

# Week #5 Labs

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## 05.1g: Storage, IAM

### 2. GCP Cloud Storage #1 (USGS)

The role attached to the Compute Engine default service account is '**Editor**'.

Yes, the '**Editor**' role is sufficient for the VM to create buckets, and read/write to them.

The default 'access scopes' to Cloud Storage is **read-only**.

No, the default 'access scopes' would not allow the VM to create buckets, only read them.

The options for the Storage API are: None, Read Only, Write Only, Read Write, Full.

### 4. USGS data and setup

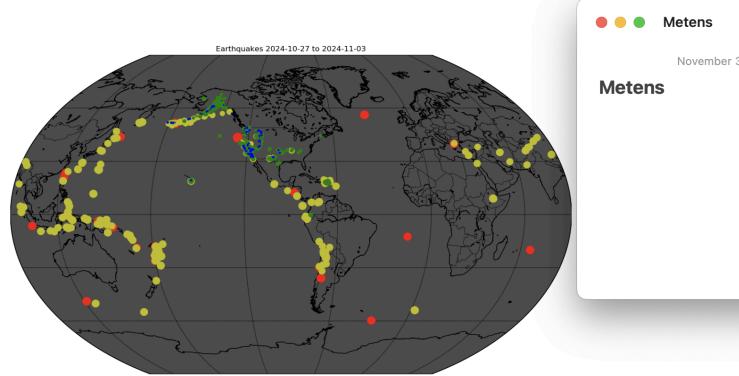
According to the `head -2 earthquakes.csv | column -t -s ','` command, the latest earthquake happened at time: **2024-11-03T19:42:54.568Z**.

The magnitude of the earthquake was **1.9**.

The place of the earthquake is **of**.

```
meters@usgs:/training-data-analyst/CFB100/lab2b$ head -2 earthquakes.csv | column -t -s ','
time           latitude    longitude   depth mag magType net  id updated place      type      horizontalError  depthError  magError  magNet  status locationSource  magSource
2024-11-03T19:42:54.568Z  59.7773   -151.686   25.2  1.9  ml       ak02de5p38vk  2024-11-03T19:44:51.683Z "5  km SW of Nikolaevsk Alaska"  earthquake  0.3  automatic  ak     status
meters@usgs:/training-data-analyst/CFB100/lab2b$
```

## 5. Python plotting Code



## 9. Service account roles (Compute)

The error I got from running the command: `gcloud compute instances list` was this:

```
WARNING: Some requests did not succeed.  
- Required 'compute.instances.list' permission for 'projects/cloud-metens'  
  
Listed 0 items.
```

For the VM to have access to the list of a project's Compute Engine resources, the role of **Compute Viewer** must be added.

```
metens@gcs-lab-vm:~$ gcloud compute instances list  
NAME          ZONE        MACHINE_TYPE  PREEMPTIBLE INTERNAL_IP  EXTERNAL_IP    STATUS  
instance-4-europe-west1-d  europe-west1-d  e2-medium    PREEMPTIBLE  10.132.0.2      TERMINATED  
course-vm2        us-west1-a   e2-medium    PREEMPTIBLE  10.138.0.7      TERMINATED  
course-vm         us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.2      RUNNING  
gcs-lab-vm        us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.18     34.168.81.250  RUNNING  
instance-001       us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.13      TERMINATED  
instance-1-us-west1-b  us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.9       TERMINATED  
instance-w5        us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.16      TERMINATED  
usgs             us-west1-b   e2-medium    PREEMPTIBLE  10.138.0.17     35.203.147.50  RUNNING  
instance-2-us-east1-c  us-east1-c   e2-medium    PREEMPTIBLE  10.142.0.2      TERMINATED  
instance-3-australia-sel1-a australia-southeast1-a e2-medium    PREEMPTIBLE  10.152.0.2      TERMINATED  
instance-1         us-west4-c   n1-standard-1 PREEMPTIBLE  10.182.0.2      TERMINATED  
instance-2         us-west4-a   n1-standard-1 PREEMPTIBLE  10.182.0.3      TERMINATED  
metens@gcs-lab-vm:~$
```

