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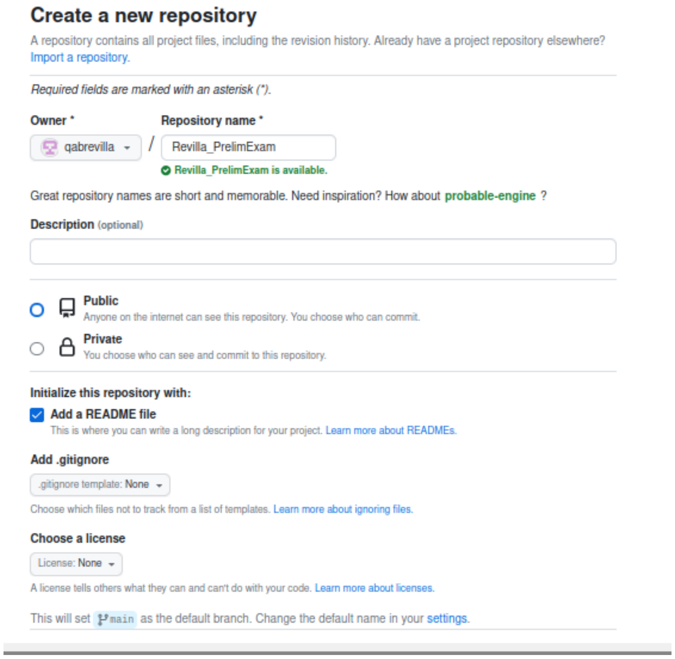
Course/Section: CPE31S5	**Date Submitted:** 10/01/2023
Instructor: Richard Roman	**Semester and SY:** 2023-2024

Hands-on Prelim Exam

Tools Needed:

1. Control Node (CN) - 1
2. Manage Node (MN) - 1
3. UbuntuManage Node (MN) - 1 CentOS

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.
2. Create a repository in your GitHub account and label it as Surname_PrelimExam



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Required fields are marked with an asterisk (*).

Owner *: qabrevilla / Repository name *: Revilla_PrelimExam

Revilla_PrelimExam is available.

Great repository names are short and memorable. Need inspiration? How about probable-engine ?

Description (optional)

● Public — Anyone on the internet can see this repository. You choose who can commit.

○ Private — You choose who can see and commit to this repository.

Initialize this repository with:

☑ Add a README file — This is where you can write a long description for your project. Learn more about READMEs.

Add .gitignore: .gitignore template: None

Choose which files not to track from a list of templates. Learn more about ignoring files.

Choose a license: License: None

A license tells others what they can and can't do with your code. Learn more about licenses.

This will set main as the default branch. Change the default name in your settings.

Figure 2.1 Creating a repository

In github, I created a new repository called “Revilla_PrelimExam” setting it on public and added a README file.

3. Clone your new repository in your CN.

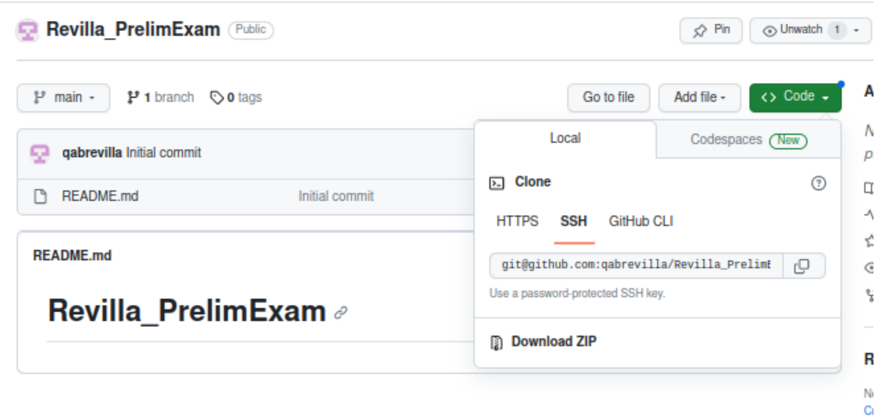
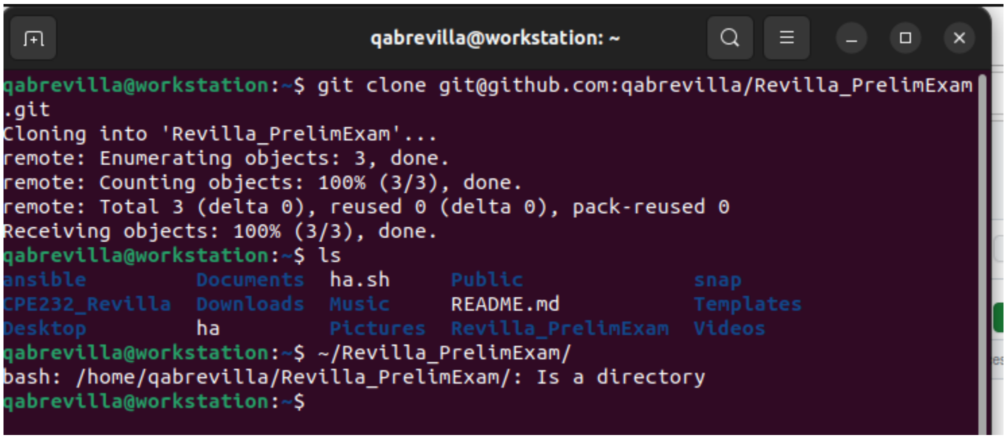


Figure 3.1 SSH Link

We can access the ssh link on the top left corner of the repository options. This link will be useful when we clone a repository on a local machine.

