SNJB's Late Sau. K. B. Jain College of Engineering, Chandwad

Department of Computer Engineering

Course Name: Laboratory Practice II(310258):Cloud Computing

Class: Third Year (TE) Div A/ Div B

Batch:T1/T2/T3/T4

Name:

Roll No:

Assignment No: 8

Answers (A) – 5M	Coding Efficiency (C) – 5M	Viva (V) – 5M	Timely Completion (T) – 5M	Total(20M)	Sign

Date of Performance:................................ .**Date of Completion:**...

1. Title of Assignment:

Installation and configure Google App Engine.

2. Objective:

1. Install and Configure Google App Engine

2. Create a simple code in python on Github and execute on Google App Engine

3. Outcome: Use tools and techniques in the area of Cloud Computing

4. Software and Hardware Requirement:

Software Requirement: 1. Console.cloud.google.com 2. Login to your Gmail account

Hardware Requirement: Internet Connection, PC with Min. 2GB RAM, Core i5 Processor

5.Relevant Theory :

Google App Engine :

Google App Engine (often referred to as GAE or simply App Engine) is a cloud computing platform as a service for developing and hosting web applications in Google- managed data centers. Applications are sandboxed and run across multiple servers. App Engine offers automatic scaling for web applications—as the number of requests increases for an application, App Engine automatically allocates more resources for the web application to handle the additional demand.

Google App Engine primarily supports Go, PHP, Java, Python, Node.js, .NET, and Ruby applications, although it can also support other languages via "custom runtimes". The service is free up to a certain level of consumed resources and only in standard environment but not in flexible environment. Fees are charged for additional storage, bandwidth, or instance hours required by the application. It was first released as a preview version in April 2008 and came out of preview in September 2011.

Runtimes and framework

Python web frameworks that run on Google App Engine include Django, CherryPy, Pyramid, Flask, web2py and webapp2, as well as a custom Google- written webapp framework and several others designed specifically for the platform that emerged since the release. Any Python framework that supports the WSGI using the CGI adapter can be used to create an application; the framework can be uploaded with the developed application. Third-party libraries written in pure Python may also be uploaded.

Google App Engine supports many Java standards and frameworks. Core to this is the servlet 2.5 technology using the open-source Jetty Web Server, along with accompanying technologies such as JSP. JavaServer Faces operates with some workarounds. A newer release of App Engine Standard Java in Beta supports Java8, Servlet 3.1 and Jetty9.

Though the integrated database, Google Cloud Datastore, may be unfamiliar to programmers, it is accessed and supported with JPA, JDO, and by the simple low-level API. There are several alternative libraries and frameworks you can use to model and map the data to the database such as Objectify, Slim3 and Jello framework.

The Spring Framework works with GAE. However, the Spring Security module (if used) requires workarounds. Apache Struts 1 is supported, and Struts 2 runs with workarounds.

The Django web framework and applications running on it can be used on App Engine with modification. Django-nonrel aims to allow Django to work with non-relational databases and the project includes support for App Engine.

Reliability and support

All billed App Engine applications have a 99.95% uptime SLA.

App Engine is designed in such a way that it can sustain multiple datacenter outages without any downtime. This resilience to downtime is shown by the statistic that the High Replication Datastore saw 0% downtime over a period of a year.

Paid support from Google engineers is offered as part of Premier Accounts.

Differences with other application hosting

Compared to other scalable hosting services such as Amazon EC2, App Engine provides more infrastructure to make it easy to write scalable applications, but can only run a limited range of applications designed for that infrastructure.

App Engine's infrastructure removes many of the system administration and development challenges of building applications to scale to hundreds of requests per second and beyond. Google handles deploying code to a cluster, monitoring, failover, and launching application instances as necessary.While other services let users install and configure nearly any *NIX compatible software, App Engine requires developers to use only its supported languages, APIs, and frameworks. Current APIs allow storing and retrieving data from the document-oriented Google Cloud Datastore database;

making HTTP requests; sending e-mail; manipulating images; and caching. Google Cloud SQL can be used for App Engine applications requiring a relational MySQL compatible database backend.

Per-day and per-minute quotas restrict bandwidth and CPU use, number of requests served, number of concurrent requests, and calls to the various APIs, and individual requests are terminated if they take more than 60 seconds or return more than 32MB of data.

Differences between SQL and GQL

Google App Engine's integrated Google Cloud Datastore database has a SQL-like syntax called "GQL" (Google Query Language). GQL does not support the Join statement. Instead, one-to- many and many-to-many relationships can be accomplished using ReferenceProperty() .

Google Firestore is the successor to Google Cloud Datastore and replaces GQL with a document-based query method that treats stored objects as collections of documents.

Portability concerns

Developers worry that the applications will not be portable from App Engine and fear being locked into the technology. In response, there are a number of projects to create open-source back-ends for the various proprietary/closed APIs of app engine, especially the datastore. AppScale, CapeDwarf and TyphoonAE are a few of the open source efforts.

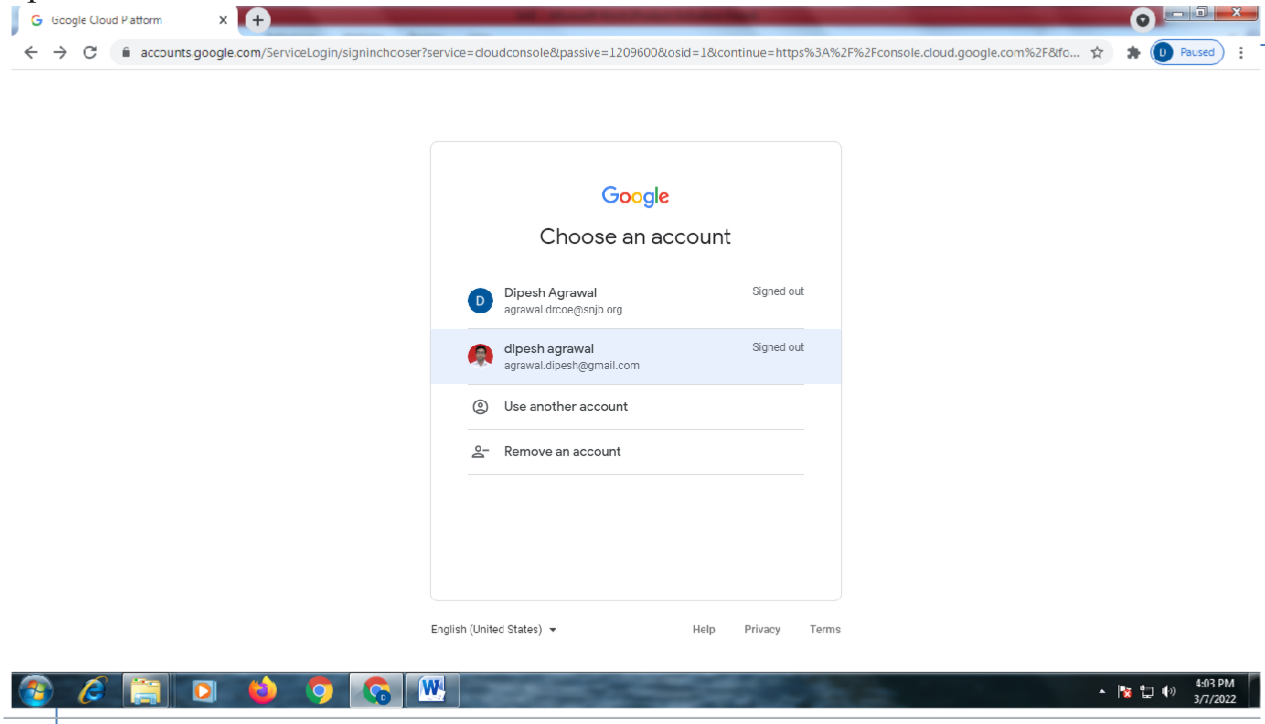
AppScale automatically deploys and scales unmodified Google App Engine applications over popular public and private cloud systems and on-premises clusters. AppScale can run Python, Java, PHP, and Go applications on EC2, Google Compute Engine, Softlayer, Azure and other cloud vendors.

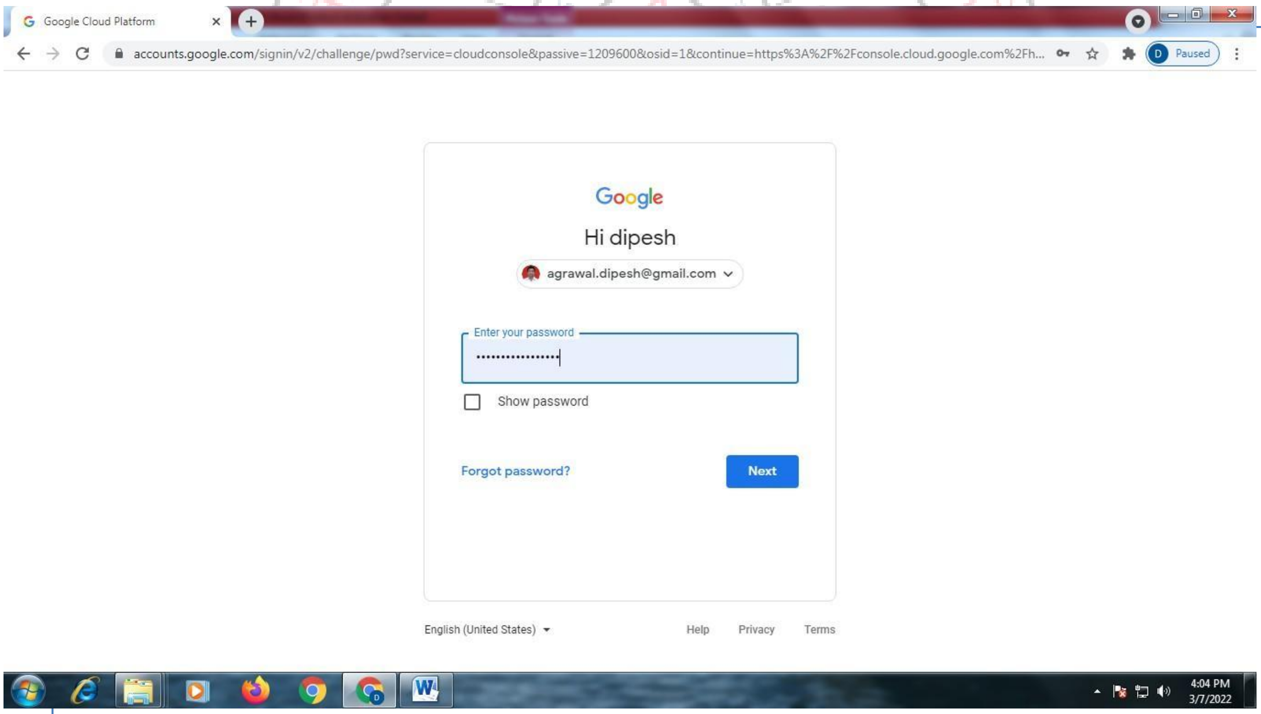
TyphoonAE can run Python App Engine applications on any cloud that support linux machines.

Web2py web framework offers migration between SQL Databases and Google App Engine, however it doesn't support several App Engine-specific features such as transactions and namespaces.

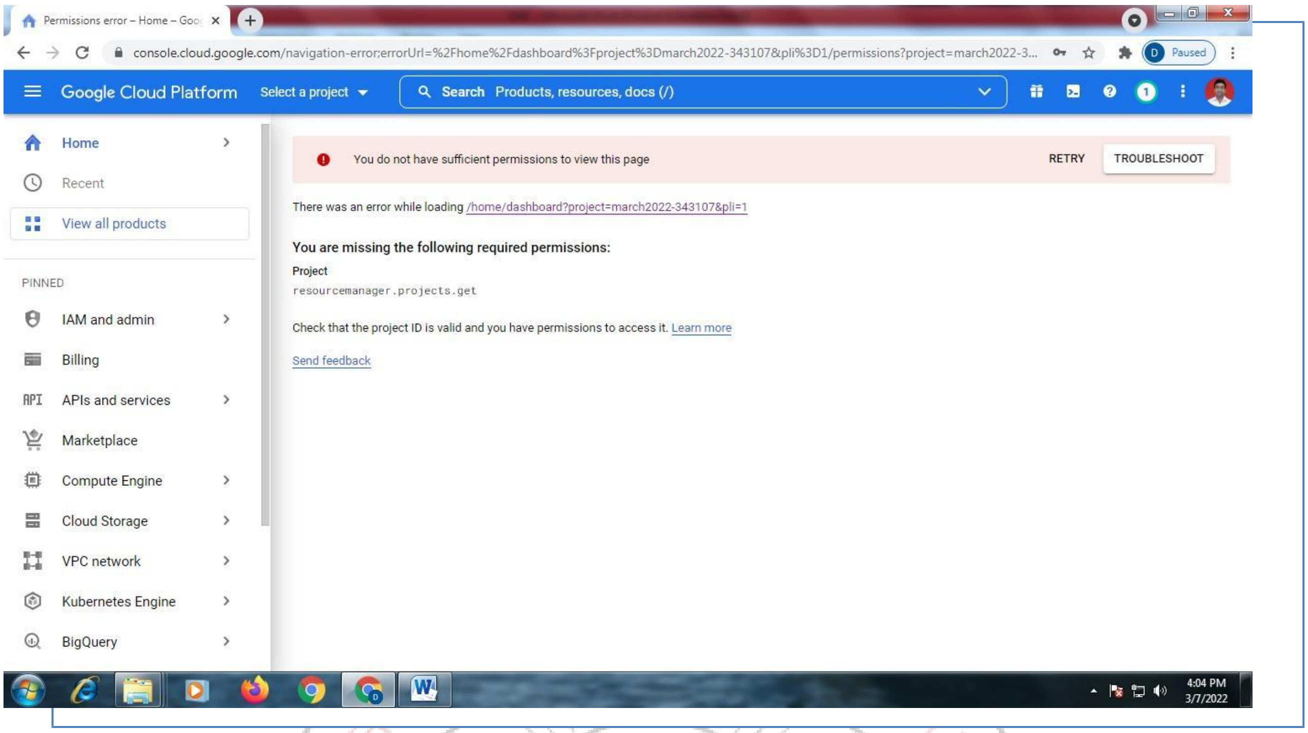
Kubernetes is an open-source job control system invented by Google to abstract away the infrastructure so that open-source (e.g. Docker) containerized applications can run on many types of infrastructure, such as Amazon Web Services, Microsoft Azure, and others. This is one of Google's answers to the portability concern.

