GCP:

GCP is **a public cloud vendor that offers a suite of computing services to do everything from data management to delivering web and video over the web to AI and machine learning tools**. Customers are able to access computer resources housed in Google's data centres around the world for free or on a pay-per-use basis.

GCP meant by:

Google Cloud Platform is **a suite of public cloud computing services offered by Google**. The platform includes a range of hosted services for compute, storage and application development that run on Google hardware.

Why Google Cloud Platform?

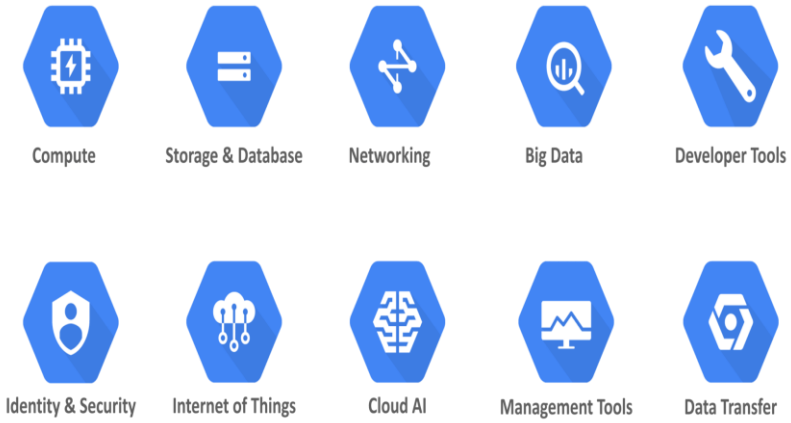
Google Cloud Platform, is a suite of cloud computing services that run on the **same infrastructure that Google uses internally for its end-user products,** such as Google Search , Gmail, Google Photos and YouTube. We all Know how big is the database of Gmail, YouTube and Google Search.

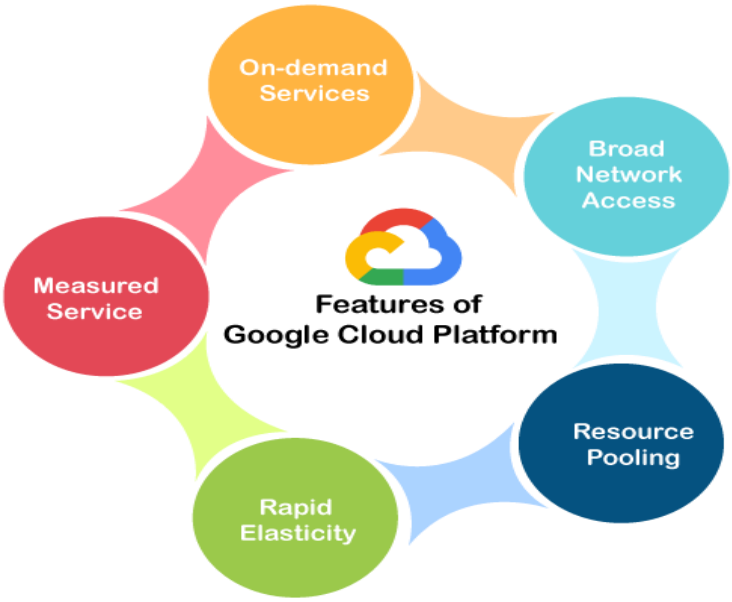
Google Cloud Platform Regions and Zones

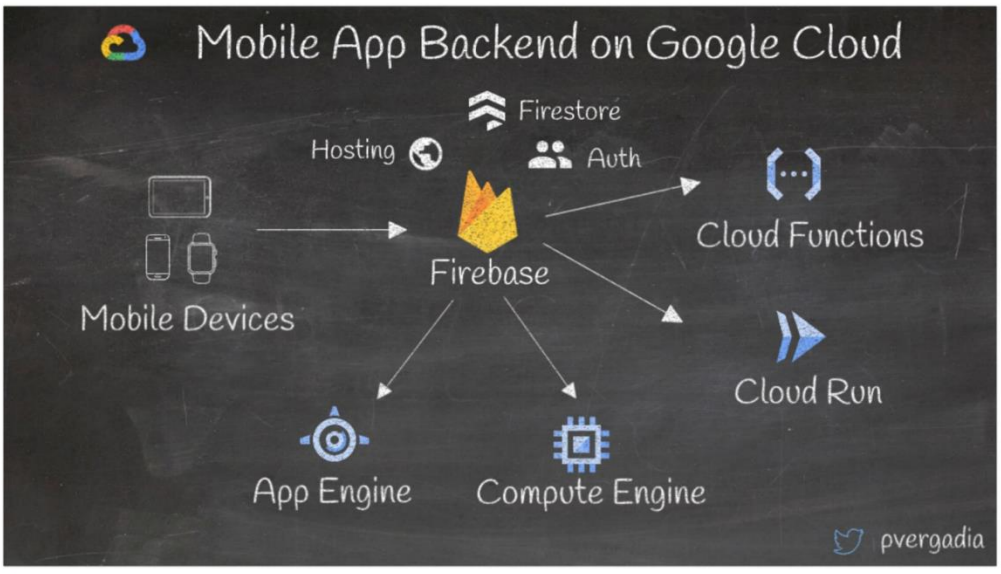
Google Cloud Platform services are available in various locations across North America, South America, Europe, Asia, and Australia. These locations are divided into regions and zones. You can choose where to locate your applications to meet your latency, availability and durability requirements.

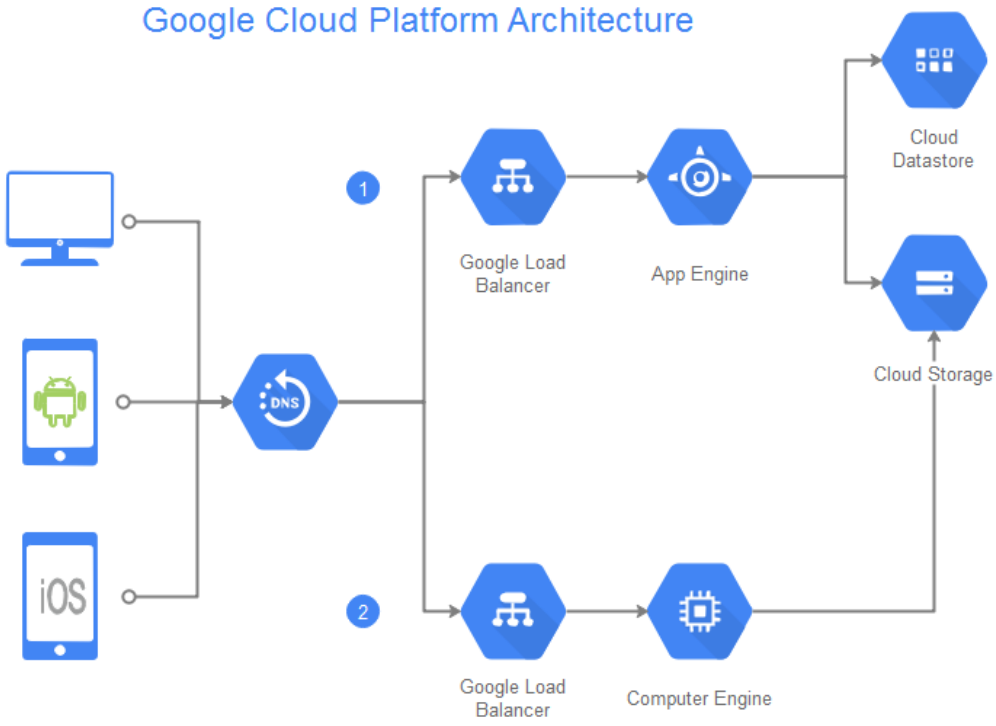
What are Google Cloud Platform (GCP) Services?

