Lab 1

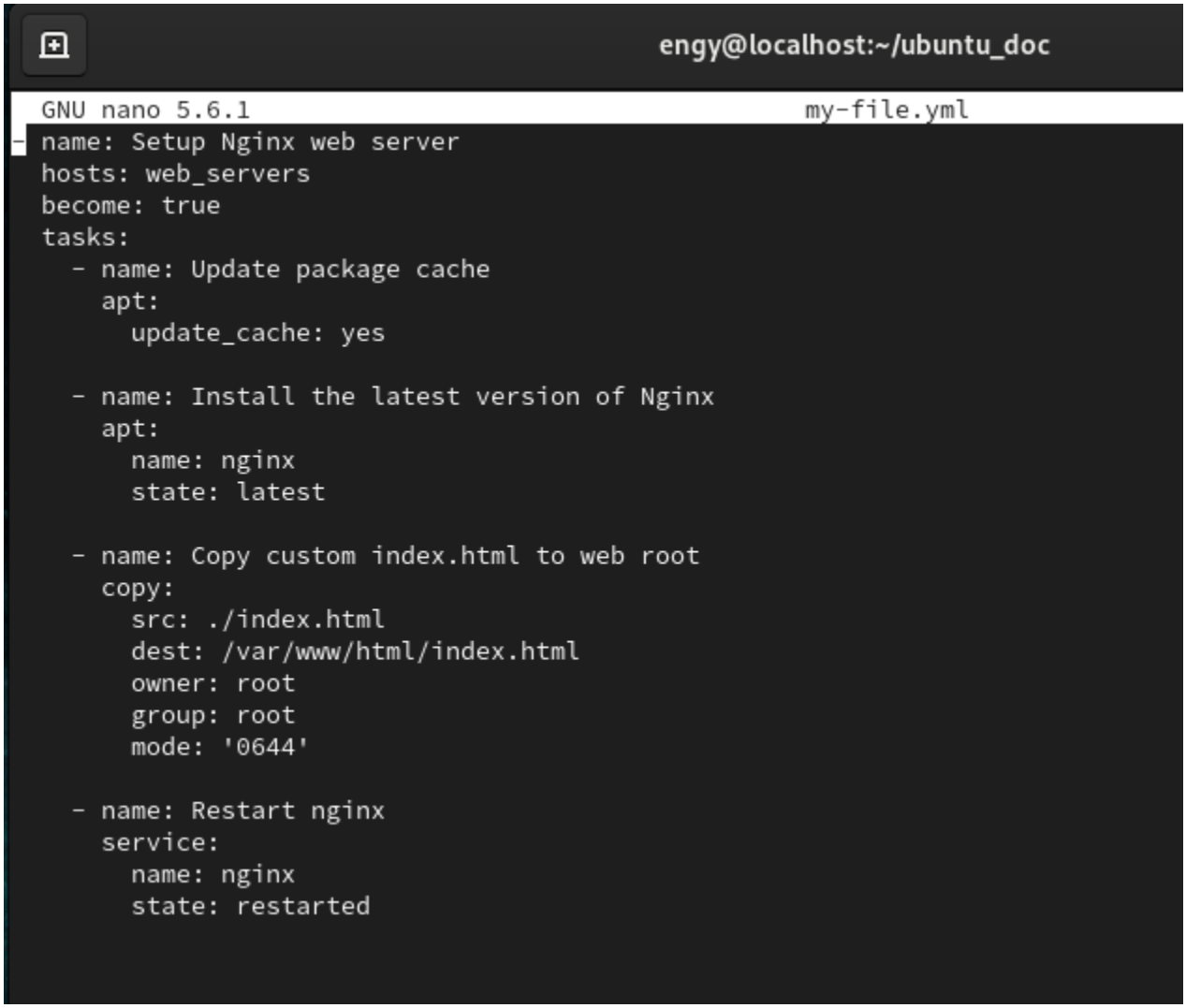
- I generated an RSA key pair using the `ssh-keygen` command. The private key is saved in `~/ubuntu_doc/keys/key`, and the public key is saved in `~/ubuntu_doc/keys/key.pub`. This key pair will be used for secure SSH connections.

```
engy@localhost:~/ubuntu_doc
[engy@localhost ~]$ mkdir ~/ubuntu_doc
[engy@localhost ~]$ cd ~/ubuntu_doc
[engy@localhost ubuntu_doc]$ touch Dockerfile ansible.cfg inventory my-file.yml index.html
[engy@localhost ubuntu_doc]$ mkdir keys
[engy@localhost ubuntu_doc]$ tree ~/ubuntu_doc
/home/engy/ubuntu_doc
├── ansible.cfg
├── Dockerfile
├── index.html
├── inventory
├── keys
└── my-file.yml

1 directory, 5 files
[engy@localhost ubuntu_doc]$ ssh-keygen -t rsa -b 2048 -f ~/ubuntu_doc/keys/key
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/engy/ubuntu_doc/keys/key
Your public key has been saved in /home/engy/ubuntu_doc/keys/key.pub
The key fingerprint is:
SHA256:5J2j1u+eBNukFn030MDt5xxRxhj7eevxL+b83DXFWZ4 engy@localhost.localdomain
The key's randomart image is:
+---[RSA 2048]----+
|            ..o++|
|             .+=.|
|        .    .o.o|
|       o . o  .**|
|        S * o .EX|
|         o O . .B|
|        o = o  +.|
|       . . o o+.*|
|          o=oo+B|
+----[SHA256]-----+
```