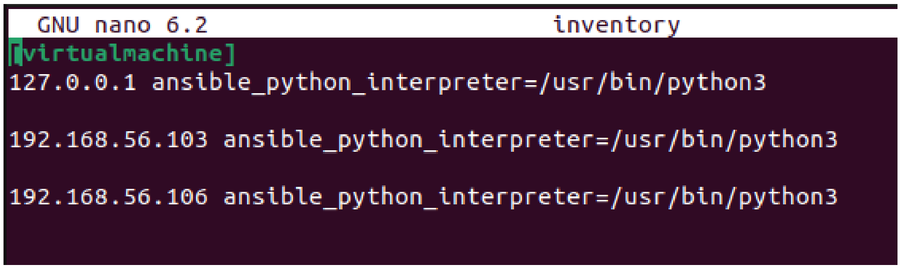


```
qabrevilla@workstation:~$ git clone git@github.com:qabrevilla/Revilla_PrelimExam
.git
Cloning into 'Revilla_PrelimExam'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
qabrevilla@workstation:~$ ls
ansible        Documents  ha.sh     Public              snap
CPE232_Revilla Downloads  Music     README.md           Templates
Desktop        ha         Pictures  Revilla_PrelimExam  Videos
qabrevilla@workstation:~$ ~/Revilla_PrelimExam/
bash: /home/qabrevilla/Revilla_PrelimExam/: Is a directory
qabrevilla@workstation:~$
```

Figure 3.2 Git Cloning

The command `git clone [ssh github link]` will access and clone an existing github repository in your local machine.

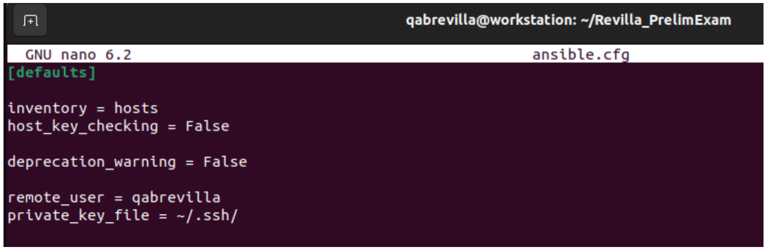
4. In your CN, create an inventory file and ansible.cfg files.



```
  GNU nano 6.2                          inventory
[virtualmachine]
127.0.0.1 ansible_python_interpreter=/usr/bin/python3

192.168.56.103 ansible_python_interpreter=/usr/bin/python3

192.168.56.106 ansible_python_interpreter=/usr/bin/python3
```

Figure 4.1 Creating an inventory file

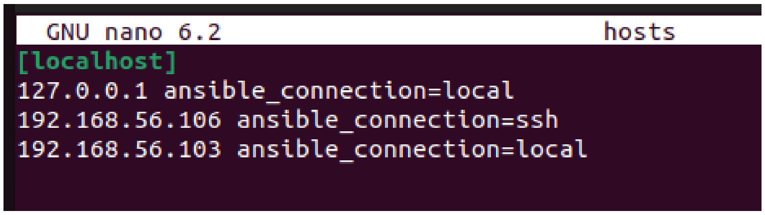
Inside the PrelimExam directory, I created a inventory file that contains the hosts or groups of hosts listed and identified by its categories.



```
  GNU nano 6.2                                        ansible.cfg
[defaults]

inventory = hosts
host_key_checking = False

deprecation_warning = False

remote_user = qabrevilla
private_key_file = ~/.ssh/
```

Figure 4.2 Creating ansible.cfg file

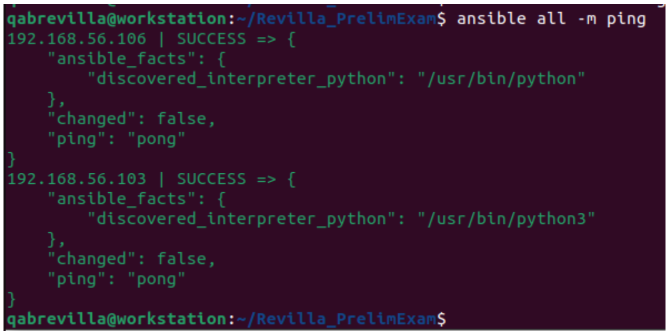
To create a ansible.cfg file, We use the command `sudo nano`. It defines the file behavior and governs all the interaction performed by the control node.



```
  GNU nano 6.2                                   hosts
[localhost]
127.0.0.1 ansible_connection=local
192.168.56.106 ansible_connection=ssh
192.168.56.103 ansible_connection=local
```

Figure 4.3 Creating hosts file

Hosts file is another important file that is used to store information about the remote nodes.



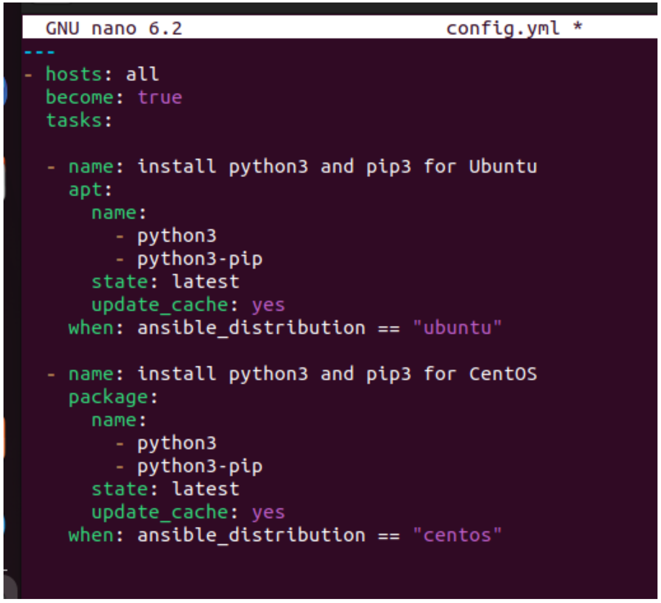
```
qabrevilla@workstation:~/Revilla_PrelimExam$ ansible all -m ping
192.168.56.106 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
192.168.56.103 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
qabrevilla@workstation:~/Revilla_PrelimExam$
```

Figure 4.4 Test of Connections

Using ansible all -m ping will provide a list of information about the connections of all the control nodes.

