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Course/Section: CPE31S5	**Date Submitted: 01/12/2023**
Instructor: Engr. Roman Richard	**Semester and SY: 1st sem 2023-2024**

Activity 13: OpenStack Prerequisite Installation

1. Objectives

Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).

2. Intended Learning Outcomes

1. Analyze the advantages and disadvantages of cloud services
2. Evaluate different Cloud deployment and service models
3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution.

3. Resources

Oracle VirtualBox (Hypervisor)

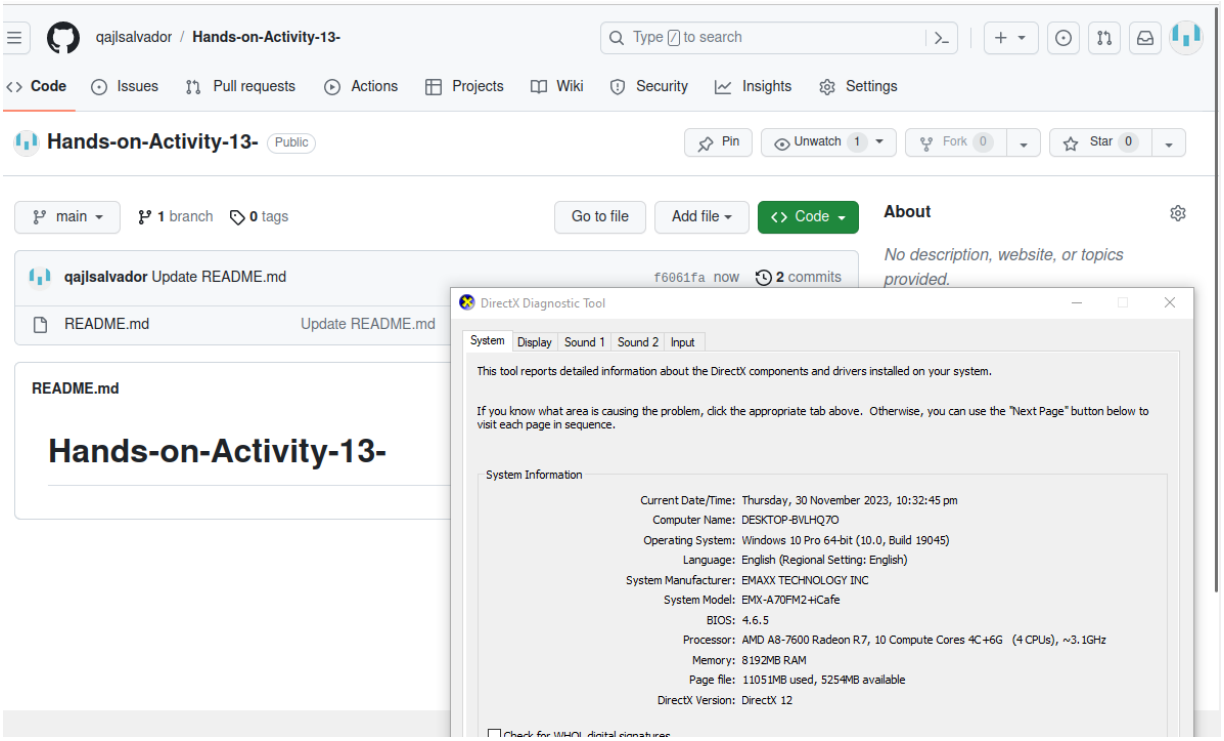
1x Ubuntu VM or Centos VM

4. Tasks

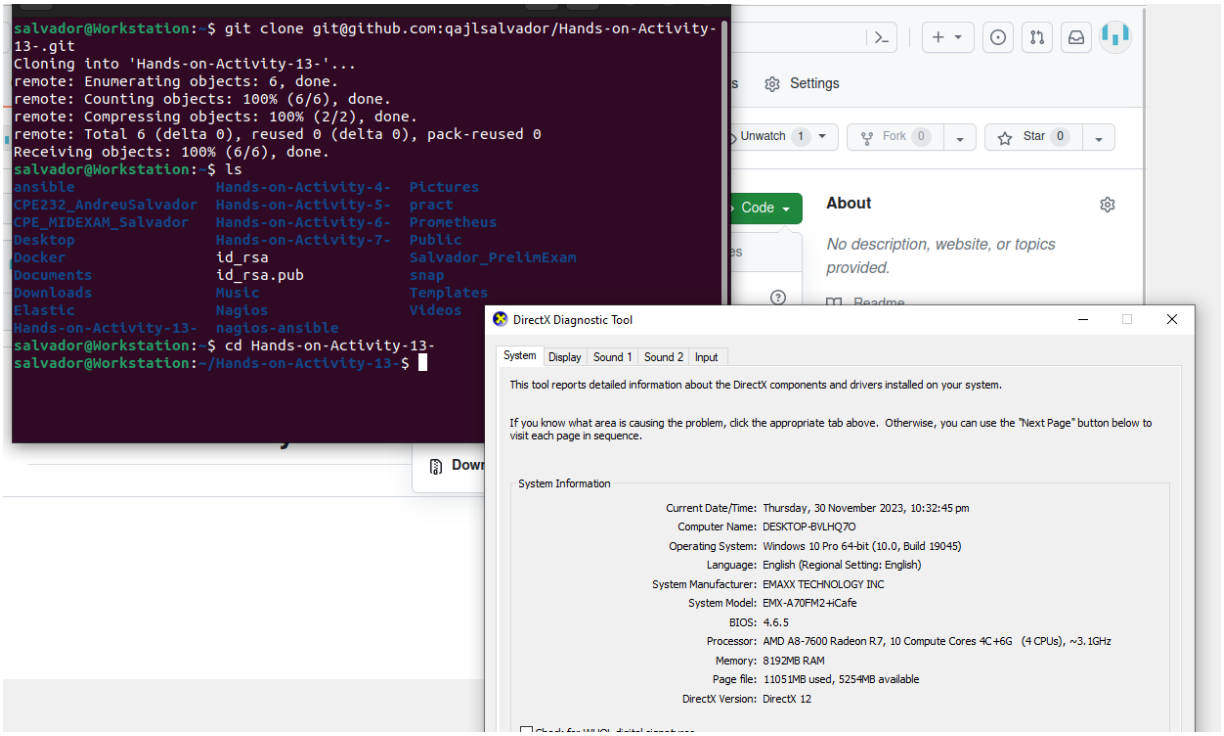
1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
    a. NTP
    b. OpenStack packages
    c. SQL Database
    d. Message Queue
    e. Memcached
    f. Etcd
    g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file.
    h. Add, commit and push it to your GitHub repo.

