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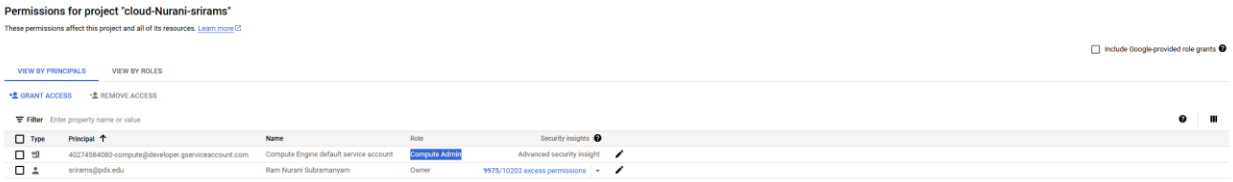
05.1g: Storage, IAM

5.1.1 GCP Cloud Storage

5.1.2 GCP Cloud Storage #1 (USGS)

- **What role is attached to the Compute Engine default service account?**

  Compute Admin



- **Would it be sufficient for the VM to perform its functions (i.e. creating buckets and reading/writing objects in them)?**

No, It wont be sufficient for the VM to perform storage related operations are not allowed in Compute Admin Role by default.

- **What permissions are given by the default access scope to Cloud Storage?**

  The **default access scope** for Cloud Storage on a VM is **Read-only**. This means the VM can view (read) objects in Cloud Storage buckets but cannot create, modify, or delete objects or buckets.

- **Would they be sufficient for the VM to perform its functions (i.e. creating buckets and reading/writing objects in them)?**

  No, the default Read-only access scope is not sufficient for performing operations such as creating buckets or writing objects in Cloud Storage.

- **What settings are possible for setting the VM's access to the Storage API?**

  None, Read Only, Write Only, Read Write, Full.

  - **None**: No access to Cloud Storage.
  - **Read-only**: Allows the VM to view objects and bucket listings only.
  - **Write-only**: Allows the VM to write objects to existing buckets but not to read or delete.
  - **Read/Write**: Allows the VM to both read from and write to objects in buckets but not manage buckets.
  - **Full**: Grants the VM complete access to Cloud Storage, enabling it to create, read, write, delete objects, and manage buckets (provided IAM roles allow it).

