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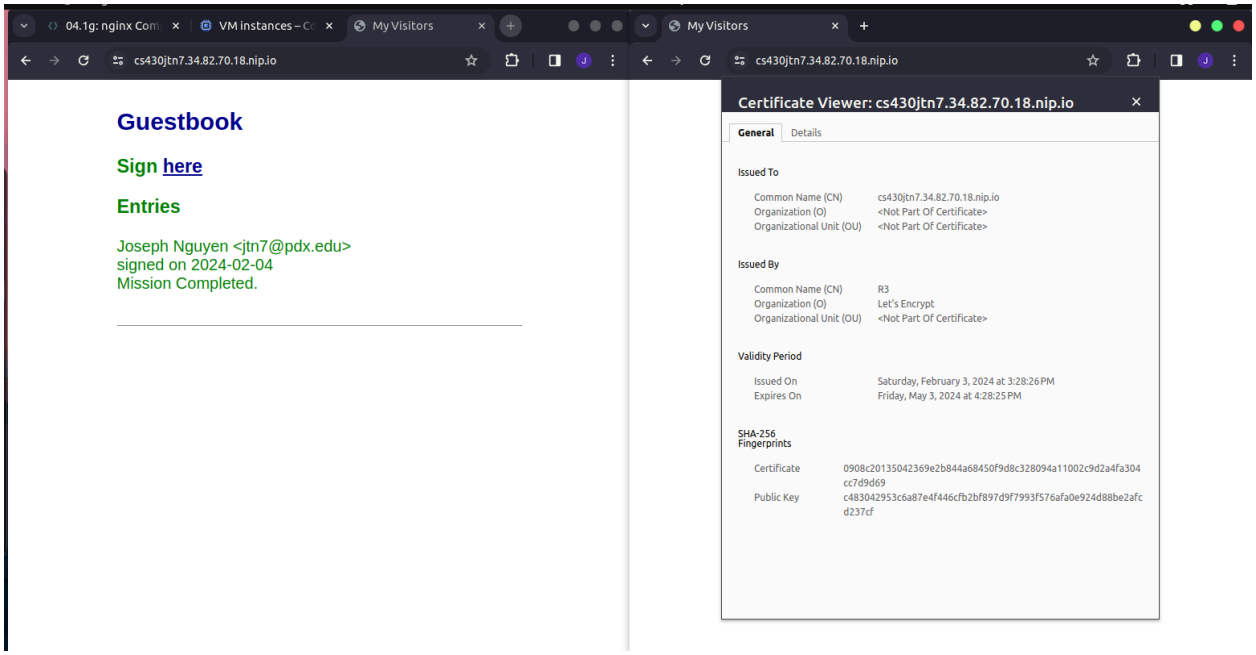
## Section 4.1

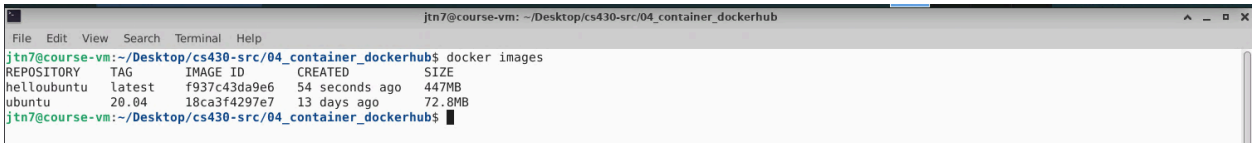
Bring the site up in a browser over HTTPS. Within the browser, find the site's certificate, who it was issued by and the dates it is valid. Then, add an entry to the guestbook.

Take a screenshot of the site along with its Let's Encrypt certificate and include it in your lab notebook




## Section 4.2

### docker images - Screenshot




Run the image directly from Docker Hub and show a screenshot of the output of the command in your lab notebook.