5. Output (screenshots and explanations)

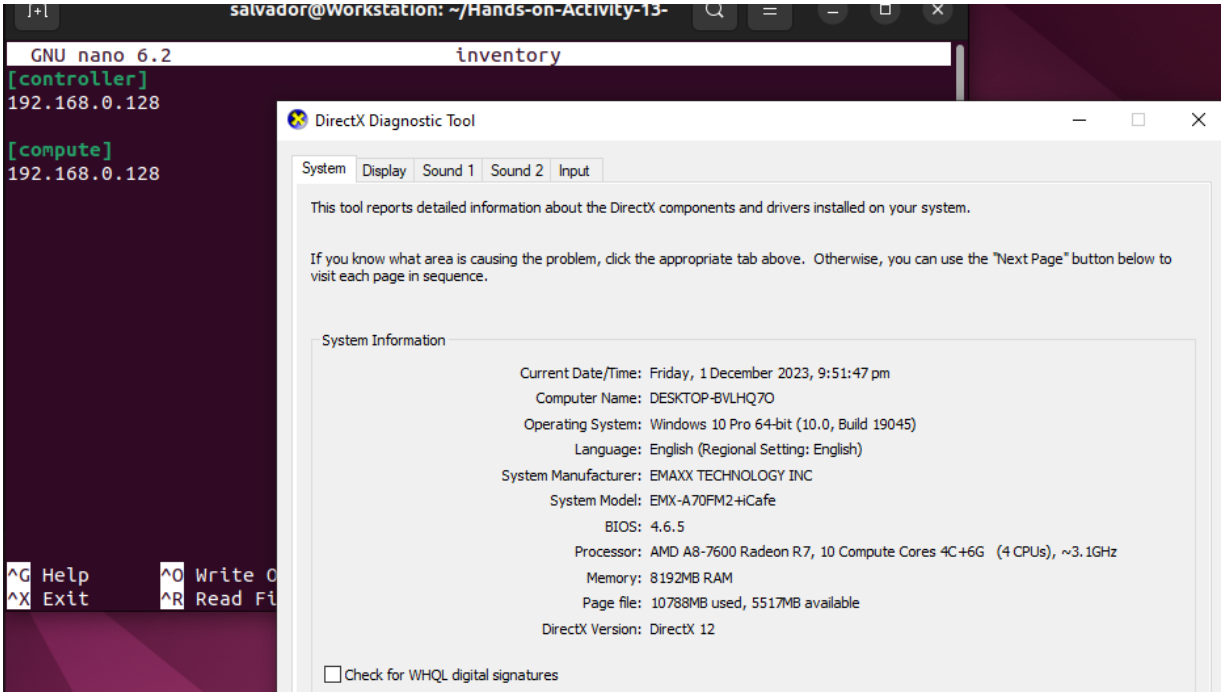
Creating the repository in github



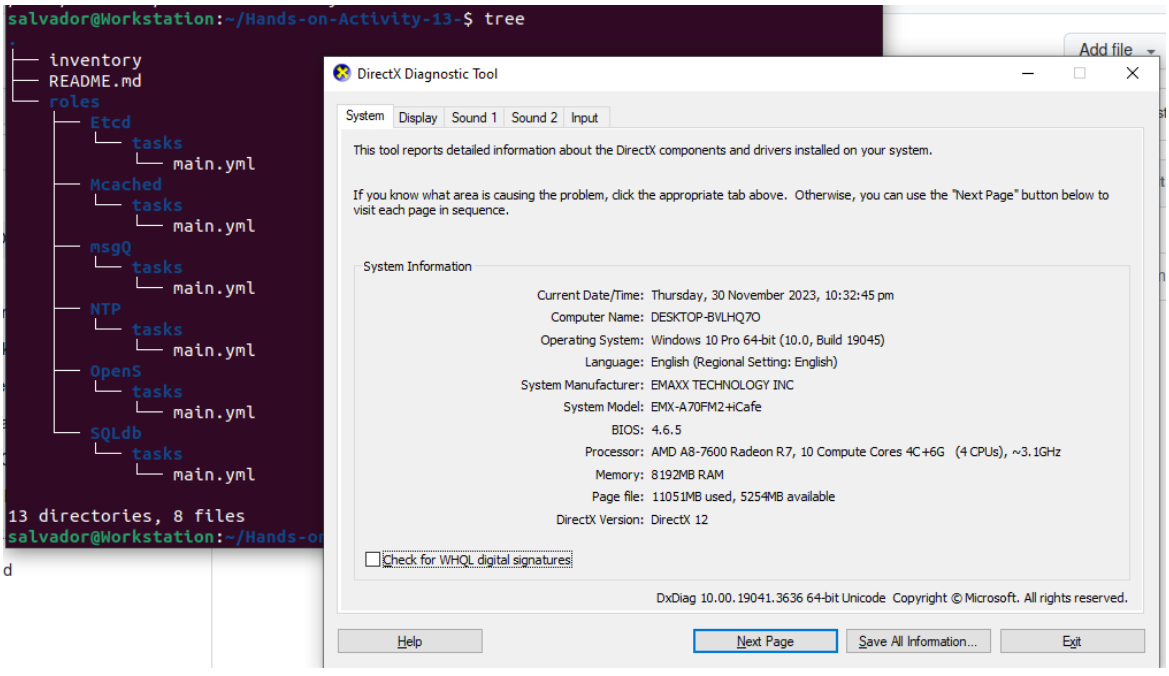
Cloning the repository to the workstation in Ubuntu



Creating the inventory to store the ip address of the server where the items will be installed.

