Experiment No.:04

Title: Installation and Configuration of Google App Engine GAE

Objectives: From this experiment, the student will be able to

- To make the students understand use of Google App Engine.
- To learn the implementation of GAE.

Theory:

Collaborating on Word Processing:

What is App Engine?

Google App Engine (GAE) is a platform-as-a-service product that provides web app developers and enterprises with access to Google's scalable hosting and tier 1 internet service. GAE requires that applications be written in Java or Python, store data in Google Bigtable and use the Google query language. Googles platform to build web application on cloud Dynamic web server with full support for common web technologies Automatic scaling and balancing Transactional datastore model.

Google Cloud Platform (GCP)

Offered by google it is suit of cloud computing services that run on the same infrastructure that google uses internally for its end user products such as google search, gmail, file storage, and youtube. Along with set of management tools it provides a series of modular cloud services including computing, data storage, data analytics and machine learning for organizations with large amount of data to store analyze. Google cloud storage prices are 20% cheaper than AWS if you. Google cloud is an industry leader in the field and is also investing heavily in AI and ML technologies. Many small and large enterprises are increasingly adopting google platform which bodes well since it disengages things and make them more secure at reasonable cost.

Overview of Google App Engine (GAE)

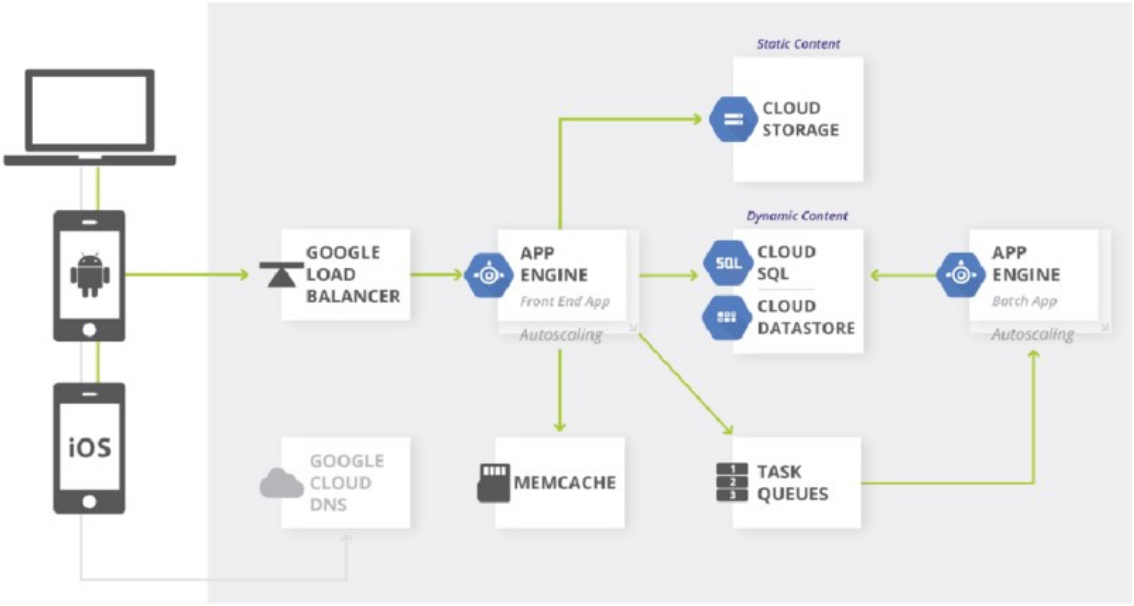
GAE is a service and cloud computing platform employed for developing and hosting web applications. It is a platform as a service cloud computing platform that is entirely managed utilizes in built services to drive the apps Once after downloading the SDK that is software development kit we can instantly start the development process but for this it is mandatory to use technical knowledge. App engine lets you built highly scalable applications on a fully managed severless platform also you can scale your applications from zero to planet scale without having to manage infrastructure. Also you can freeup your developers with zero main server management and zero configuration deployments. You can even stay agile with support for popular development languages and a range of developer tools with 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

Key Features of GAE
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.

Architecture of GAE



Google Load Balancer: Manages the load balancing of the application

Front End App: Responsible for redirecting request for appropriate services

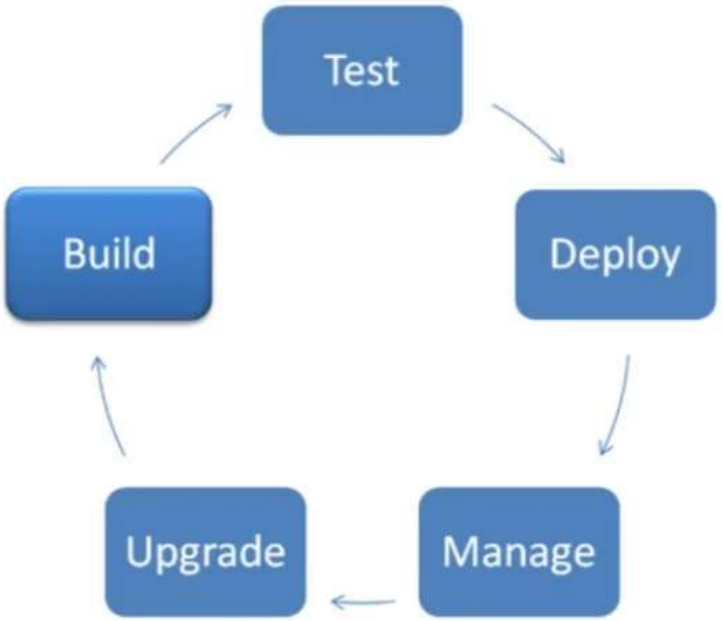
Memcached: That is the cache memory shared between instances of a google app engine generating high speed in the availability of the information on the server

Task Queue: Mechanism provides a redirection of long task to backend servers making front end servers free for new users requests

Static Storage:Provides the file storage called cloud storage.

