

Tools Needed:
<ol style="list-style-type: none"> 1. Control Node (CN) - 1 2. Manage Node (MN) - 1 Ubuntu 3. Manage Node (MN) - 1 CentOS
Procedure:
<ol style="list-style-type: none"> 1. Note: You are required to create a document report of the steps you will do for this exam. All screenshots should be labeled and explained properly. LABELLED AND EXPLAIN EACH CODE (PLAYBOOK) No explanation = Minus Points 2. Create a repository in your GitHub account and label it as Surname_PrelimExam 3. Clone your new repository in your CN. 4. In your CN, create an inventory file and ansible.cfg files. 5. Create an Ansible playbook that does the following with an input of a config.yaml file for both Manage Nodes <ul style="list-style-type: none"> o Installs the latest python3 and pip3 o use pip3 as default pip o use python3 as default python o Install Java open-jdk o Install MariaDB as well as starting the server, create a database and a table using mariaDB and input one record into a table USING ANSIBLE ONLY o Create Motd containing the text defined by a variable defined in config.yaml file and if there is no variable input the default motd is "Ansible Managed node by (your user name)" o Create a user with a variable defined in config.yaml 5. PUSH and COMMIT your PrelimExam in your GitHub repo 6. Your document report should be submitted here. 7. For your prelim exam to be counted, please paste your repository link here. (Failure to submit will result in ZERO) 8. NO USE OF EXTERNAL WEBSITES SUCH AS , REDDIT, CHATGPT, GITHUB, GEMINI, CLAUDE, FORUMS, AND DOCUMENTATIONS. FAILURE TO COMPLY WITH RESULT IN ZERO.
Output:
Setting up:

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212

atian@ATIAN-Workstation:~$ sudo ufw allow ssh
[sudo] password for atian:
Skipping adding existing rule
Skipping adding existing rule (v6)
atian@ATIAN-Workstation:~$ sudo ufw enable
Firewall is active and enabled on system startup
atian@ATIAN-Workstation:~$ sudo ufw status
Status: active

To          Action      From
--          ----      ---
22/tcp       ALLOW      Anywhere
22/tcp (v6)  ALLOW      Anywhere (v6)

atian@ATIAN-Workstation:~$ ping 192.168.56.102
PING 192.168.56.102 (192.168.56.102) 56(84) bytes of data.
64 bytes from 192.168.56.102: icmp_seq=1 ttl=64 time=0.984 ms
64 bytes from 192.168.56.102: icmp_seq=2 ttl=64 time=0.416 ms
64 bytes from 192.168.56.102: icmp_seq=3 ttl=64 time=0.377 ms
^Z
[1]+  Stopped                  ping 192.168.56.102
atian@ATIAN-Workstation:~$ ping 192.168.56.103
PING 192.168.56.103 (192.168.56.103) 56(84) bytes of data.
64 bytes from 192.168.56.103: icmp_seq=1 ttl=64 time=0.967 ms
```

```
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212

[2]+  Stopped                  ping 192.168.56.103
atian@ATIAN-Workstation:~$ ssh atian@192.168.56.101
atian@192.168.56.101's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-27-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

*** System restart required ***
Last login: Fri Aug  8 07:56:10 2025 from 192.168.56.101
atian@ATIAN-Workstation:~$ atian@Workstation
atian@Workstation: command not found
atian@ATIAN-Workstation:~$ ssh atian@Workstation
atian@Workstation's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-27-generic x86_64)
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212

logout
Connection to server2 closed.
atian@ATIAN-Workstation:~$ ssh-keygen
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/atian/.ssh/id_ed25519): id-rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id-rsa
Your public key has been saved in id-rsa.pub
The key fingerprint is:
SHA256:qhfIQtJN+hSBwAu5KsgnXLmzEQ8J35n5sd07rIiFHT8 atian@ATIAN-Workstation
The key's randomart image is:
+--[ED25519 256]--+
|oo ...
|oo. o
|.o+++.+
|o.+Bo= .
|=o.+==S .
|++.=++o. .
|.. o.++ E. .
| . .+ . .+
| .o . . .
+---[SHA256]----+
atian@ATIAN-Workstation:~$ ssh-keygen
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212