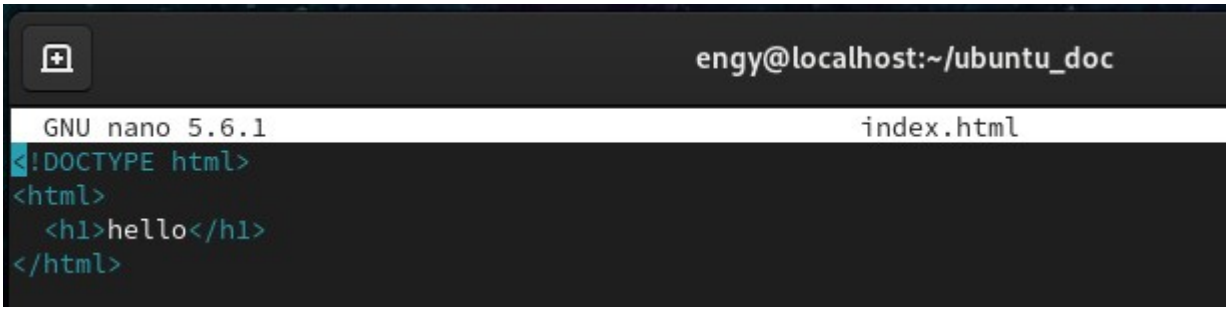
- I successfully built the Docker image using the `docker build` command, and the image was tagged as `ubuntu_doc`. After running the container with the `docker run` command, it started successfully. The container's IP address is `172.17.0.2`, which I can use to test the setup.

```
[engy@localhost ubuntu_doc]$ [200~sudo docker build -t ubuntu_doc .
bash: [200~sudo: command not found...
[engy@localhost ubuntu_doc]$ sudo docker build -t ubuntu_doc .
[+] Building 67.9s (10/10) FINISHED                                    docker:default
 => [internal] load build definition from Dockerfile                           0.0s
 => => transferring dockerfile: 260B                                           0.0s
 => [internal] load metadata for docker.io/library/ubuntu:latest               1.5s
 => [auth] library/ubuntu:pull token for registry-1.docker.io                  0.0s
 => [internal] load .dockerignore                                              0.1s
 => => transferring context: 2B                                                0.0s
 => CACHED [1/5] FROM docker.io/library/ubuntu:latest@sha256:80dd3c3b9c6cecb9f1667e9290  0.0s
 => [2/5] RUN apt update && apt install ssh sudo -y                           64.1s
 => [3/5] RUN adduser iti                                                      0.6s
 => [4/5] RUN echo "iti:123" | chpasswd                                        0.3s
 => [5/5] RUN usermod -aG sudo iti                                             0.3s
 => exporting to image                                                         0.8s
 => => exporting layers                                                        0.7s
 => => writing image sha256:b2676f61e53499f1ae34c68b1c02ee145164cd9568c49fb4d50c8f30007  0.0s
 => => naming to docker.io/library/ubuntu_doc                                  0.0s

 1 warning found (use docker --debug to expand):
 - JSONArgsRecommended: JSON arguments recommended for ENTRYPOINT to prevent unintended behavior related to OS
 signals (line 6)
[engy@localhost ubuntu_doc]$ sudo docker run -dit --name ubuntu_doc ubuntu_doc
e9a533e5942dd2082cfad5336677cb98292be5d8b50cc4f8c7f307154a871d0d
[engy@localhost ubuntu_doc]$ sudo docker ps -a
CONTAINER ID   IMAGE        COMMAND                  CREATED         STATUS         PORTS     NAMES
e9a533e5942d   ubuntu_doc   "/bin/sh -c 'service…"   7 seconds ago   Up 7 seconds             ubuntu_doc
[engy@localhost ubuntu_doc]$ sudo docker inspect -f '{{range.NetworkSettings.Networks}}{{.IPAddress}}{{end}}'
ubuntu_doc
172.17.0.2
```