5. Create an Ansible playbook that does the following with an input of a config.yaml file for both Manage Nodes

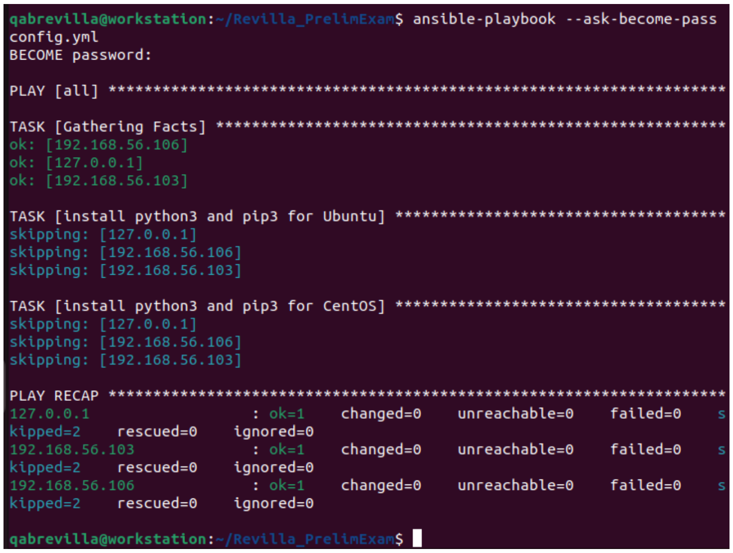
◦ Installs the latest python3 and pip3



```
  GNU nano 6.2                                    config.yml *
---
- hosts: all
  become: true
  tasks:

  - name: install python3 and pip3 for Ubuntu
    apt:
      name:
        - python3
        - python3-pip
      state: latest
      update_cache: yes
    when: ansible_distribution == "ubuntu"

  - name: install python3 and pip3 for CentOS
    package:
      name:
        - python3
        - python3-pip
      state: latest
      update_cache: yes
    when: ansible_distribution == "centos"
```

Figure 5.1 Creating a playbook python3 installation

To create a Ansible playbook containing the input of config.yml use the command `sudo nano`. Inside the playbook, we have to first initialize the host's group name that will perform the playbook. We can name them by using - name syntax to provide a name for a certain task. Under apt/package, define the tasks needed for installing python3 and python3-pip.

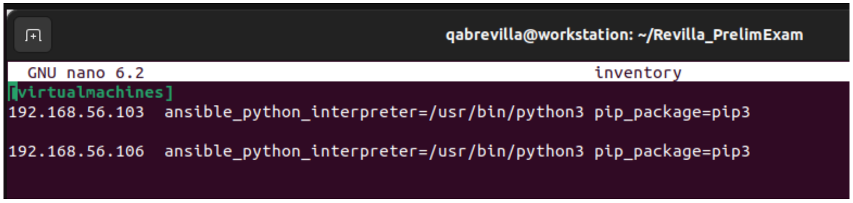


```
qabrevilla@workstation:~/Revilla_PrelimExam$ ansible-playbook --ask-become-pass
config.yml
BECOME password:

PLAY [all] **********************************************************************

TASK [Gathering Facts] **********************************************************
ok: [192.168.56.106]
ok: [127.0.0.1]
ok: [192.168.56.103]

TASK [install python3 and pip3 for Ubuntu] **************************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

TASK [install python3 and pip3 for CentOS] **************************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

PLAY RECAP **********************************************************************
127.0.0.1                  : ok=1    changed=0    unreachable=0    failed=0    s
kipped=2    rescued=0    ignored=0
192.168.56.103             : ok=1    changed=0    unreachable=0    failed=0    s
kipped=2    rescued=0    ignored=0
192.168.56.106             : ok=1    changed=0    unreachable=0    failed=0    s
kipped=2    rescued=0    ignored=0

qabrevilla@workstation:~/Revilla_PrelimExam$ 
```

Figure 5.1.1 Running config.yml

After running the playbook, we can see the different tasks performed and if it worked properly.

◦ use pip3 as default pip

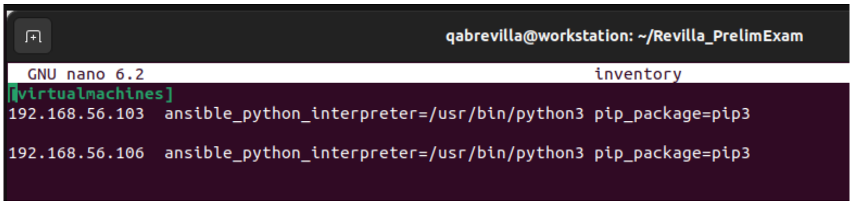


```
  GNU nano 6.2                                           inventory
[virtualmachines]
192.168.56.103  ansible_python_interpreter=/usr/bin/python3 pip_package=pip3

192.168.56.106  ansible_python_interpreter=/usr/bin/python3 pip_package=pip3
```

Figure 5.2 Pip3

In the inventory file, I set pip3 as the default pip for both server and CentOS.

◦ use python3 as default python

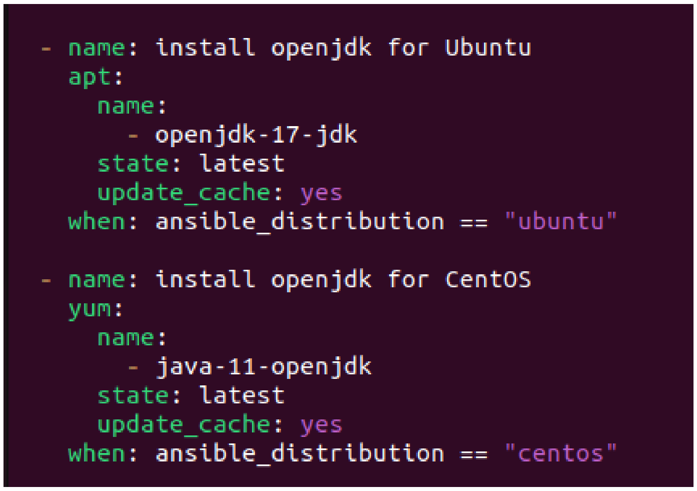


```
  GNU nano 6.2                                           inventory
[virtualmachines]
192.168.56.103  ansible_python_interpreter=/usr/bin/python3 pip_package=pip3

192.168.56.106  ansible_python_interpreter=/usr/bin/python3 pip_package=pip3
```

Figure 5.3 Python3

In the inventory, I set python3 as the default python for all the hosts listed on the inventory file.