## 10. Service account roles (Storage)

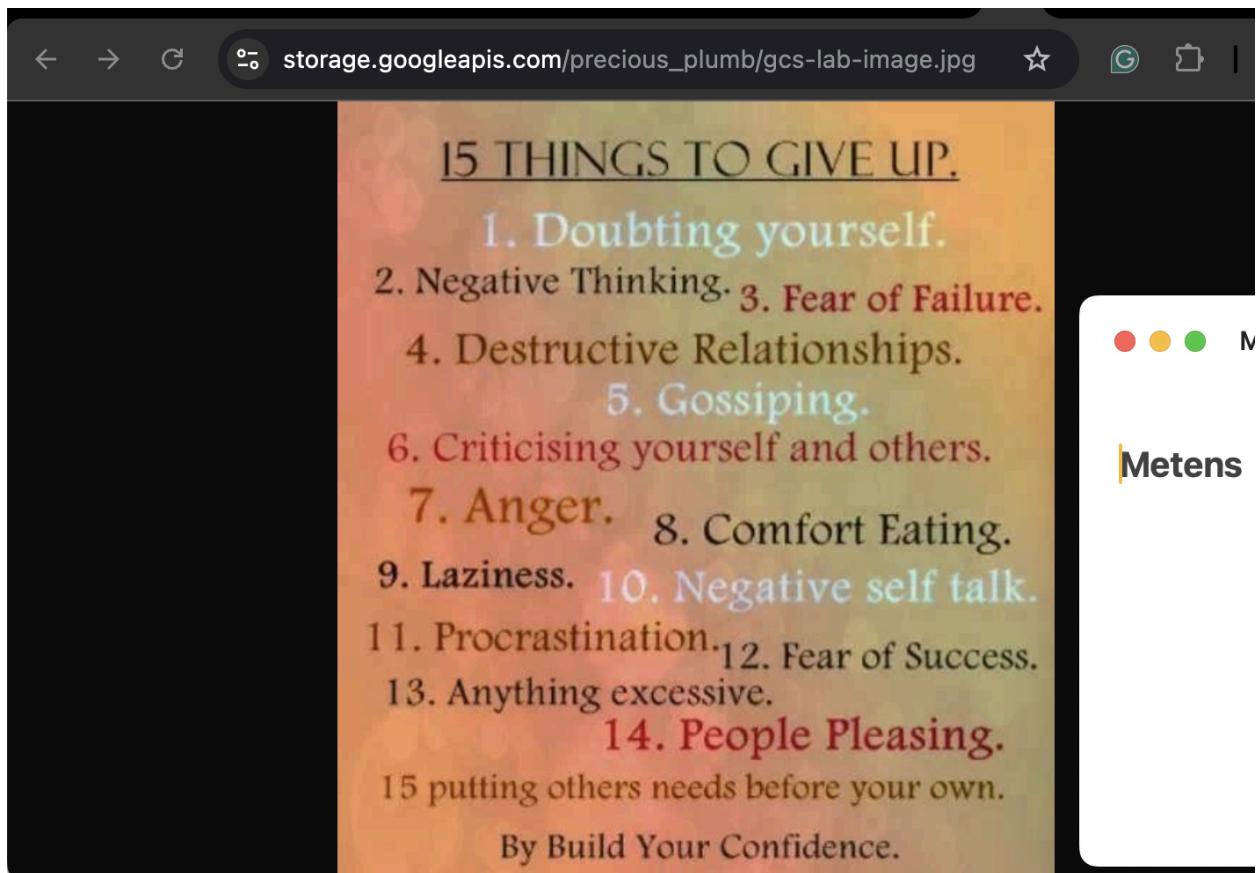
After running the command: `gsutil cp moonquakes.png gs://precious_plumb/` I got error:

```
Copying file://moonquakes.png [Content-Type=image/png]...  
AccessDeniedException: 403 gcs-lab@cloud-metens.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).
```

