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Walchand College of Engineering, Sangli

Department of Computer Science and Engineering

Software Engineering Tools Lab

Assignment No 4

(Module 4- Configuration management tools)

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Q 1. Differentiate **Chef Vs Puppet Vs Ansible Vs Saltstack** w.r.t properties given below

a. Owner/ Company
b. Open/free/proprietary
c. Size
d. Configuration type(push/pull)
e. Components
f. Written in language
g. Tasks that can be performed (infrastructure/code management etc.)
h. Advantages
i. Disadvantages
j. Website
k. Installation prerequisite

Ans:

Properties	**Chef**	**Puppet**	**Ansible**	**Saltstack**
Owner/Company	Opscode	Yvonne Wassenaar	Michael DeHaan	VMware
Open/free/proprietary	Open source	Open source	Open source	Open source
Size	0.08 mb	0.08 mb	0.08 mb	0.08 mb
Configuration type(push/pull)	Pull based	Pull, Push	Push based	Push based
Components	3 main	Manifests	Inventory	Salt Master

	components 1. Workstation 2. Server 3. Nodes	Module Resource Factor M-collective Catalogs Class Nodes	Playbooks Plays Tasks Roles Handlers Templates Variables	Salt Minions Execution Modules Formulas (States) Grains Pillar Top File Runners Returners Reactor Salt Cloud/Salt Virt Salt SSH
Written in language	Ruby and Erlang	Ruby	Ruby, Python	Python
Tasks that can be performed (infrastructure/ code management etc.)	Deployment task In devops	Deployment task In devops	Deployment task In devops	Deployment task In devops
Advantages	1.Manages huge amount node 2.Write once deploy many times 3.High availability	1.Reduce downtime 2.Faster deployment 3.Easy automation	1.Simple to learn 2.Easily understand to Python 3.No dependency on agents	1. Flexible 2.Python api 3.Parallel execution
Disadvantages	1.Not good documentation 2.Not easy to learn if you don't know ruby	1.Not good documentation 2.Not easy to learn if you don't know ruby 3.Not suitable for small businesses	1.Insufficient UI 2.Limited windows Support 3.Not have experience	Not good UI
Website	www.chef.io	www.puppet.com	www.ansible.com	saltprojects.io

Installation prerequisite	4 GB RAM	4 GB RAM	4 GB RAM	4 GB RAM

Q 2. What are the different flavors of **Chef configuration management tool**?

Ans: Chef comes in various flavors, such as Chef Solo, which has no remote server and cookbooks are located on the local site itself.

There's also Hosted Chef, where a Chef server is provided as a service on the cloud. Thus, there is no need to set up a server yourself.

If you want traditional Chef architecture, there's Chef Client/Server. With this flavor, a hosted remote server communicates between the workstation and node.

Finally, there is a Private Chef, which is the enterprise version of Chef. With this flavor, the server is hosted within the enterprise infrastructure.

Q 3. What is **Pull and Push** configuration?

Ans: Push configuration entails the server pushing configuration to the nodes. Pull configuration involves the nodes checking with the server periodically, and fetching the configurations from it.

Q 4. What is **Playbook and Inventory w.r.t Ansible** and **recipe and cookbook w.r.t Chef** configuration management tool?

Ans: **Playbook w.r.t. Ansible**: A playbook is where you define how to apply policies, declare configurations, orchestrate steps and launch tasks either synchronously or asynchronously on your servers. Each playbook is composed of one or more "plays". Playbooks are normally maintained and managed in a version control system like Git. They are expressed in **YAML** (**Y**et **A**nother **M**arkup **L**anguage).

Inventory w.r.t. Ansible: The "inventory" is a configuration file where you define the host information.