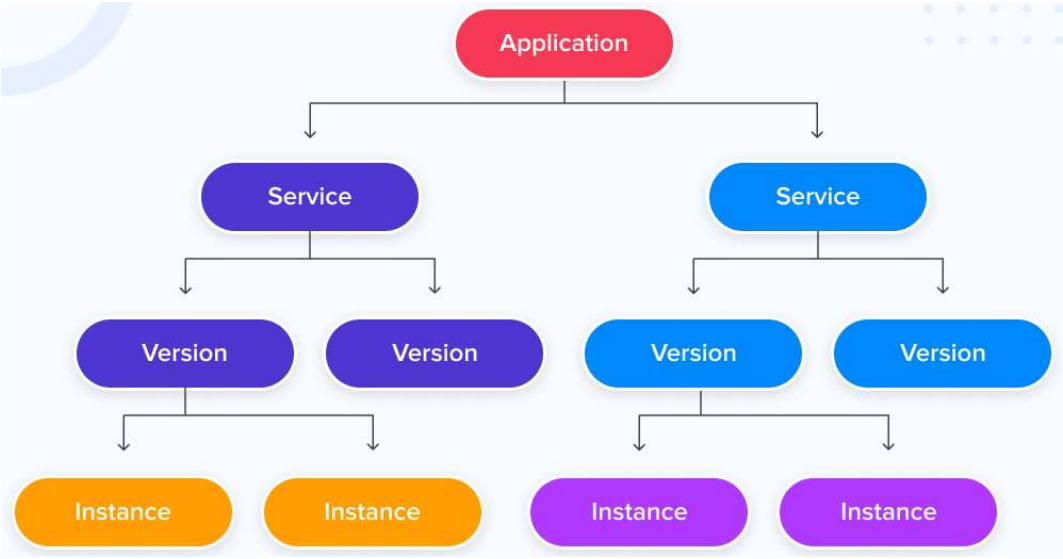
Dynamic storage: Provides relational database services such as cloud SQL and no relational NoSQL such as cloud store.

GAE Development Cycle



Test, deploy, and build is SDK means software development kit is a set of software development tools that allows the creation of applications for a certain software package, software framework hardware platform for computer system, video game, console also operating system or similar development platform.
Managed is an app engine administration control.
Upgrades like all the updates are being provides for software development kit.

Components of an Application

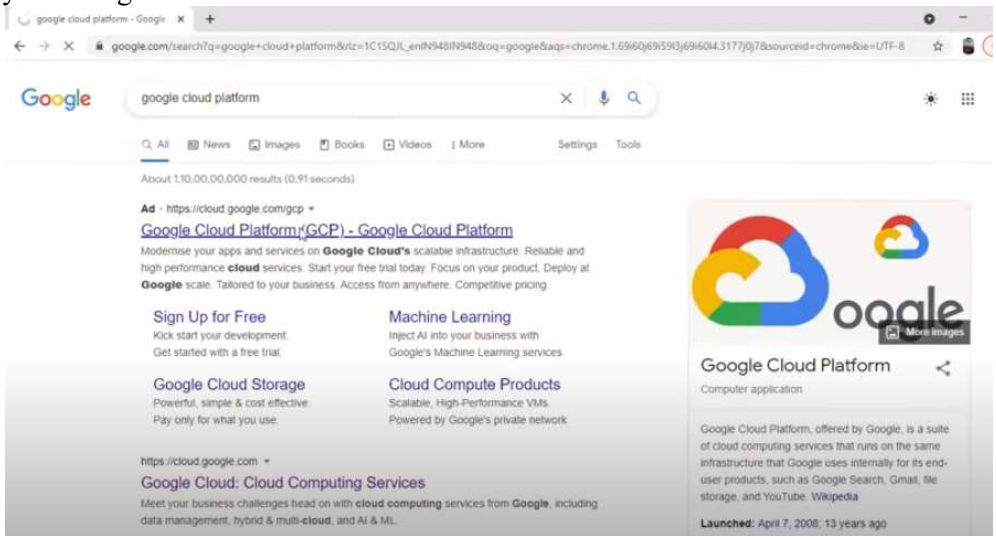


An App Engine application is created under your google cloud project when you create an application resource.The app engine application is top level container that includes the service version and instance resources that make up your app. When you create your app engine app all your resources are created in the region that you choose

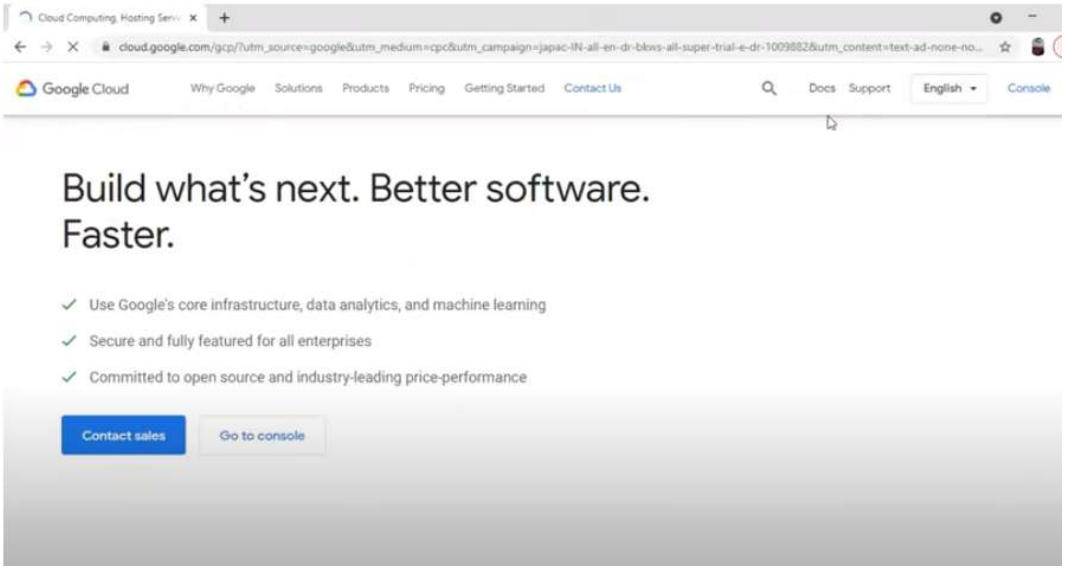
including your app code along with a collection of settings credentials and your apps metadata. Each app engine application includes at least one service the default service which can hold many versions depend on your app billings status. The diagram illustrates the hierarchy of an app engine application running with multiple services.In the diagram theapp has two services that containing multiple versions and two of those versions actively running on multiple instances. You can use services in app engine to factor your large apps into logical components that can securely share app engine features and communicate with one another.Generally, your engine services behave like microservices therefore you can run your whole app in a single service or you can design and deploy multiple services to run as a set of microservices.
e.g. An app that handles your customer request might include separate services that each handle different task such as API request from mobile devices, internal administration, type requests, backend processing such as billing pipelines and data analysis. Each service in App Engine consists of the source code from your app and the corresponding app engine configuration files. The set of files that you deploy to your service represent a single version of that service and each time that you deploy it to that service you are creating additional versions within that same service. Then you have versions having multiple versions of your app within each service allows you to quickly switch between different versions of the app for rollbacks, testing or other temporary events. You can rout traffic to one or more specific versions of your app by migrating or spreading traffic then we have instances. So, the versions within your services run on one or more instances. By default, app engine scales your app to match the load your apps will scale up the number of instances that are running to provide consistent performance or scale down to minimize idle instances and reduces cost