5.1.3 Configuring permissions

5.1.4 USGS data and setup

- **What time did the latest earthquake happen?**

  2024-11-03T00:31:11.890Z

- **What was the magnitude (mag)?**

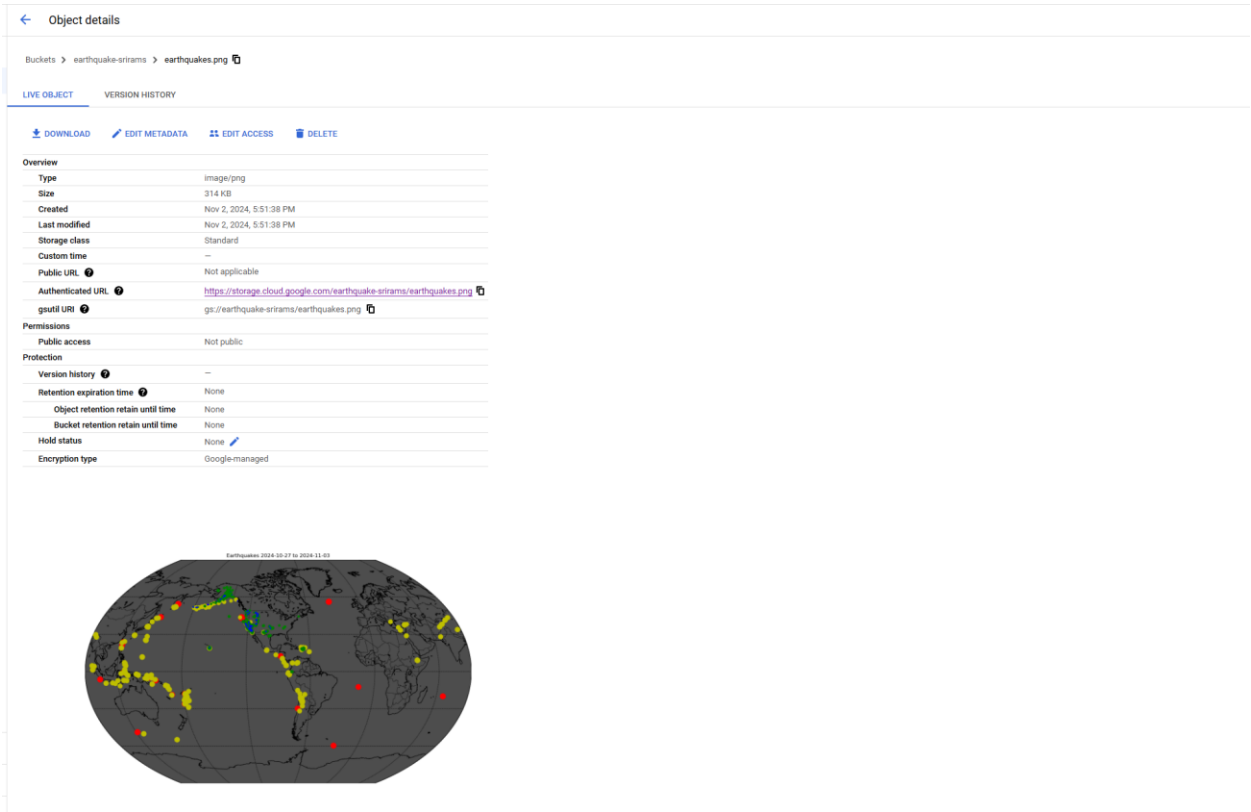
  1.8

- **Where was the place it happened?**

  52 km NNE of Chase, Alaska

5.1.5 Python plotting code

- **Take a screenshot of the image that has been created for your lab notebook.**



5.1.6 GCP Cloud Storage #2 (IAM roles)

5.1.7 Create service account

5.1.8 Create Compute Engine VM

5.1.9 Service account roles (Compute)

- **What is the exact error message that is returned?**

  Some requests did not succeed.

  - Required 'compute.instances.list' permission for 'projects/cloud-nurani-srirams'

```
srirams@gcs-lab-vm:~$ gcloud compute instances list
WARNING: Some requests did not succeed.
 - Required 'compute.instances.list' permission for 'projects/cloud-nurani-srirams'

Listed 0 items.
srirams@gcs-lab-vm:~$
```

- **What role needs to be added to the service account's permissions for the VM to have access to list the project's Compute Engine resources?**

Compute Viewer Role

- **Take a screenshot of the output for your notebook.**

```
srirams@gcs-lab-vm:~$ gcloud compute instances list
NAME        ZONE        MACHINE_TYPE  PREEMPTIBLE  INTERNAL_IP  EXTERNAL_IP    STATUS
course-vm   us-west1-b  e2-medium                  10.138.0.2                  TERMINATED
gcs-lab-vm  us-west1-b  e2-medium                  10.138.0.11  34.83.234.215  RUNNING
usgs        us-west1-b  e2-medium                  10.138.0.10  34.82.64.164   RUNNING
srirams@gcs-lab-vm:~$
```

5.1.10 Service account roles (Storage)

- **What is the exact error message that is returned?**

  AccessDeniedException: 403 gcs-lab@cloud-nurani-srirams.iam.gserviceaccount.com does not have storage.objects.create access to the Google Cloud Storage object. Permission 'storage.objects.create' denied on resource (or it may not exist).

```
srirams@gcs-lab-vm:~$ gsutil cp moonquakes.png gs://earthquake-srirams
Copying file://moonquakes.png [Content-Type=image/png]...
AccessDeniedException: 403 gcs-lab@cloud-nurani-srirams.iam.gserviceaccount.com does not have storage.objects.create access to the Google Cloud Storage object. Permission 'storage.objects.create' denied on resource (or it may not exist).
srirams@gcs-lab-vm:~$
```

- **What role needs to be added to the service account's permissions for the VM to have access to add an object to a storage bucket?**

  Storage Object Creator

- **Take a screenshot of the output for your notebook.**

```
srirams@gcs-lab-vm:~$ gsutil cp moonquakes.png gs://earthquake-srirams
Copying file://moonquakes.png [Content-Type=image/png]...
/ [1 files][314.0 KiB/314.0 KiB]
Operation completed over 1 objects/314.0 KiB.
srirams@gcs-lab-vm:~$
```