Google offers a wide range of Services. Following are the major Google Cloud Services:


Compute
Storage & Database
Networking
Big Data
Developer Tools
Identity & Security
Internet of Things
Cloud AI
Management Tools
Data Transfer


On-demand Services
Broad Network Access
Measured Service
Features of Google Cloud Platform
Resource Pooling
Rapid Elasticity


Mobile App Backend on Google Cloud
Firestore
Hosting
Auth
Cloud Functions
Firebase
Mobile Devices
Cloud Run
App Engine
Compute Engine
pvergadia



Compute:

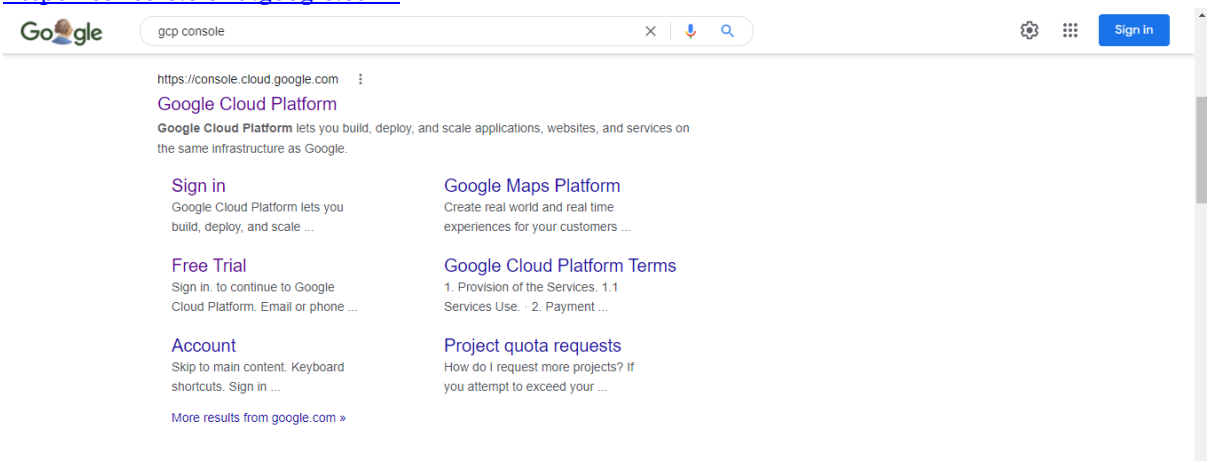
- App Engine - Platform as a Service to deploy Java, PHP, Node.js, Python, C#, .Net, Ruby and Go applications.
- Compute Engine - Infrastructure as a Service to run Microsoft Windows and Linux virtual machines.
- Google Kubernetes Engine (GKE) or GKE on-prem offered as part of Anthos platform - Containers as a Service based on Kubernetes.
- Cloud Functions - Functions as a Service to run event-driven code written in Node.js, Java, Python, or Go.
- Cloud Run - Compute execution environment based on Knative. Offered as Cloud Run (fully managed) or as Cloud Run for Anthos. Currently supports GCP, AWS and VMware management.

Steps to follow for deploy our source in GCP:

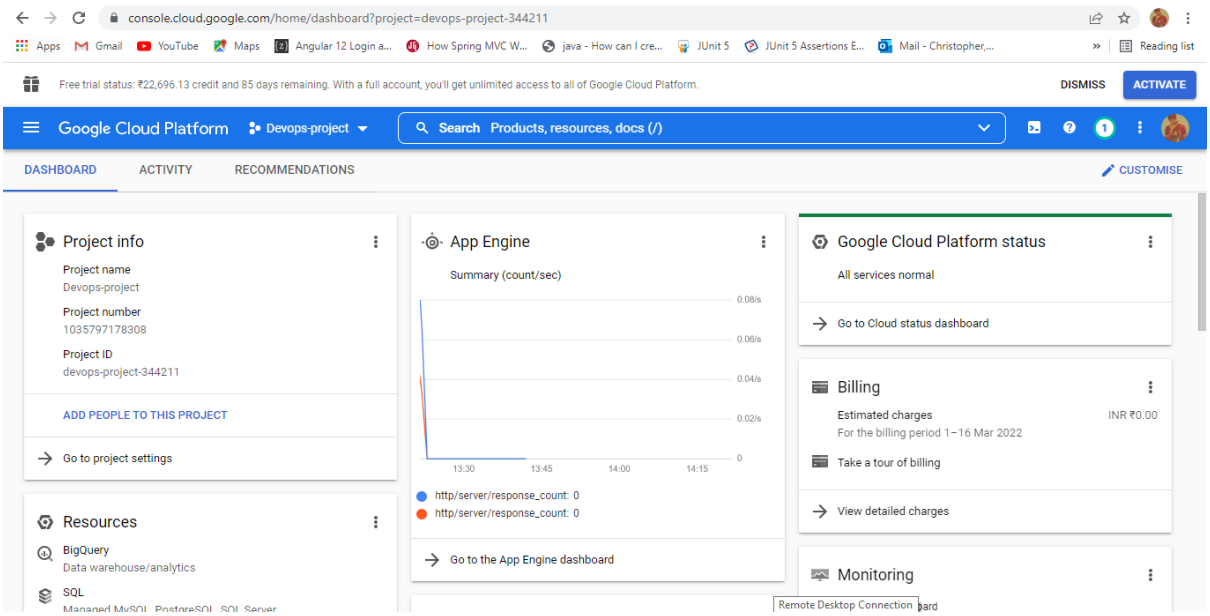
Steps to create Billing account.