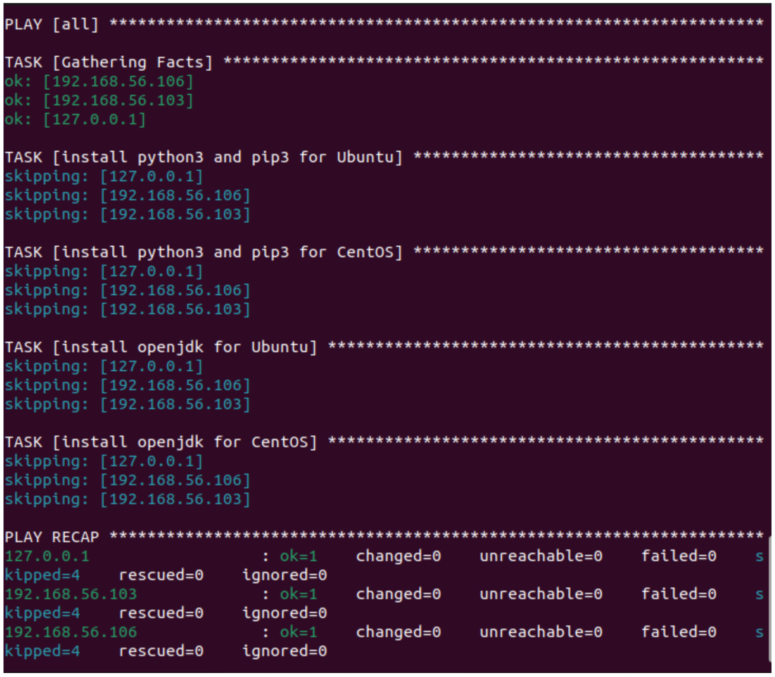
◦ Install Java open-jdk



```
- name: install openjdk for Ubuntu
  apt:
    name:
      - openjdk-17-jdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "ubuntu"

- name: install openjdk for CentOS
  yum:
    name:
      - java-11-openjdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "centos"
```

Figure 5.4 Installing openjdk on Playbook

I created another task for installing openjdk in Ubuntu and CentOS. As we can see, I use apt in ubuntu and yum for CentOS for the tasks to work.

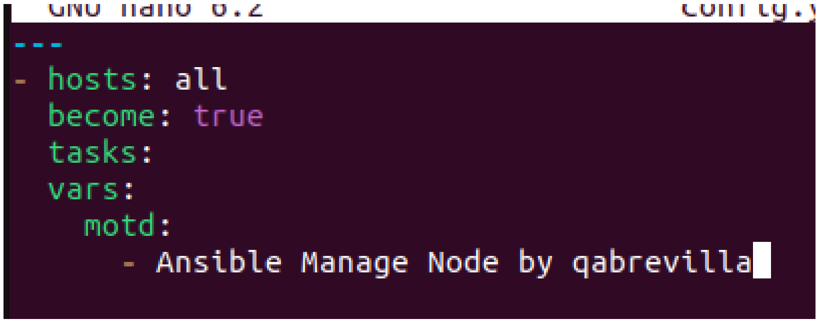


```
PLAY [all] ****************************************************************

TASK [Gathering Facts] ****************************************************
ok: [192.168.56.106]
ok: [192.168.56.103]
ok: [127.0.0.1]

TASK [install python3 and pip3 for Ubuntu] ********************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

TASK [install python3 and pip3 for CentOS] ********************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

TASK [install openjdk for Ubuntu] *****************************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

TASK [install openjdk for CentOS] *****************************************
skipping: [127.0.0.1]
skipping: [192.168.56.106]
skipping: [192.168.56.103]

PLAY RECAP ****************************************************************
127.0.0.1                  : ok=1    changed=0    unreachable=0    failed=0    s
kipped=4    rescued=0    ignored=0
192.168.56.103             : ok=1    changed=0    unreachable=0    failed=0    s
kipped=4    rescued=0    ignored=0
192.168.56.106             : ok=1    changed=0    unreachable=0    failed=0    s
kipped=4    rescued=0    ignored=0
```

Figure 5.4.1 Running config.yml

The playbook runs perfectly and openjdk was able to installed in both distributions

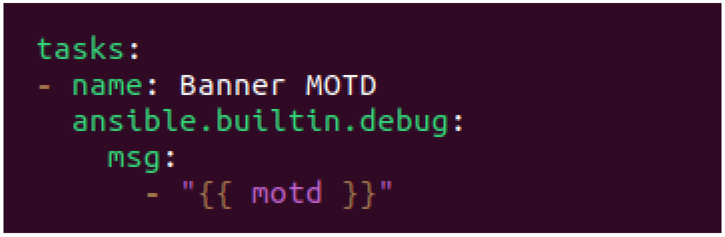
◦ Create Motd containing the text defined by a variable defined in config.yaml file and if there is no variable input the default
motd is "Ansible Managed node by (your user name)"



```
  GNU nano 6.2                                    config.y
---
- hosts: all
  become: true
  tasks:
  vars:
    motd:
      - Ansible Manage Node by qabrevilla
```