Steps


Google Cloud Platform
accounts.google.com/ServiceLogin/signinchooser?service=cloudconsole&passive=1209600&osid=1&continue=https%3A%2F%2Fconsole.cloud.google.com%2F&fc...
Paused
Google
Choose an account
Dipesh Agrawal
agrawal.dmce@snjb.org
Signed out
dipesh agrawal
agrawal.dipesh@gmail.com
Signed out
Use another account
Remove an account
English (United States)
Help
Privacy
Terms
4:03 PM
3/7/2022


Google Cloud Platform
accounts.google.com/signin/v2/challenge/pwd?service=cloudconsole&passive=1209600&osid=1&continue=https%3A%2F%2Fconsole.cloud.google.com%2Fh...
Paused
Google
Hi dipesh
agrawal.dipesh@gmail.com
Enter your password
Show password
Forgot password?
Next
English (United States)
Help
Privacy
Terms
4:04 PM
3/7/2022

Following Screen Will Appear



Permissions error – Home – Goo

console.cloud.google.com/navigation-error;errorUrl=%2Fhome%2Fdashboard%3Fproject%3Dmarch2022-343107&pli%3D1/permissions?project=march2022-3...

Google Cloud Platform Select a project Search Products, resources, docs (/)

You do not have sufficient permissions to view this page RETRY TROUBLESHOOT

There was an error while loading /home/dashboard?project=march2022-343107&pli=1

You are missing the following required permissions:

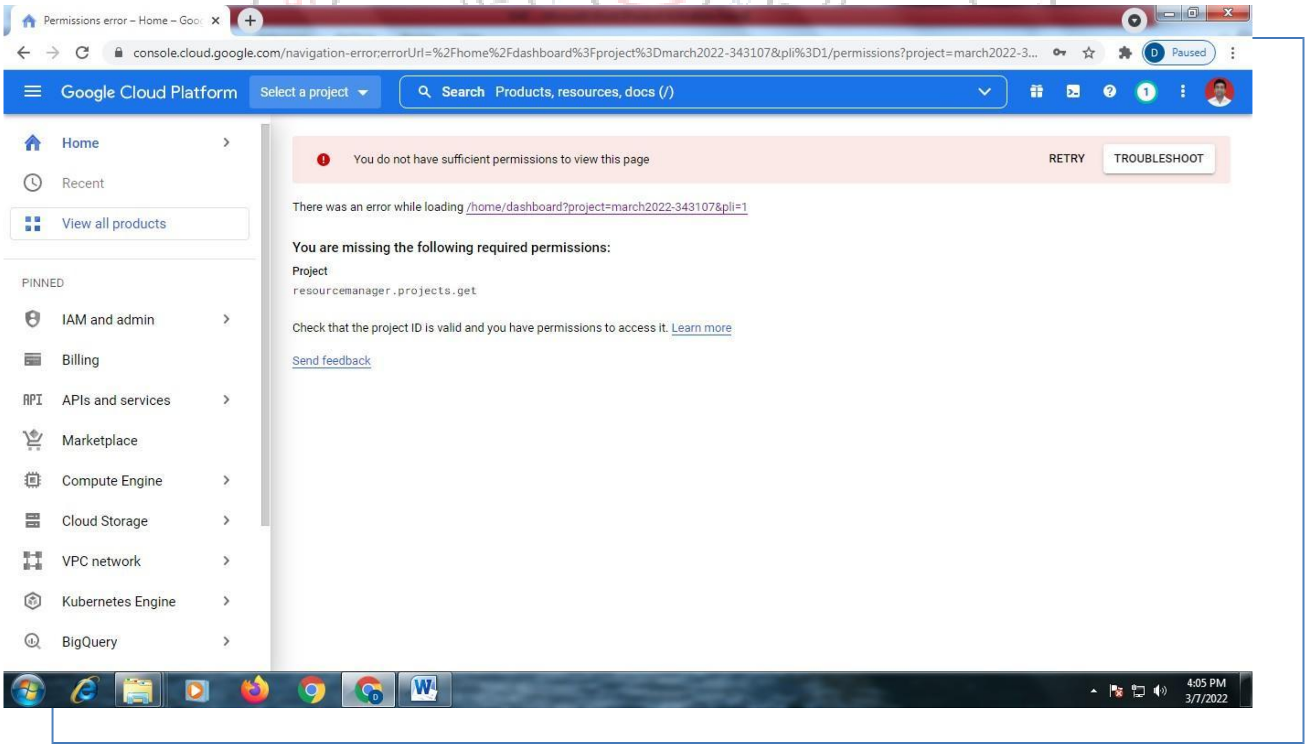
Project

```
resourcemanager.projects.get
```

Check that the project ID is valid and you have permissions to access it. Learn more

Send feedback

Click on Select new project



Permissions error – Home – Goo

console.cloud.google.com/navigation-error;errorUrl=%2Fhome%2Fdashboard%3Fproject%3Dmarch2022-343107&pli%3D1/permissions?project=march2022-3...

Google Cloud Platform Select a project Search Products, resources, docs (/)

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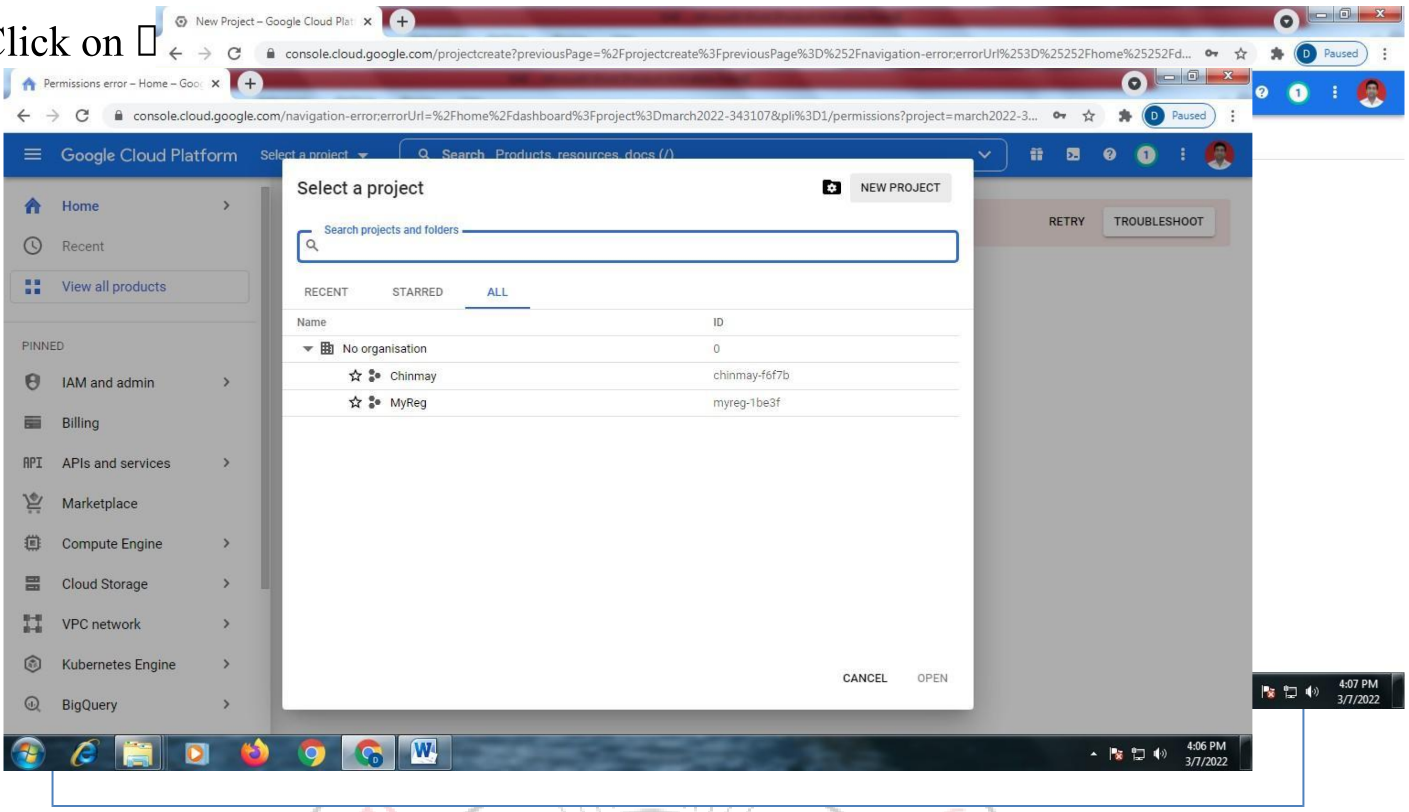

New Project – Google Cloud Plat
console.cloud.google.com/projectcreate?previousPage=%2Fprojectcreate%3FpreviousPage%3D%252Fnavigation-error;errorUrl%253D%25252Fhome%25252Fd...
Permissions error – Home – Goo
console.cloud.google.com/navigation-error;errorUrl=%2Fhome%2Fdashboard%3Fproject%3Dmarch2022-343107&pli%3D1/permissions?project=march2022-3...
Paused
Google Cloud Platform
Select a project
Search Products, resources, docs (/)
Home
Recent
View all products
PINNED
IAM and admin
Billing
APIs and services
Marketplace
Compute Engine
Cloud Storage
VPC network
Kubernetes Engine
BigQuery
RETRY
TROUBLESHOOT
4:07 PM 3/7/2022
4:06 PM 3/7/2022

Select a project

NEW PROJECT

Search projects and folders

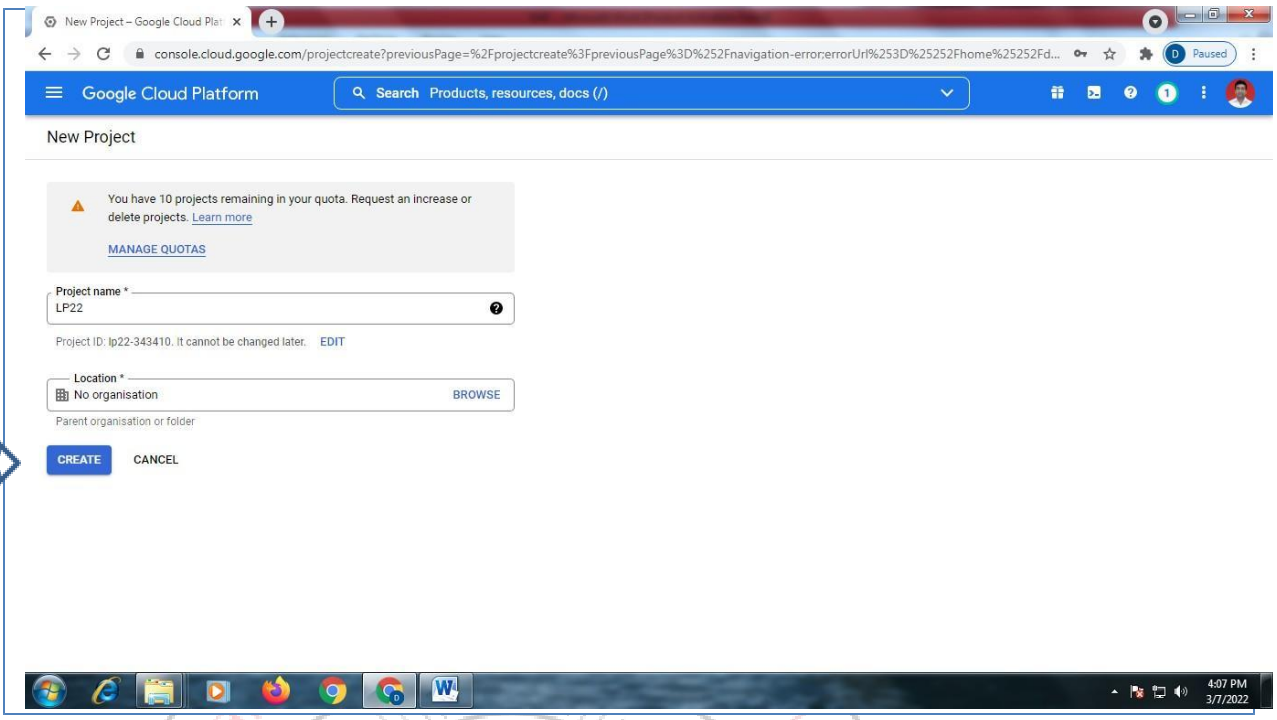
RECENT STARRED ALL

Name	ID
No organisation	0
Chinmay	chinmay-f6f7b
MyReg	myreg-1be3f

CANCEL OPEN

Give project name

Click on create


New Project

You have 10 projects remaining in your quota. Request an increase or delete projects. Learn more