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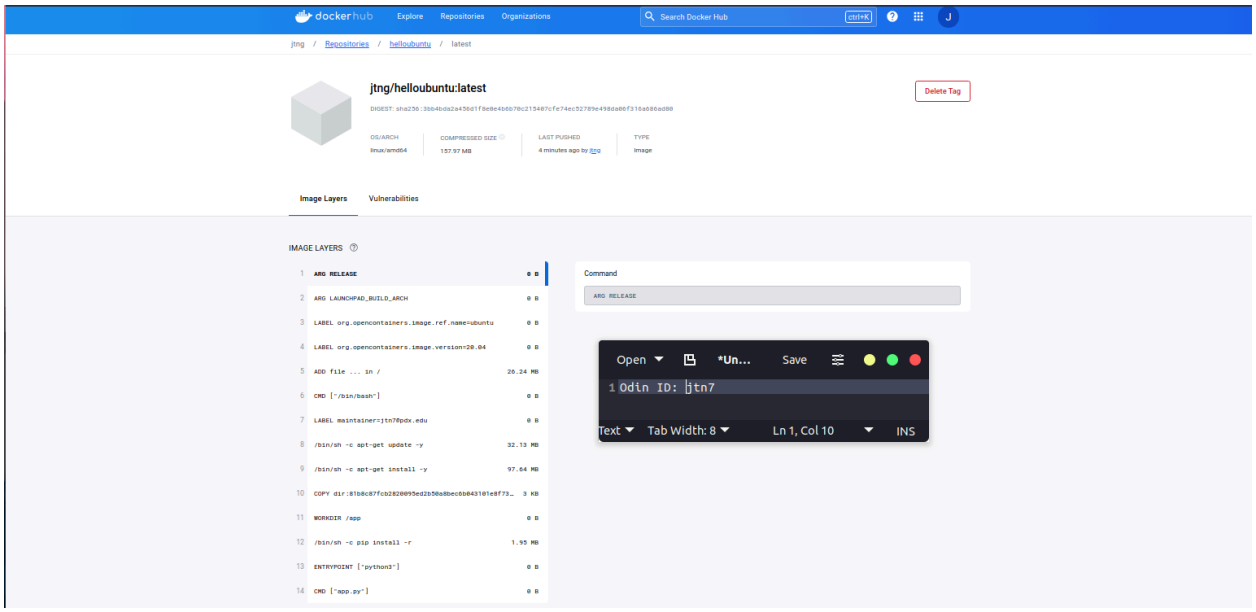
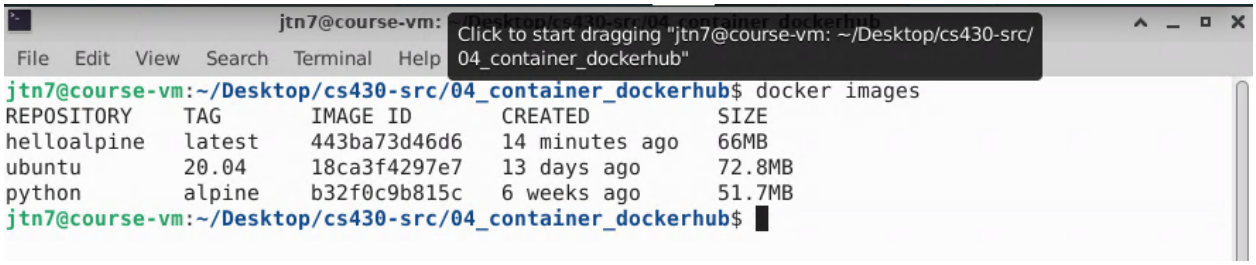
Take a screenshot of the container image and its size for your lab notebook.




What layer adds the most to the container image? How much does it add?
**Layer 9 adds the most to the container image. It adds 97.64 MB.**

Take a screenshot of the image generated and its size for your lab notebook.