Figure 5.5 Creating a Motd

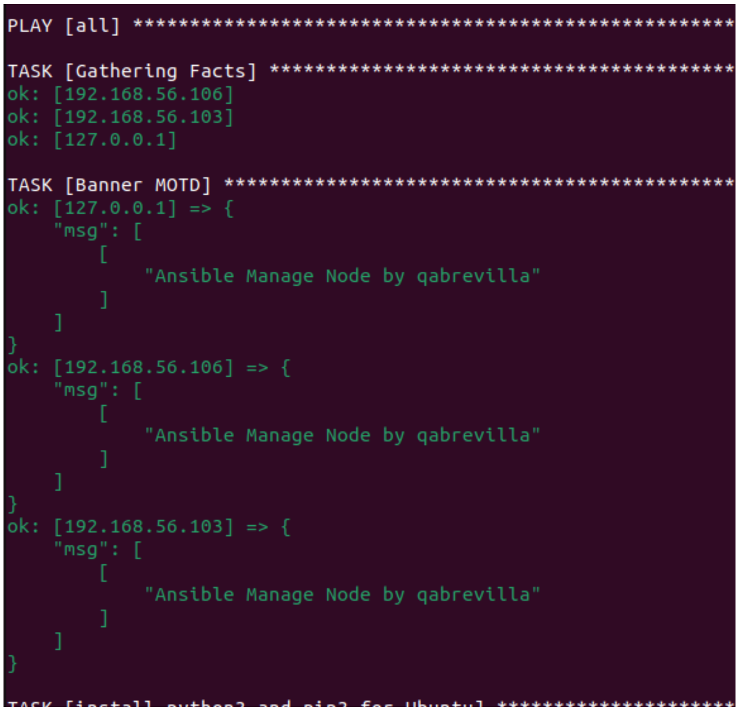
The `vars` means variable in the playbook. It is similar to any other variable in programming languages. It is used to assign values to variables that can be used by the administrator.



```
tasks:
- name: Banner MOTD
  ansible.builtin.debug:
    msg:
      - "{{ motd }}"
```

Figure 5.5.1 Printing “motd”

This is the task where it will print a message “motd” defined on the vars. The `ansible.builtin.debug` is a module that debugs the statement without halting the playbook.

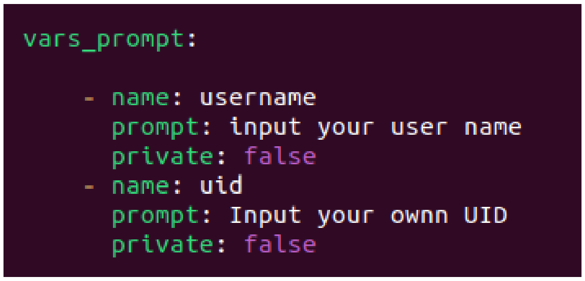


```
PLAY [all] *************************************************************

TASK [Gathering Facts] *************************************************
ok: [192.168.56.106]
ok: [192.168.56.103]
ok: [127.0.0.1]

TASK [Banner MOTD] *****************************************************
ok: [127.0.0.1] => {
    "msg": [
        [
            "Ansible Manage Node by qabrevilla"
        ]
    ]
}
ok: [192.168.56.106] => {
    "msg": [
        [
            "Ansible Manage Node by qabrevilla"
        ]
    ]
}
ok: [192.168.56.103] => {
    "msg": [
        [
            "Ansible Manage Node by qabrevilla"
        ]
    ]
}

TASK [install python3 and pip3 for Ubuntu] *****************************
```

Figure 5.5.2 Running config.yml

After running config.yml, the playbook shows a motd “Ansible Manage Node by qabrevilla” for both Ubuntu and CentOS manage nodes.

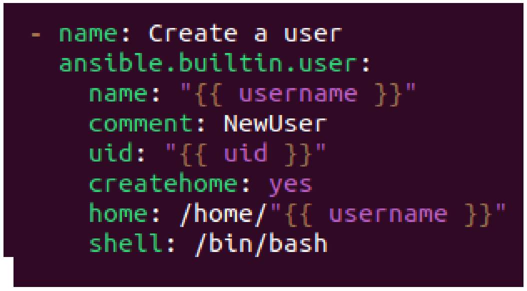
◦ Create a user with a variable defined in config.yaml



```
vars_prompt:

    - name: username
      prompt: input your user name
      private: false
    - name: uid
      prompt: Input your ownn UID
      private: false
```

Figure 5.6 Creating a variable for user creation

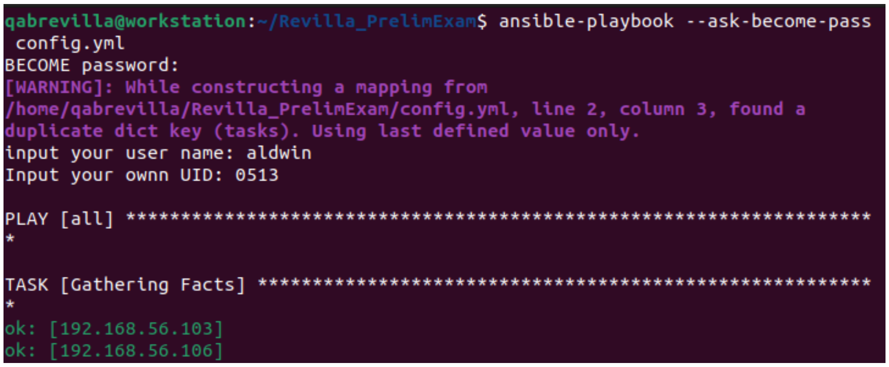
In this section, It was defined how it will create a user interaction prompt for creating a user.



```
- name: Create a user
  ansible.builtin.user:
    name: "{{ username }}"
    comment: NewUser
    uid: "{{ uid }}"
    createhome: yes
    home: /home/"{{ username }}"
    shell: /bin/bash
```