MANAGE QUOTAS

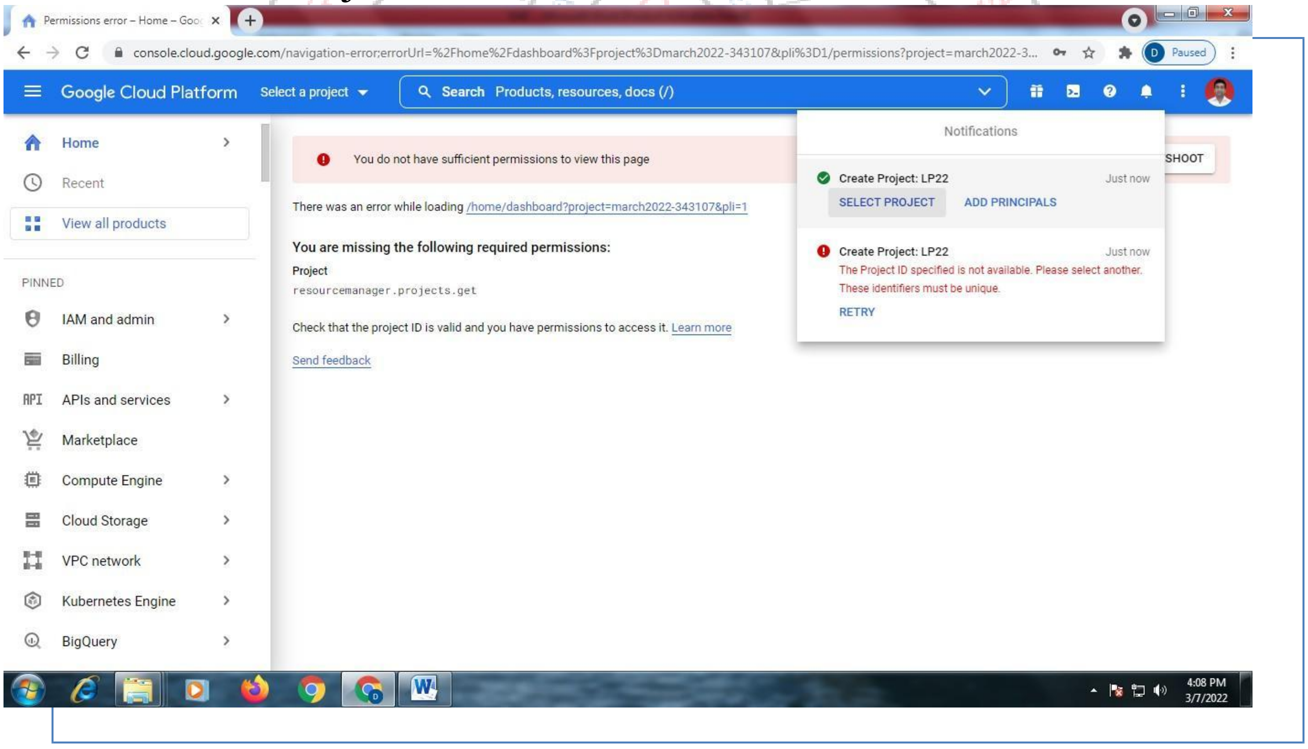
Project name *
LP22

Project ID: lp22-343410. It cannot be changed later. EDIT

Location *
No organisation BROWSE

Parent organisation or folder

Click on Select Project


You do not have sufficient permissions to view this page

There was an error while loading /home/dashboard?project=march2022-343107&pli=1

You are missing the following required permissions:

Project
resourcemanager.projects.get

Check that the project ID is valid and you have permissions to access it. Learn more

Send feedback

Notifications

Create Project: LP22 Just now

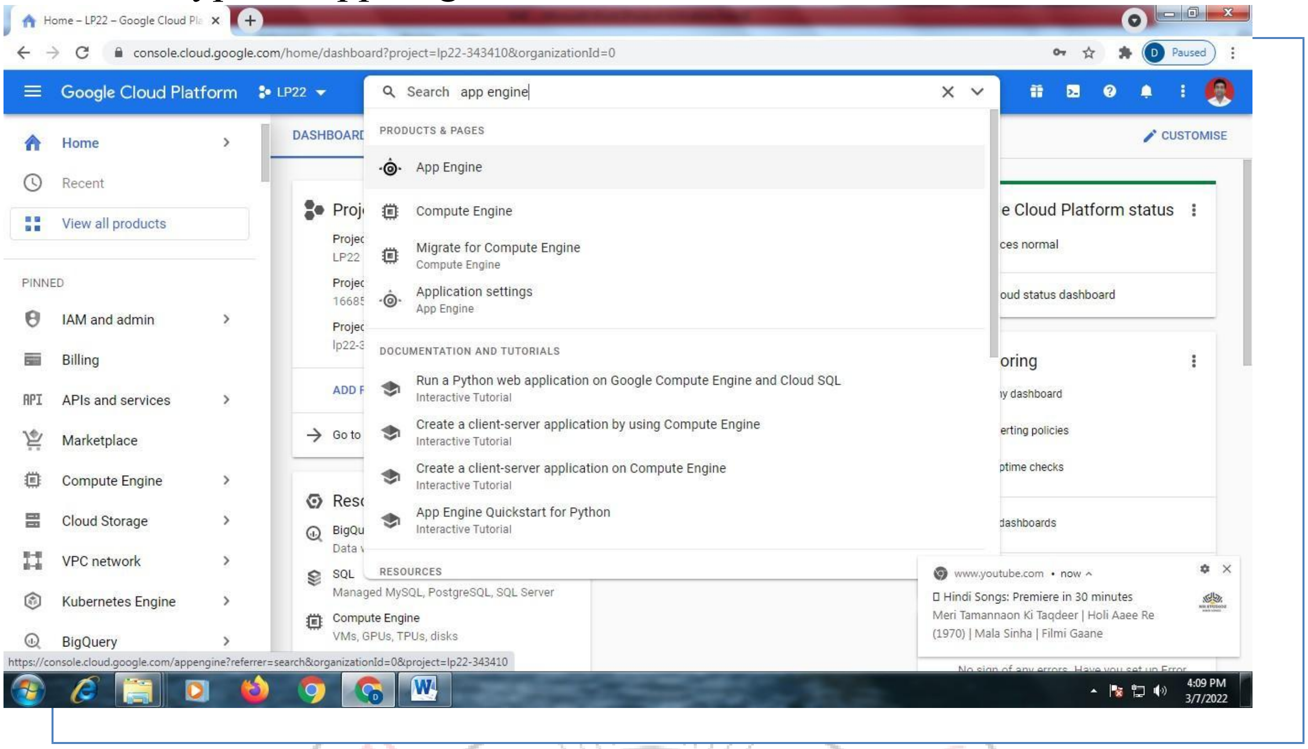
SELECT PROJECT ADD PRINCIPALS

Create Project: LP22 Just now

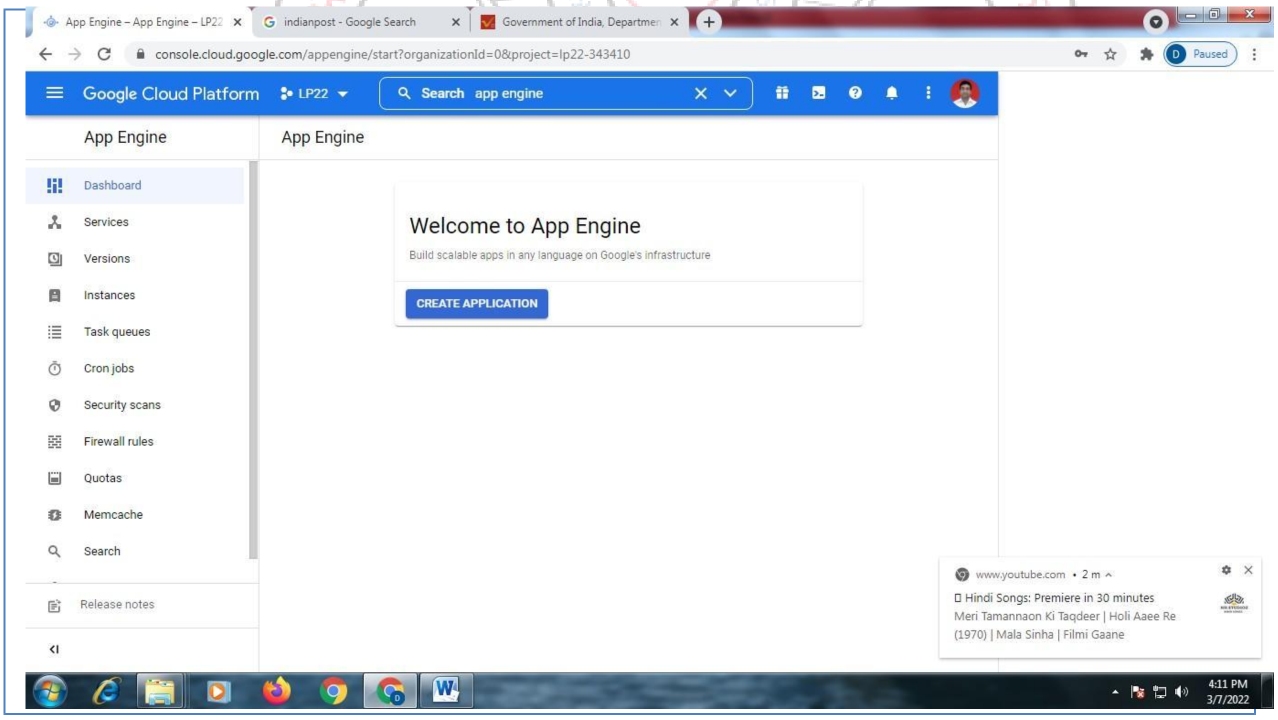
The Project ID specified is not available. Please select another. These identifiers must be unique.

RETRY

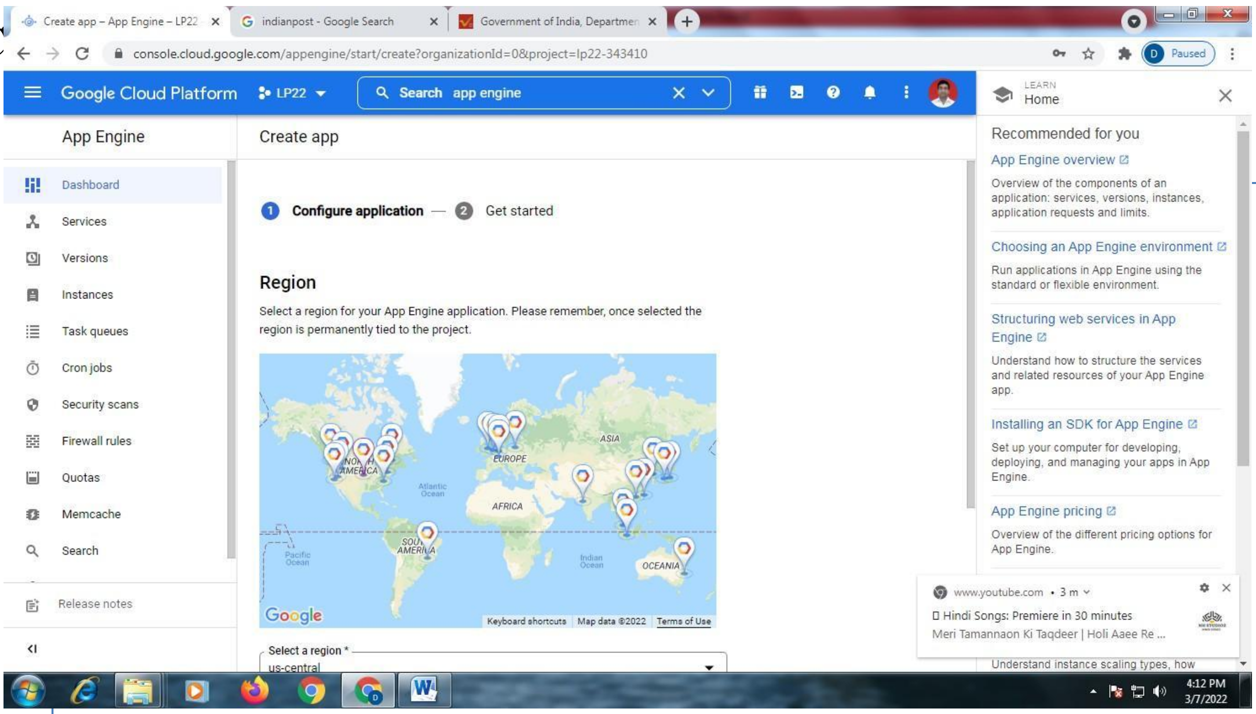
In search type ―App Engine‖



Click on – ―App Engine‖ Following screen will appear



C



console.cloud.google.com/appengine/start/create?organizationId=0&project=lp22-343410

Create app

1 Configure application — 2 Get started

Region

Select a region for your App Engine application. Please remember, once selected the region is permanently tied to the project.