SNAPSHOTS

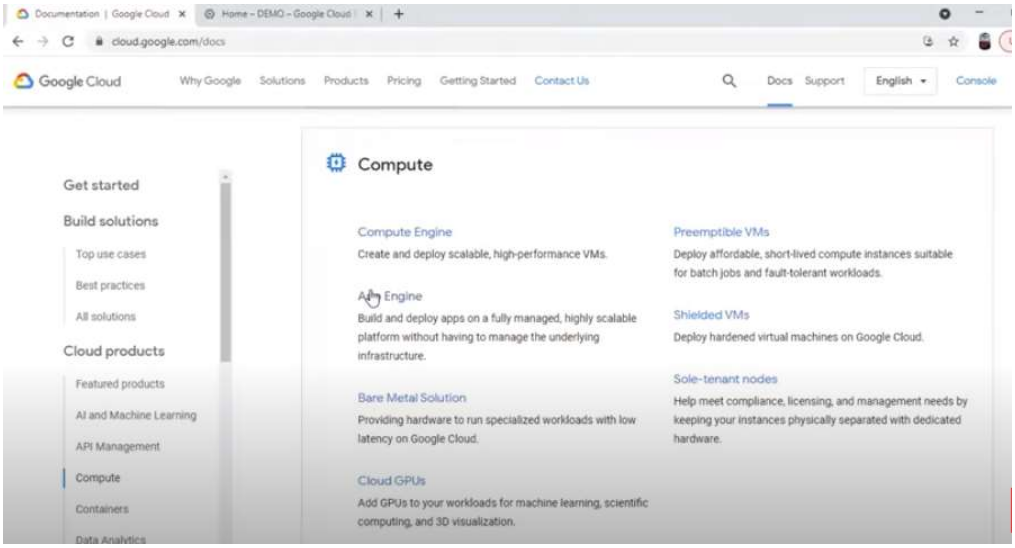
Step 1: Go to Google cloud platform by Signing into the Google Drive website with your Google account.



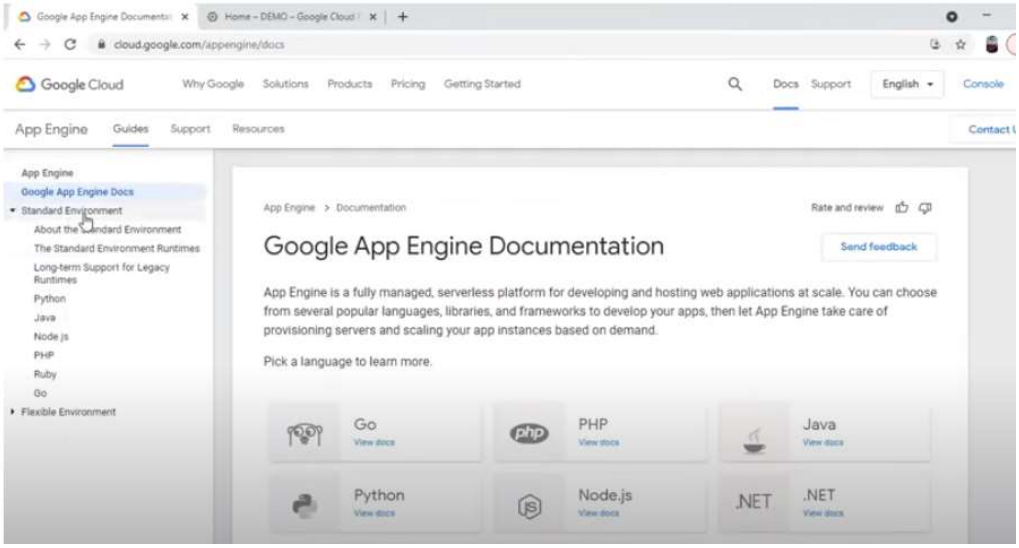
Step 2: Open the console and go to the documents part and go to the compute part (doc)