Figure 5.6.1 Create User Task

Here is where it is defined how the playbook will do when creating a user

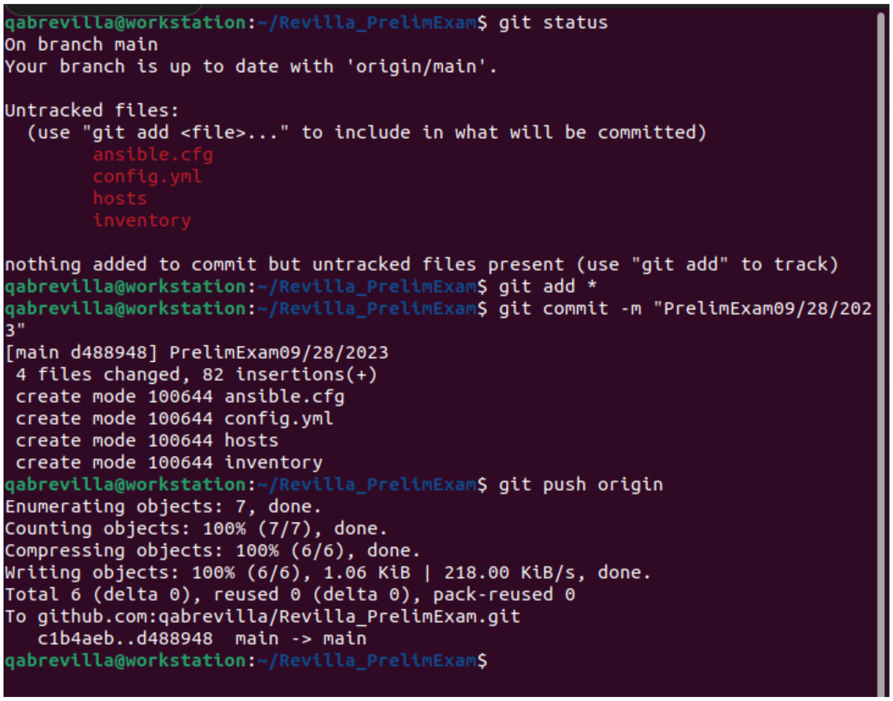


```
qabrevilla@workstation:~/Revilla_PrelimExam$ ansible-playbook --ask-become-pass
 config.yml
BECOME password:
[WARNING]: While constructing a mapping from
/home/qabrevilla/Revilla_PrelimExam/config.yml, line 2, column 3, found a
duplicate dict key (tasks). Using last defined value only.
input your user name: aldwin
Input your ownn UID: 0513

PLAY [all] *********************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.103]
ok: [192.168.56.106]
```

Figure 5.6.2 Running config.yml

We can see that It performed the task of creating a user asking its username and UID.

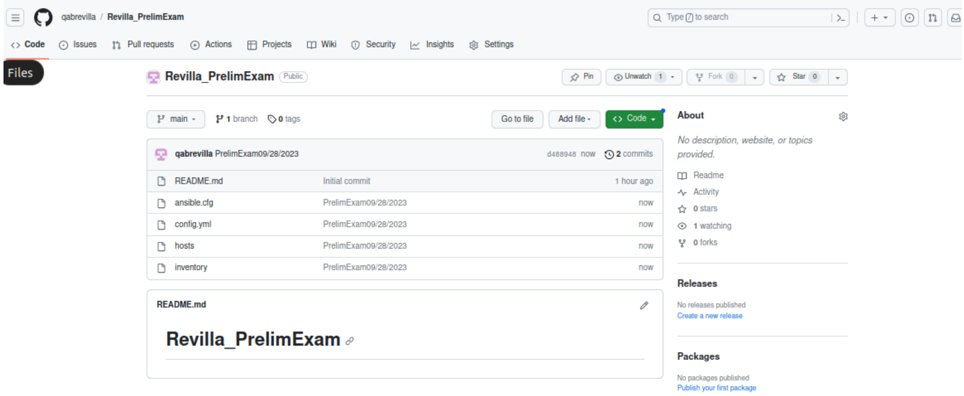
6. PUSH and COMMIT your PrelimExam in your GitHub repo



```
qabrevilla@workstation:~/Revilla_PrelimExam$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        ansible.cfg
        config.yml
        hosts
        inventory

nothing added to commit but untracked files present (use "git add" to track)
qabrevilla@workstation:~/Revilla_PrelimExam$ git add *
qabrevilla@workstation:~/Revilla_PrelimExam$ git commit -m "PrelimExam09/28/202
3"
[main d488948] PrelimExam09/28/2023
 4 files changed, 82 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yml
 create mode 100644 hosts
 create mode 100644 inventory
qabrevilla@workstation:~/Revilla_PrelimExam$ git push origin
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 1.06 KiB | 218.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:qabrevilla/Revilla_PrelimExam.git
   c1b4aeb..d488948  main -> main
qabrevilla@workstation:~/Revilla_PrelimExam$
```

Figure 6.1 Committing PrelimExam

Using these steps of commands will enable a user to commit all the files on Github.



qabrevilla PrelimExam09/28/2023 d488948 now 2 commits

README.md	Initial commit	1 hour ago
ansible.cfg	PrelimExam09/28/2023	now
config.yml	PrelimExam09/28/2023	now
hosts	PrelimExam09/28/2023	now
inventory	PrelimExam09/28/2023	now