Select a region *
us-central

Recommended for you

App Engine overview: Overview of the components of an application: services, versions, instances, application requests and limits.

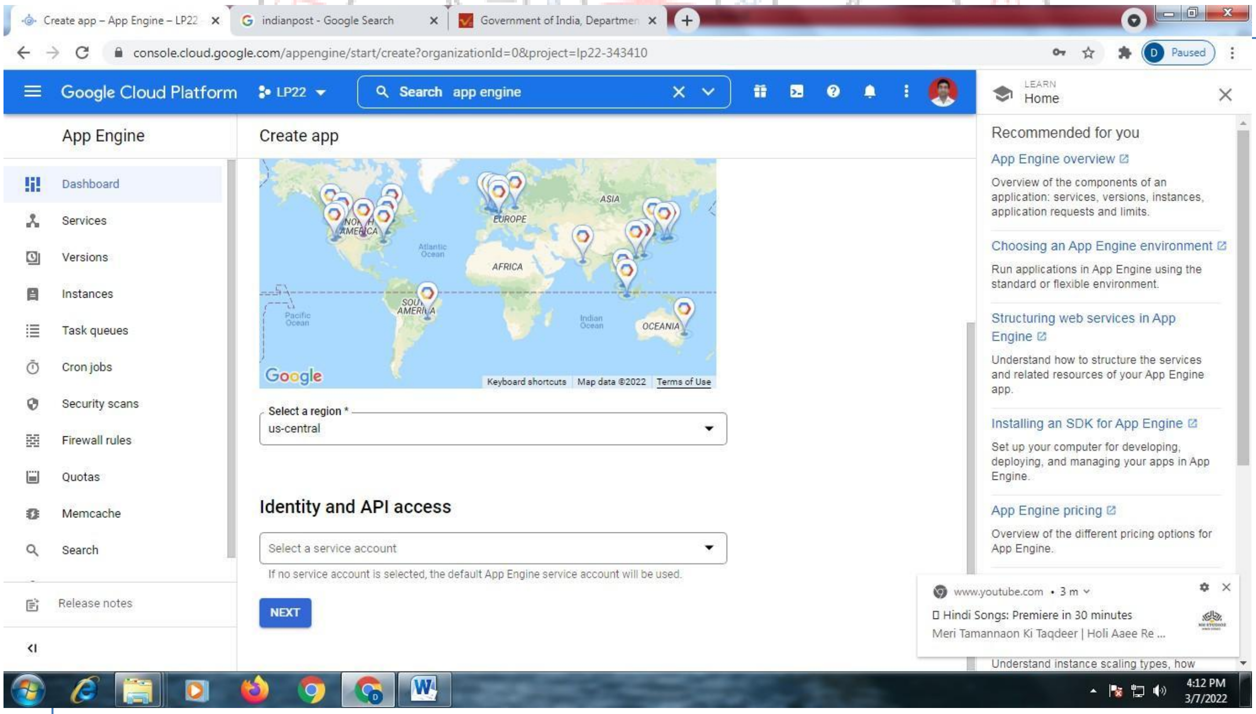
Choosing an App Engine environment: Run applications in App Engine using the standard or flexible environment.

Structuring web services in App Engine: Understand how to structure the services and related resources of your App Engine app.

Installing an SDK for App Engine: Set up your computer for developing, deploying, and managing your apps in App Engine.

App Engine pricing: Overview of the different pricing options for App Engine.

Scroll Down



console.cloud.google.com/appengine/start/create?organizationId=0&project=lp22-343410

Create app

Select a region *
us-central

Identity and API access

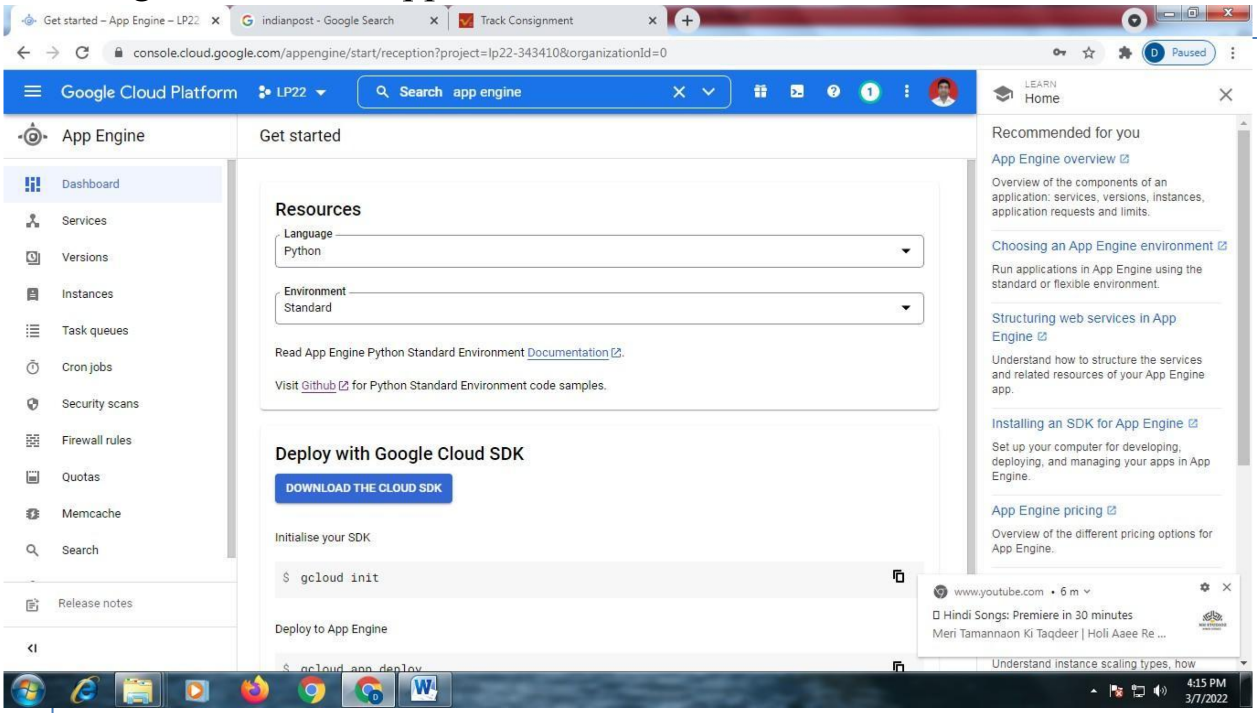
Select a service account

If no service account is selected, the default App Engine service account will be used.

NEXT

Click on —Next‖

Following Screen Will Appear


Get started

Resources

Language: Python

Environment: Standard

Read App Engine Python Standard Environment Documentation.

Visit Github for Python Standard Environment code samples.

Deploy with Google Cloud SDK

DOWNLOAD THE CLOUD SDK

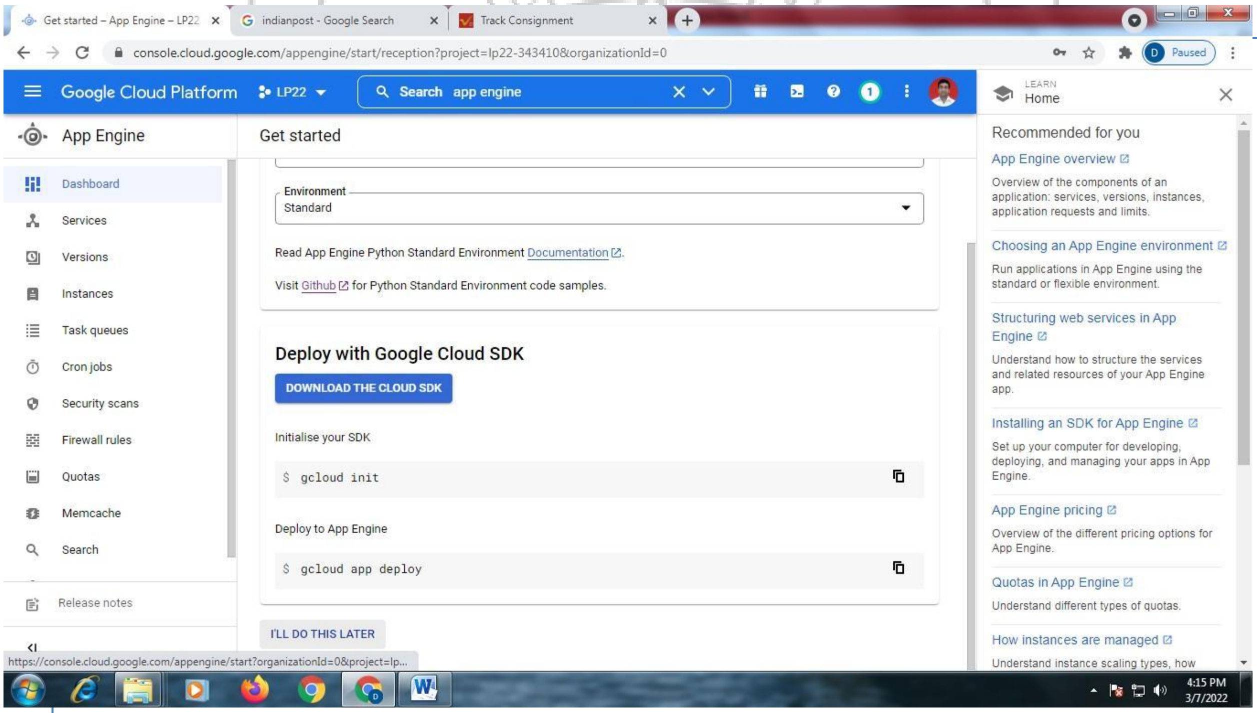
Initialise your SDK

```
$ gcloud init
```

Deploy to App Engine

```
$ gcloud app deploy
```

Scroll Down Click on – —I will do it Later‖


Get started

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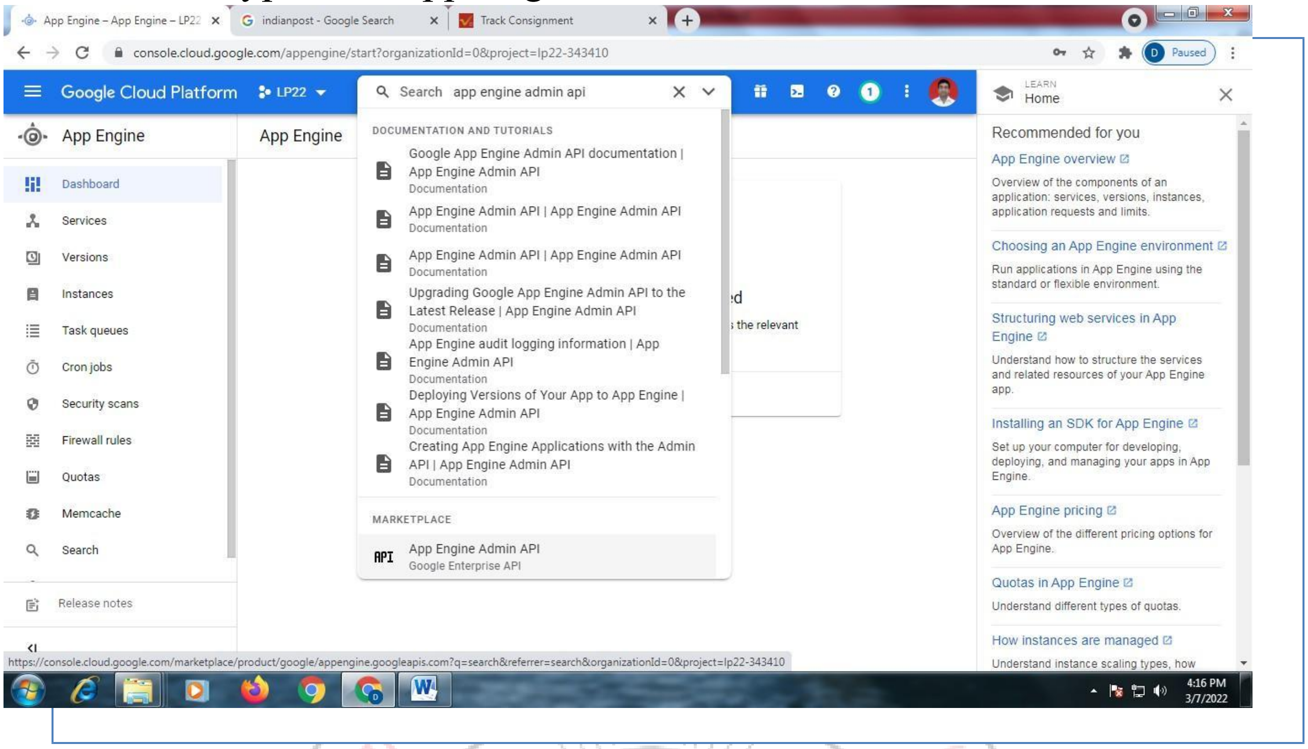
```
$ gcloud init
```