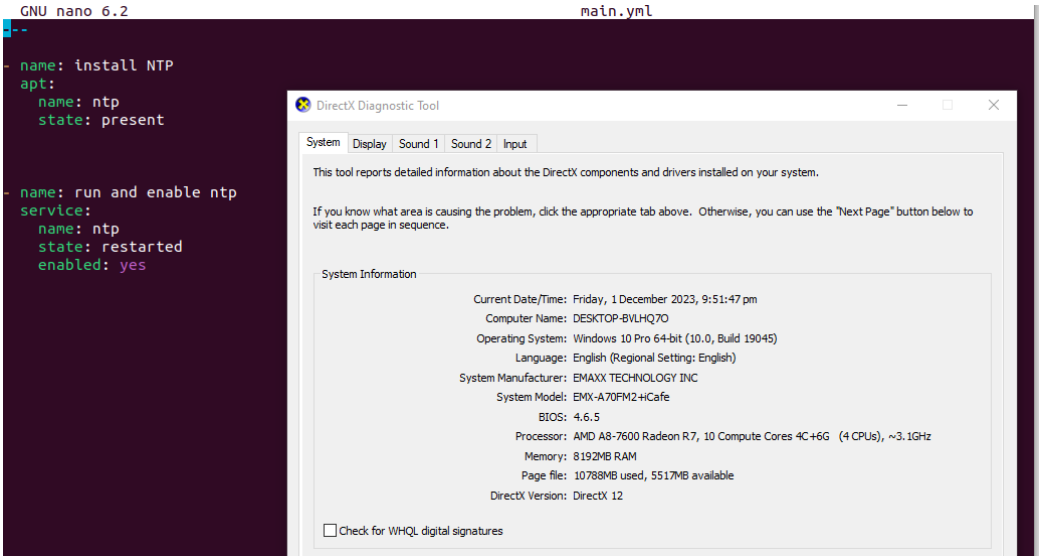


Creating the roles directory and creating a tasks directory within each roles and naming main.yml the yaml file that will contain the codes that is needed in automating the installation of the said items.