How much smaller is the image than the Ubuntu one?
**The alpine version is 66MB while the Ubuntu one was 447MB, so the alpine image is 381MB less.**

Attempt to get an interactive shell on the container by performing the following:
docker exec -it helloa /bin/bash
Show the output of this command in a screenshot for your lab notebook. What might have happened?

```
jtn7@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/bash
OCI runtime exec failed: exec failed: unable to start container process: exec: "/bin/bash": stat /bin/bash: no such file or directory: unknown
jtn7@course-vm:~/Desktop/cs430-src/04_container_dockerhub$
```

**The interactive shell might not be stored at that location.**

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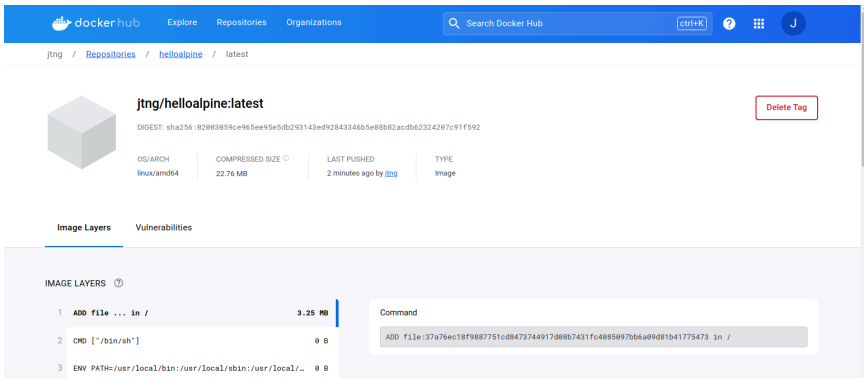
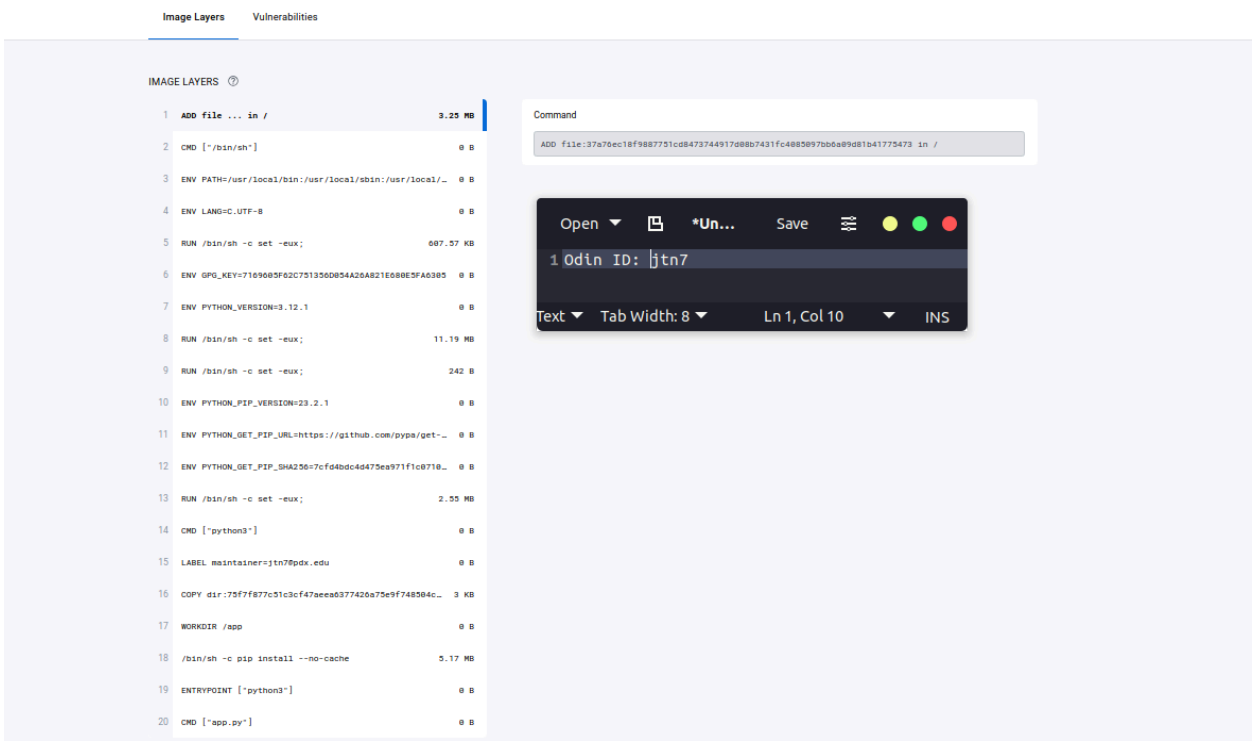
Finally, within the container, examine the file specifying the Alpine release being used (/etc/alpine-release) and perform a process listing command (ps -ef).
Take a screenshot of the output of each

```
jtn7@course-vm:~/Desktop/cs430-src/04_container_dockerhub$ docker exec -it helloa /bin/sh
/app # ps -ef
PID   USER     TIME  COMMAND
    1 root      0:00 python3 app.py
    7 root      0:01 /usr/local/bin/python3 app.py
   28 root      0:00 /bin/sh
   34 root      0:00 ps -ef
/app # cat /etc/alpine-release
3.19.1
/app #
```