Deploy to App Engine

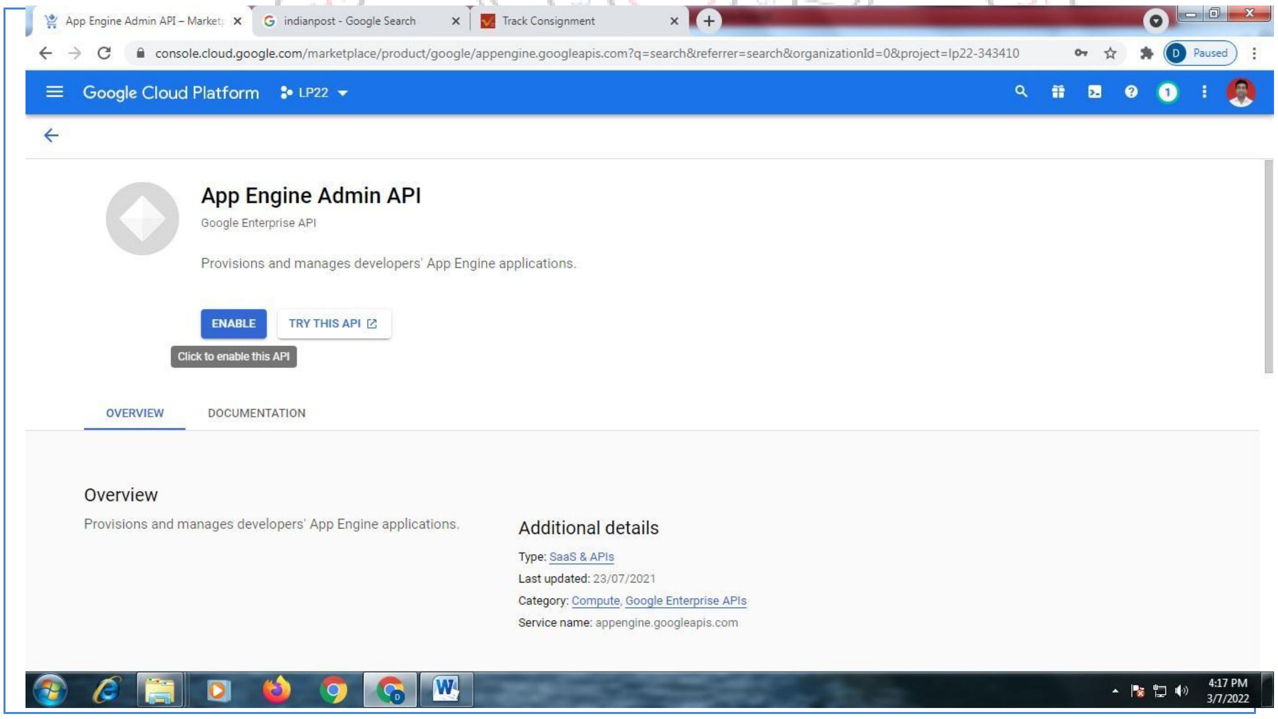
```
$ gcloud app deploy
```

I'LL DO THIS LATER

In search box, type —App Engine Admin API‖


Search app engine admin api
DOCUMENTATION AND TUTORIALS
Google App Engine Admin API documentation | App Engine Admin API
App Engine Admin API | App Engine Admin API
Upgrading Google App Engine Admin API to the Latest Release | App Engine Admin API
App Engine audit logging information | App Engine Admin API
Deploying Versions of Your App to App Engine | App Engine Admin API
Creating App Engine Applications with the Admin API | App Engine Admin API
MARKETPLACE
App Engine Admin API
Google Enterprise API

Click on ‖App Engine Admin API‖ Click on —Enable‖



App Engine Admin API

Google Enterprise API

Provisions and manages developers' App Engine applications.

Overview

Provisions and manages developers' App Engine applications.

Additional details

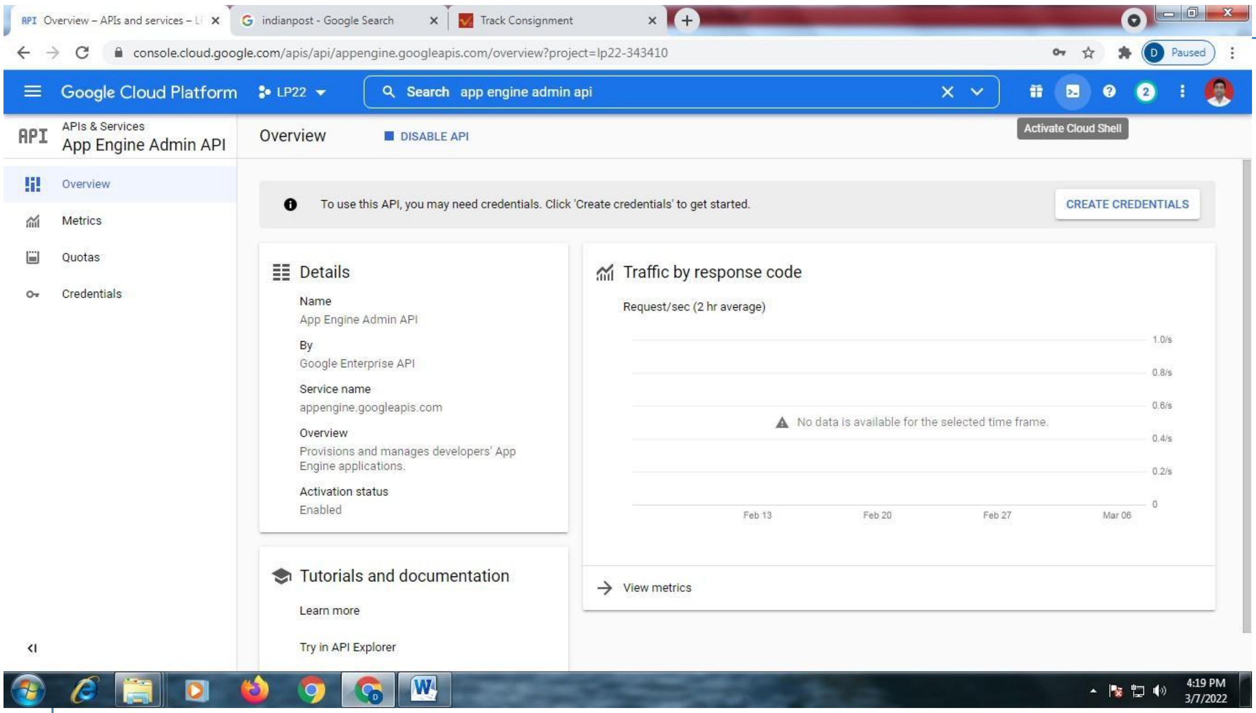
Type: SaaS & APIs

Last updated: 23/07/2021

Category: Compute, Google Enterprise APIs

Service name: appengine.googleapis.com

Click on —Activate Cloud Shell‖

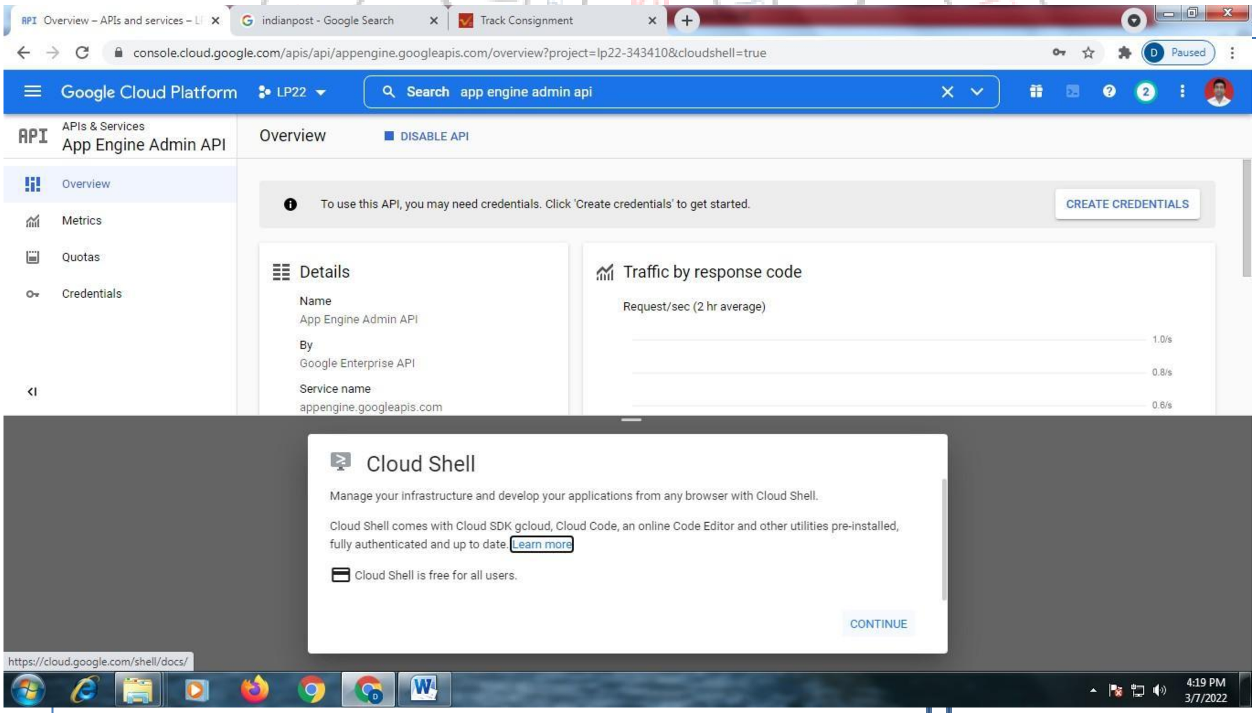


To use this API, you may need credentials. Click 'Create credentials' to get started.

Name: App Engine Admin API
By: Google Enterprise API
Service name: appengine.googleapis.com
Overview: Provisions and manages developers' App Engine applications.
Activation status: Enabled

No data is available for the selected time frame.

Click on —Continue‖


Overview – APIs and services
indianpost - Google Search
Track Consignment
console.cloud.google.com/apis/api/appengine.googleapis.com/overview?project=lp22-343410&cloudshell=true
Google Cloud Platform
LP22
Search app engine admin api
APIs & Services
App Engine Admin API
Overview
DISABLE API
Metrics
Quotas
Credentials
CREATE CREDENTIALS
Details
Traffic by response code
CONTINUE
https://cloud.google.com/shell/docs/
4:19 PM
3/7/2022

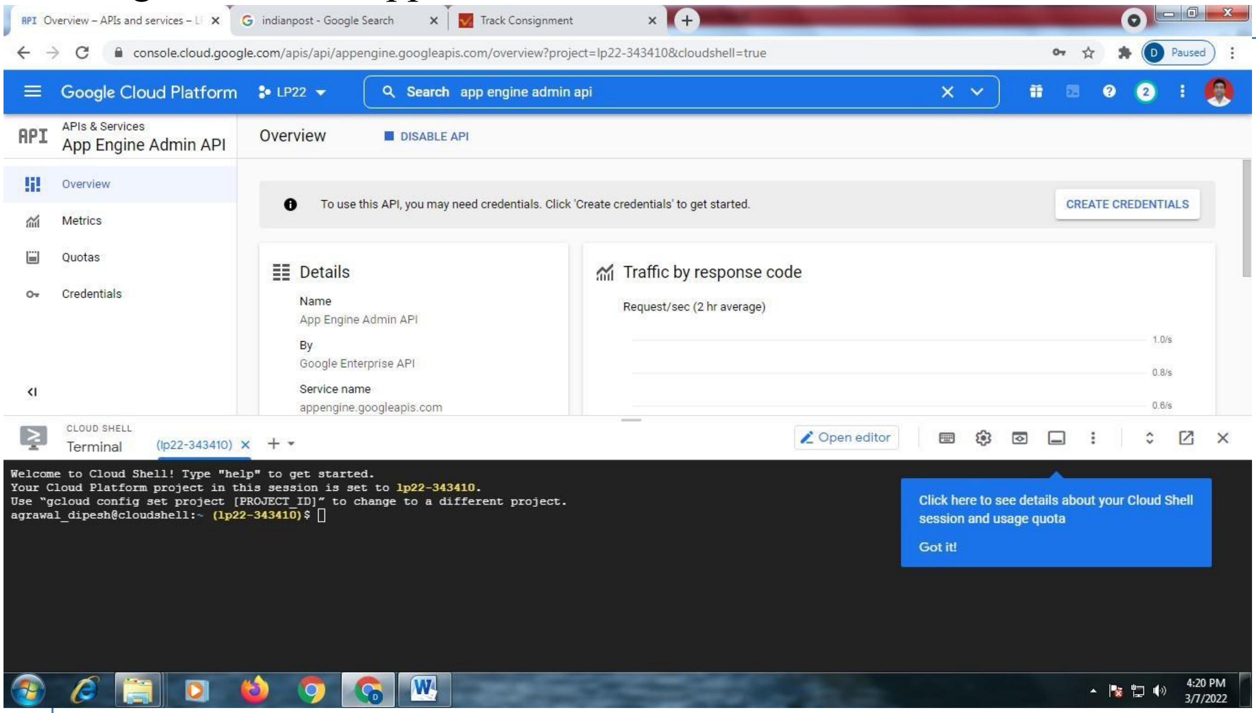
Cloud Shell

Manage your infrastructure and develop your applications from any browser with Cloud Shell.

Cloud Shell comes with Cloud SDK gcloud, Cloud Code, an online Code Editor and other utilities pre-installed, fully authenticated and up to date. Learn more

Cloud Shell is free for all users.