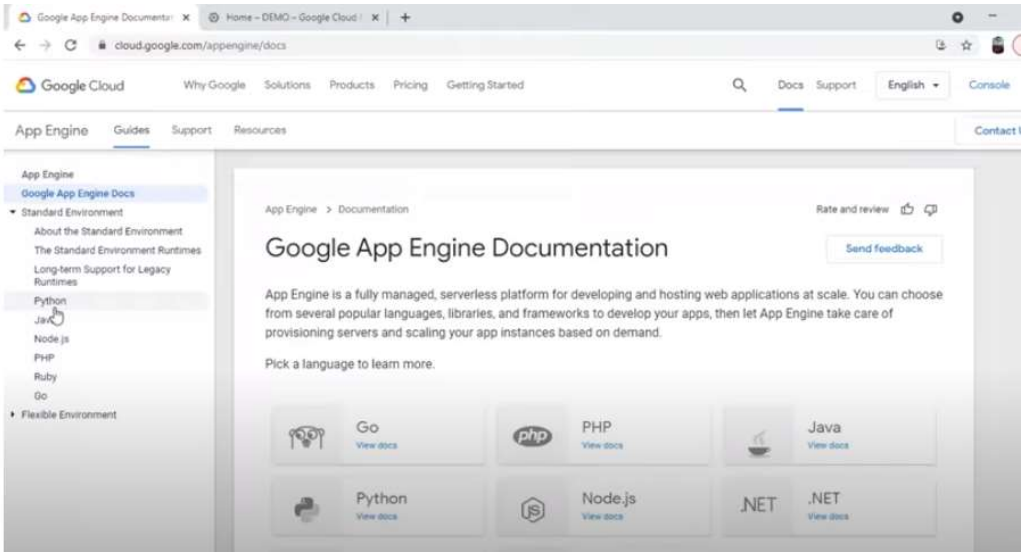


Step 3: In the compute you will find **app engine**

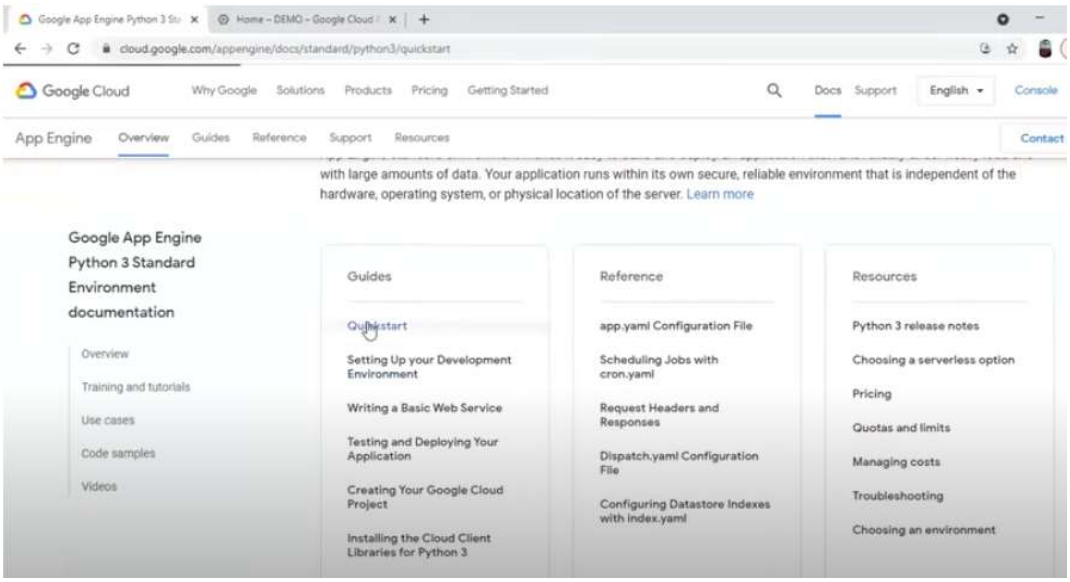


Step 4: Go to **standard environment =>Python**

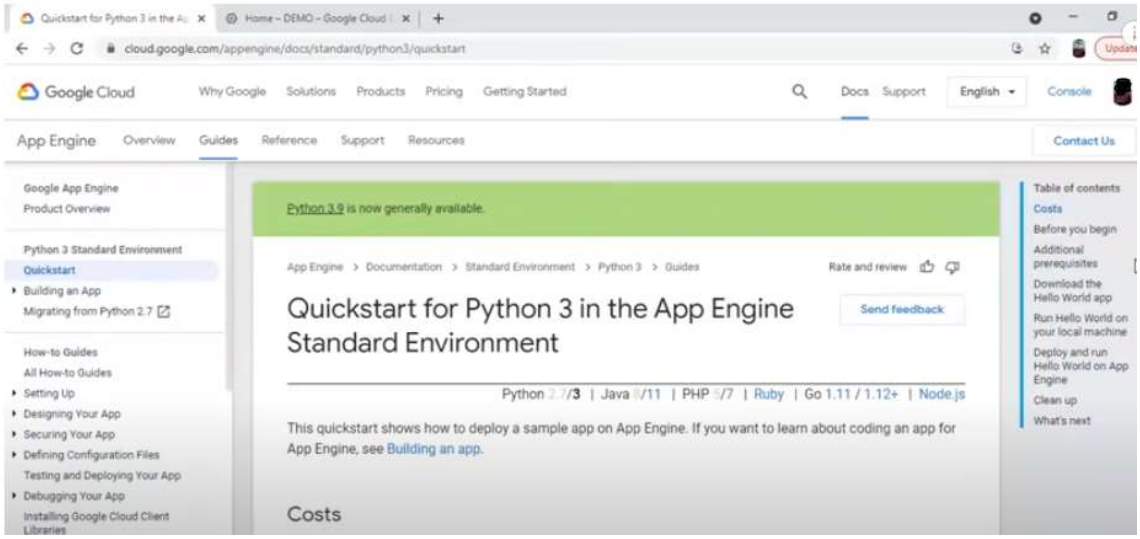




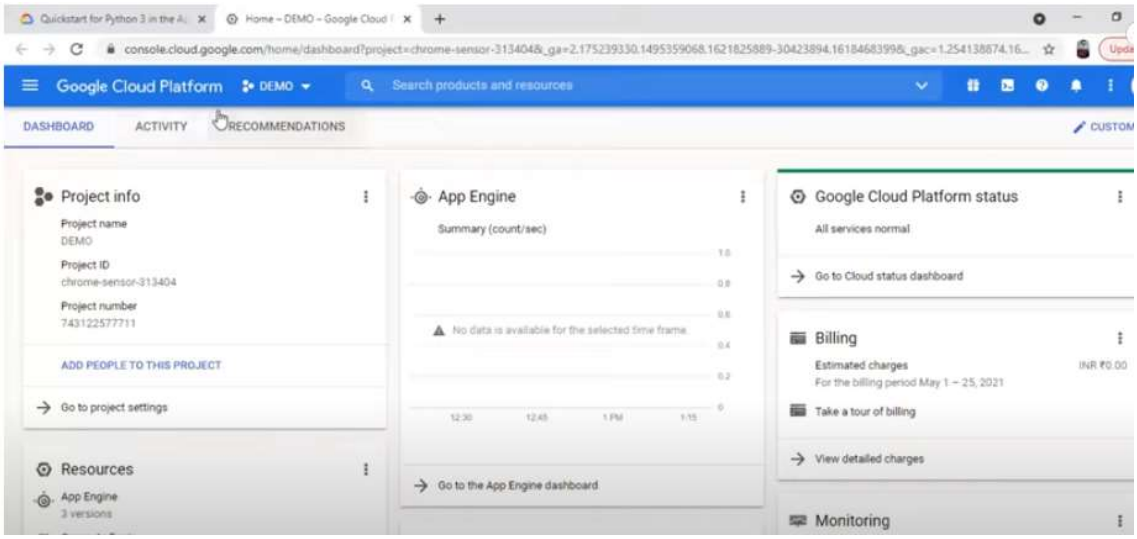
Step 5: We are implementing simple app of **"Hello World"** using python
Go to **Quick Start**