atian@ATIAN-Workstation:~$ ssh-keygen -t rsa -b 4096
Generating public/private rsa key pair.
Enter file in which to save the key (/home/atian/.ssh/id_rsa): id_rsa
id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_rsa
Your public key has been saved in id_rsa.pub
The key fingerprint is:
SHA256:v9E8moLJW33y8nPqh1YVBF4amNuCUD+ZASsbryHhoeQ atian@ATIAN-Workstation
The key's randomart image is:
+--[RSA 4096]----+
|       .ooo... |
|       . oo= +. |
|   . o o...=oo  .|
| o o o =. o... .|
| E o oS. . . .|
|   . oo o  . |
|   . +. = =o  .|
|   +.. .0+.o  .|
|   ... .+==  . |
+---[SHA256]----+
atian@ATIAN-Workstation:~$ ls -la .ssh
total 24
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212
|   ... .+==  |
+---[SHA256]---+
atian@ATIAN-Workstation:~$ ls -la .ssh
total 24
drwx----- 2 atian atian 4096 Aug 22 07:49 .
drwxr-x-- 19 atian atian 4096 Aug 29 06:13 ..
-rw----- 1 atian atian 0 Aug 1 07:29 authorized_keys
-rw----- 1 atian atian 3389 Aug 22 07:48 id_rsa
-rw-r--r-- 1 atian atian 749 Aug 22 07:48 id_rsa.pub
-rw----- 1 atian atian 1546 Aug 8 07:58 known_hosts
-rw-r--r-- 1 atian atian 142 Aug 8 07:41 known_hosts.old
atian@ATIAN-Workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa atian@Server1
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/atian/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed

/usr/bin/ssh-copy-id: WARNING: All keys were skipped because they already exist on the remote system.
          (if you think this is a mistake, you may want to use -f option)

atian@ATIAN-Workstation:~$ ssh-copy-id -i ~/.ssh/id_rsa atian@Server2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/atian/.ssh/id_rsa.pub"
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212
on)

atian@ATIAN-Workstation:~$ sudo apt install git
[sudo] password for atian:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
git is already the newest version (1:2.43.0-1ubuntu7.3).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
atian@ATIAN-Workstation:~$ which git
/usr/bin/git
atian@ATIAN-Workstation:~$ git --version
git version 2.43.0
atian@ATIAN-Workstation:~$ cat .ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQADKfaLv7C3m/aVczYTk4ECN+dXwwVG95vG4cDME
n0yeUK1K53ZLWx4dUZIfoBRE5eBF8ZoVsLxzGdkDtgbpOP1pcvmVi7TqxacJMScD9EcPVOAD8lu
kAycGl21DnBYeqkYT+M5p72A3upWKHyyeDXHKrwy1vEen0qSF+q9oHA4g+AJRJ9SmNA4/2NwuED
/XY2F9EE... 0: X6 D LWWMM E61757 1161 6 6756 11KUM21E2 27 12V61 3B2H9E7 Tl
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212
rvn8COW52y2Wk8taivmb21go1I8XTm20tUp9+Nfh2LzP2rrbP/Vqs8jfnUZflfZObs/+HJpsN31
DGXDqtsqpdjV/hznaJtbRFe4VT5DMZs/sItBXRxppmK5hrXXjjoC9wSsJ0yr2T/tx2eFWtpc7lk
D8UBtN4uJNeA990idY/1AmZ47x+h9r/HuCbQRAQ00GKgvAWLcHr6rK9oLzKRyykvPFEB7HrRIaxi
hrTNocxQe/R57pOCmW525SfwFb4X340WXV05xw== atian@ATIAN-Workstation
atian@ATIAN-Workstation:~$ git clone git@github.com:zhriiosk/ATIAN_PrelimExam
.git
Cloning into 'ATIAN_PrelimExam'...
The authenticity of host 'github.com (20.87.245.0)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvvV6TuJJhbpZisF/zLDA0zPMsvHdkr4UvC0q
U.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts
.
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
atian@ATIAN-Workstation:~$ ls
ATIAN_PrelimExam  Documents  id_rsa      Music      snap
CPE212           Downloads  id-rsa.pub  Pictures   Templates
Desktop          id-rsa    id-rsa.pub  Public     Videos
atian@ATIAN-Workstation:~$ cd ATIAN_PrelimExam
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ ls
README.md
```