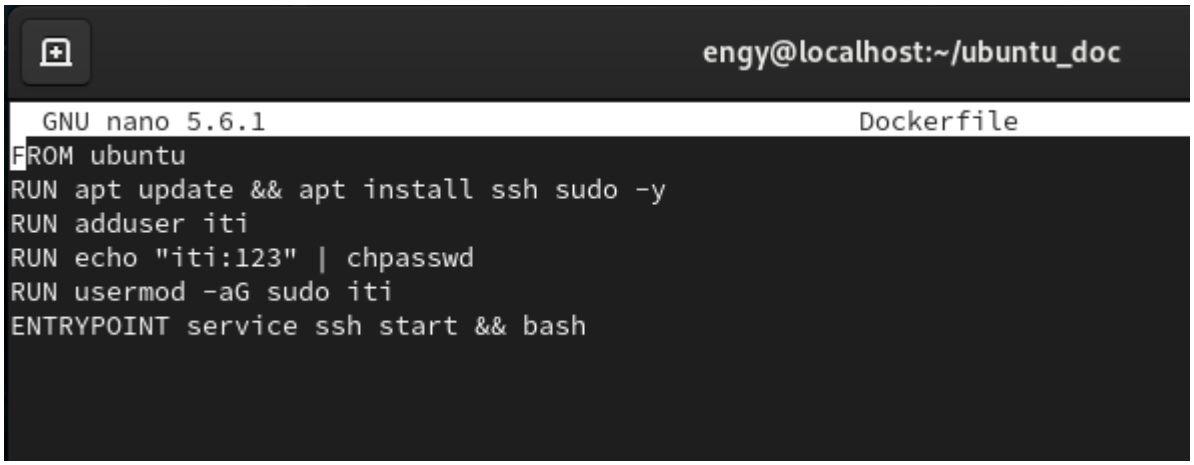
- The `my-file.yml` is an Ansible playbook that installs and configures Nginx on a web server. It updates the package cache, installs the latest Nginx version, copies a custom `index.html` file to the web root, and restarts the Nginx service.