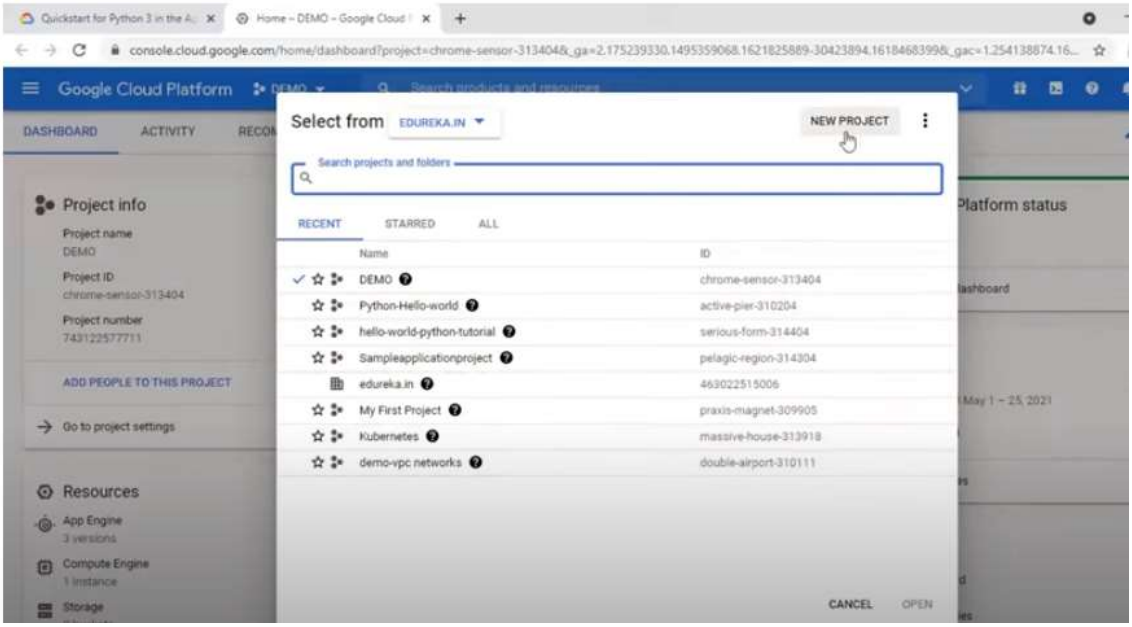
Step 6: Following snapshot shows the table of content, at right side, how you going to implement the app.



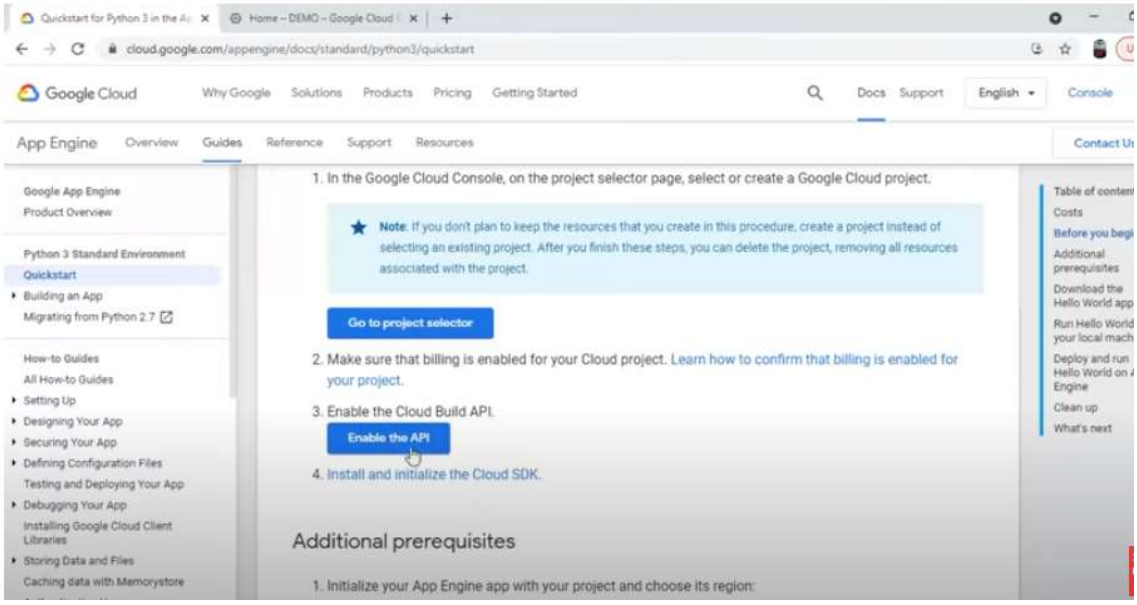
Step 7: GO to dashboard of google cloud platform