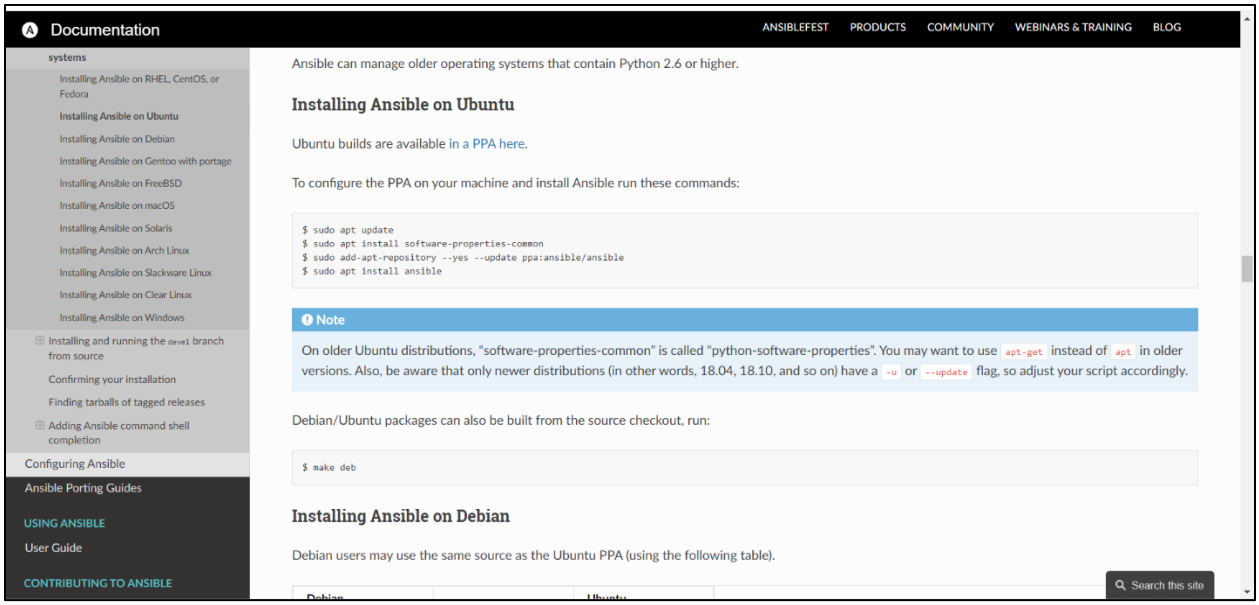
Recipe w.r.t. Chef: It can be defined as a collection of attributes which are used to manage the infrastructure. These attributes which are present in the recipe are used to change the existing state or setting a particular infrastructure node.

Cookbook w.r.t. Chef: A cookbook is a collection of recipes. They are the basic building blocks which get uploaded to Chef server.

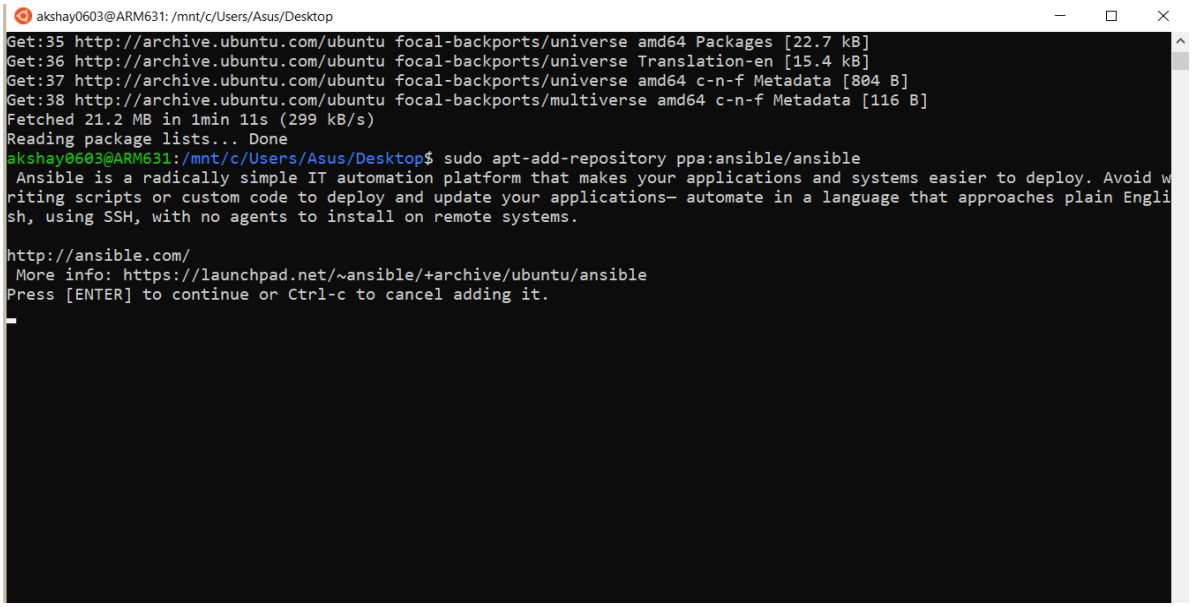
Q 5. Perform below operations on your machine to check **working of Ansible**