Following Screen will appear



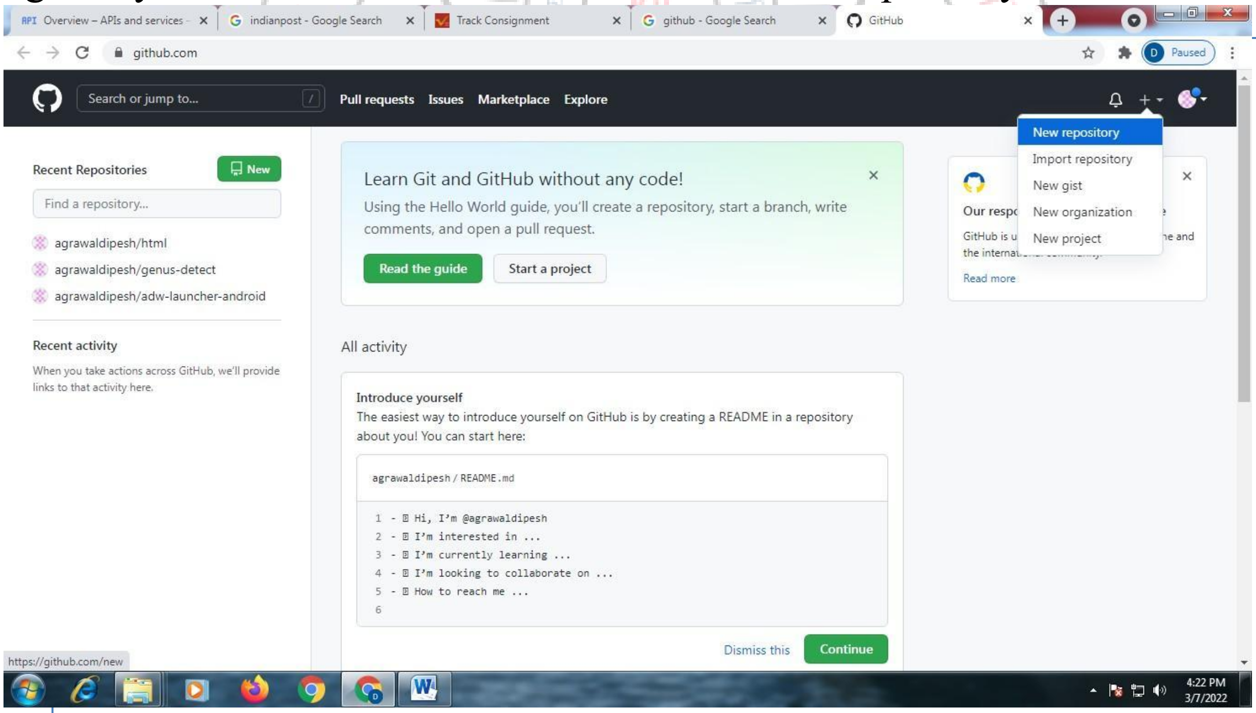
To use this API, you may need credentials. Click 'Create credentials' to get started.

Name
App Engine Admin API
By
Google Enterprise API
Service name
appengine.googleapis.com

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to lp22-343410.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
agrawal_dipesh@cloudshell:~ (lp22-343410)$
```

Click here to see details about your Cloud Shell session and usage quota

Login to your Github Account Click on ―New Repository‖



Learn Git and GitHub without any code!

Using the Hello World guide, you'll create a repository, start a branch, write comments, and open a pull request.

Recent activity

When you take actions across GitHub, we'll provide links to that activity here.

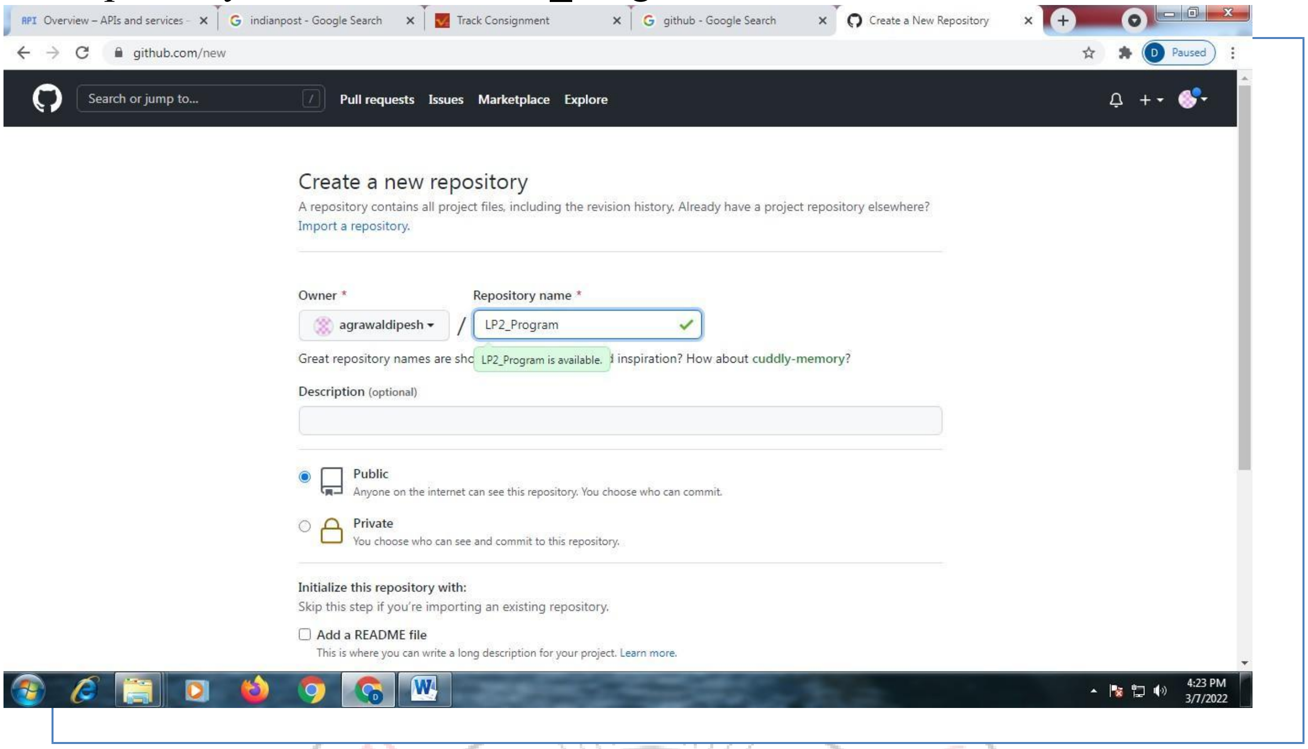
Introduce yourself

The easiest way to introduce yourself on GitHub is by creating a README in a repository about you! You can start here:

```
agrawaldipesh / README.md

- Hi, I'm @agrawaldipesh
- I'm interested in ...
- I'm currently learning ...
- I'm looking to collaborate on ...
- How to reach me ...
```

Give repository name as – ―LP2_Program‖



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Owner * agrawaldipesh / Repository name * LP2_Program

LP2_Program is available.

Great repository names are short and memorable. Need inspiration? How about cuddly-memory?

Description (optional)

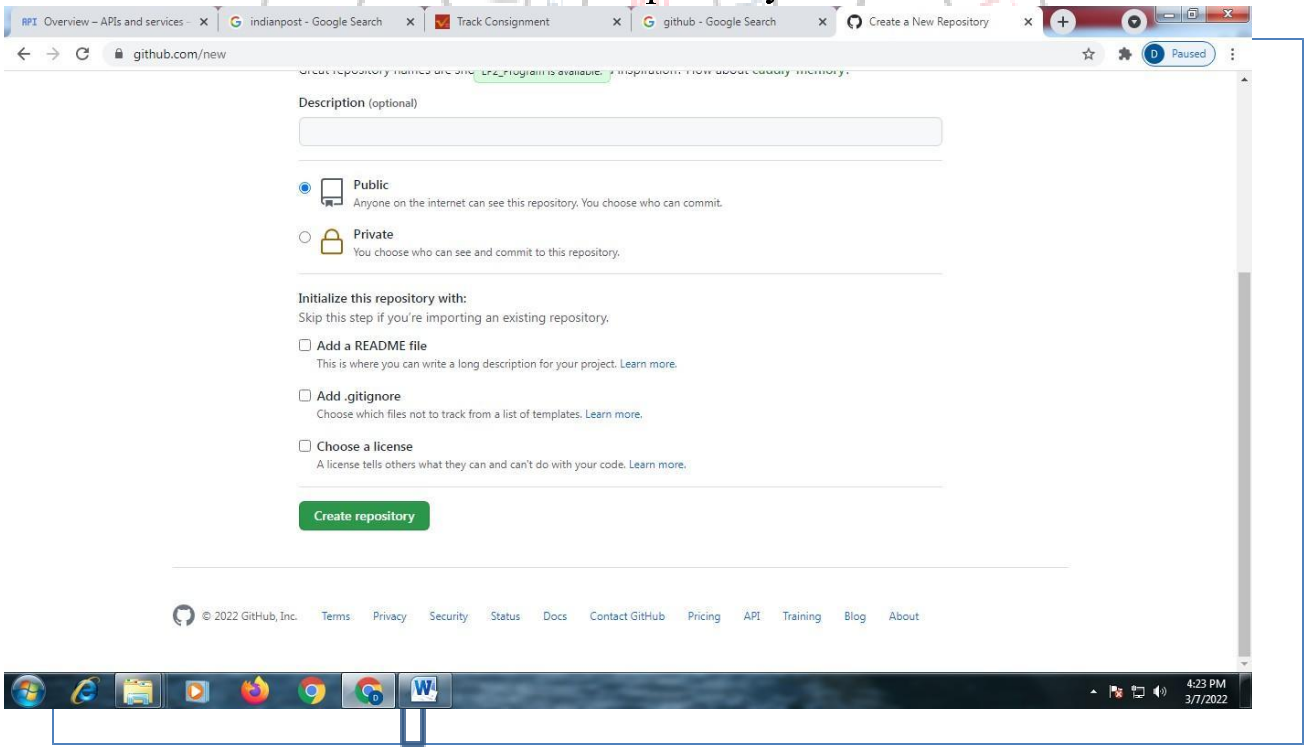
Public
Anyone on the internet can see this repository. You choose who can commit.

Private
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

Add a README file
This is where you can write a long description for your project. Learn more.

Scroll Down and Click on ―Create Repository‖



Description (optional)

Public
Anyone on the internet can see this repository. You choose who can commit.

Private
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

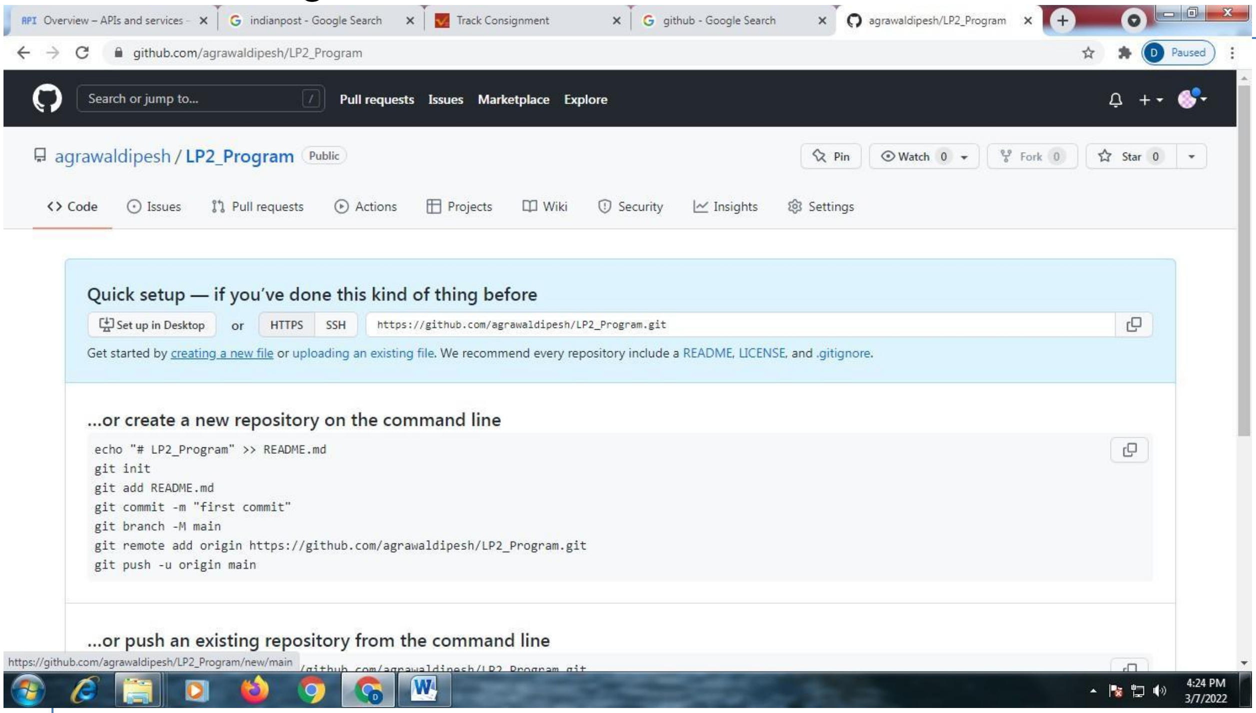
Add a README file
This is where you can write a long description for your project. Learn more.

Add .gitignore
Choose which files not to track from a list of templates. Learn more.

Choose a license
A license tells others what they can and can't do with your code. Learn more.

© 2022 GitHub, Inc. Terms Privacy Security Status Docs Contact GitHub Pricing API Training Blog About

Click on ―Creating a new File‖



Quick setup — if you've done this kind of thing before

https://github.com/agrawaldipesh/LP2_Program.git

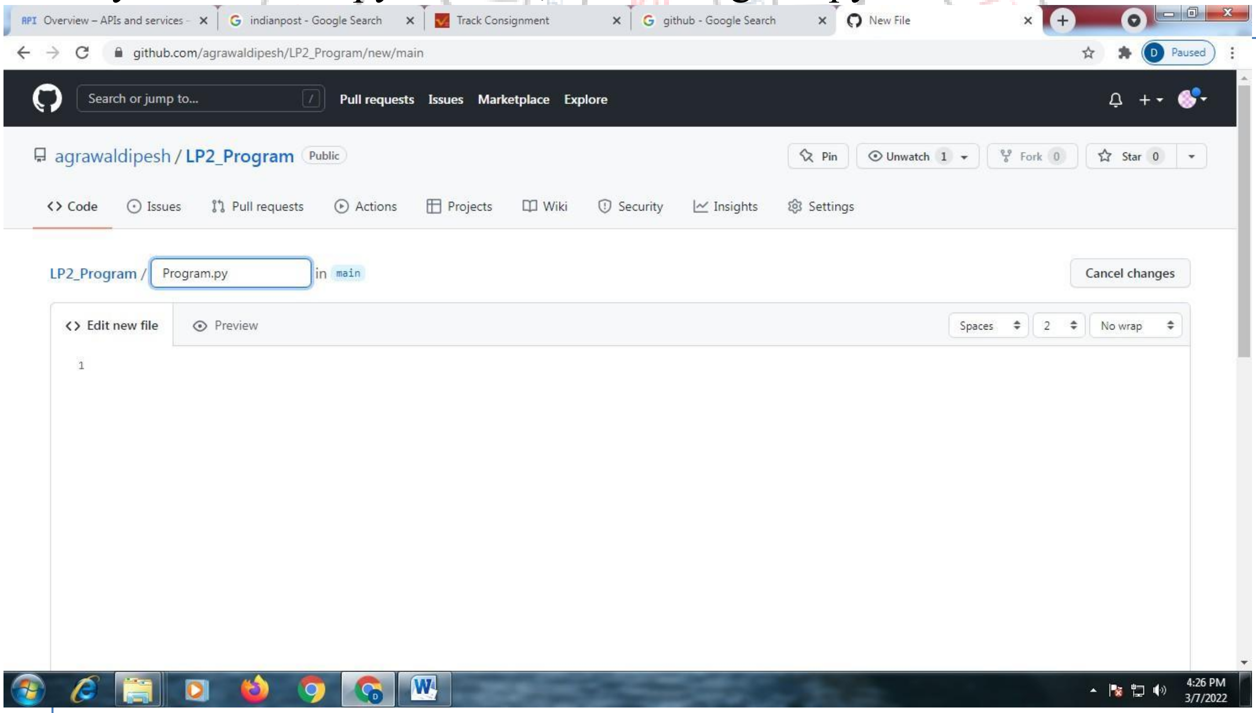
Get started by creating a new file or uploading an existing file. We recommend every repository include a README, LICENSE, and .gitignore.

...or create a new repository on the command line