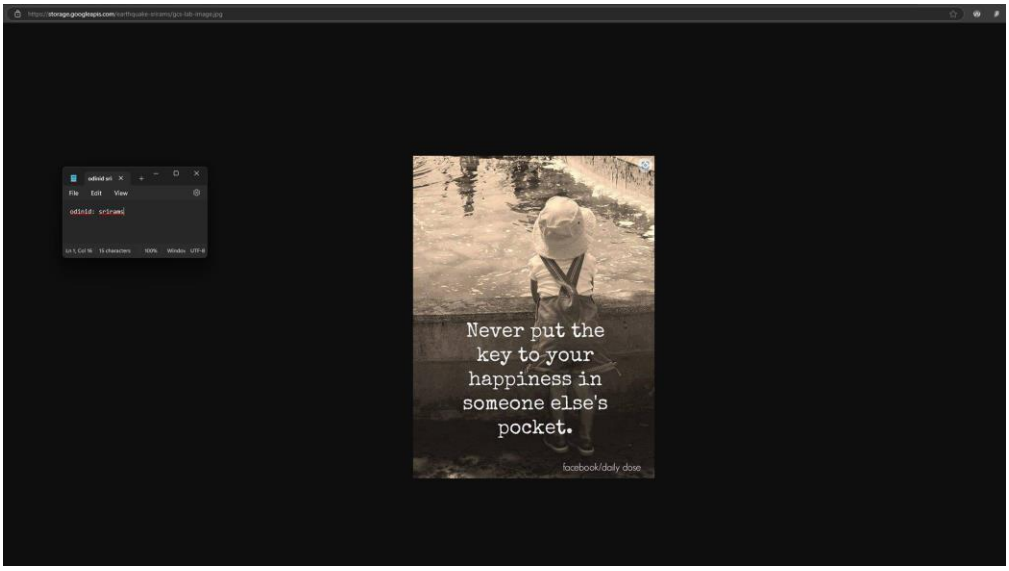
5.1.11 GCP Cloud Storage #3 (Python)

5.1.12 Python storage code

5.1.13 View object

- **Take a screenshot the shows the entire URL and the image that has been retrieved:**