```
atian@ATIAN-Workstation: ~/CPE212
atian@ATIAN-Workstation: ~      atian@ATIAN-Workstation: ~/CPE212
To github.com:zhriiosk/ATIAN_PrelimExam.git
 b459caa..b8c074f  main -> main
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ sudo apt install ansible
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ansible is already the newest version (9.2.0+dfsg-0ubuntu5).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ cd
atian@ATIAN-Workstation:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ansible is already the newest version (9.2.0+dfsg-0ubuntu5).
The following packages were automatically installed and are no longer required:
  libgl1-amber-dri libglapi-mesa
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
```

```
atian@ATIAN-Workstation:~/CPE212
atian@ATIAN-Workstation:~      atian@ATIAN-Workstation:~/CPE212

atian@ATIAN-Workstation:~$ ls
ATIAN_PrelimExam  Documents  id_rsa      Music      snap
CPE212           Downloads  id-rsa.pub  Pictures   Templates
Desktop          id-rsa    id_rsa.pub  Public     Videos
atian@ATIAN-Workstation:~$ cd CPE212
atian@ATIAN-Workstation:~/CPE212$ ls
ansible.cfg  inventory.yaml  pbook.yml
atian@ATIAN-Workstation:~/CPE212$ ansible --version
ansible [core 2.16.3]
  config file = /home/atian/CPE212/ansible.cfg
  configured module search path = ['/home/atian/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
    ansible python module location = /usr/lib/python3/dist-packages/ansible
    ansible collection location = /home/atian/.ansible/collections:/usr/share/ansible/collections
    executable location = /usr/bin/ansible
    python version = 3.12.3 (main, Aug 14 2025, 17:47:21) [GCC 13.3.0] (/usr/bin/python3)
    jinja version = 3.1.2
    libyaml = True
atian@ATIAN-Workstation:~/CPE212$ sudo nano inventory.ini
atian@ATIAN-Workstation:~/CPE212$ sudo nano ansible.cfg
atian@ATIAN-Workstation:~/CPE212$ sudo nano ansible2.cfg
atian@ATIAN-Workstation:~/CPE212$ ls
ansible.cfg  inventory.ini  inventory.yaml  pbook.yml
```

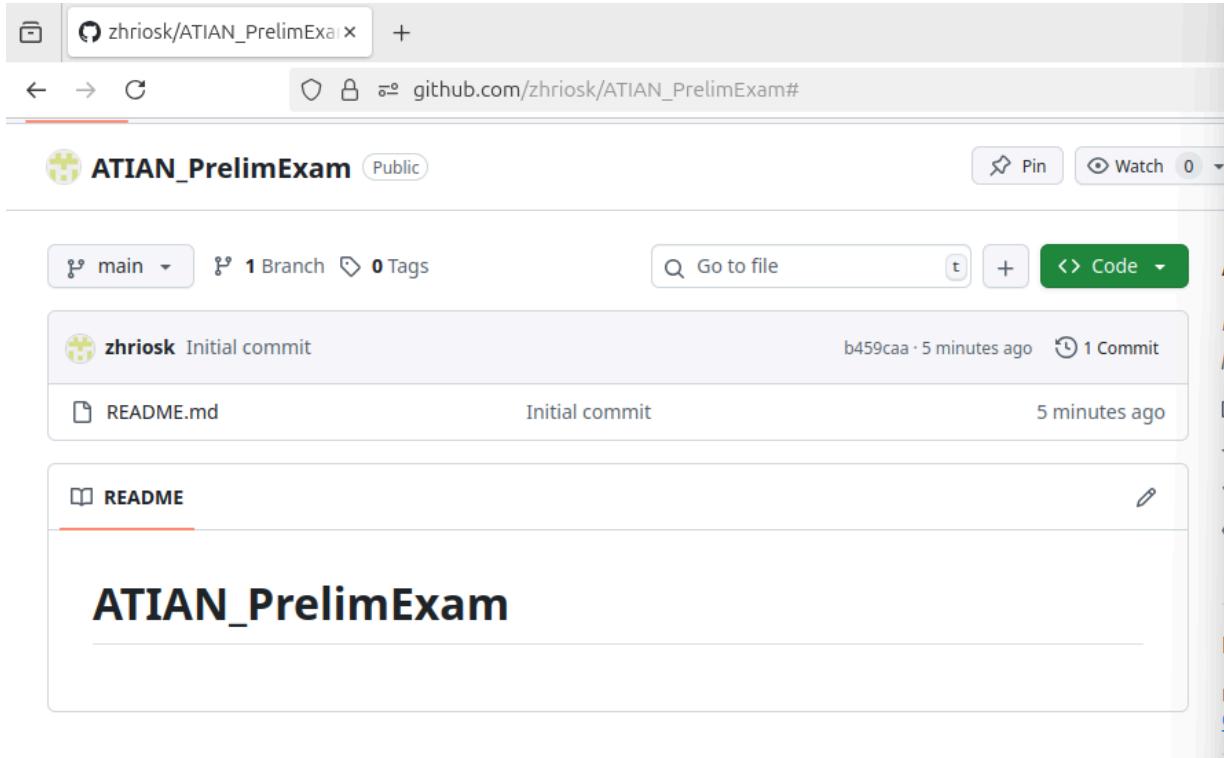
```
atian@ATIAN-Workstation:~      atian@ATIAN-Workstation:~