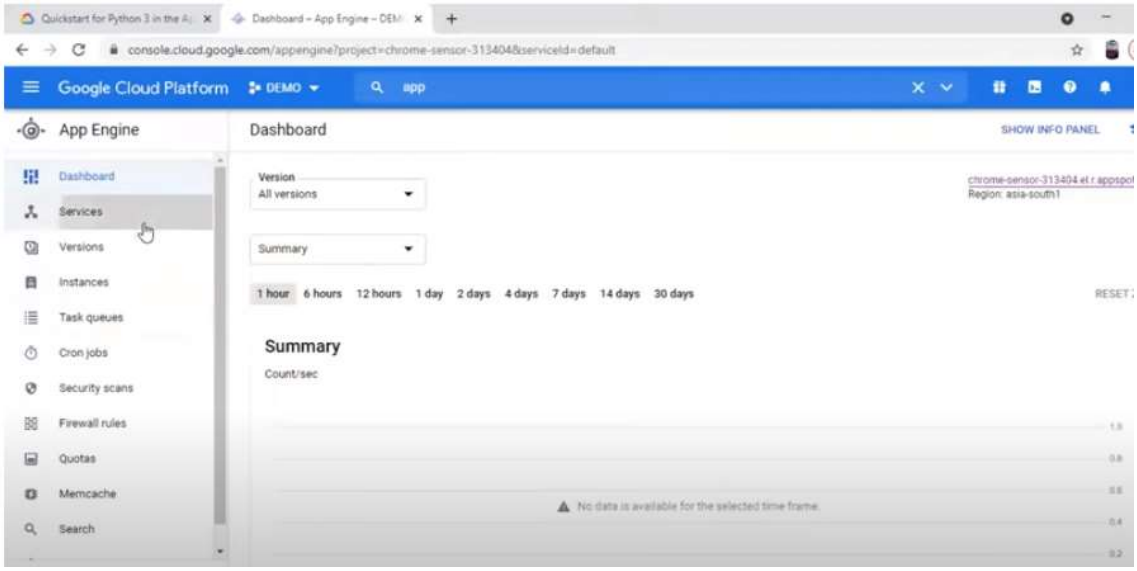
Step 8: Create new project



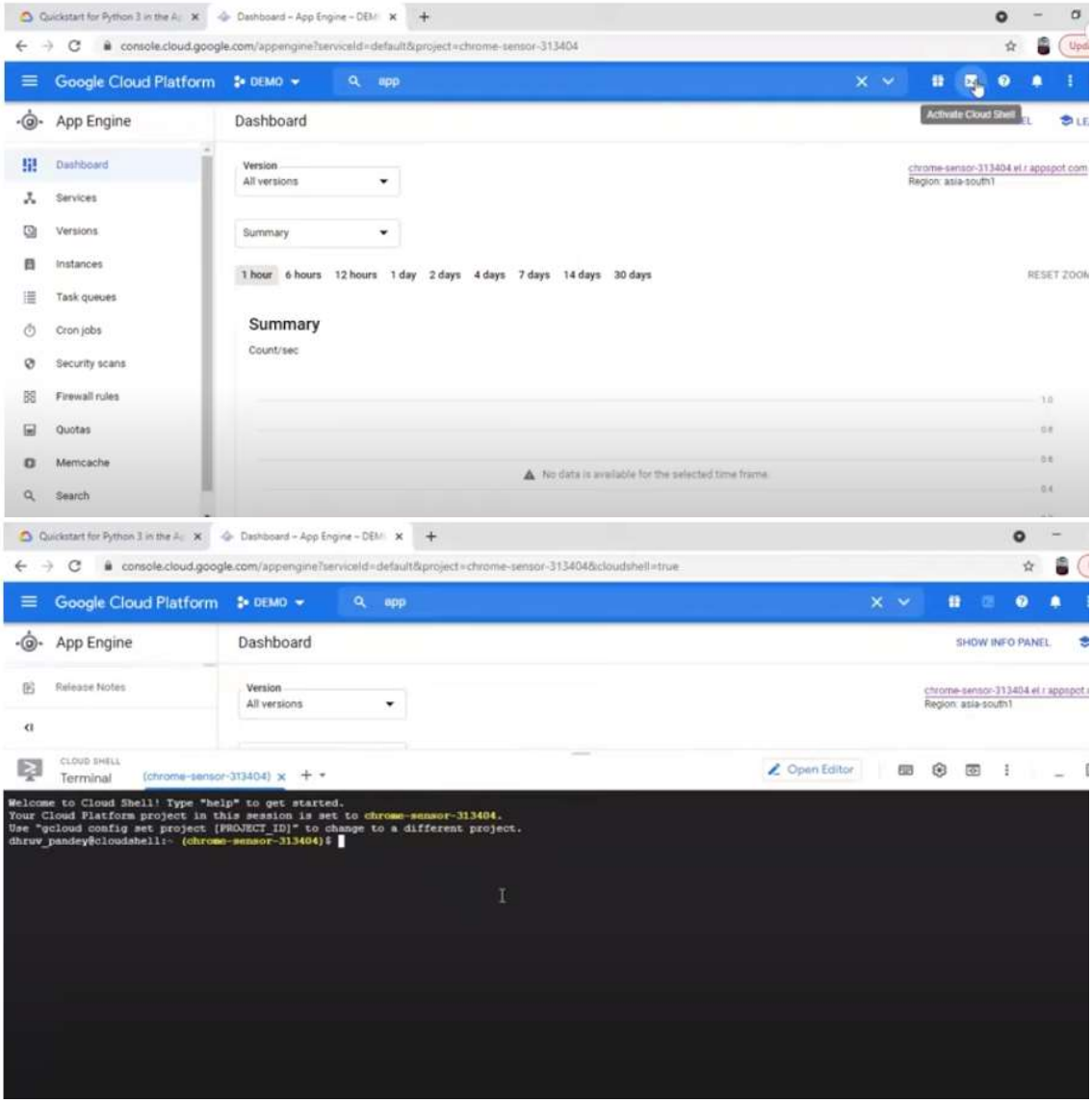
Step 9: Enable the API



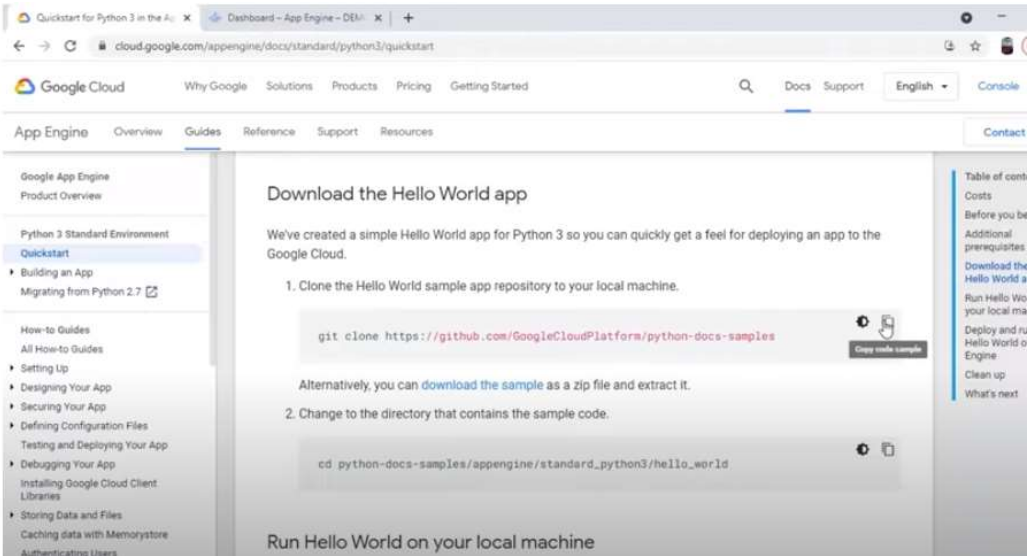
Step 10: GO to app engine in google cloud platform