https://storage.googleapis.com/earthquake-srirams/gcs-lab-image.jpg



5.1.14 Clean up

5.1.15 IAM and least privileges #4 (Optional)

05.2a: DynamoDB Guestbook

5.2.1 DynamoDB

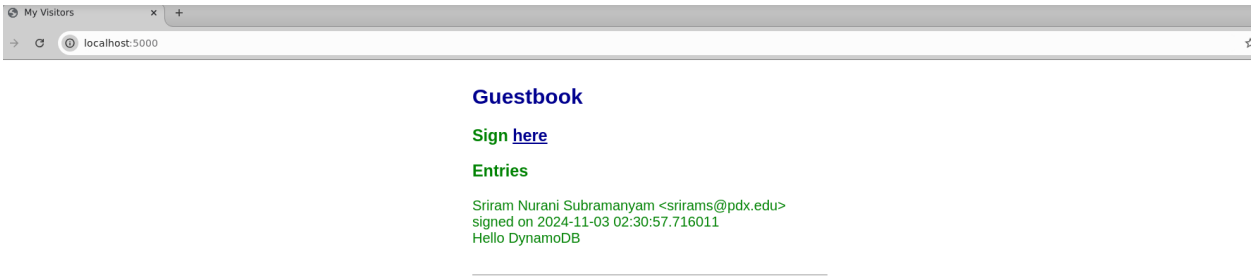
5.2.2 model_dynamodb

5.2.3 Version 1: Ubuntu VM Python

5.2.4 Obtain AWS credentials

5.2.5 Run the application

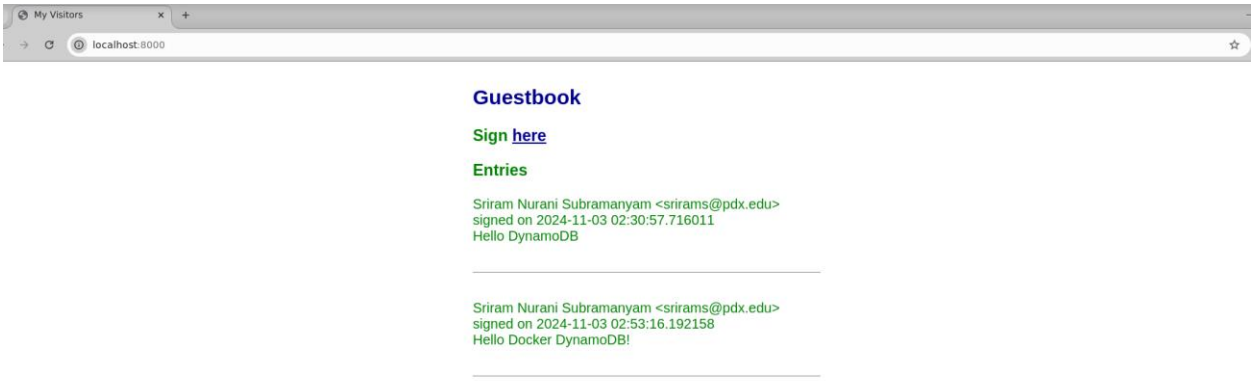
- **Take a screenshot of the output for your lab notebook.**



5.2.6 Version 2: Ubuntu VM Docker

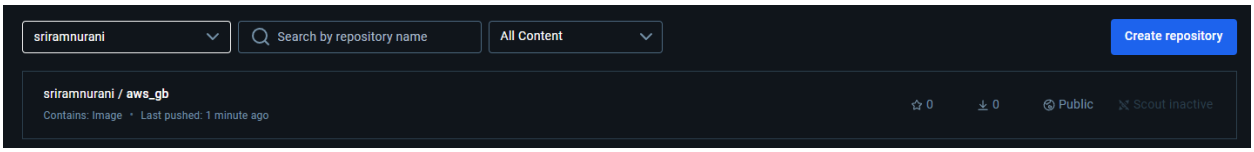
5.2.7 Run the application

- **Take a screenshot of the output for your lab notebook.**



5.2.8 Push the container image

- **Take a screenshot of the container image on DockerHub.**

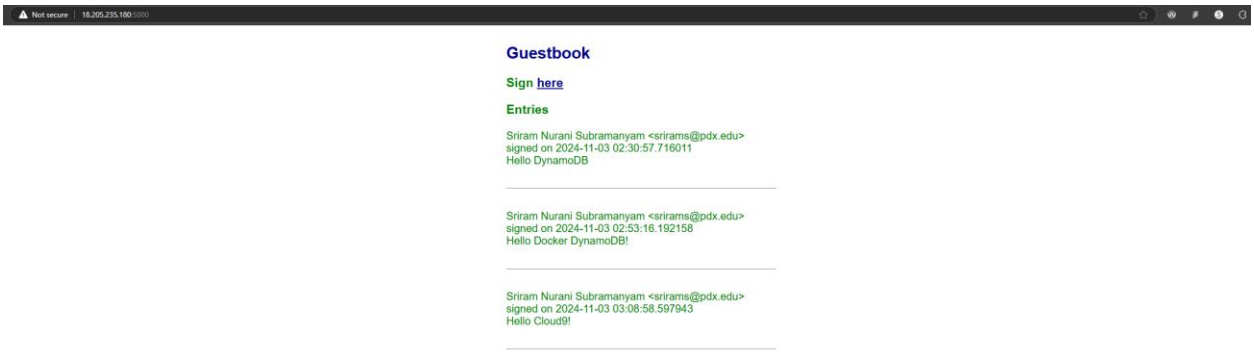


5.2.9 Version 3: AWS Cloud9 IDE

5.2.10 Configure the Security Group

5.2.11 Run the application

- **Take a screenshot as before that shows your entry and the IP address in the URL bar.**