Step 1:- Login to the below link

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

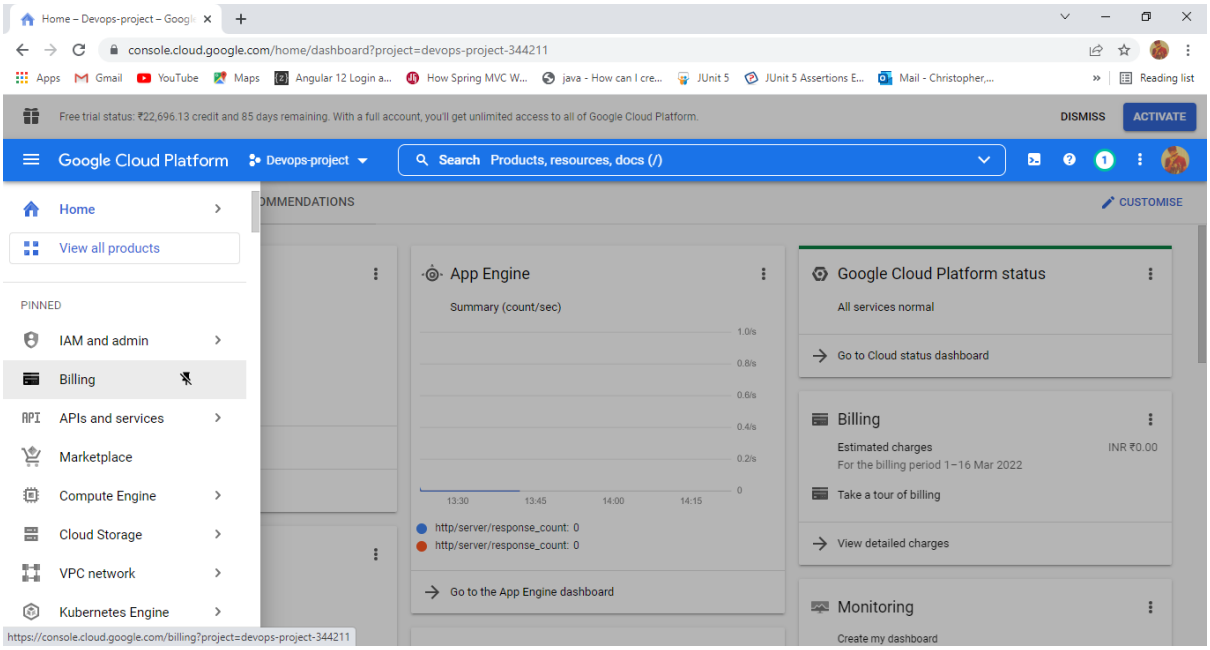


Step 2:- After login, go to GCP Dashboard.

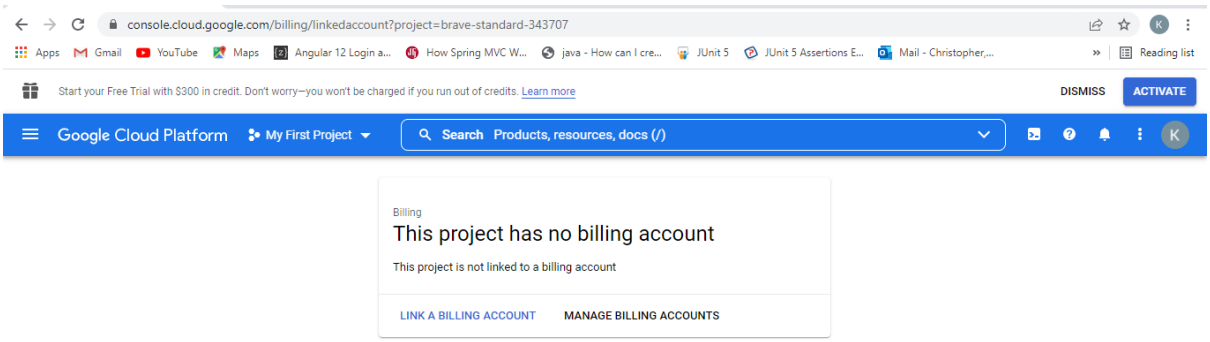


Step 3:- In Dashboard We will find a Home -> Billing

Click **Billing** to create the account.

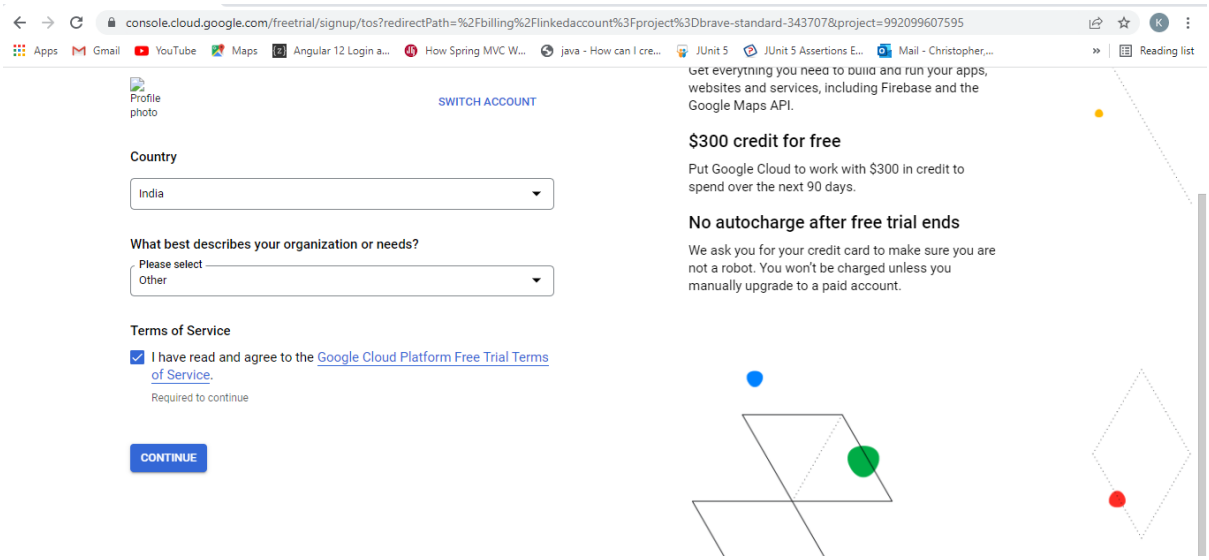


Step 4:- Here we need to Link the billing account.

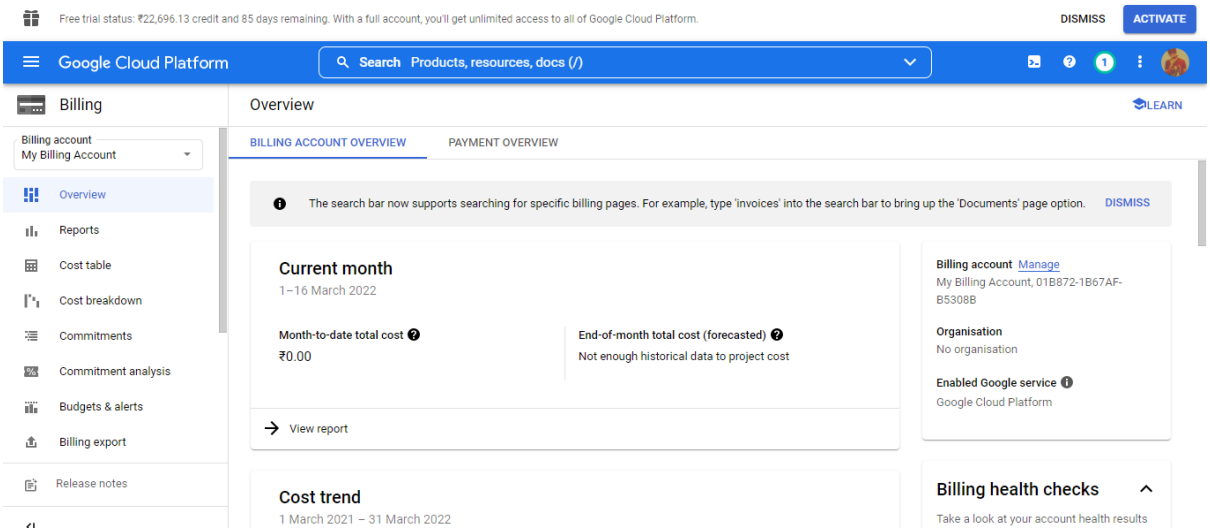


Step 5:- After Clicking the Link a Billing account, It will navigate to billing window for creating billing account. Once Window open

Select country→India and **click Continue**.



Step 6:- Once billing account created, your billing account dashboard looks like this.