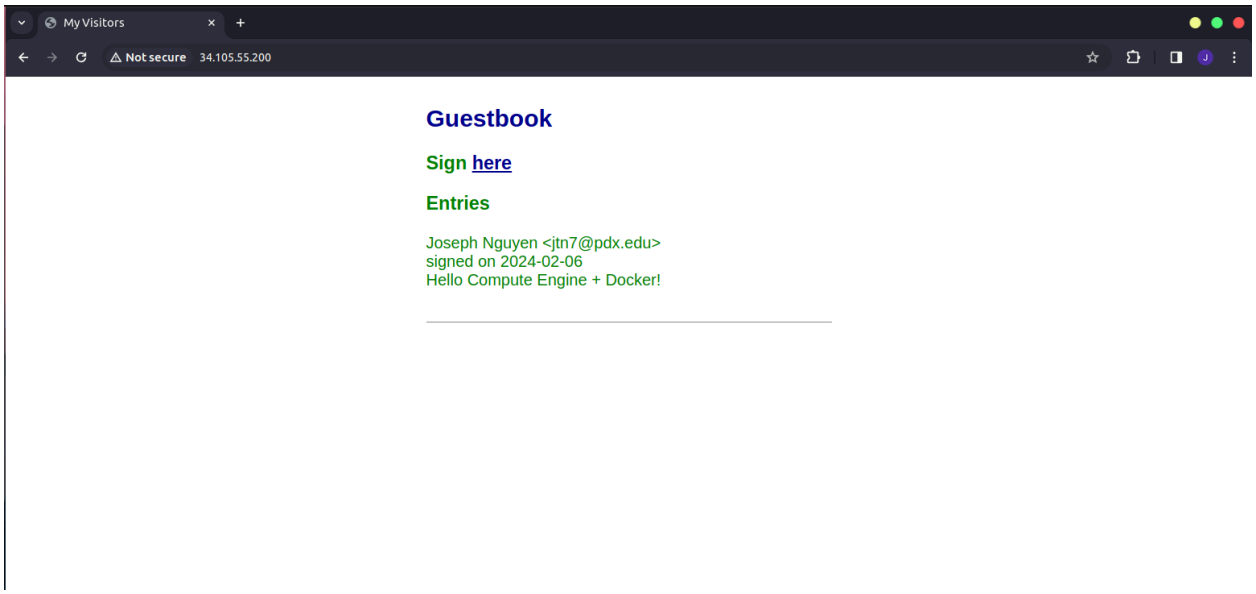
Alpine Docker Image - Take a screenshot of the container image and its size.



Go to a web browser and point it to the External IP address of the VM. Note that, this can also be done by clicking on the IP address from the Compute Engine console. Sign the guestbook with the message "Hello Compute Engine + Docker!"

Take a screenshot of the entry that includes the VM's external IP address for your lab notebook




Finally, visit the site via the external IP address on port 5000 to show the site is running. Add a "Hello ContainerOS!" guestbook entry.

Take a screenshot of the entry that includes the VM's external IP address for your lab notebook