jinja version = 3.1.2
libyaml = True
atian@ATIAN-Workstation:~/CPE212$ sudo nano inventory.ini
atian@ATIAN-Workstation:~/CPE212$ sudo nano ansible.cfg
atian@ATIAN-Workstation:~/CPE212$ sudo nano ansible2.cfg
atian@ATIAN-Workstation:~/CPE212$ ls
ansible.cfg  inventory.ini  inventory.yaml  pbook.yml
atian@ATIAN-Workstation:~/CPE212$ sudo nano ansible2.cfg
atian@ATIAN-Workstation:~/CPE212$ ls
ansible2.cfg  ansible.cfg  inventory.ini  inventory.yaml  pbook.yml
atian@ATIAN-Workstation:~/CPE212$ cd
atian@ATIAN-Workstation:~$ ansible --version
ansible [core 2.16.3]
  config file = None
  configured module search path = ['/home/atian/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
    ansible python module location = /usr/lib/python3/dist-packages/ansible
    ansible collection location = /home/atian/.ansible/collections:/usr/share/ansible/collections
    executable location = /usr/bin/ansible
    python version = 3.12.3 (main, Aug 14 2025, 17:47:21) [GCC 13.3.0] (/usr/bin/python3)
    jinja version = 3.1.2
    libyaml = True
atian@ATIAN-Workstation:~$
```

- These first ten screenshot are proof of setting up the control node

connecting it to the other servers and testing its connectivity. From checking the hostnames, to host ip addresses, to installing and updating the ubuntu, the git and the ansible.

2.



The screenshot shows a GitHub repository page for 'zhriosk/ATIAN_PrelimExam'. The repository is public, has 1 branch (main), and 0 tags. There is 1 commit from 'zhriosk' labeled 'Initial commit' made 5 minutes ago. The README file contains the text 'ATIAN_PrelimExam'.

- Starting here, we are tasked to create a new repository in GitHub labeled with our surname and prelim exam.

3.