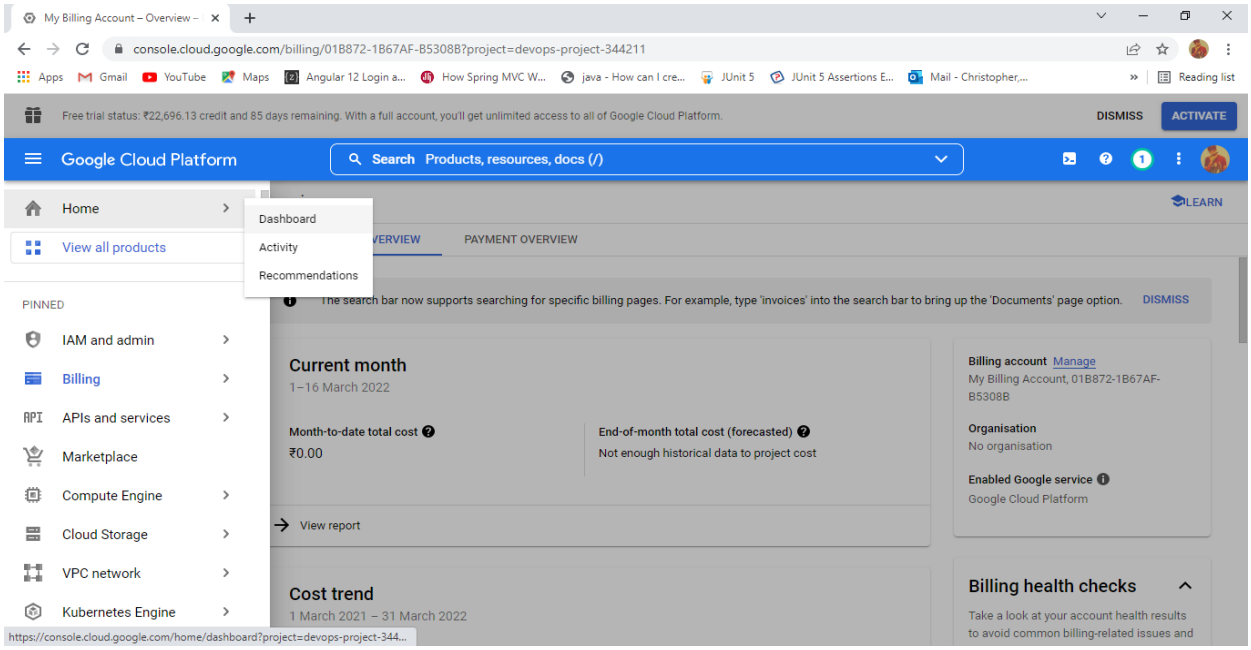
2. Setup and requirements:

Self-paced environment Setup:

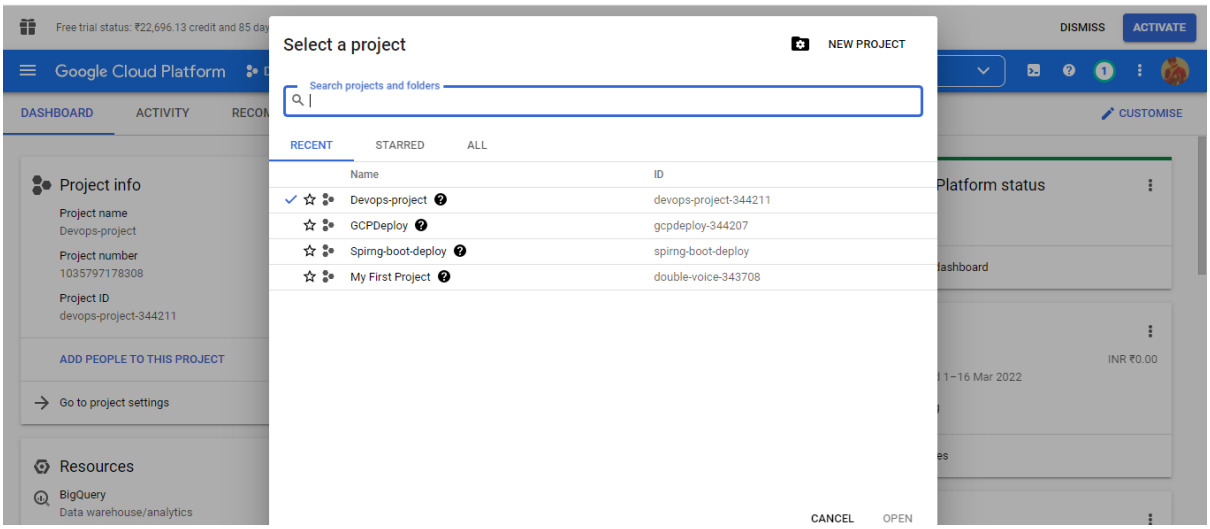
Sign in to **Cloud Console** and create a new project or reuse an existing one. If you don't already have a Gmail or Google Workspace account, you must **create one**.

Steps to create New Project in GCP:

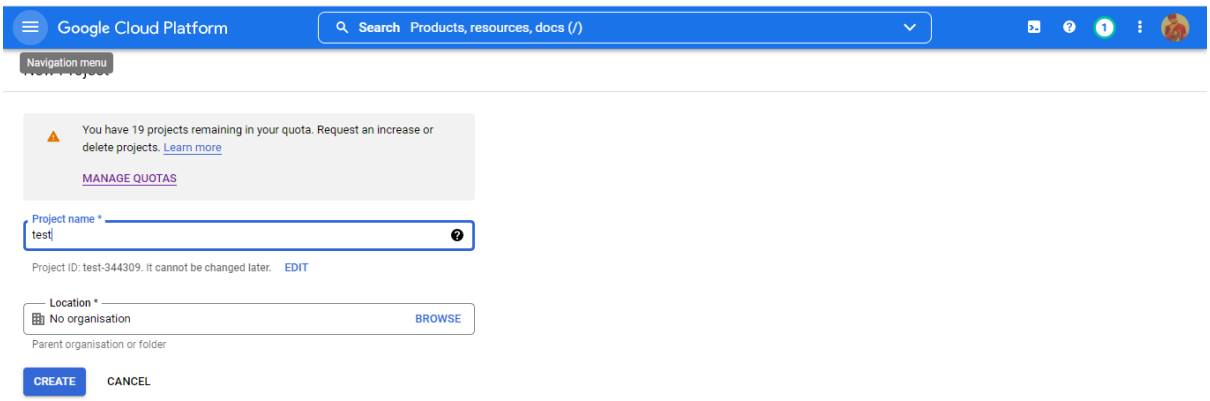
Step 7:-In order to create a project go to Home -> Dashboard and top Right corner **Click →New Project** as show in the below image.