```
echo "# LP2_Program" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/agrawaldipesh/LP2_Program.git
git push -u origin main
```

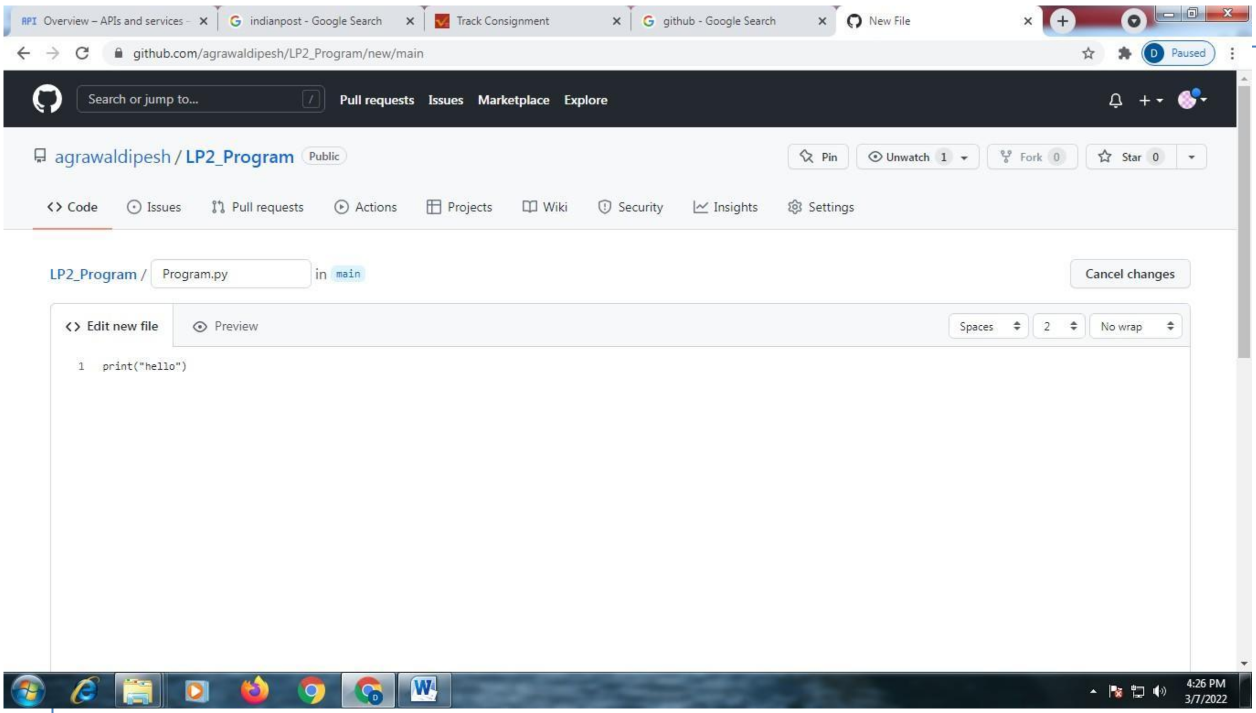
...or push an existing repository from the command line

Give any name to the python file, like Program.py



LP2_Program / Program.py in main

Type your code Print(—hello‖)



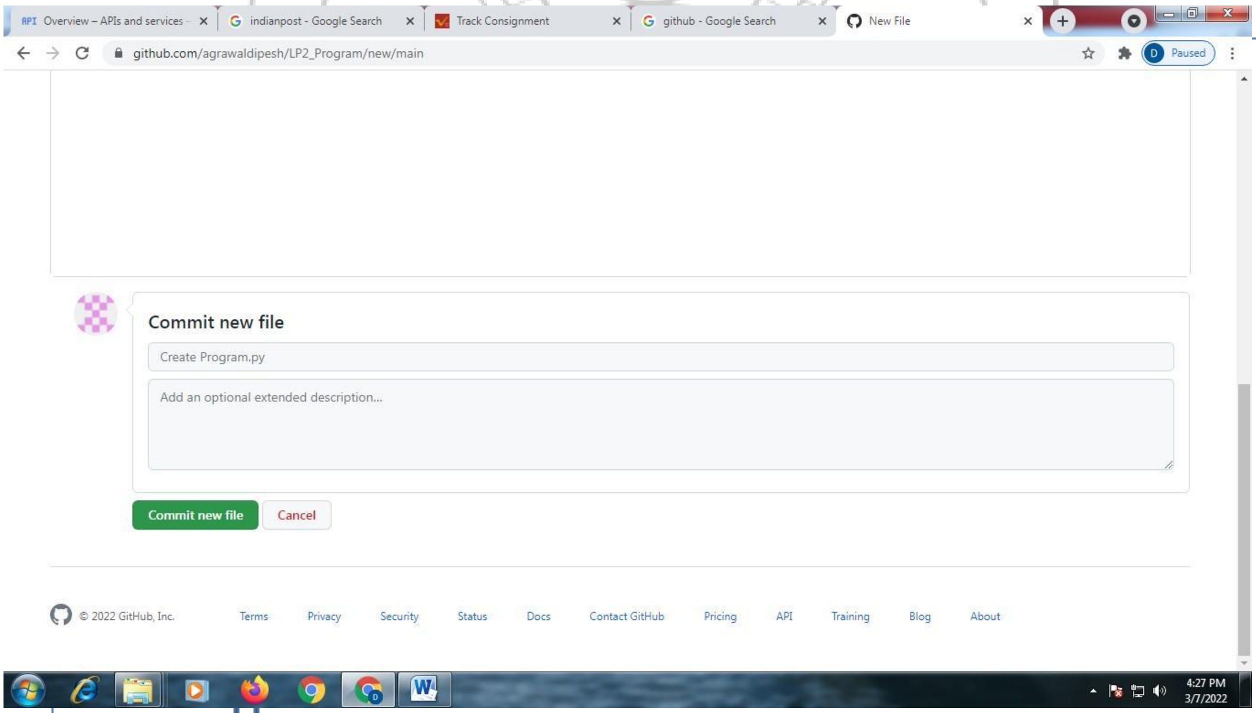
github.com/agrawaldipesh/LP2_Program/new/main

agrawaldipesh / LP2_Program Public

LP2_Program / Program.py in main

```
print("hello")
```

Scroll Down and Click on —Commit new file‖



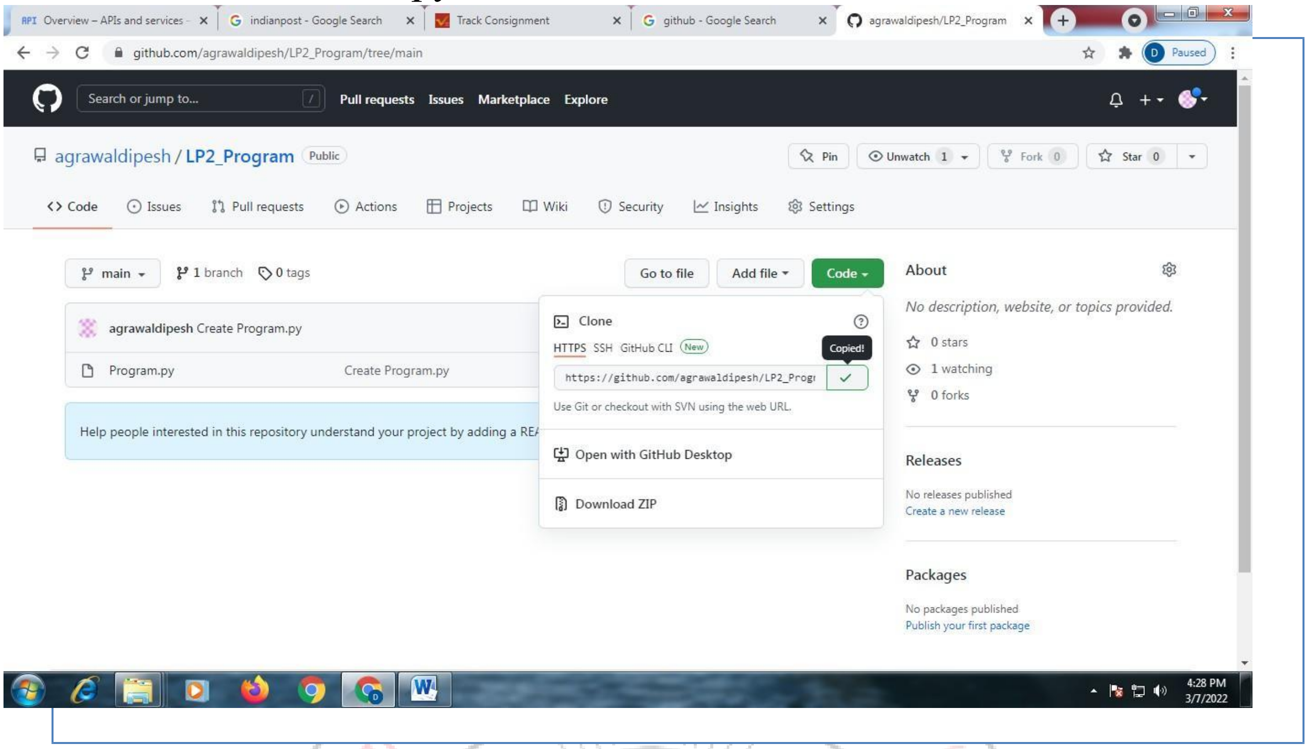
github.com/agrawaldipesh/LP2_Program/new/main

Commit new file

Create Program.py

Add an optional extended description...

Click on ―Code‖ and Copy URL



agrawaldipesh / LP2_Program Public

Clone

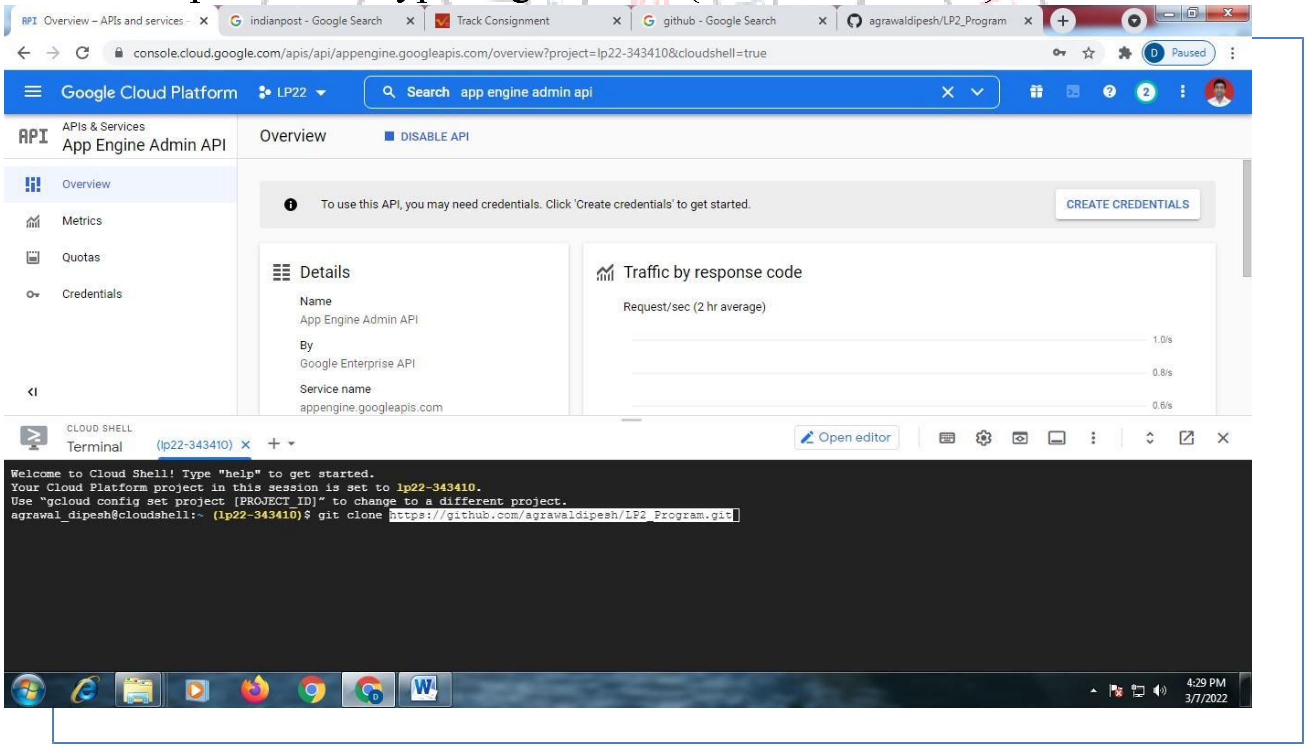
HTTPS SSH GitHub CLI