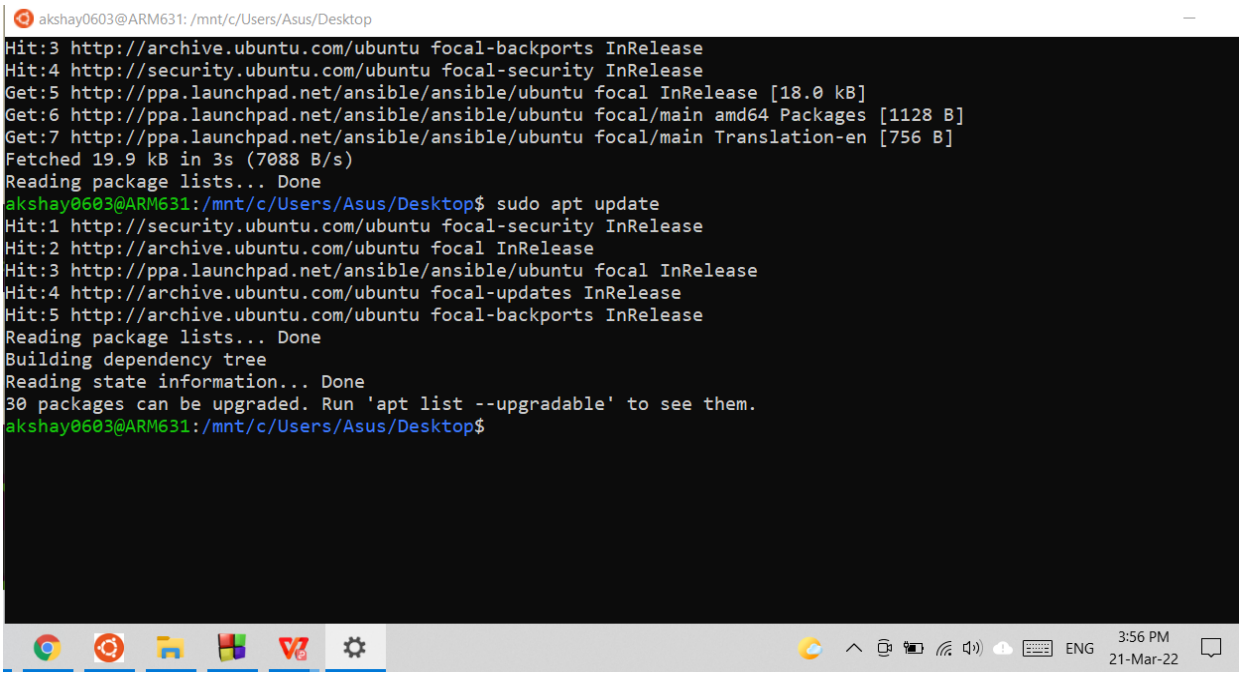
a. Install Ansible
b. Setup an Inventory
c. Create a playbook to install MySQL db on one node.
d. Execute a playbook

Steps to execute installation of ansible:

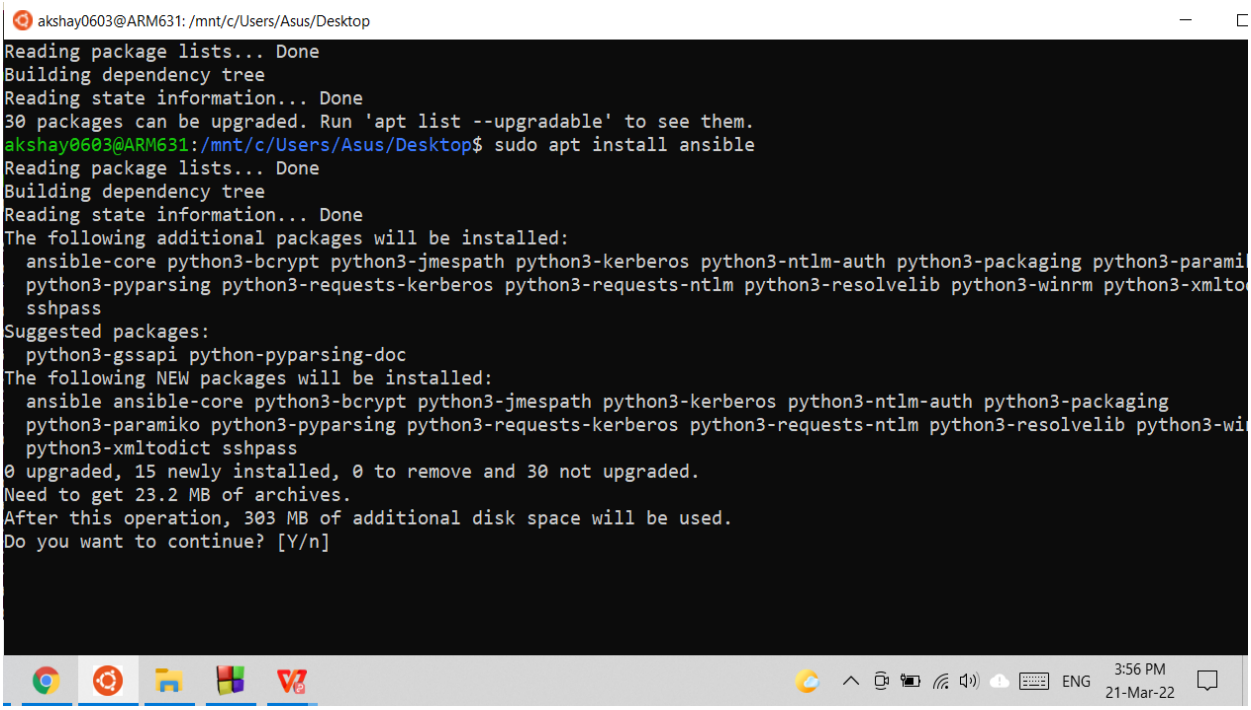


Updated the existing packages:

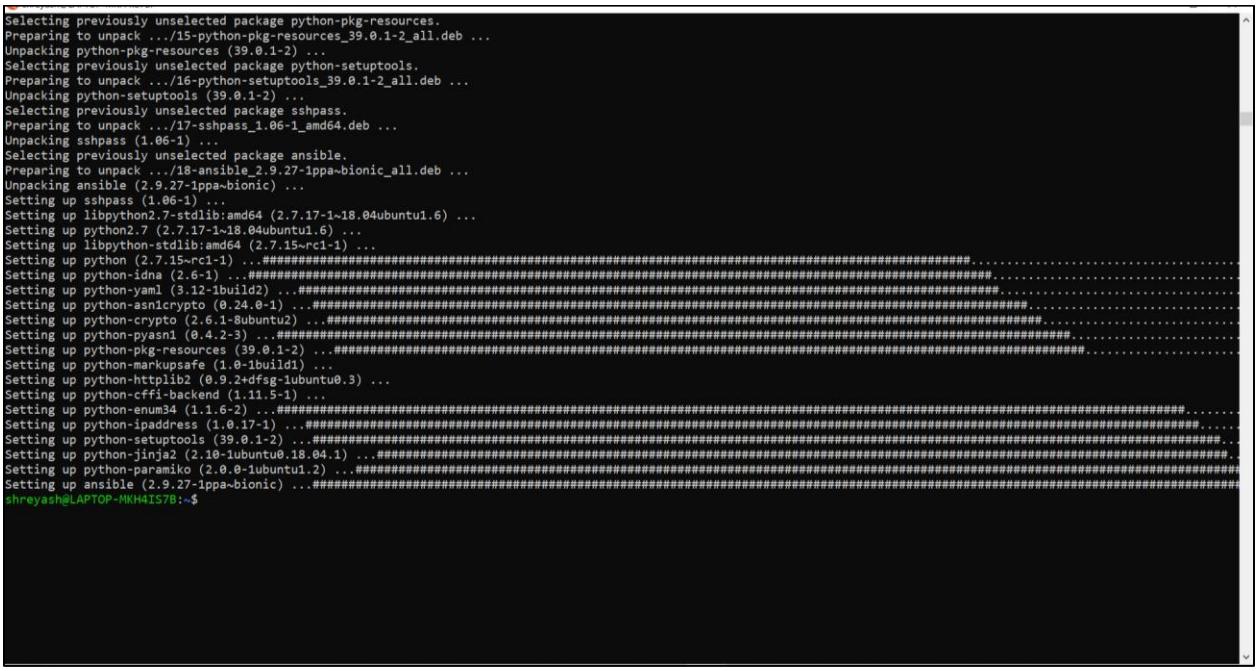




Executed above commands to install ansible:



Installation complete.