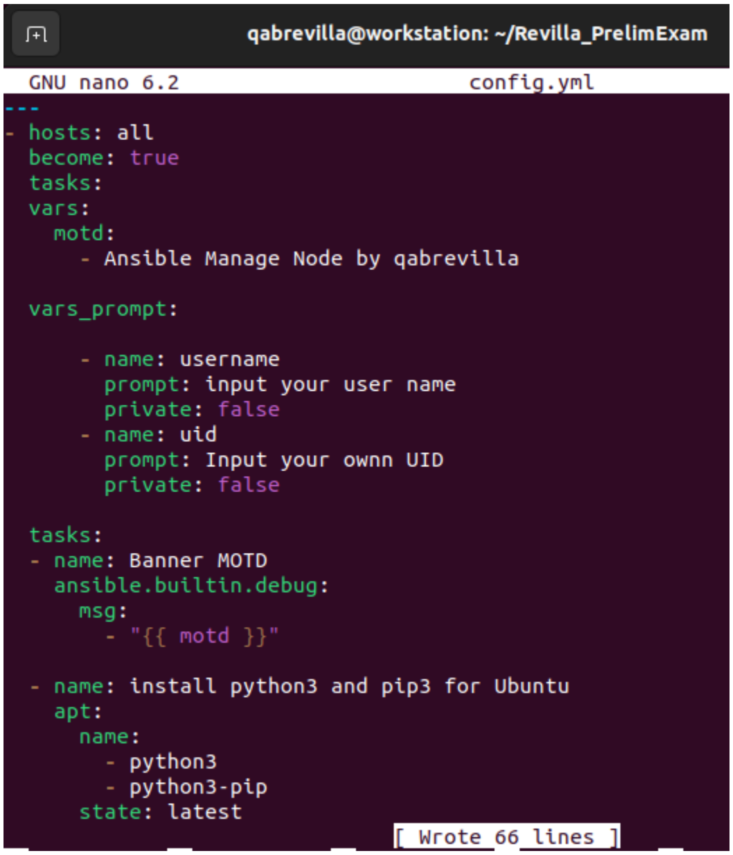
README.md

Revilla_PrelimExam

Figure 6.1.1 Checking Repository

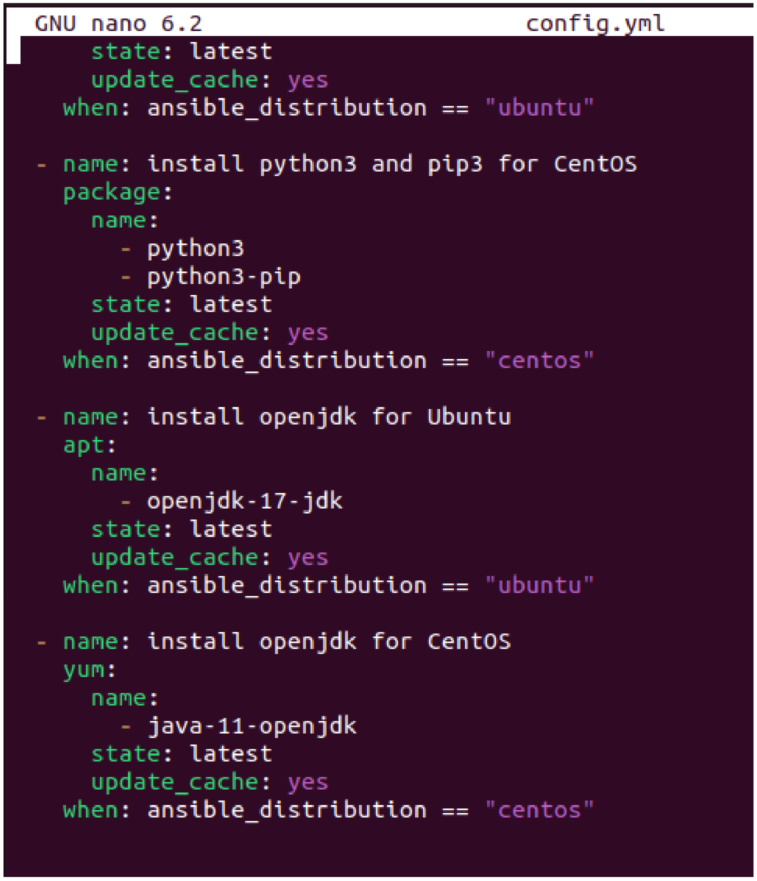
The file inside the directory was able to be transferred to the github repository.

7. Your document report should be submitted here.

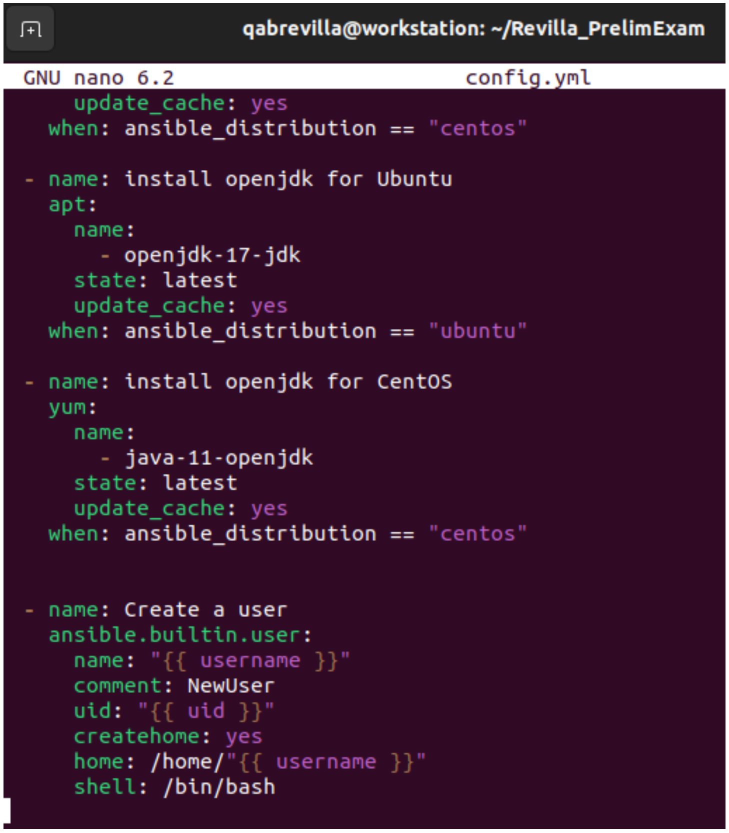


qabrevilla@workstation: ~/Revilla_PrelimExam

```
  GNU nano 6.2                            config.yml
---
- hosts: all
  become: true
  tasks:
  vars:
    motd:
      - Ansible Manage Node by qabrevilla

  vars_prompt:

      - name: username
        prompt: input your user name
        private: false
      - name: uid
        prompt: Input your ownn UID
        private: false

  tasks:
  - name: Banner MOTD
    ansible.builtin.debug:
      msg:
        - "{{ motd }}"

  - name: install python3 and pip3 for Ubuntu
    apt:
      name:
        - python3
        - python3-pip
      state: latest
                               [ Wrote 66 lines ]
```