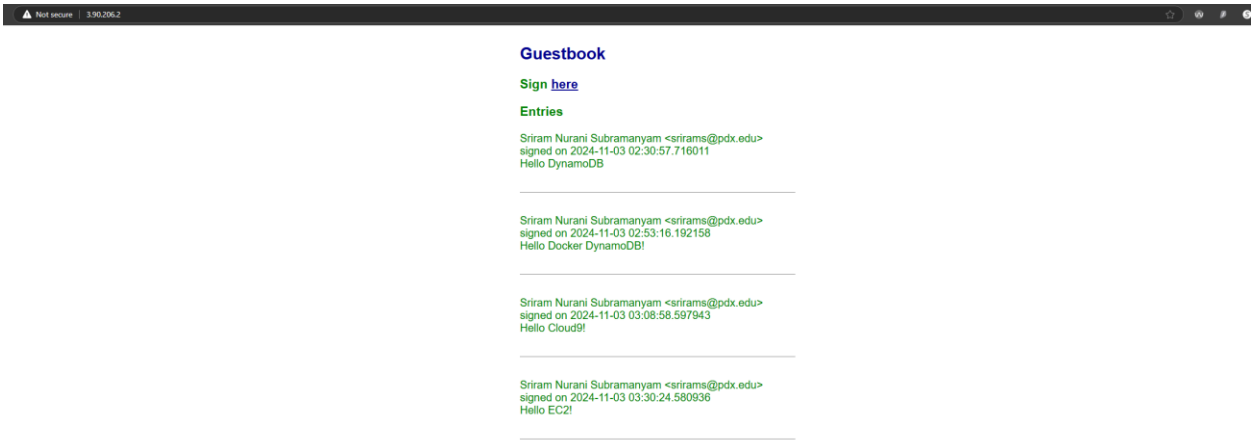
5.2.12 Version 4: AWS EC2

5.2.13 Connect to the instance

5.2.14 Set up the instance

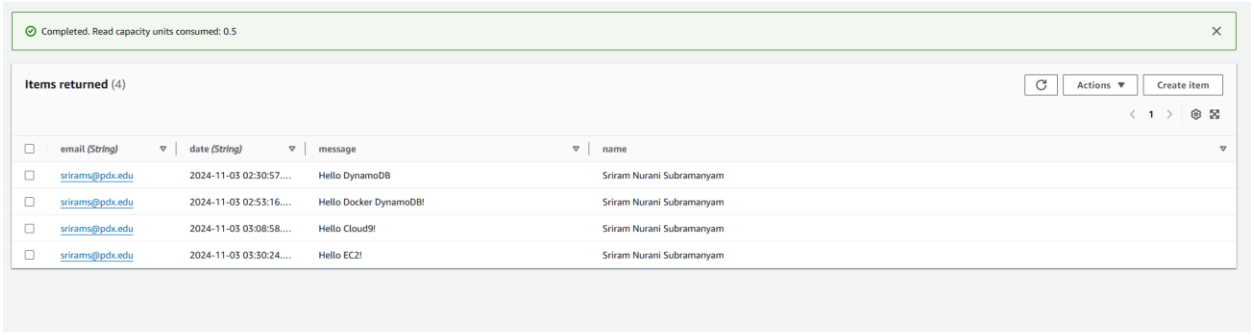
5.2.15 Visit the application

- **Take a screenshot as before that shows your entry and the IP address in the URL bar.**



5.2.16 View the database

- **Take a screenshot that shows all of the guestbook entries that you added to the DynamoDB table including their timestamps.**