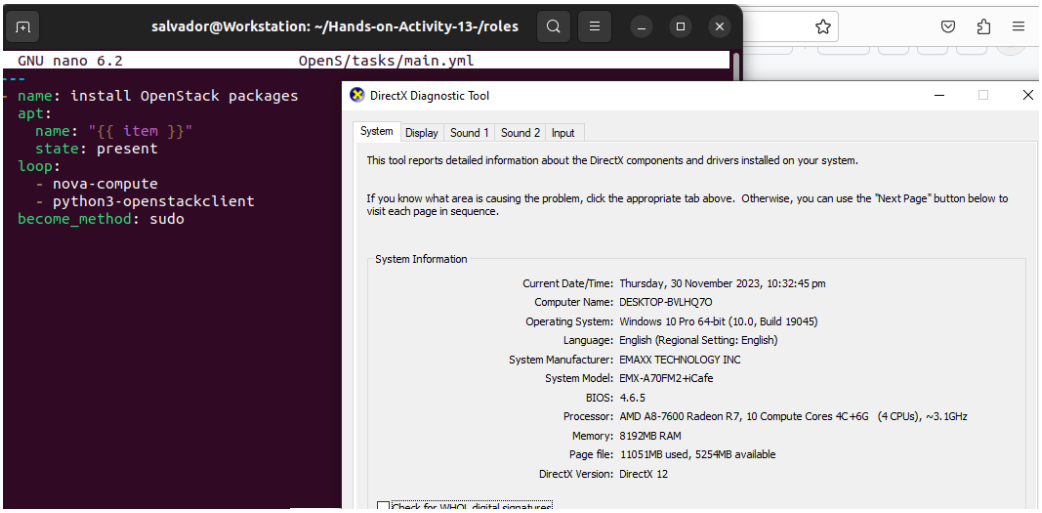


Writing the codes inside each main.yml for the automation

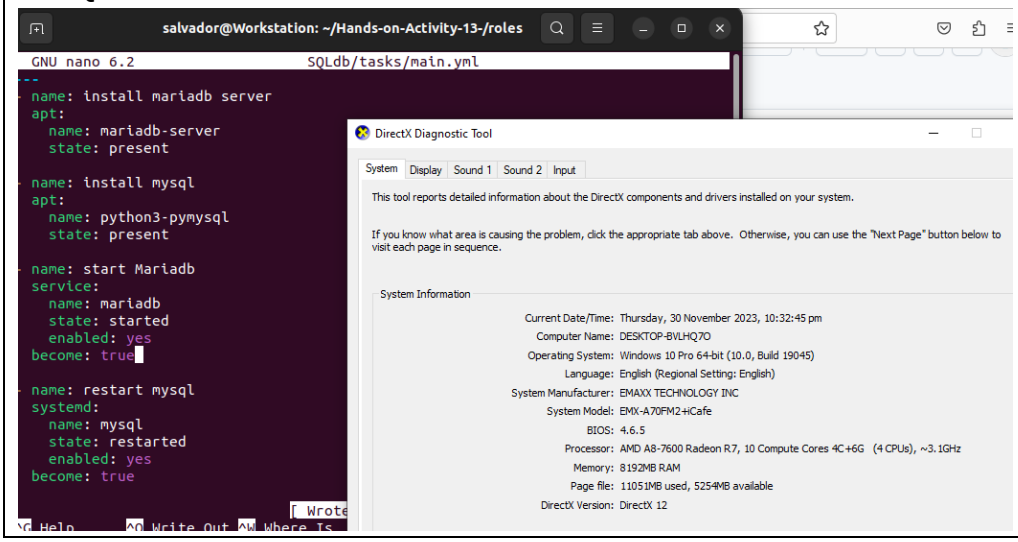
a. NTP



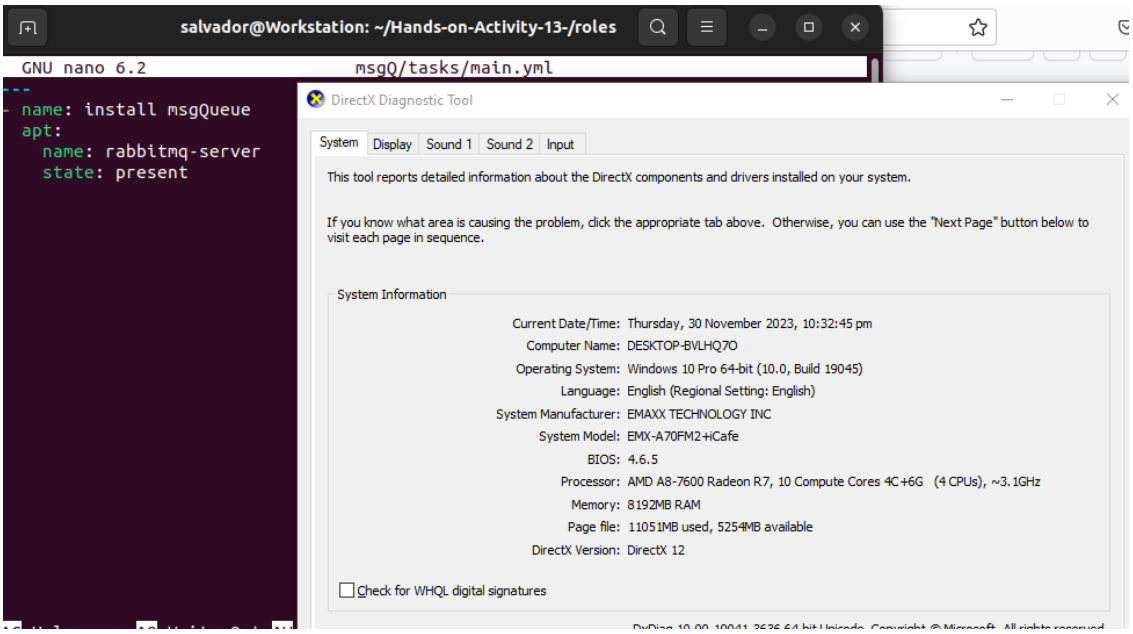
b. OpenStack



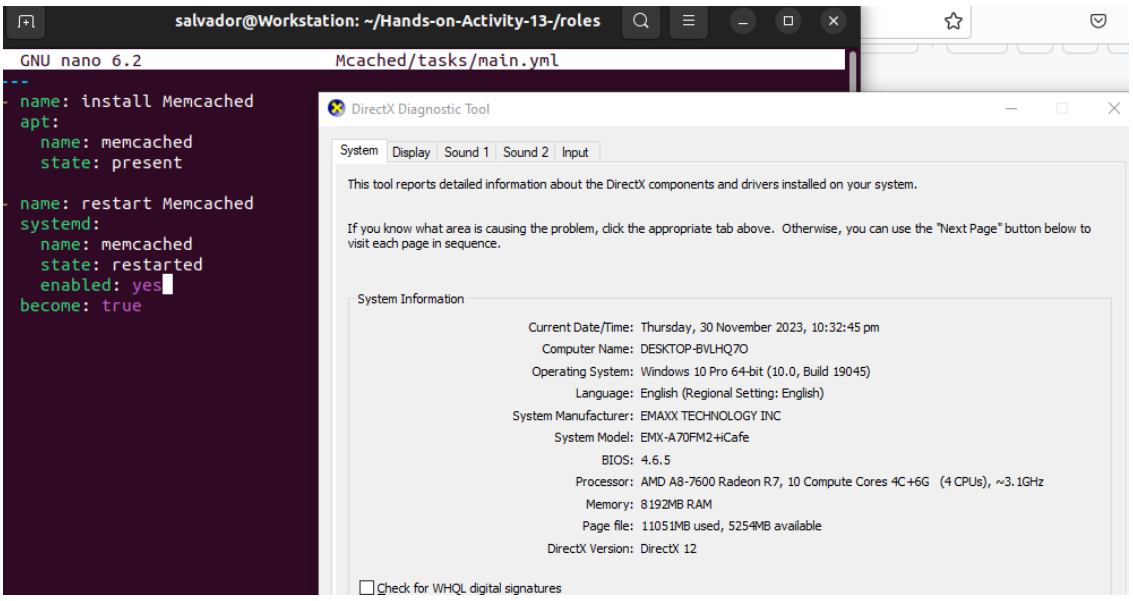
c. SQL Database



