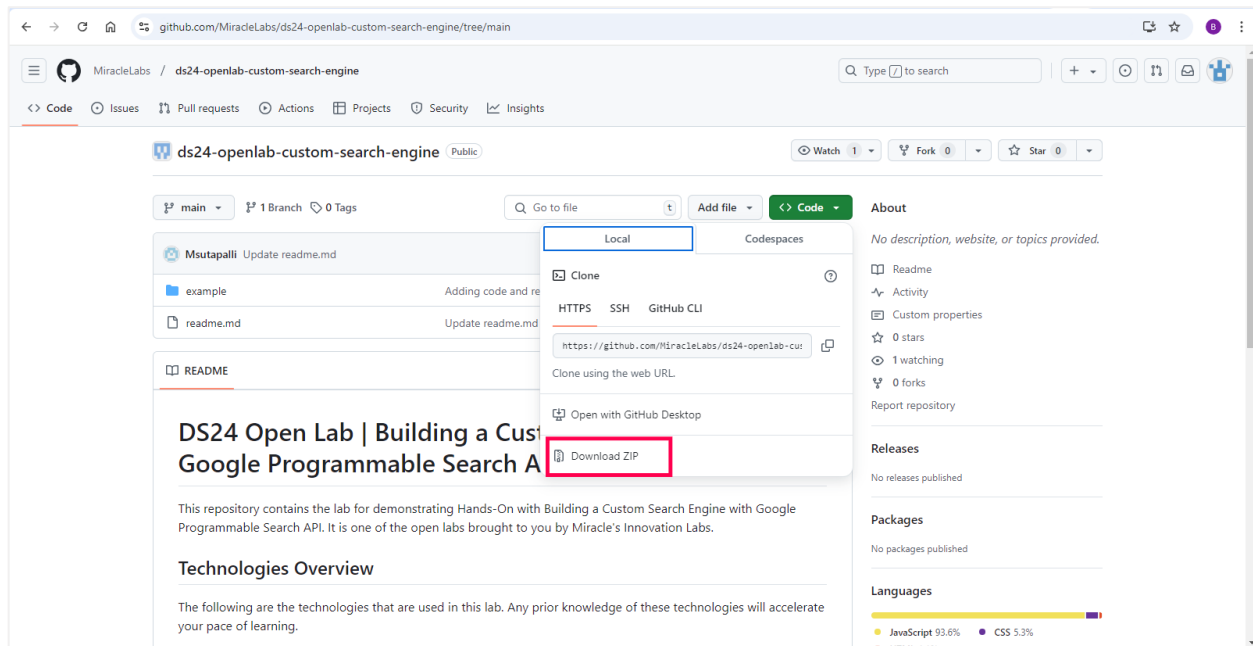
<https://github.com/MiracleLabs/ds24-openlab-custom-search-engine>



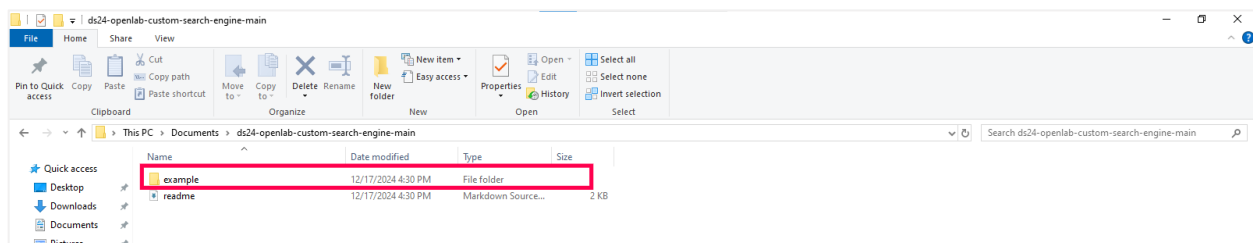
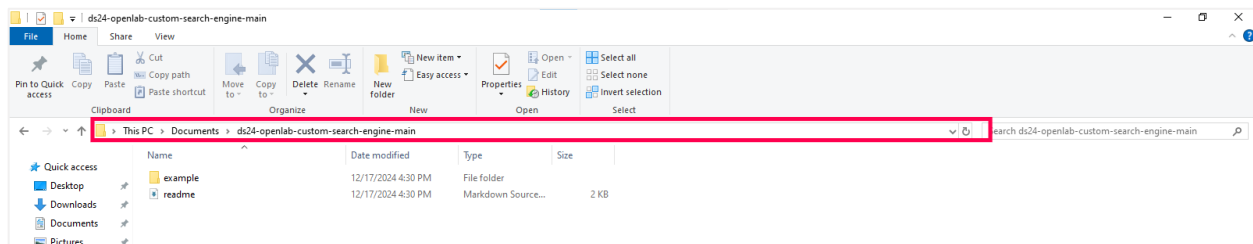


Download the code as Zip.