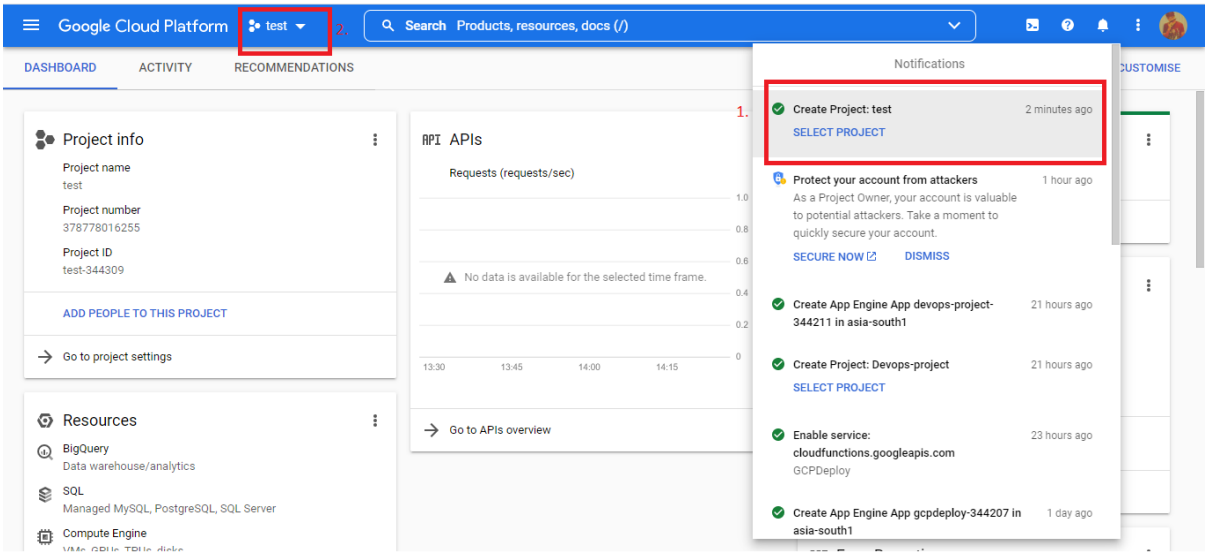
Click →New Project



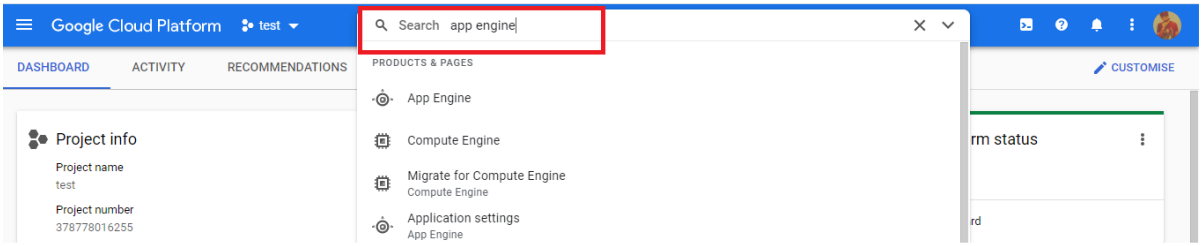
Step 8:- Enter the project name shown in the image:



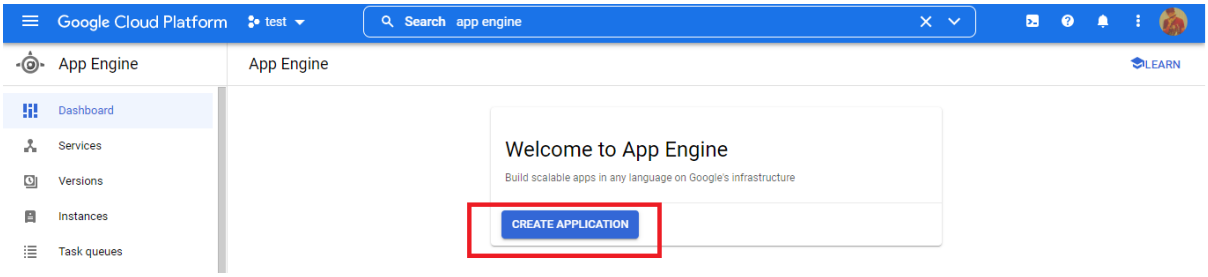
Once Project is created, our created project will looks likes this.



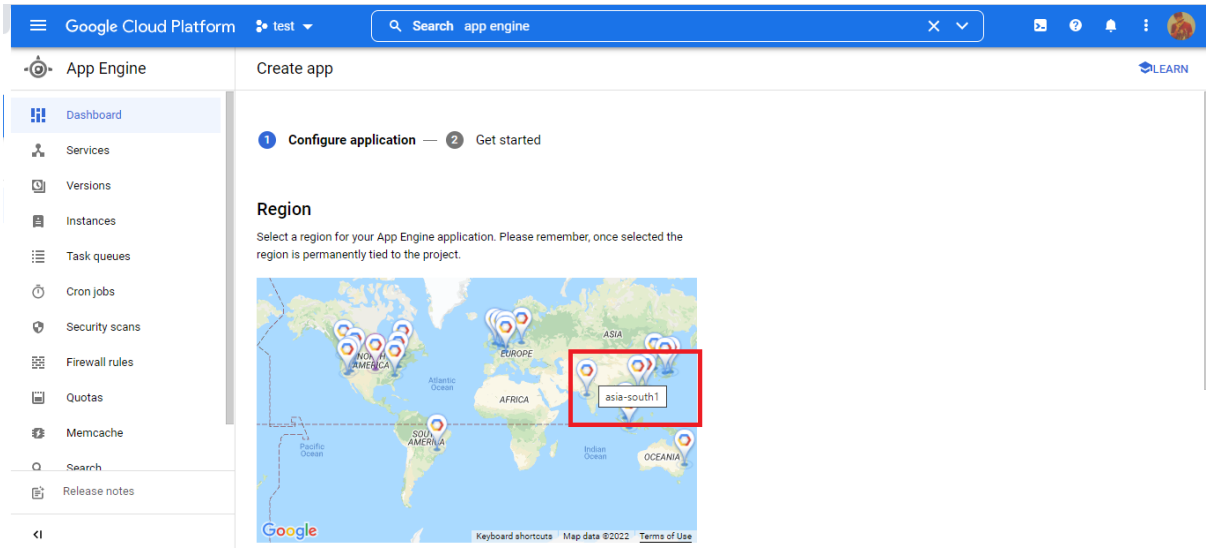
Step 9:- In search bar type **App engine** and select the engine:

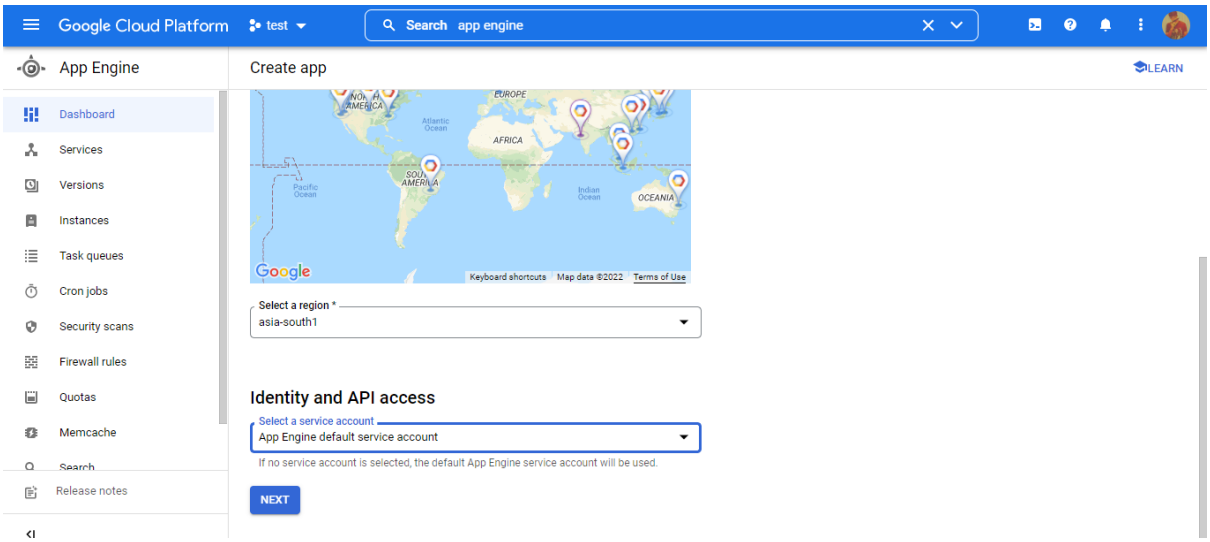


Once App Engine is selected **click→ Create Application**

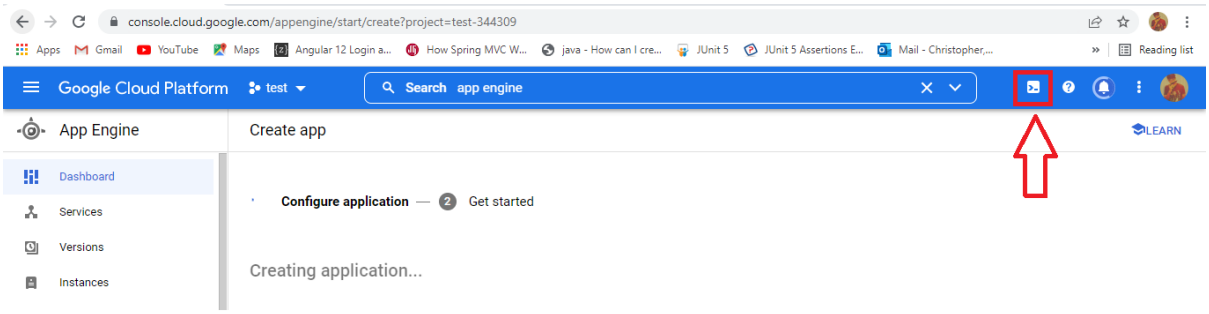


Then create app window will open in that **select region as Asia- south1** which let as We are in India South.

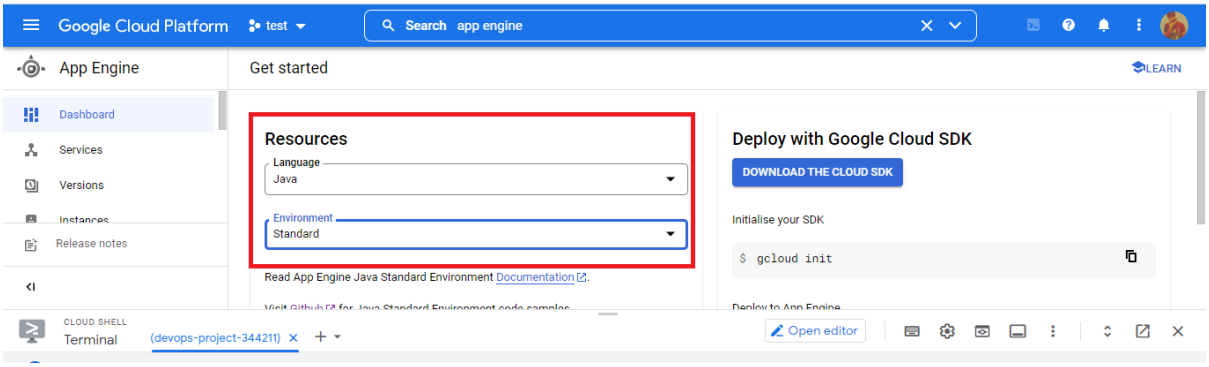




Step 10:- After creating all these steps we need to click the Cloud Shell to run our commands (like Command Promote).



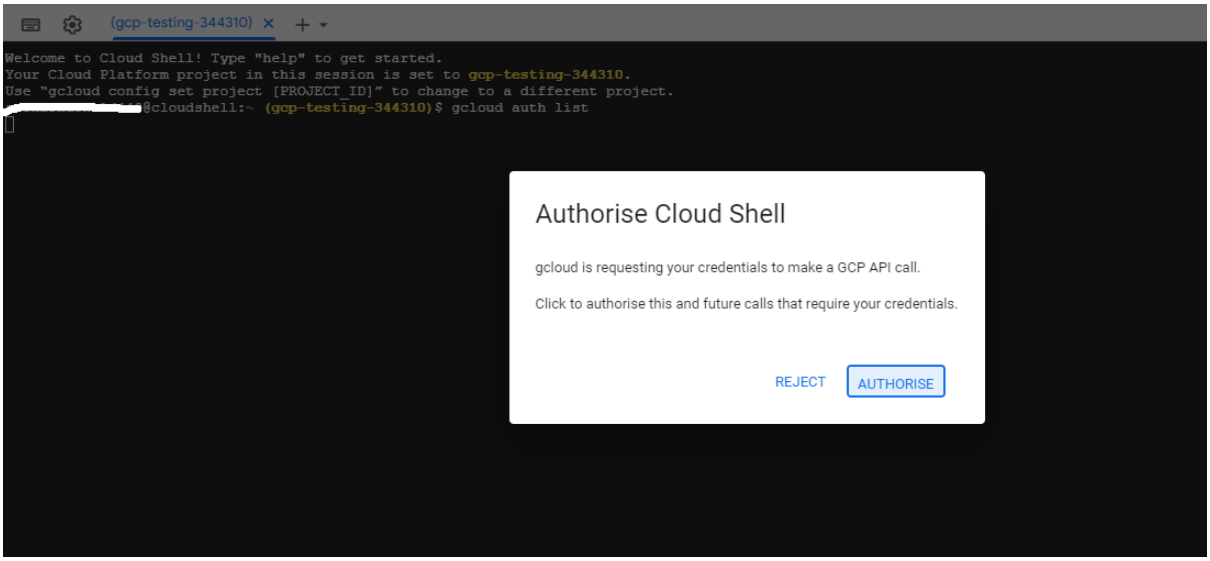
To Get Start we need to select languages as Java and environment as Standard.

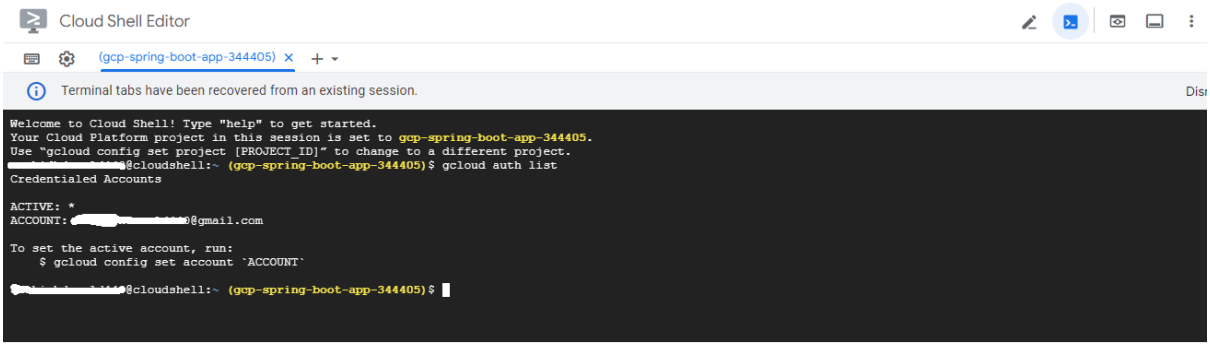


Step 11:- Once the shell is open it looks like this.