5.2.17 Clean-up

5.2g: Cloud Datastore Guestbook

5.2.1 Cloud Datastore

5.2.2 model_datastore setup

5.2.3 model_datastore

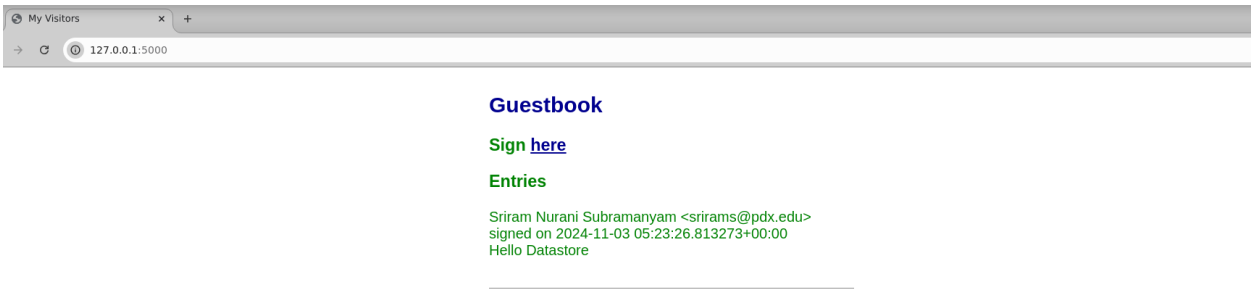
5.2.4 Datastore setup

5.2.5 Version 1: Ubuntu VM Python

5.2.6 Obtain GCP credentials

5.2.7 Run the application

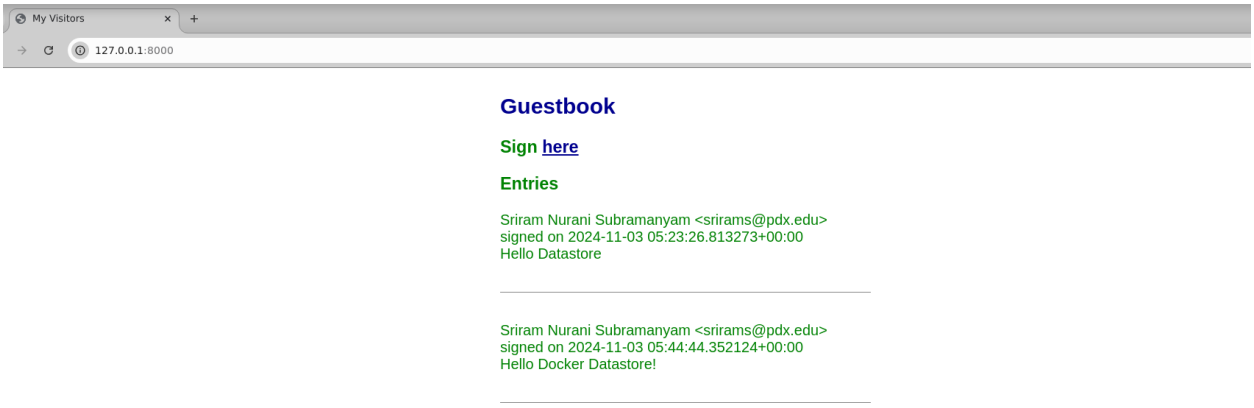
- **Take a screenshot of the output for your lab notebook.**



5.2.8 Version 2: Ubuntu VM Docker

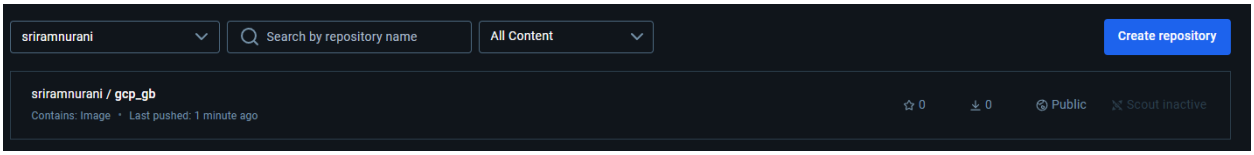
5.2.9 Run the application

- **Take a screenshot of the output for your lab notebook.**



5.2.10 Push the container image

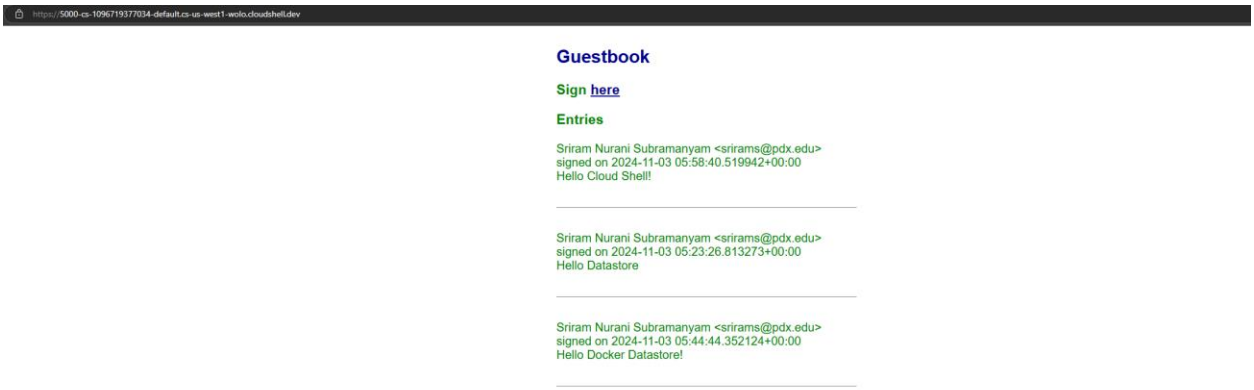
- **Take a screenshot of the container image on DockerHub.**