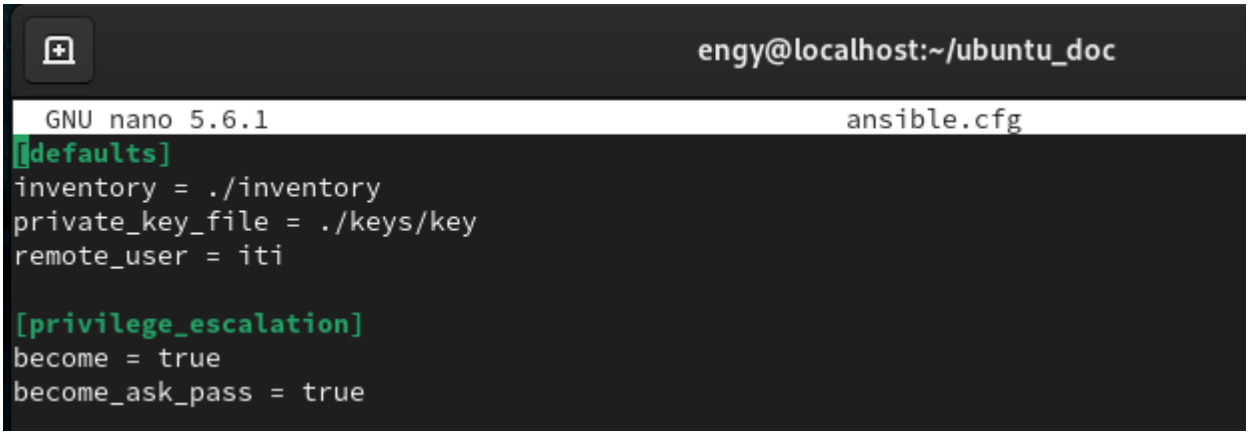
- The `index.html` file contains a simple HTML structure with a heading (`<h1>`) that displays "hello".



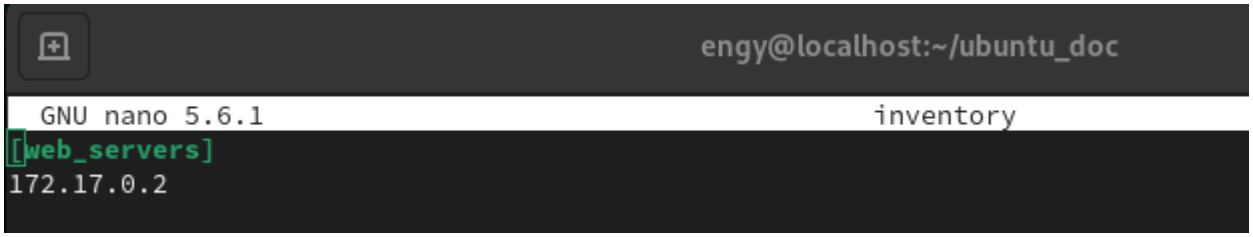
- The `Dockerfile` creates an Ubuntu-based image, installs `ssh` and `sudo`, adds a user `iti` with a password, grants sudo access to `iti`, and sets the container to start the SSH service and Bash.



- The `ansible.cfg` file is configured to use the local `inventory` file, the private key located at `./keys/key`, and sets the remote user to `iti`. It also enables privilege escalation (sudo) and prompts for a password when necessary.



- The `inventory` file lists a group called `web_servers`, with the IP address `172.17.0.2` as its member. This allows Ansible to target this IP address when running tasks.



- I copied the `index.html` file to the container, restarted Nginx, and verified that the custom page with the "hello" message was displayed by using `curl` both from inside the container and from my host machine.

```
[engy@localhost ubuntu_doc]$ docker cp ~/ubuntu_doc/index.html ubuntu_doc:/root/index.html
Successfully copied 2.05kB to ubuntu_doc:/root/index.html
[engy@localhost ubuntu_doc]$ docker exec -it ubuntu_doc /bin/bash
Error response from daemon: container c4adda2f4c3d1977a3430408e5e461c5e39457cb6d0c6a3692ee4cbbc8e4e214 is not
running
[engy@localhost ubuntu_doc]$ docker start ubuntu_doc
ubuntu_doc
[engy@localhost ubuntu_doc]$ docker exec -it ubuntu_doc /bin/bash
root@c4adda2f4c3d:/# cp /root/index.html /var/www/html/index.html
root@c4adda2f4c3d:/# service nginx restart
 * Restarting nginx nginx                                                                    [ OK ]

root@c4adda2f4c3d:/# curl http://172.17.0.2
<!DOCTYPE html>
<html>
  <h1>hello</h1>
</html>
root@c4adda2f4c3d:/# exit
exit
[engy@localhost ubuntu_doc]$ curl http://localhost
<!DOCTYPE html>
<html>
  <h1>hello</h1>
</html>
[engy@localhost ubuntu_doc]$ curl http://172.17.0.2
<!DOCTYPE html>
<html>
  <h1>hello</h1>
</html>
```