Run the following command in Cloud Shell to confirm that you are authenticated:

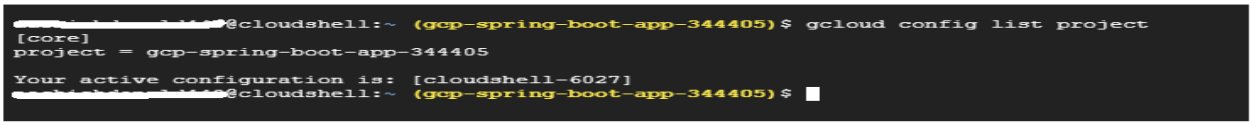
Step 12:- Run the following command in cloud shell to confirm you're you are authenticated.→**gcloud auth list** to authenticated. It will give the authorised username and essential details.





Step 13:- Run the following command in Cloud Shell to confirm that the gcloud command knows about your project:

gcloud config list project



Steps to create spring boot Application:

Here we have given the simple hello world program to deploy in GCP.

Create a new Spring Boot App

Create basic program and do the following steps.

Update Maven pom.xml

There are two ways to deploy a Java server app – either by using Maven App Engine Plugin or Gradle App Engine Plugin, or by deploying the War package directory. You'll use Maven App Engine Plugin to deploy the app.

Add Maven App Engine Plugin

Update pom.xml to include a Google Cloud Plugin that simplifies the deployment process.

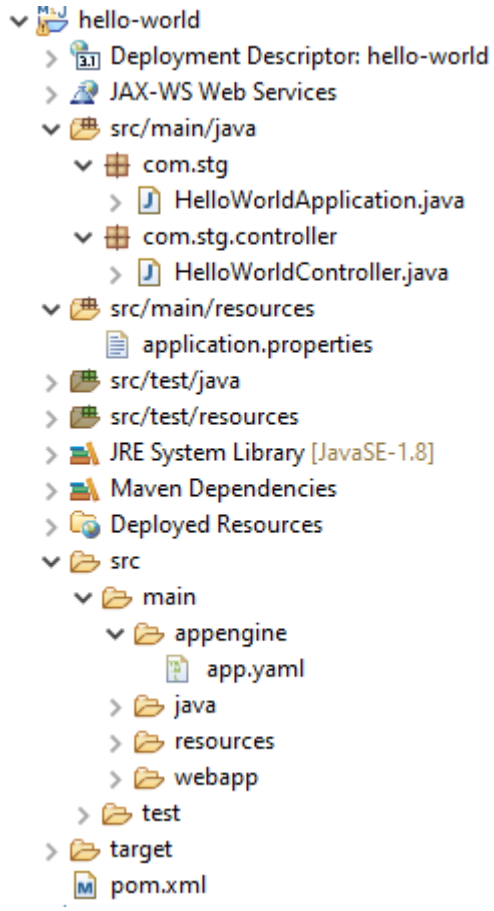
pom.xml

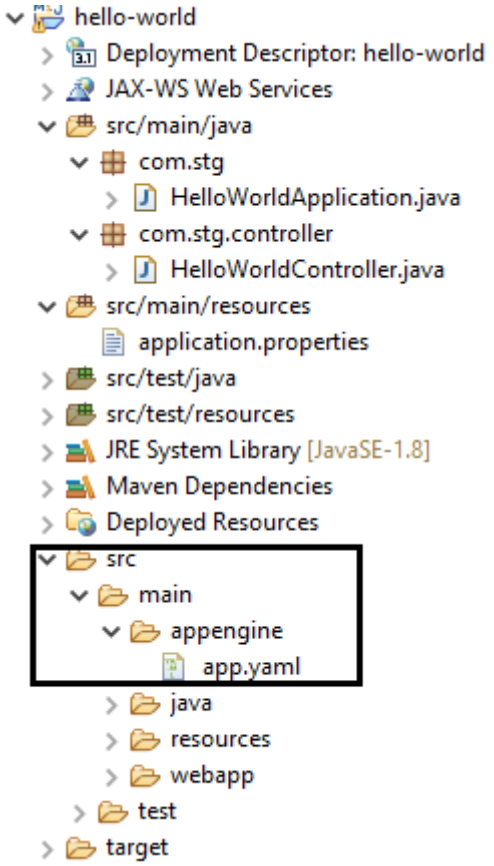
```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" ...>
  ...
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>com.google.cloud.tools</groupId>
        <artifactId>appengine-maven-plugin</artifactId>
        <version>2.2.0</version>
        <configuration>
          <version>1</version>
          <projectId>GCLOUD_CONFIG</projectId>
        </configuration>
      </plugin>
      ...
    </plugins>
  </build>
</project>
```

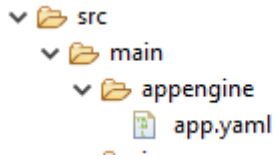
Add App Engine descriptor

To deploy the app to App Engine standard environment, you must create a new src/main/appengine/app.yaml descriptor file.

Project Structure Looks as shown in below image:


hello-world
Deployment Descriptor: hello-world
JAX-WS Web Services
src/main/java
com.stg
HelloWorldApplication.java
com.stg.controller
HelloWorldController.java
src/main/resources
application.properties
src/test/java
src/test/resources
JRE System Library [JavaSE-1.8]
Maven Dependencies
Deployed Resources
src
main
appengine
app.yaml
java
resources
webapp
test
target
pom.xml


hello-world
Deployment Descriptor: hello-world
JAX-WS Web Services
src/main/java
com.stg
HelloWorldApplication.java
com.stg.controller
HelloWorldController.java
src/main/resources
application.properties
src/test/java
src/test/resources
JRE System Library [JavaSE-1.8]
Maven Dependencies
Deployed Resources
src
main
appengine
app.yaml
java
resources
webapp
test
target



Edit the src/main/appengine/app.yaml file and add the following content:

src/main/appengine/app.yaml

```
runtime: java11
instance_class: F1
```

Add a controller

Add a new controller that returns "GCP App Engine Service - Build & Deployed Successfully using GCP Pipeline" in GcpApplication.java.

Once all done Start your application run and see the Output locally.

GCP App Engine Service - Build & Deployed Successfully using GCP Pipeline

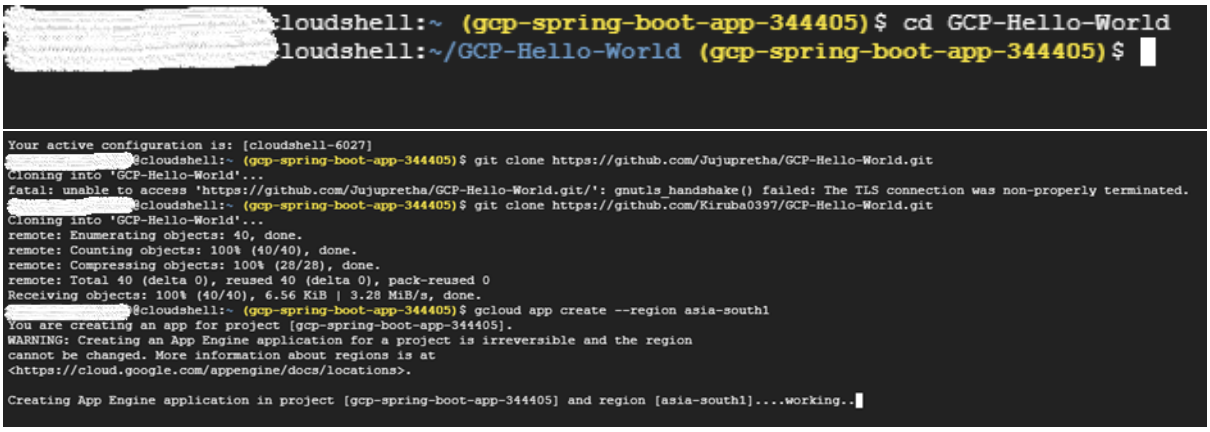
After doing all the steps push your code in Git.