```
atian@ATIAN-Workstation:~$ git clone git@github.com:zhriosk/ATIAN_PrelimExam.git
Cloning into 'ATIAN_PrelimExam'...
The authenticity of host 'github.com (20.87.245.0)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvvV6TuJJhbpbZisF/zLDA0zPMSvHdkr4UvC0qJ.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts.
.
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
```

- Next. we have to clone our GitHub repository to our control node, which is the main server, local machine or the workstation.

4.

The image displays four terminal windows from a Linux workstation named 'ATICAN-Workstation' (username 'atian').

- Terminal 1:** Shows the creation of the inventory file. The command 'sudo nano inventory.ini' is run, and the file is edited to contain the following content:

```
[webservers]
192.168.56.102
192.168.56.103
```
- Terminal 2:** Shows the creation of the ansible.cfg file. The command 'sudo nano ansible.cfg' is run, and the file is edited to contain the following content:

```
[defaults]
inventory = inventory.yaml
private_key_file = ~/.ssh/ansible
```
- Terminal 3:** Shows the creation of a second ansible.cfg file. The command 'sudo nano ansible2.cfg' is run, and the file is edited to contain the following content:

```
[defaults]
inventory=inventory.ini
private_key_file = ~/.ssh/ansible
```
- Terminal 4:** Shows the user navigating through the directory and listing files. The commands run are:

```
atian@ATICAN-Workstation:~/CPE212$ sudo nano inventory.ini
atian@ATICAN-Workstation:~/CPE212$ sudo nano ansible.cfg
atian@ATICAN-Workstation:~/CPE212$ sudo nano ansible2.cfg
atian@ATICAN-Workstation:~/CPE212$ ls
ansible.cfg  inventory.ini  inventory.yaml  pbook.yml
atian@ATICAN-Workstation:~/CPE212$ sudo nano ansible2.cfg
atian@ATICAN-Workstation:~/CPE212$ ls
ansible2.cfg  ansible.cfg  inventory.ini  inventory.yaml  pbook.yml
atian@ATICAN-Workstation:~/CPE212$
```

- Showing these four screenshots holds the created inventory file with its contents and the ansible.cfg files. In the 'inventory.ini' consisting of the two hosts which are the manage nodes.

5.

```
atian@ATIAN-Workstation: ~/ATIAN_PrelimExam
```

```
-bash: cd: ATIAN_PrelimExam: Not a directory
atian@ATIAN-Workstation:~/CPE212$ cd
atian@ATIAN-Workstation:~$ cd CPE212
atian@ATIAN-Workstation:~/CPE212$ git commit -m "Changes:"
fatal: not a git repository (or any of the parent directories): .git
atian@ATIAN-Workstation:~/CPE212$ cd
atian@ATIAN-Workstation:~$ git push origin main
fatal: not a git repository (or any of the parent directories): .git
atian@ATIAN-Workstation:~$ cd ATIAN_PrelimExam
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ git push origin main
^[[AEverything up-to-date
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ git commit -m "Changes:"
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ git push origin mai
error: src refspec mai does not match any
error: failed to push some refs to 'github.com:zhriiosk/ATIAN_PrelimExam.git'
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ git push origin maim
error: src refspec maim does not match any
error: failed to push some refs to 'github.com:zhriiosk/ATIAN_PrelimExam.git'
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$ git push origin main
Everything up-to-date
atian@ATIAN-Workstation:~/ATIAN_PrelimExam$
```

- This is where the changes are found and pushed to the GitHub

7. https://github.com/zhriiosk/ATIAN_PrelimExam#