To be able to add an object to the storage bucket, the VM needs to add the **Storage Object Creator** role. Once the role was added:

```
metens@gcs-lab-vm:~$ ls
earthquakes.png moonquakes.png snap
metens@gcs-lab-vm:~$ gsutil cp moonquakes.png gs://precious_plumb/
Copying file://moonquakes.png [Content-Type=image/png]...
/ [1 files] [315.0 KiB/315.0 KiB]
Operation completed over 1 objects/315.0 KiB.
metens@gcs-lab-vm:~$ █
```

### 13. View object



## 05.2a: DynamoDB Guestbook

### 5. Run the application

I tried to access the flask app from my web browsers for over an hour and tried clearing my cache, changing the port, and the incognito window, and tried to connect to the Windows app but nothing worked. So I used curl to post on the app instead, here is my work:

```
(env) metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ ls
Dockerfile __pycache__ application.py env gbmmodel index.py requirements.txt sign.py static templates
(env) metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ python3 application.py
* Serving Flask app 'application'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5001
* Running on http://10.138.0.19:5001
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 111-110-944
10.138.0.19 - - [04/Nov/2024 19:36:38] "GET / HTTP/1.1" 200 -
10.138.0.19 - - [04/Nov/2024 19:36:48] "GET /sign/ HTTP/1.1" 200 -
10.138.0.19 - - [04/Nov/2024 19:37:27] "POST /sign/ HTTP/1.1" 302 -
10.138.0.19 - - [04/Nov/2024 19:37:36] "GET / HTTP/1.1" 200 -

```

Here is used curl to access the running application to create a post:

```
metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ ls
Dockerfile __pycache__ application.py env gbmmodel index.py requirements.txt sign.py static templates
metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ curl http://10.138.0.19:5001/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

<h2>Guestbook</h2>

<h3>Sign <a href="/sign/">here</a></h3>
<h3>Entries</h3>

<p class=entry>
    &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;;
    <br>signed on 2024-11-04 19:35:42.589998<br>
    Hello DynamoDB
</p>

</div>
</html>metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ curl http://10.138.0.19:5001/sign/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

<h2>Sign Guestbook</h2>
<form action="/sign/" method=post>
    <p class="heading">Name: <input type=text name=name></p>
    <p class="heading">Email: <input type=text name=email></p>
    <p class="heading">Message:
        <textarea rows=5 cols=50 name=message></textarea></p>
        <p><input type=submit value=Sign></p>
</form>

</div>
```

```

metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ curl -X POST http://10.138.0.19:5001/sign/ \
>     -d 'name="Nathan Metens"' \
>     -d 'email=metens@pdx.edu' \
>     -d 'message=Hello DynamoDB'
<!doctype html>
<html lang=en>
<title>Redirecting...</title>
<h1>Redirecting...</h1>
<p>You should be redirected automatically to the target URL: <a href="/">/</a>. If not, click the link.
metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ curl http://10.138.0.19:5001/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

<h2>Guestbook</h2>

<h3>Sign <a href="/sign/">here</a></h3>
<h3>Entries</h3>

<p class=entry>
    Nathan Metens <metens@pdx.edu>
    signed on 2024-11-04 19:35:42.589998<br>
    Hello DynamoDB
</p>

<p class=entry>
    Nathan Metens <metens@pdx.edu>
    signed on 2024-11-04 19:37:26.954167<br>
    Hello DynamoDB
</p>

</div>
</html>metens@instance-20241104-185212:~/cs430-src/05_aws_dynamodb$ █

```

## 7. Run the application

Again, RDP doesn't work no matter what I try so I cannot access the guestbook on a browser or through Windows app. Here is the guestbook over curl:

```

G4Ld7atM= --env PORT=80 -p 8001:80 aws_gb
[2024-11-05 01:09:57 +0000] [1] [INFO] Starting gunicorn 23.0.0
[2024-11-05 01:09:57 +0000] [1] [INFO] Listening at: http://0.0.0.0:80 (1)
[2024-11-05 01:09:57 +0000] [1] [INFO] Using worker: gthread
[2024-11-05 01:09:57 +0000] [7] [INFO] Booting worker with pid: 7
█