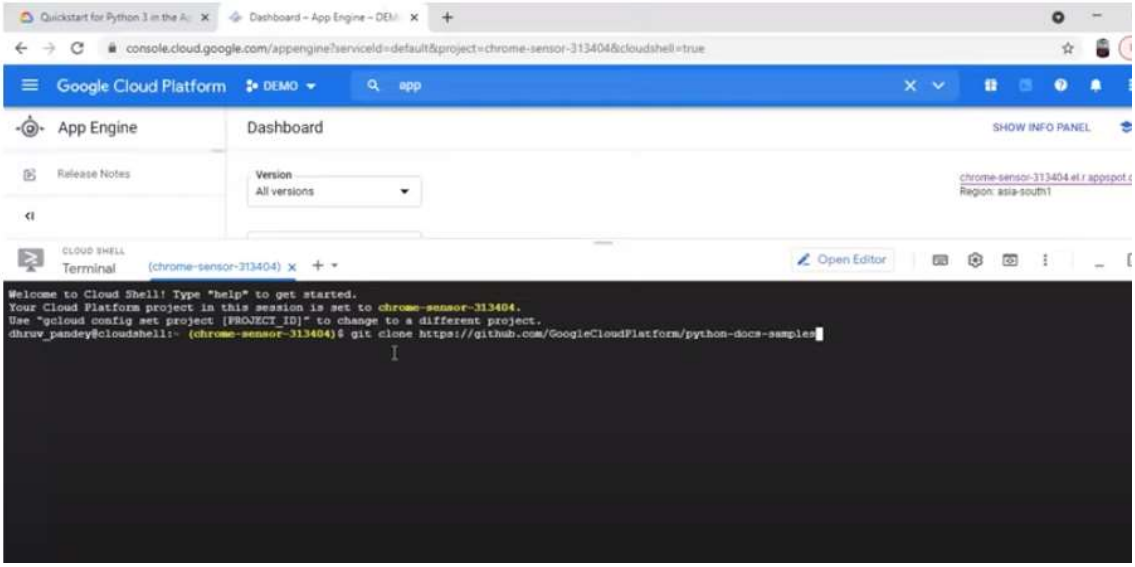
Step 11: Open the activate cloud shell



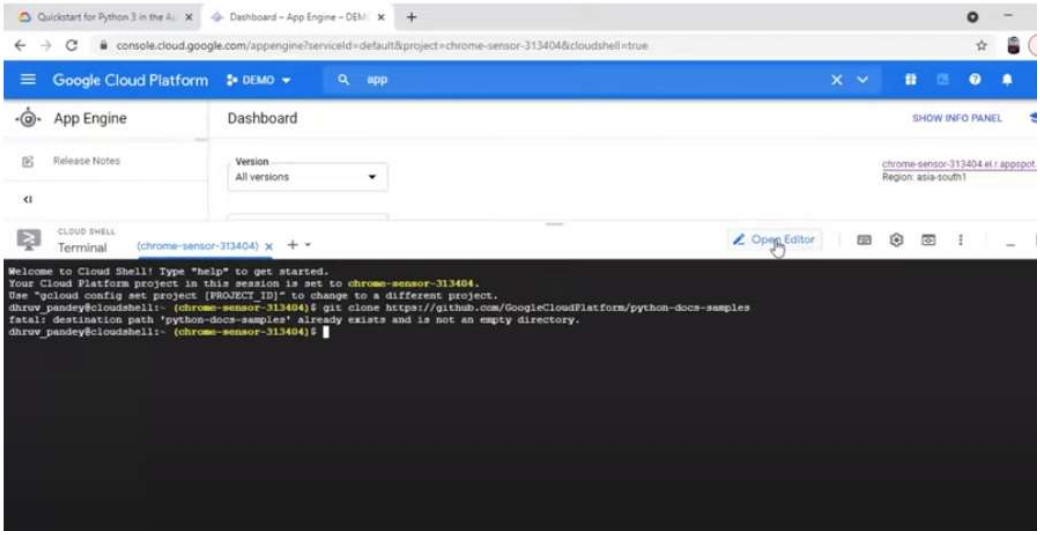
Step 12: Go to documents part and copy clone address