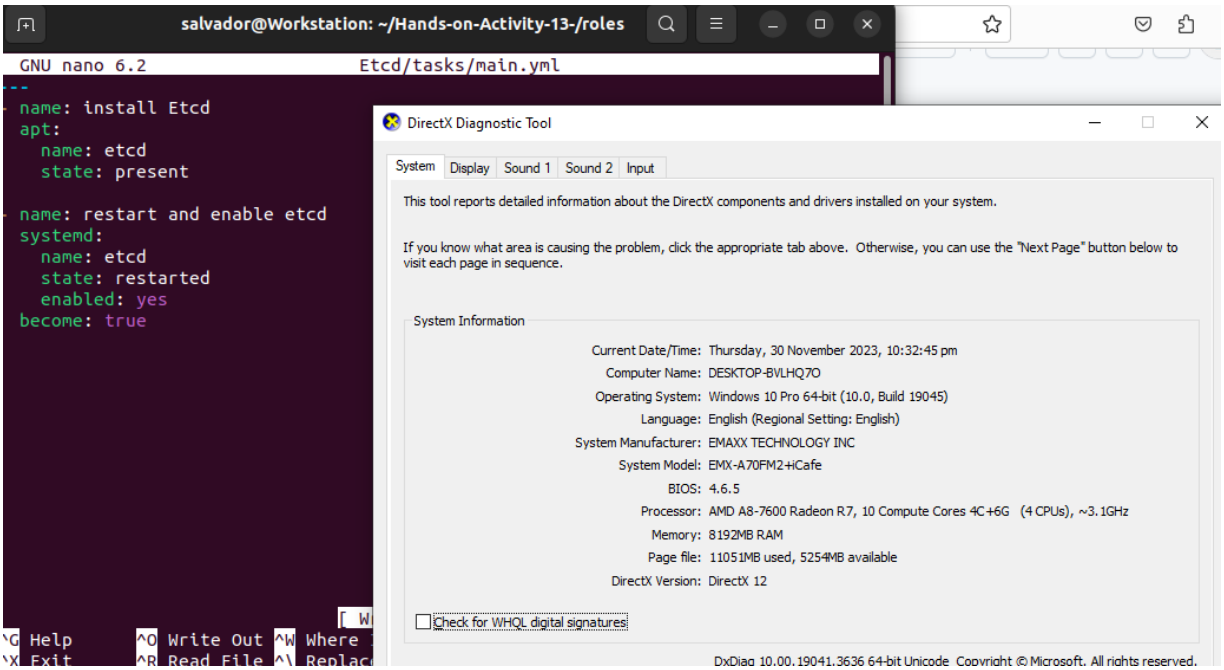
d. Message Queue



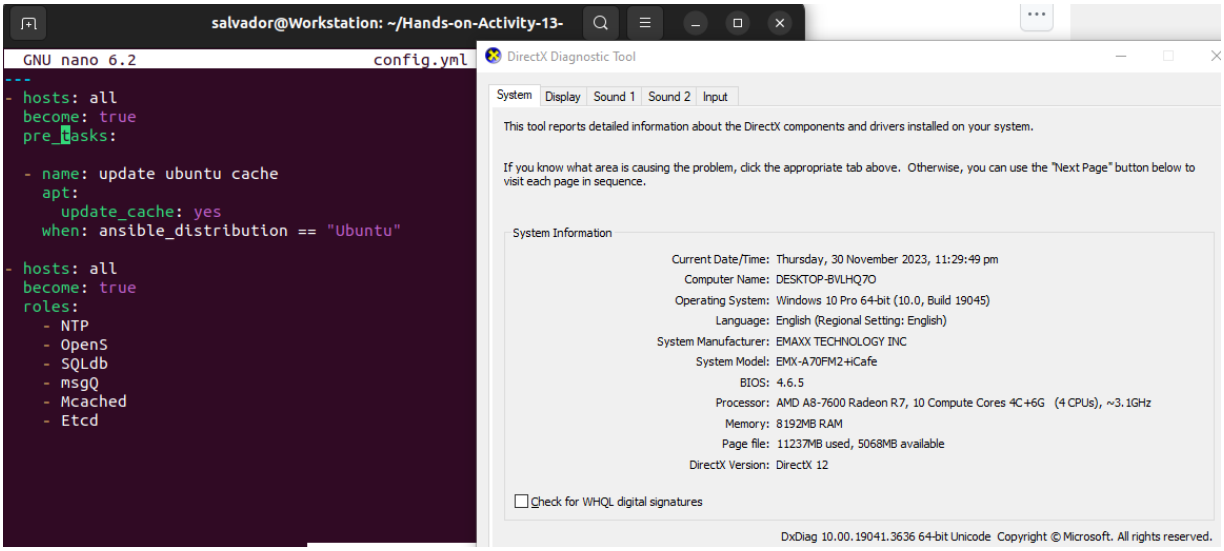
e. Memcached



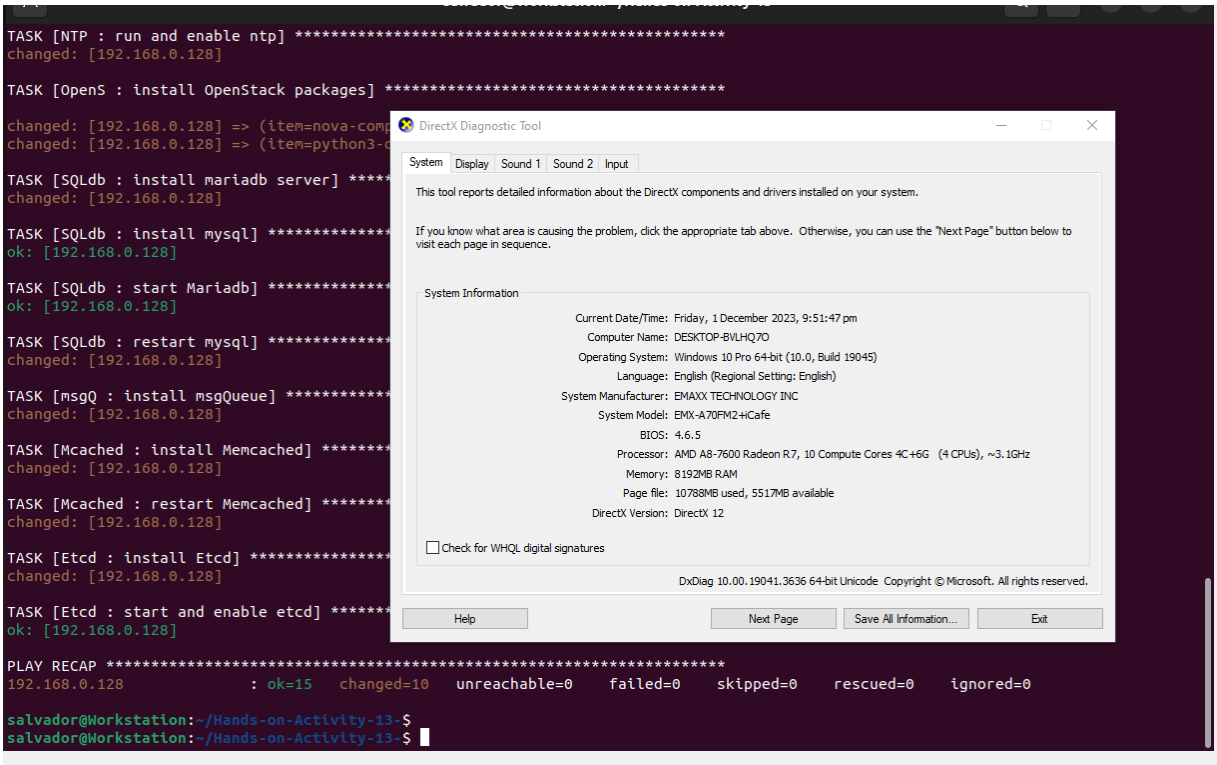
f. Etcd



Creating the config.yml to run each role



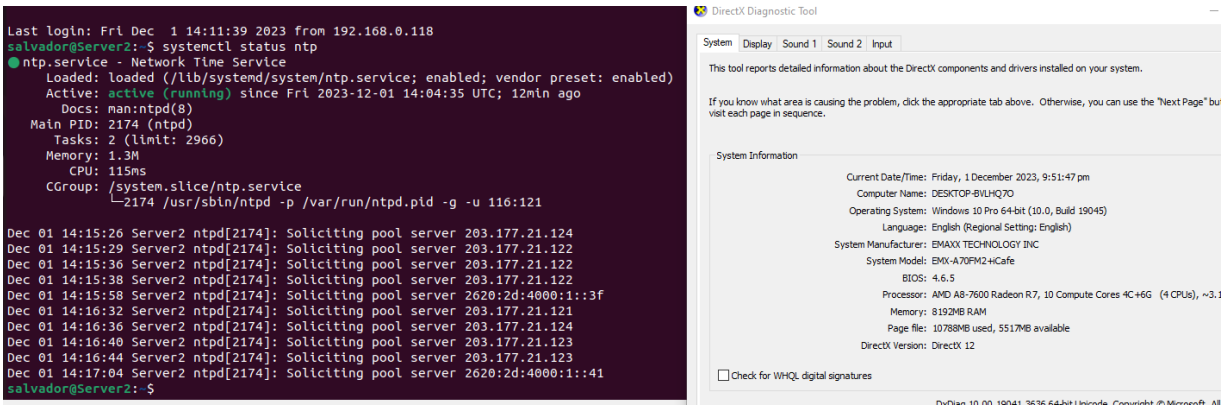
Running the file:



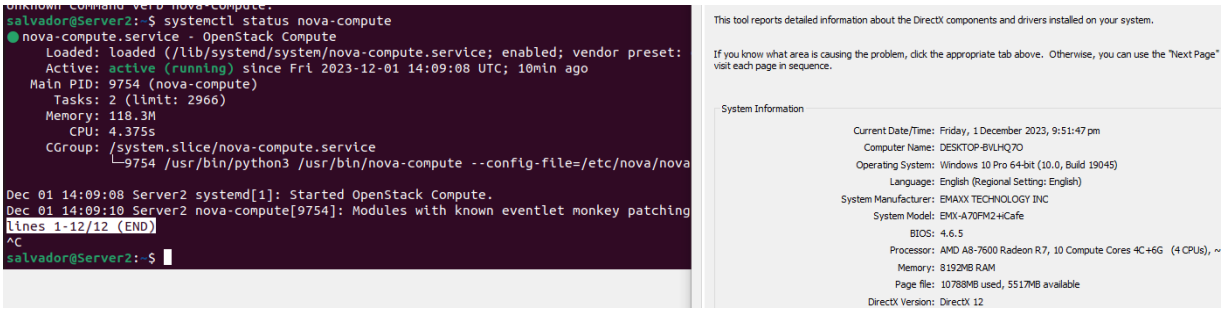
Ok indicates that the code ran successfully and the changes indicates the changes that was made when the code was run. It is the installation that was made for the server.

Checking the status

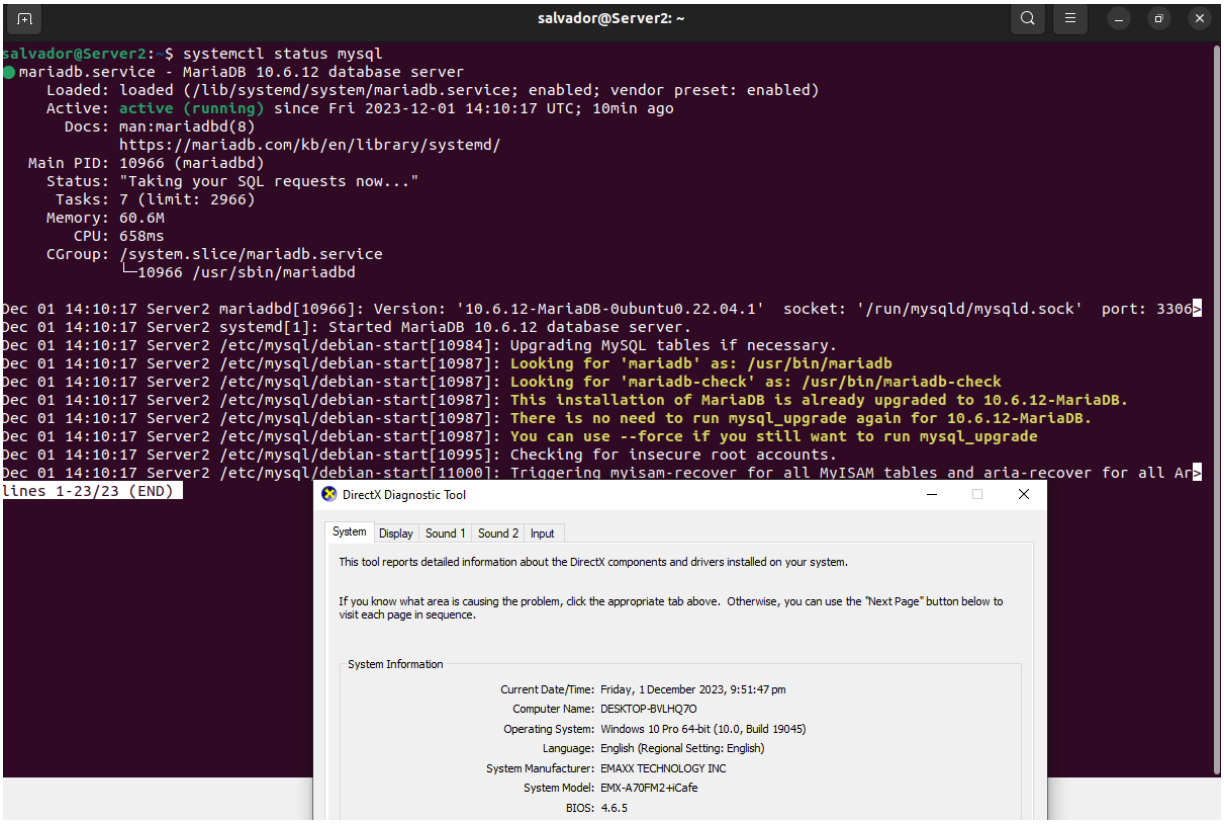
NTP:



Openstack:

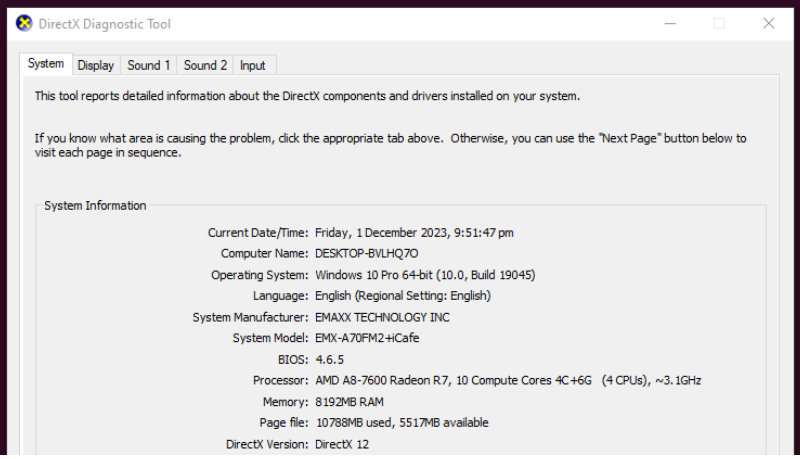


SQL:



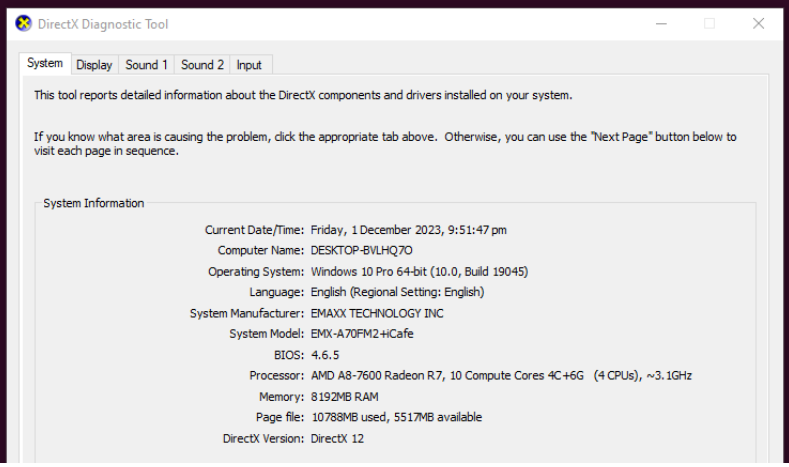
Message Queue:

```
salvador@Server2:~$ systemctl status rabbitmq-server
● rabbitmq-server.service - RabbitMQ Messaging Server
     Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-12-01 14:10:58 UTC; 12min ago
   Main PID: 11427 (beam.smp)
      Tasks: 21 (limit: 2966)
     Memory: 88.3M
        CPU: 11.947s
     CGroup: /system.slice/rabbitmq-server.service
             ├─11427 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageffcbf -MHas ageffcbf -MBlmbcs 512 -MHlmbcs 512 -M
             ├─11438 erl_child_setup 65536
             ├─11485 inet_gethost 4
             └─11486 inet_gethost 4

Dec 01 14:10:51 Server2 systemd[1]: Starting RabbitMQ Messaging Server...
Dec 01 14:10:58 Server2 systemd[1]: Started RabbitMQ Messaging Server.
lines 1-15/15 (END)
```



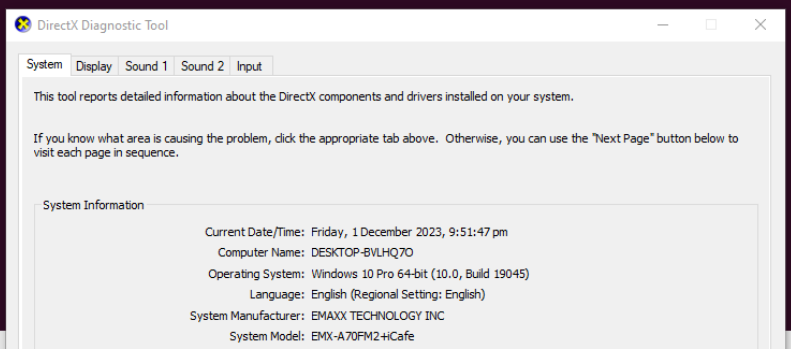
Memcached:

```
salvador@Server2:~$ systemctl status memcached
● memcached.service - memcached daemon
     Loaded: loaded (/lib/systemd/system/memcached.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-12-01 14:11:21 UTC; 13min ago
       Docs: man:memcached(1)
   Main PID: 11973 (memcached)
      Tasks: 10 (limit: 2966)
     Memory: 1.7M
        CPU: 265ms
     CGroup: /system.slice/memcached.service
             └─11973 /usr/bin/memcached -m 64 -p 11211 -u memcache -l 127.0.0.1 -P /var/run/memcached/memcached.pid

Dec 01 14:11:21 Server2 systemd[1]: Stopped memcached daemon.
Dec 01 14:11:21 Server2 systemd[1]: Started memcached daemon.
salvador@Server2:~$
```



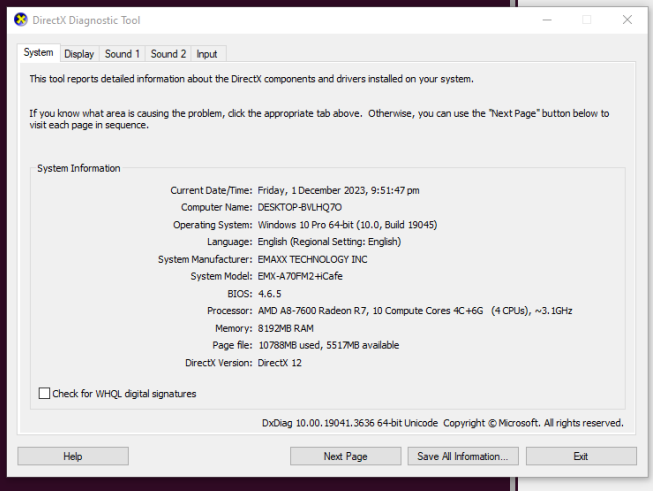
Etcd:

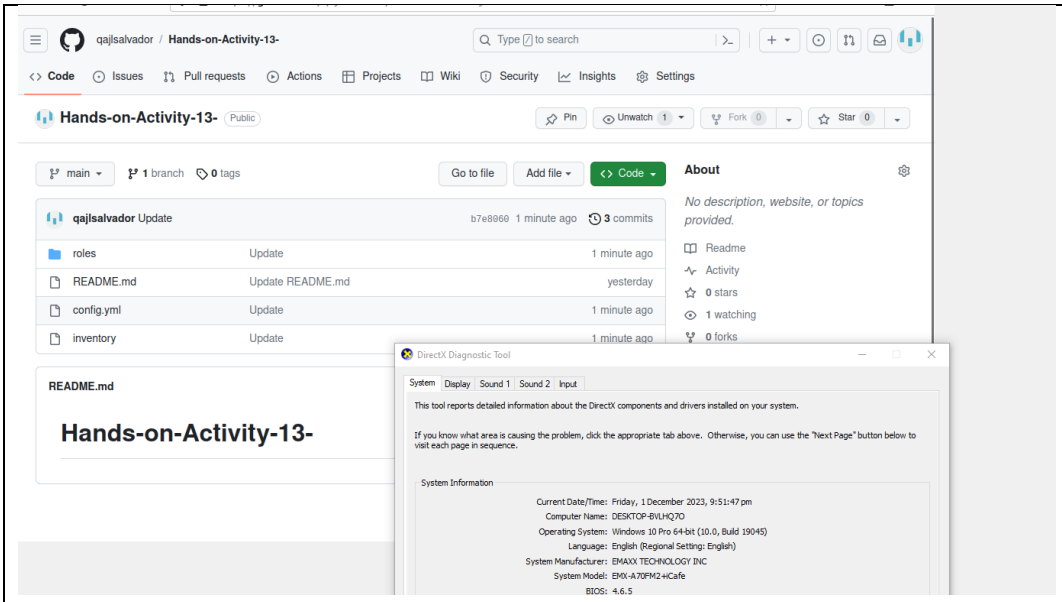
```
salvador@Server2:~$ systemctl status etcd
● etcd.service - etcd - highly-available key value store
     Loaded: loaded (/lib/systemd/system/etcd.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-12-01 14:11:33 UTC; 14min ago
       Docs: https://etcd.io/docs
             man:etcd
   Main PID: 12211 (etcd)
      Tasks: 7 (limit: 2966)
     Memory: 5.6M
        CPU: 3.279s
     CGroup: /system.slice/etcd.service
             └─12211 /usr/bin/etcd

Dec 01 14:11:33 Server2 etcd[12211]: 8e9e05c52164694d received MsgVoteResp from 8e9e05c52164694d at term 2
Dec 01 14:11:33 Server2 etcd[12211]: 8e9e05c52164694d became leader at term 2
Dec 01 14:11:33 Server2 etcd[12211]: raft.node: 8e9e05c52164694d elected leader 8e9e05c52164694d at term 2
Dec 01 14:11:33 Server2 etcd[12211]: published {Name:Server2 ClientURLs:[http://localhost:2379]} to cluster cdf818194e3a8c32
Dec 01 14:11:33 Server2 etcd[12211]: setting up the initial cluster version to 3.3
Dec 01 14:11:33 Server2 etcd[12211]: ready to serve client requests
Dec 01 14:11:33 Server2 etcd[12211]: serving insecure client requests on 127.0.0.1:2379, this is strongly discouraged!
Dec 01 14:11:33 Server2 systemd[1]: Started etcd - highly-available key value store.
Dec 01 14:11:33 Server2 etcd[12211]: set the initial cluster version to 3.3
Dec 01 14:11:33 Server2 etcd[12211]: enabled capabilities for version 3.3
salvador@Server2:~$
```



Pushing the files to the github repository

```
salvador@Workstation:~$ cd Hands-on-Activity-13-
salvador@Workstation:~/Hands-on-Activity-13-$ ls
config.yml  inventory  README.md  roles
salvador@Workstation:~/Hands-on-Activity-13-$ git add *
salvador@Workstation:~/Hands-on-Activity-13-$ git commit -m "Update"
[main b7e8060] Update
 8 files changed, 100 insertions(+)
 create mode 100644 config.yml
 create mode 100644 inventory
 create mode 100644 roles/Etcd/tasks/main.yml
 create mode 100644 roles/Mcached/tasks/main.yml
 create mode 100644 roles/NTP/tasks/main.yml
 create mode 100644 roles/OpenS/tasks/main.yml
 create mode 100644 roles/SQLdb/tasks/main.yml
 create mode 100644 roles/msgQ/tasks/main.yml
salvador@Workstation:~/Hands-on-Activity-13-$ git push origin main
Enumerating objects: 24, done.
Counting objects: 100% (24/24), done.
Compressing objects: 100% (11/11), done.
Writing objects: 100% (23/23), 1.90 KiB | 650.00 KiB/s, done.
Total 23 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:qajlsalvador/Hands-on-Activity-13-.git
   f6061fa..b7e8060  main -> main
salvador@Workstation:~/Hands-on-Activity-13-$ git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
salvador@Workstation:~/Hands-on-Activity-13-$
```





Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?

Managing nodes and private or public clouds are the used of Openstack, It is an open source platform for developers and Administrators to handle projects in cloud-computing, with this they can organize the application and tools they need to handle the core cloud-computing services. With Openstack thye can manage the tools and utilize it to make more and fast innovation.

Conclusions:

Throughout the activity, the main goal was to establish a workflow in installing OpenStack. A guide was provided in the beginning in explaining the prerequisites that should be installed inside the server. Using the ansible playbook, I was able to use automation in installing the needed tools and application that was intended to do in the first place, this automation will make the installation more convenient and less complexity when it comes to the installation. To further utilize the function of ansible playbook, roles was implemented in the playbook to organize each application and prerequisite that was needed, then creating the main playbook in the directory where the roles directory was also there for the automation to be done. Lastly we check whether the applications and tools that was given in the beginning was already installed by running the systemctl status in the terminal and the pictures shows that it was successfully been installed within the server as the status of each applications and tools was active. The goal of the activity was achieved and demonstrated the how it was implemented and created.