To check and ref use the below Repository:

https://github.com/Kiruba0397/testgcp.git

Deploy the app to App Engine

First, initialize the project to be able to run App Engine apps. Also, initialize the project to run in the central region of the US.

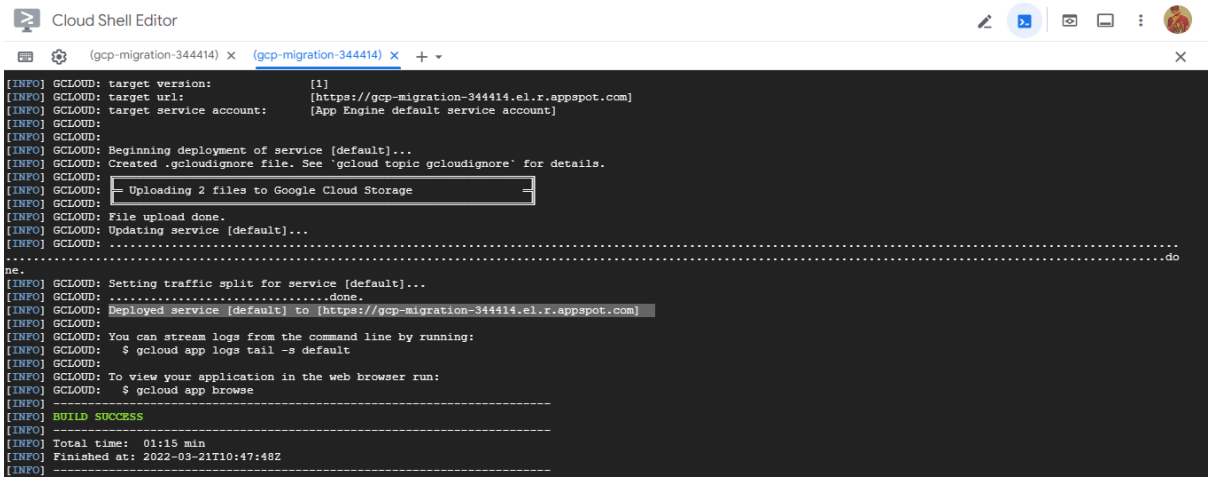


Then, deploy your app to App Engine standard environment by running mvn appengine:deploy

```
cloudshell:~/GCP-Hello-World (gcp-spring-boot-app-344405)$ mvn package appengine:deploy
[INFO] Scanning for projects...
[INFO]
[INFO] ----------------------< com.javatpoint:hello-world >----------------------
[INFO] Building hello-world 0.0.1-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-starter/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.0 kB at 667 B/s)
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-starters/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starters/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starters/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (861 B at 693 B/s)
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.2 kB at 774 B/s)
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-autoconfigure/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-autoconfigure/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-autoconfigure/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.3 kB at 2.0
 kB/s)
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-starter-logging/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-logging/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-logging/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.0 kB at 1
.6 kB/s)
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-starter-web/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-web/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-web/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.0 kB at 612 B
/s)
Downloading from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-json/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloading from spring-milestones: https://repo.spring.io/milestone/org/springframework/boot/spring-boot-starter-json/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml
Downloaded from spring-snapshots: https://repo.spring.io/snapshot/org/springframework/boot/spring-boot-starter-json/2.2.2.BUILD-SNAPSHOT/maven-metadata.xml (1.0 kB at 1.0
kB/s)
```

```
[INFO]
[INFO] --- appengine-maven-plugin:2.2.0:deploy (default-cli) @ hello-world ---
[INFO] Staging the application to: /home/[redacted]/GCP-Hello-World/target/appengine-staging
[INFO] Detected App Engine app.yaml based application.
Mar 17, 2022 6:23:02 AM com.google.cloud.tools.appengine.operations.GcloudRunner run
INFO: submitting command: /home/[redacted].cache/google-cloud-tools-java/managed-cloud-sdk/LATEST/google-cloud-sdk/bin/gcloud app deploy --version 1 --project gcp-s
pring-boot-app-344405
[INFO] GCLOUD: Services to deploy:
[INFO] GCLOUD:
[INFO] GCLOUD: descriptor:                  [/home/[redacted]/GCP-Hello-World/target/appengine-staging/app.yaml]
[INFO] GCLOUD: source:                      [/home/[redacted]/GCP-Hello-World/target/appengine-staging]
[INFO] GCLOUD: target project:              [gcp-spring-boot-app-344405]
[INFO] GCLOUD: target service:              [default]
[INFO] GCLOUD: target version:              [1]
[INFO] GCLOUD: target url:                  [https://gcp-spring-boot-app-344405.el.r.appspot.com]
[INFO] GCLOUD: target service account:      [App Engine default service account]
[INFO] GCLOUD:
[INFO] GCLOUD:
[INFO] GCLOUD: Beginning deployment of service [default]...
[INFO] GCLOUD: Created .gcloudignore file. See `gcloud topic gcloudignore` for details.
[INFO] GCLOUD:
[INFO] GCLOUD: | Uploading 3 files to Google Cloud Storage |
[INFO] GCLOUD:
[INFO] GCLOUD: File upload done.
[INFO] GCLOUD: Updating service [default]...
[INFO] GCLOUD: ..........................................................................................................................
..........................................................................................................................
..........................................................................................................................
.....................................................done.
[INFO] GCLOUD: Setting traffic split for service [default]...
[INFO] GCLOUD: ..............................done.
[INFO] GCLOUD: Deployed service [default] to [https://gcp-spring-boot-app-344405.el.r.appspot.com]
```

It will load for some time and at last it will show Build success.

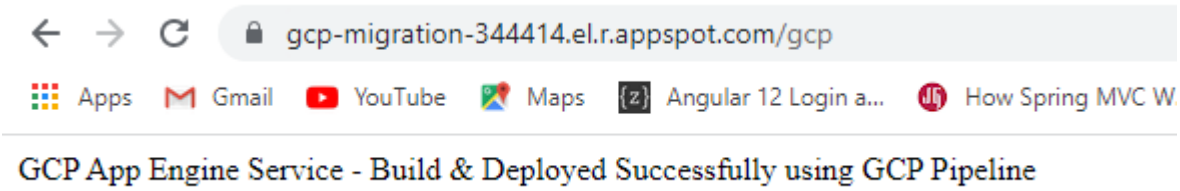


After the app is deployed, you can visit it by opening http://<project-id>.appspot.com in your web browser or use the following command in Cloud Shell:

Here we get the URL that is deployed in the GCP.

```
[redacted]@cloudshell:~/testgcp (gcp-migration-344414)$ gcloud app browse
Did not detect your browser. Go to this link to view your app:
https://gcp-migration-344414.el.r.appspot.com
[redacted]@cloudshell:~/testgcp (gcp-migration-344414)$
```

OutPut in GCP:



The URL is: "https://gcp-migration-344414.el.r.appspot.com/gcp"