```

I used port 8001 because I was getting error messages saying that port 8000 was already occupied.

```
metens@course-vm:~$ curl http://localhost:8001
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

    <h2>Guestbook</h2>

    <h3>Sign <a href="/sign/">here</a></h3>
    <h3>Entries</h3>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;
        <br>signed on 2024-11-04 19:35:42.589998<br>
        Hello DynamoDB
    </p>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;
        <br>signed on 2024-11-04 19:37:26.954167<br>
        Hello DynamoDB
    </p>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;
        <br>signed on 2024-11-04 19:48:10.936737<br>
        Hello Dynamo
    </p>

    <p class=entry>
        Nathan Metens &lt;metens@pdx.edu&gt;
        <br>signed on 2024-11-05 00:03:08.300858<br>
        Hello Docker DynamoDB
    </p>

</div>
```

```
</html>metens@course~$ curl http://localhost:8001/sign/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

    <h2>Sign Guestbook</h2>
    <form action="/sign/" method=post>
        <p class="heading">Name: <input type=text name=name></p>
        <p class="heading">Email: <input type=text name=email></p>
        <p class="heading">Message:
        <textarea rows=5 cols=50 name=message></textarea></p>
        <p><input type=submit value=Sign></p>
    </form>

</div>
</html>metens@coursecurl -X POST http://localhost:8000/sign/ \sign/ \
-d "name=Nathan Metens&email=metens@pdx.edu&message>Hello Docker DynamoDB"
<!doctype html>
<html lang=en>
<title>Redirecting...</title>
<h1>Redirecting...</h1>
<p>You should be redirected automatically to the target URL: <a href="/">/</a>. If not, click the link.
```

```
metens@course-vm:~$ curl http://localhost:8001/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

    <h2>Guestbook</h2>

    <h3>Sign <a href="/sign/">here</a></h3>
    <h3>Entries</h3>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;;
        <br>signed on 2024-11-04 19:35:42.589998<br>
        Hello DynamoDB
    </p>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;;
        <br>signed on 2024-11-04 19:37:26.954167<br>
        Hello DynamoDB
    </p>

    <p class=entry>
        &#34;Nathan Metens&#34; &lt;metens@pdx.edu&gt;;
        <br>signed on 2024-11-04 19:48:10.936737<br>
        Hello Dynamo
    </p>

    <p class=entry>
        Nathan Metens &lt;metens@pdx.edu&gt;;
        <br>signed on 2024-11-05 00:03:08.300858<br>
        Hello Docker DynamoDB
    </p>

    <p class=entry>
        Nathan Metens &lt;metens@pdx.edu&gt;;
        <br>signed on 2024-11-05 01:11:55.896432<br>
        Hello Docker DynamoDB
    </p>

</div>
metens@course-vm:~$
```

## 8. Push the container image

The screenshot shows the Docker Hub interface for the repository `nmetens/aws_gb`. The repository has 0 stars and was updated 1 minute ago by `nmetens`. The `IMAGE` tab is selected. A button labeled `Manage Repository` is visible in the top right. Below the repository name, there are tabs for `Overview` and `Tags`, with `Tags` being the active tab. It shows a dropdown for `Sort by` set to `Newest` and a search bar for `Filter Tags`. Under the `Tags` section, there is a table with one row for the `latest` tag. The table columns are `Digest`, `OS/ARCH`, `Last pull`, and `Compressed Size`. The digest is `232b43849daf`, the OS/ARCH is `linux/amd64`, the last pull was `a few seconds ago`, and the compressed size is `48.55 MB`. A blue `Copy` button is located next to the `docker pull nmetens/aws_gb:latest` command.