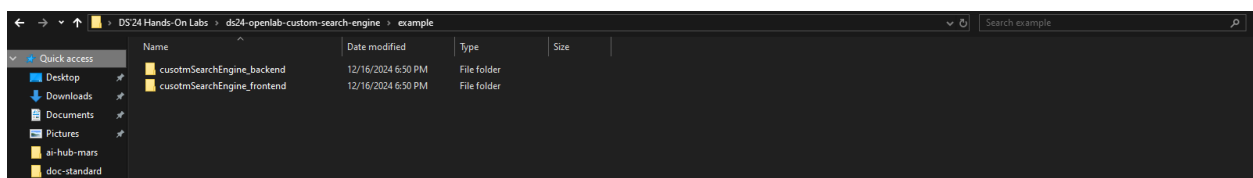




Extract the Zip folder.



Here you can see both the Backend and Frontend code folders



## Set Up Project Structure

Create the following files in the existing code on root path:

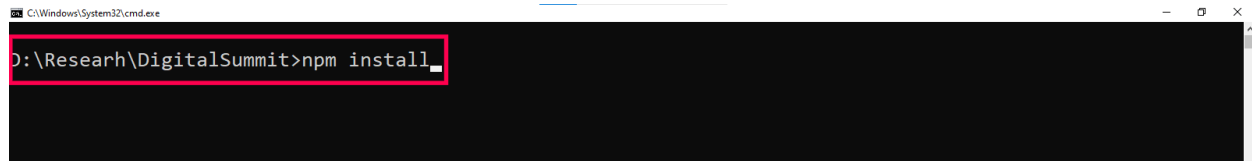
**.env**

### Environment Variables (.env)

- Replace the keys that you have copied in previous steps  
**GOOGLE\_API\_KEY=<Your-Google-API-Key>**  
**SEARCH\_ENGINEID=<Your-Search-Engine-ID>**

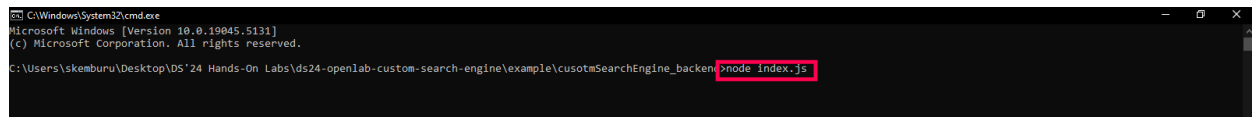
## Install Modules and Run the Node App

- Install node modules by using the command `npm install`



```
C:\Windows\System32\cmd.exe
D:\Research\DigitalSummit>npm install
```

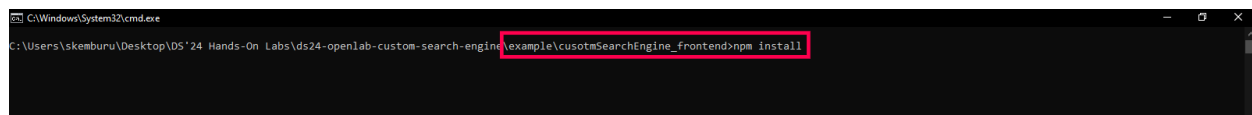
Run the node JS code by using the command `node index.js`.



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19045.5131]
(c) Microsoft Corporation. All rights reserved.
C:\Users\skemburu\Desktop\DS'24 Hands-On Labs\ds24-openlab-custom-search-engine\example\cusotmSearchEngine_backend>node index.js
```

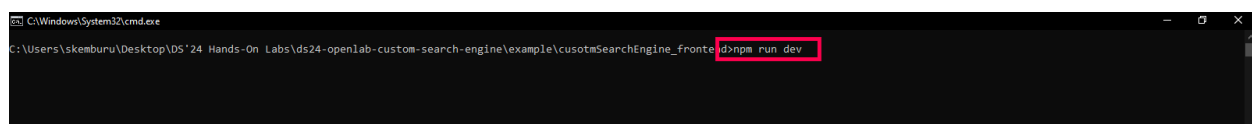
Install Modules and Run the Frontend code.

- Open the frontend folder, then open the command prompt and run the command `npm install`



```
C:\Windows\System32\cmd.exe
C:\Users\skemburu\Desktop\DS'24 Hands-On Labs\ds24-openlab-custom-search-engine\example\cusotmSearchEngine_frontend>npm install
```

Run the React code by using the command `npm run dev`



```
C:\Windows\System32\cmd.exe
C:\Users\skemburu\Desktop\DS'24 Hands-On Labs\ds24-openlab-custom-search-engine\example\cusotmSearchEngine_frontend>npm run dev
```

## Step #3 | Test the Application

- Open the frontend in your browser at <http://localhost:5173>.
- Enter a search query in the input field and view results.
- Here are the sample queries,
  - Best tips for UPSC mains
  - React tutorial AND hooks
  - JavaScript ES6 features intitle:2024