```
https://github.com/agrawaldipesh/LP2_Progr
```

Copied!

Use Git or checkout with SVN using the web URL.

Go to cloud platform type ―git clone‖ {Paste URL Here}



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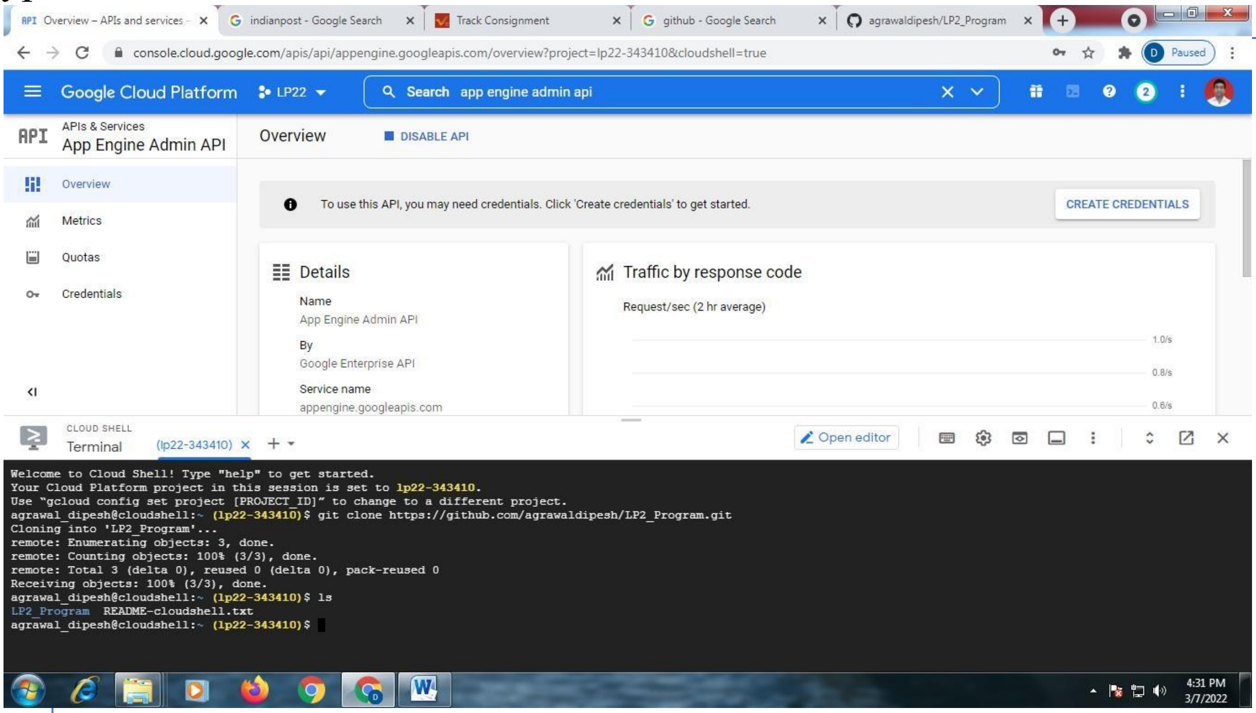
agrawal_dipesh@cloudshell:~ (lp22-343410)$ git clone https://github.com/agrawaldipesh/LP2_Program.git
```

Type ―ls‖



```
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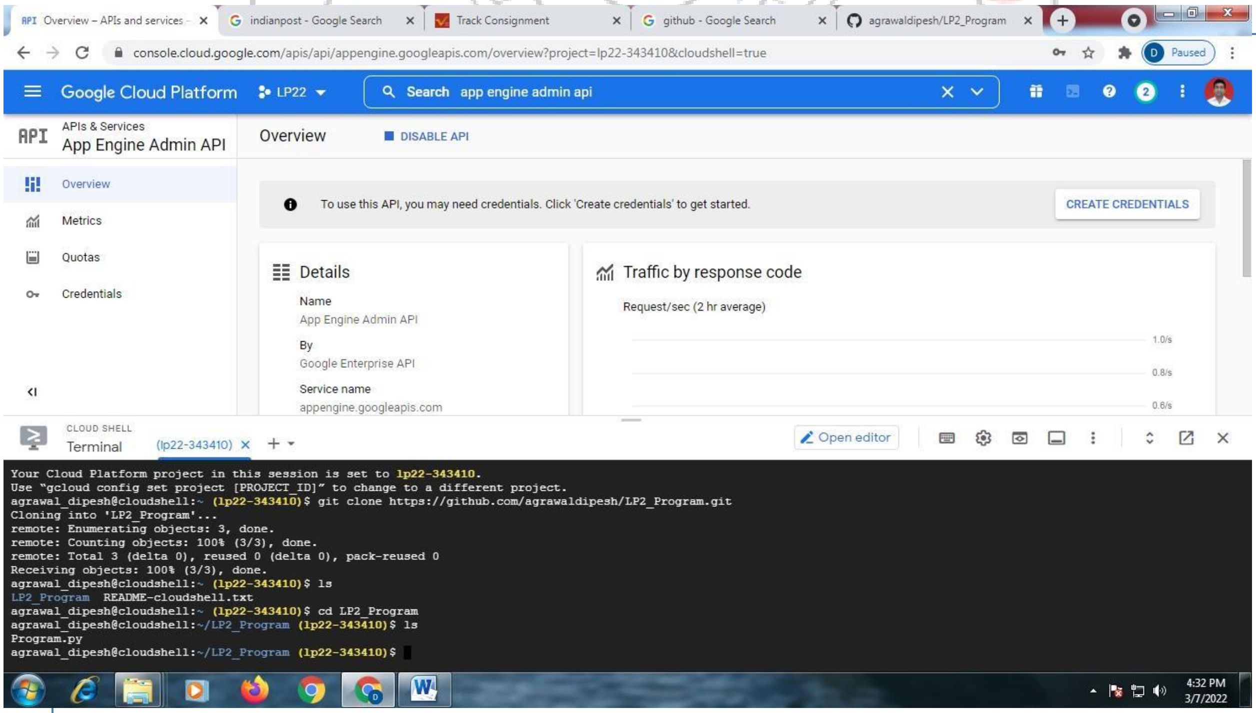
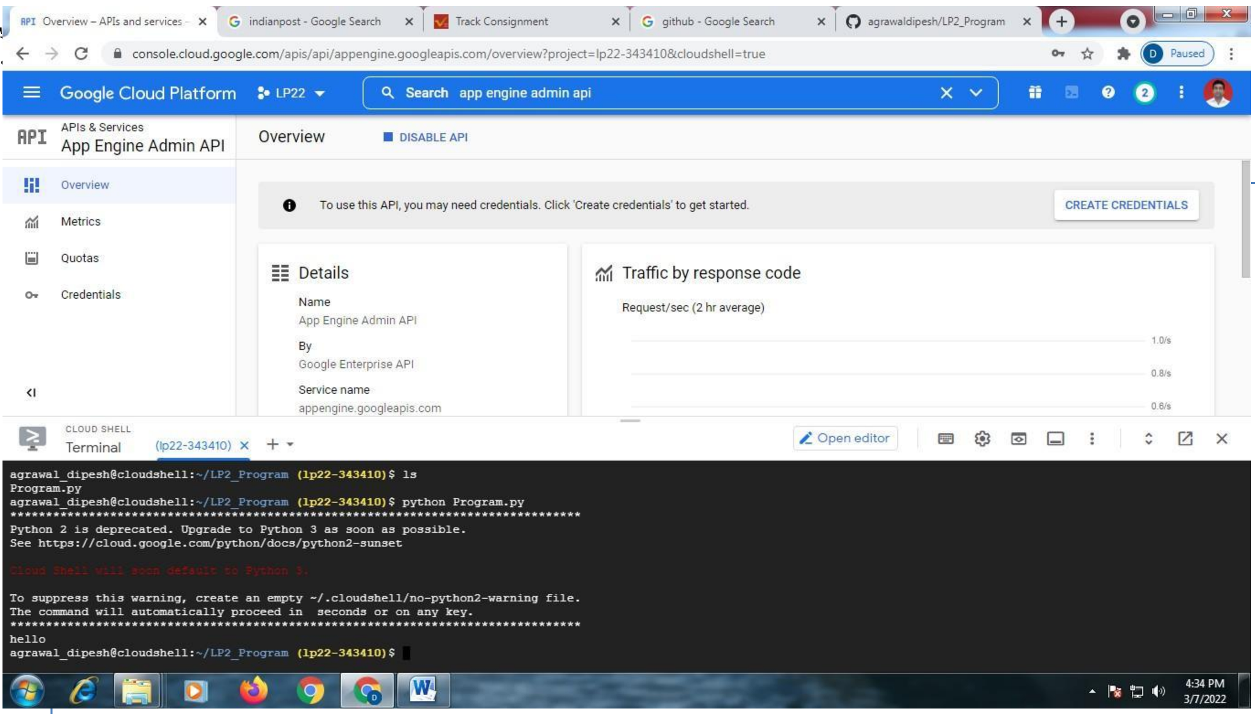
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
agrawal_dipesh@cloudshell:~ (lp22-343410)$ git clone https://github.com/agrawaldipesh/LP2_Program.git
Cloning into 'LP2_Program'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
agrawal_dipesh@cloudshell:~ (lp22-343410)$ ls
LP2_Program  README-cloudshell.txt
agrawal_dipesh@cloudshell:~ (lp22-343410)$
```

Enter into repository, using command cd repository name (here it is – LP2_Program) ls



```
Your Cloud Platform project in this session is set to lp22-343410.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
agrawal_dipesh@cloudshell:~ (lp22-343410)$ git clone https://github.com/agrawaldipesh/LP2_Program.git
Cloning into 'LP2_Program'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
agrawal_dipesh@cloudshell:~ (lp22-343410)$ ls
LP2_Program  README-cloudshell.txt
agrawal_dipesh@cloudshell:~ (lp22-343410)$ cd LP2_Program
agrawal_dipesh@cloudshell:~/LP2_Program (lp22-343410)$ ls
Program.py
agrawal_dipesh@cloudshell:~/LP2_Program (lp22-343410)$
```

T



To use this API, you may need credentials. Click 'Create credentials' to get started.

```
agrawal_dipesh@cloudshell:~/LP2_Program (lp22-343410)$ ls
Program.py
agrawal_dipesh@cloudshell:~/LP2_Program (lp22-343410)$ python Program.py
********************************************************************************
Python 2 is deprecated. Upgrade to Python 3 as soon as possible.
See https://cloud.google.com/python/docs/python2-sunset

Cloud Shell will soon default to Python 3.

To suppress this warning, create an empty ~/.cloudshell/no-python2-warning file.
The command will automatically proceed in  seconds or on any key.
********************************************************************************
hello
agrawal_dipesh@cloudshell:~/LP2_Program (lp22-343410)$
```

6.Frequently Asked Questions:

1. What is Google App Engine ?
2. What is difference between SQL and GQL ?
3. What are the advantages of Google App Engine over Amazon EC2 ?
4. What is Kubernetes ?
5. What is AppScale ?

7.Conclusion:

Successfully Installation and configure Google App Engine