## 11. Run the application

The screenshot shows a Cloud9 IDE session at the URL `https://us-east-1.console.aws.amazon.com/cloud9/ide/e2b515e732cb4c579165a6ec1a1914ec?region=us-east-1`. The terminal window displays the output of a Python script. The script prints several entries from a DynamoDB table, each containing a name, email, and a timestamp. The output is as follows:

```
</p>
<p class=entry>
    &#34;Nathan Metens&#34; <metens@pdx.edu>;
    <br>signed on 2024-11-04 19:37:26.954167<br>
    Hello DynamoDB
</p>

<p class=entry>
    &#34;Nathan Metens&#34; <metens@pdx.edu>;
    <br>signed on 2024-11-04 19:48:10.936737<br>
    Hello Dynamo
</p>

<p class=entry>
    Nathan Metens <metens@pdx.edu>;
    <br>signed on 2024-11-05 00:03:08.300858<br>
    Hello Docker DynamoDB
</p>

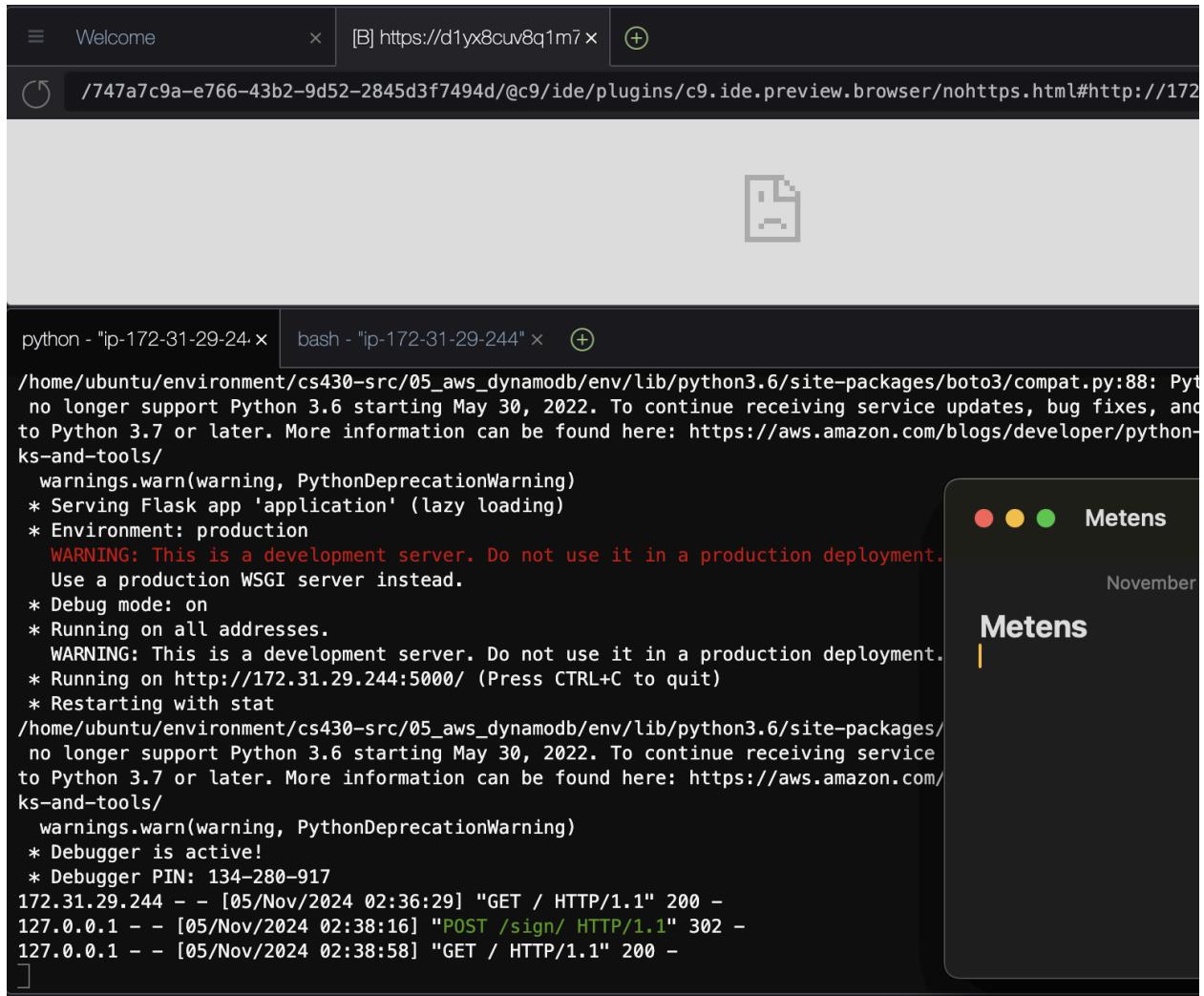
<p class=entry>
    Nathan Metens <metens@pdx.edu>;
    <br>signed on 2024-11-05 01:11:55.896432<br>
    Hello Docker DynamoDB
</p>

<p class=entry>
    Nathan Metens <metens@pdx.edu>;
    <br>signed on 2024-11-05 02:38:16.002604<br>
    Hello Cloud9!
</p>

</div>
voclabs:~/environment $
```