5.2.11 Version 3: GCP Cloud Shell

5.2.12 Run the application

- **Take a screenshot as before that shows your entry and the URL bar.**

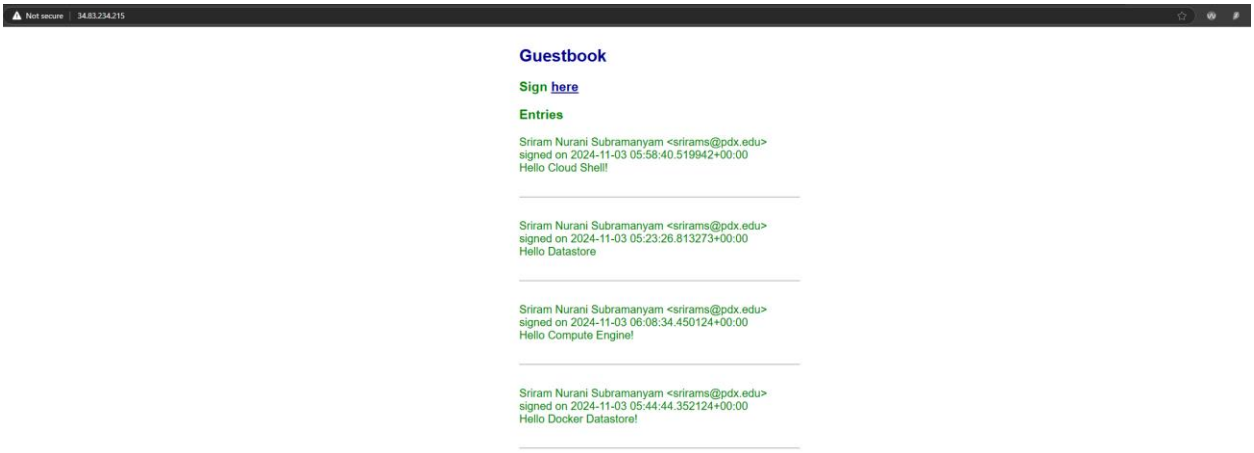


5.2.13 Version 4: GCP Compute Engine

5.2.14 Set up the instance

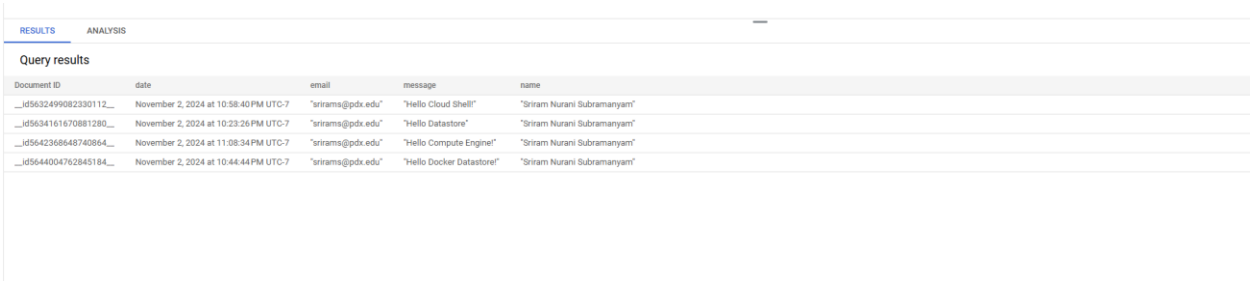
5.2.15 Visit the application

- **Take a screenshot as before that shows your entry and the IP address in the URL bar.**



5.2.16 View the database

- **Take a screenshot of all of the entries that have been added including their timestamps for your lab notebook.**



5.2.17 Clean up