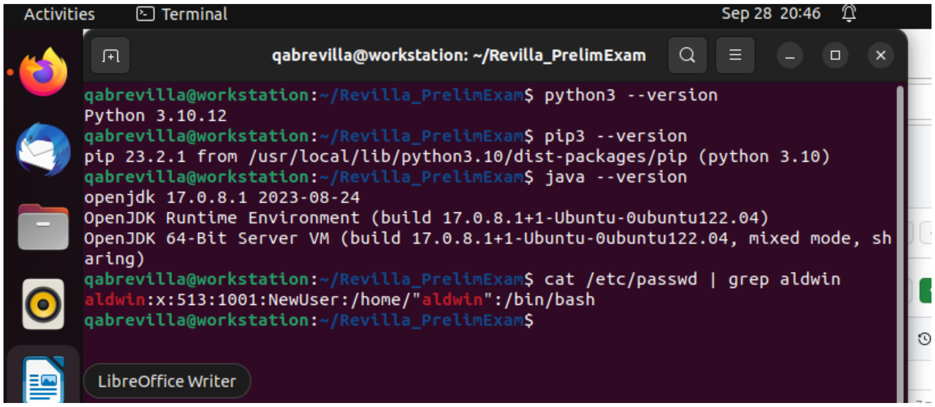


```
    state: latest
    update_cache: yes
  when: ansible_distribution == "ubuntu"

- name: install python3 and pip3 for CentOS
  package:
    name:
      - python3
      - python3-pip
    state: latest
    update_cache: yes
  when: ansible_distribution == "centos"

- name: install openjdk for Ubuntu
  apt:
    name:
      - openjdk-17-jdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "ubuntu"

- name: install openjdk for CentOS
  yum:
    name:
      - java-11-openjdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "centos"
```



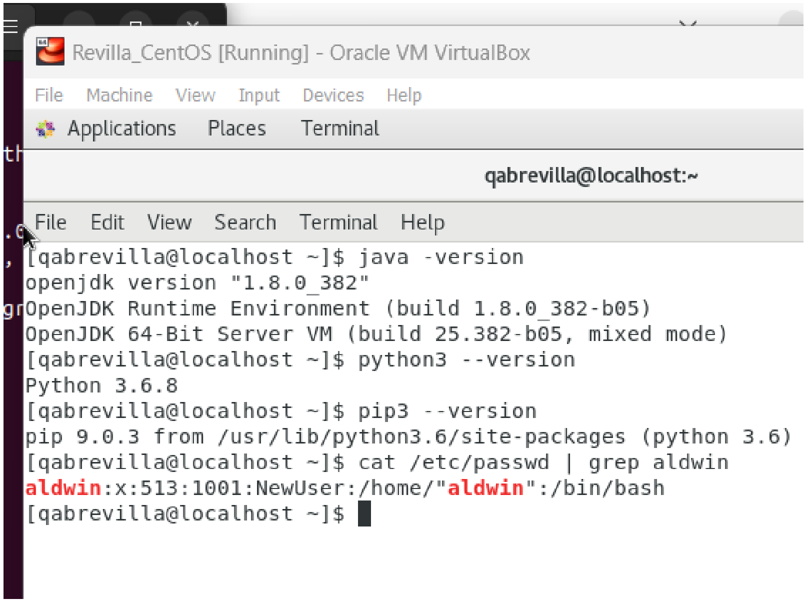
```
    update_cache: yes
  when: ansible_distribution == "centos"

- name: install openjdk for Ubuntu
  apt:
    name:
      - openjdk-17-jdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "ubuntu"

- name: install openjdk for CentOS
  yum:
    name:
      - java-11-openjdk
    state: latest
    update_cache: yes
  when: ansible_distribution == "centos"


- name: Create a user
  ansible.builtin.user:
    name: "{{ username }}"
    comment: NewUser
    uid: "{{ uid }}"
    createhome: yes
    home: /home/"{{ username }}"
    shell: /bin/bash
```

Figure 7.1 Full Syntax of Playbook



```
qabrevilla@workstation:~/Revilla_PrelimExam$ python3 --version
Python 3.10.12
qabrevilla@workstation:~/Revilla_PrelimExam$ pip3 --version
pip 23.2.1 from /usr/local/lib/python3.10/dist-packages/pip (python 3.10)
qabrevilla@workstation:~/Revilla_PrelimExam$ java --version
openjdk 17.0.8.1 2023-08-24
OpenJDK Runtime Environment (build 17.0.8.1+1-Ubuntu-0ubuntu122.04)
OpenJDK 64-Bit Server VM (build 17.0.8.1+1-Ubuntu-0ubuntu122.04, mixed mode, sh
aring)
qabrevilla@workstation:~/Revilla_PrelimExam$ cat /etc/passwd | grep aldwin
aldwin:x:513:1001:NewUser:/home/"aldwin":/bin/bash
qabrevilla@workstation:~/Revilla_PrelimExam$
```

Figure 7.2 Checking Installations and new user in Ubuntu
These are the evidence that the playbook works properly and was able to do its tasks in Ubuntu.



Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
qabrevilla@localhost:~
File Edit View Search Terminal Help

```
[qabrevilla@localhost ~]$ java -version
openjdk version "1.8.0_382"
OpenJDK Runtime Environment (build 1.8.0_382-b05)
OpenJDK 64-Bit Server VM (build 25.382-b05, mixed mode)
[qabrevilla@localhost ~]$ python3 --version
Python 3.6.8
[qabrevilla@localhost ~]$ pip3 --version
pip 9.0.3 from /usr/lib/python3.6/site-packages (python 3.6)
[qabrevilla@localhost ~]$ cat /etc/passwd | grep aldwin
aldwin:x:513:1001:NewUser:/home/"aldwin":/bin/bash
[qabrevilla@localhost ~]$ 
```

Figure 7.2.1 Checking Installations and new user in CentOS
These are the evidence that the playbook works properly and was able to do its tasks in CentOS.

8. For your prelim exam to be counted, please paste your repository link here.
https://github.com/qabrevilla/CPE232_Revilla