The Cloud9 interface includes a sidebar with file navigation, a preview pane, and a status bar at the bottom indicating the master branch and AWS profile.

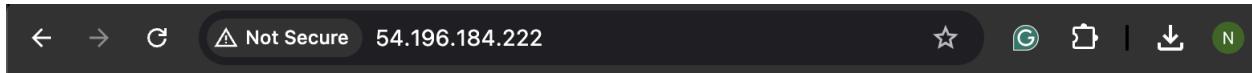
Again, when I clicked the <http://172.31.29.244.5000/> link from flask, the page was not accessible. So I curled as before to access the notebook.



The screenshot shows a terminal window with two tabs: "python - "ip-172-31-29-24.x" and "bash - "ip-172-31-29-244". The "python" tab displays the Flask application logs, which include several deprecation warnings about Python 3.6 support ending in May 2022. The "bash" tab shows the command used to start the application. To the right of the terminal, a browser window is open to a preview URL, showing a simple "File" icon on a white background.

```
python - "ip-172-31-29-24.x" bash - "ip-172-31-29-244" x +  
/home/ubuntu/environment/cs430-src/05_aws_dynamodb/env/lib/python3.6/site-packages/boto3/compat.py:88: Py  
no longer support Python 3.6 starting May 30, 2022. To continue receiving service updates, bug fixes, and  
to Python 3.7 or later. More information can be found here: https://aws.amazon.com/blogs/developer/python-  
ks-and-tools/  
    warnings.warn(warning, PythonDeprecationWarning)  
* Serving Flask app 'application' (lazy loading)  
* Environment: production  
    WARNING: This is a development server. Do not use it in a production deployment.  
    Use a production WSGI server instead.  
* Debug mode: on  
* Running on all addresses.  
    WARNING: This is a development server. Do not use it in a production deployment.  
* Running on http://172.31.29.244:5000/ (Press CTRL+C to quit)  
* Restarting with stat  
/home/ubuntu/environment/cs430-src/05_aws_dynamodb/env/lib/python3.6/site-packages/  
no longer support Python 3.6 starting May 30, 2022. To continue receiving service  
to Python 3.7 or later. More information can be found here: https://aws.amazon.com/  
ks-and-tools/  
    warnings.warn(warning, PythonDeprecationWarning)  
* Debugger is active!  
* Debugger PIN: 134-280-917  
172.31.29.244 - - [05/Nov/2024 02:36:29] "GET / HTTP/1.1" 200 -  
127.0.0.1 - - [05/Nov/2024 02:38:16] "POST /sign/ HTTP/1.1" 302 -  
127.0.0.1 - - [05/Nov/2024 02:38:58] "GET / HTTP/1.1" 200 -
```

## 15. Visit the application



Nathan Metens <metens@pdx.edu>  
signed on 2024-11-05 01:11:55.896432  
Hello Docker DynamoDB

---

Nathan Metens <metens@pdx.edu>  
signed on 2024-11-05 02:38:16.002604  
Hello Cloud9!

---

Nathan Metens <metens@pdx.edu>  
signed on 2024-11-05 04:39:52.560737  
Hello EC2!