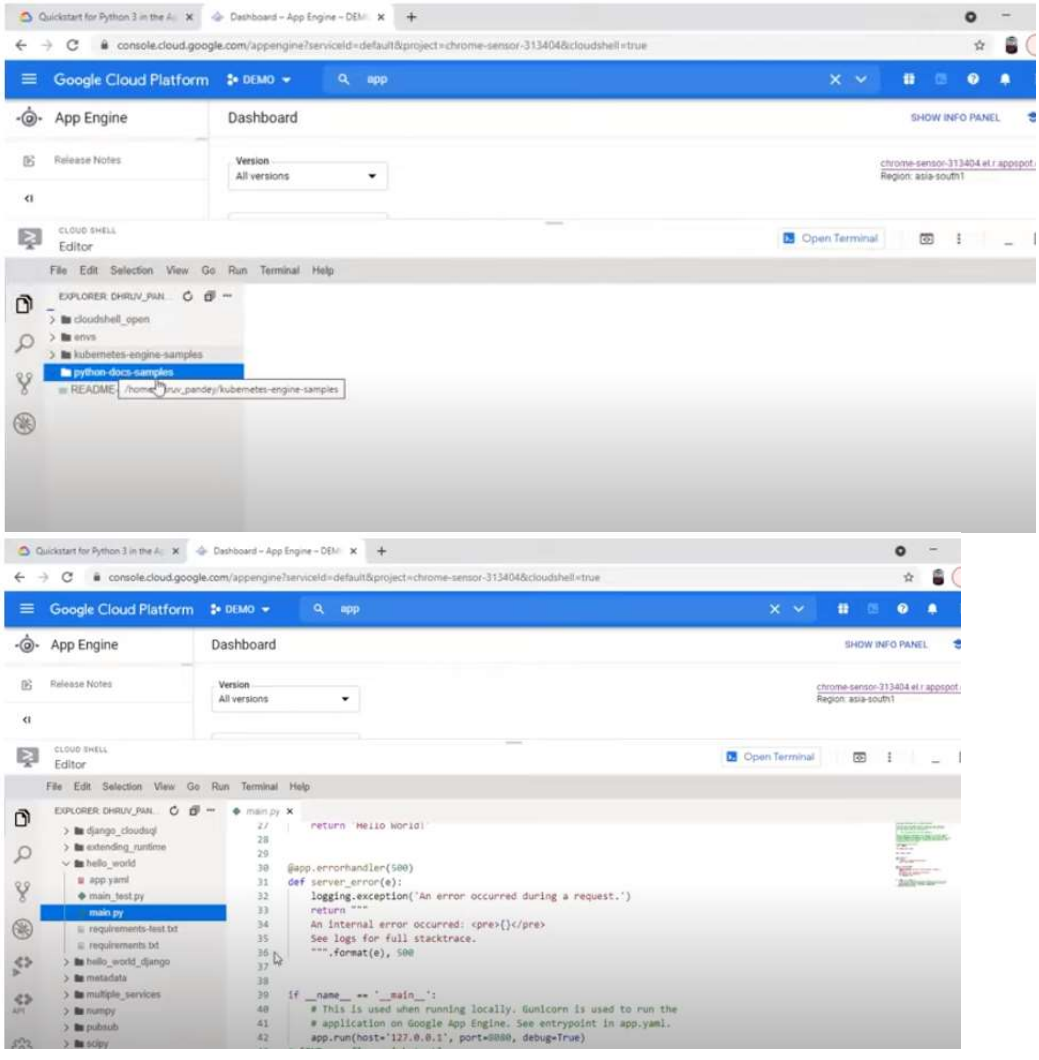
Step 13: Copied clone address paste on shell and hit ENTER



Step 14: Go to editor -> python doc samples-> appengine->flexible->HelloWorld->main.py

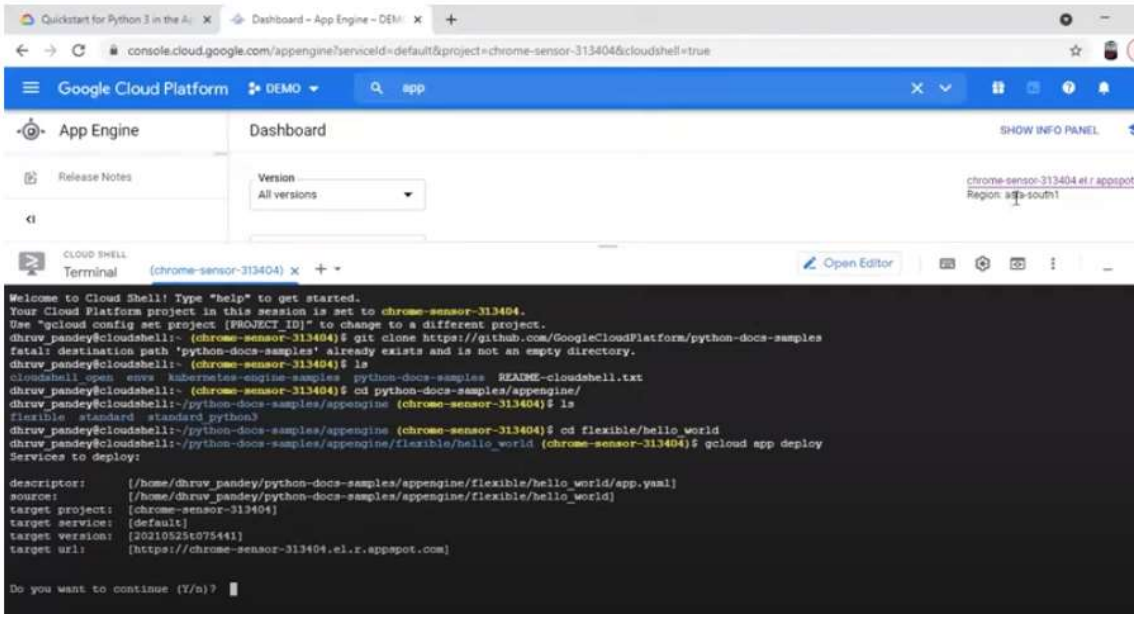


Step 15: Go to Hello World program



Step 16: Check app.yaml and go back to terminal
Type Command ls ⏎

Step 17: Cd python-docs-samples/appengine/ ⏎
ls
Cd flexible/hello_world ⏎
Gcloud appdeploy ⏎
Authorize
Do you want to continue (Y/N): Y ⏎ (for the first time it will ask you to select project)



Step 18: Now copy the link of deployed service and paste in to browser ⏎

Conclusion:

Google App Engine is a fully managed serverless platform for developing and hosting web applications at a scale. Users can choose from several popular languages, libraries, and frameworks to develop their applications and then App Engine takes care of provisioning servers and scaling app instances based on demand.