---

## 16. View the database

Select a table or index **Table - guestbook** Select attribute projection **All attributes**

▶ Filters

**Run** **Reset**

✓ Completed. Read capacity units consumed: 0.5 X

Items returned (7)						Actions ▾	Create item
	email (String)	date (String)	message	name			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-04 19:35:42....	Hello Dyna...	"Nathan Metens"			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-04 19:37:26....	Hello Dyna...	"Nathan Metens"			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-04 19:48:10....	Hello Dyna...	"Nathan Metens"			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-05 00:03:08....	Hello Docke...	Nathan Metens			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-05 01:11:55....	Hello Docke...	Nathan Metens			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-05 02:38:16....	Hello Cloud9!	Nathan Metens			
<input type="checkbox"/>	<a href="#">metens@pdx.edu</a>	2024-11-05 04:39:52....	Hello EC2!	Nathan Metens			

# 05.2g: Cloud Datastore Guestbook

## 7. Run the application

```
metens@course-vm:~/cs430-src/05_gcp_datastore$ curl http://10.138.0.2:5000/
<!doctype html>
<html>
<title>My Visitors</title>
<link rel=stylesheet type=text/css href="/static/style.css">
<div class=page>

<h2>Guestbook</h2>

<h3>Sign <a href="/sign/">here</a></h3>
<h3>Entries</h3>

<p class=entry>
    Nathan Metens &lt;metens@pdx.edu&gt;
    <br>signed on 2024-11-05 06:07:00.327416+00:00<br>
    Hello Datastore
</p>

</div>
</html>metens@course-vm:~/cs430-src/05_gcp_datastore$ █
```

## 9. Run the application

Nothing is working. I've worked on this lab for at least 9 hours today. I give up, for now. I'll try again later and put it in the late folder.

```
File "<frozen importlib._bootstrap>", line 1206, in _gcd_import
File "<frozen importlib._bootstrap>", line 1178, in _find_and_load
File "<frozen importlib._bootstrap>", line 1149, in _find_and_load_unlocked
File "<frozen importlib._bootstrap>", line 690, in _load_unlocked
File "<frozen importlib._bootstrap_external>", line 940, in exec_module
File "<frozen importlib._bootstrap>", line 241, in _call_with_frames_removed
File "/app/app.py", line 6, in <module>
    from index import Index
File "/app/index.py", line 3, in <module>
    import gbmodel
File "/app/gbmodel/__init__.py", line 17, in <module>
    appmodel = model()
    ^^^^^^^^
File "/app/gbmodel/model_datastore.py", line 39, in __init__
    self.client = datastore.Client('cloud-metens')
    ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "/env/lib/python3.11/site-packages/google/cloud/datastore/client.py", line 324, in __init__
    super(Client, self).__init__(
File "/env/lib/python3.11/site-packages/google/cloud/client/__init__.py", line 321, in __init__
    Client.__init__(
File "/env/lib/python3.11/site-packages/google/cloud/client/__init__.py", line 178, in __init__
    credentials, _ = google.auth.default(scopes=scopes)
    ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "/env/lib/python3.11/site-packages/google/auth/_default.py", line 659, in default
    credentials, project_id = checker()
    ^^^^^^^^
File "/env/lib/python3.11/site-packages/google/auth/_default.py", line 652, in <lambda>
    lambda: _get_explicit_environ_credentials(quota_project_id=quota_project_id),
    ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
File "/env/lib/python3.11/site-packages/google/auth/_default.py", line 271, in _get_explicit_environ_credentials
    credentials, project_id = load_credentials_from_file(
    ^^^^^^^^^^^^^^^^^^^^^
File "/env/lib/python3.11/site-packages/google/auth/_default.py", line 118, in load_credentials_from_file
    with io.open(filename, "r") as file_obj:
    ^^^^^^^^
IsADirectoryError: [Errno 21] Is a directory: '/tmp/guestbook-key-on-container.json'
[2024-11-05 07:03:21 +0000] [7] [INFO] Worker exiting (pid: 7)
[2024-11-05 07:03:21 +0000] [1] [ERROR] Worker (pid:7) exited with code 3
[2024-11-05 07:03:21 +0000] [1] [ERROR] Shutting down: Master
[2024-11-05 07:03:21 +0000] [1] [ERROR] Reason: Worker failed to boot.
(env) metens@course-vm:~/cs430-src/05_gcp_datastore$
```