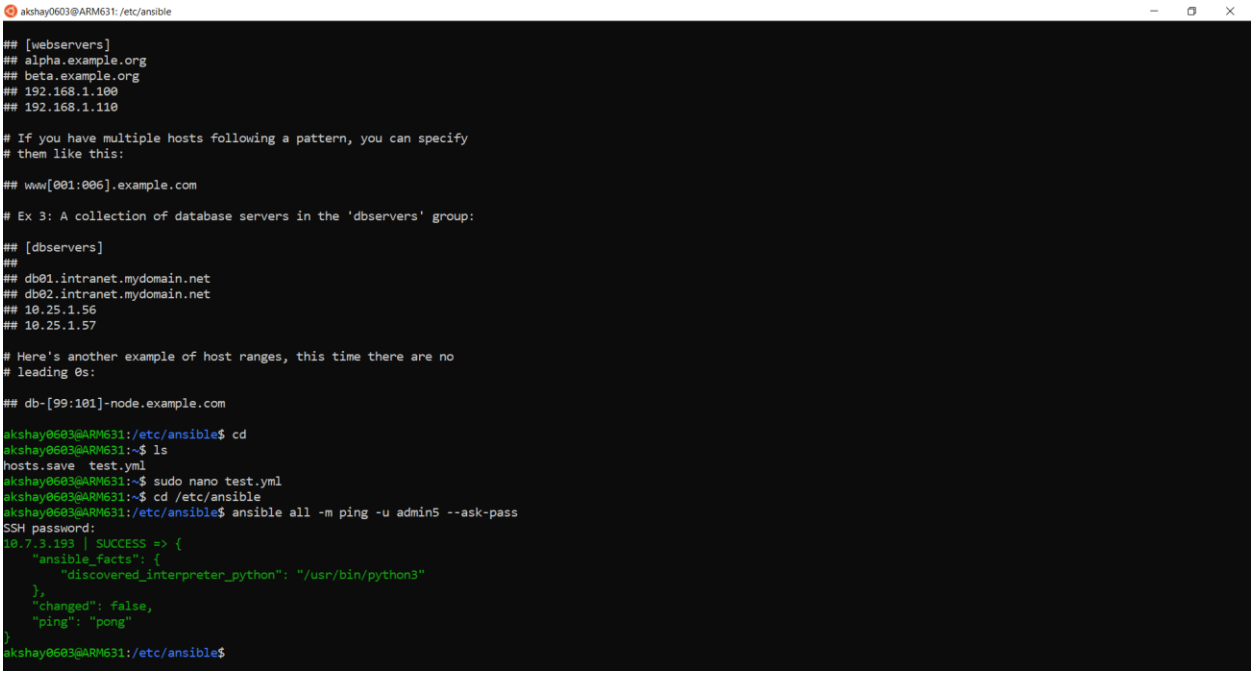


Checked installation of ansible on server:

```
akshay0603@ARM631:~$ ansible --version
ansible [core 2.12.2]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/akshay0603/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /home/akshay0603/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Nov 26 2021, 20:14:08) [GCC 9.3.0]
  jinja version = 2.10.1
  libyaml = True
akshay0603@ARM631:~$
```

Edited hosts inventory file, added IP address of working node.

```
  GNU nano 2.9.3                                    hosts

# This is the default ansible 'hosts' file.
#
# It should live in /etc/ansible/hosts
#
#   - Comments begin with the '#' character
#   - Blank lines are ignored
#   - Groups of hosts are delimited by [header] elements
#   - You can enter hostnames or ip addresses
#   - A hostname/ip can be a member of multiple groups

# Ex 1: Ungrouped hosts, specify before any group headers.

## green.example.com
## blue.example.com
## 192.168.100.1
## 192.168.100.10

# Ex 2: A collection of hosts belonging to the 'webservers' group

## [webservers]
## alpha.example.org
## beta.example.org
## 192.168.1.100
## 192.168.1.110

# If you have multiple hosts following a pattern you can specify
# them like this:

## www[001:006].example.com
                                    [ Read 44 lines ]
^G Get Help    ^O Write Out   ^W Where Is    ^K Cut Text    ^J Justify     ^C Cur Pos     M-U Undo       M-A Mark Text
^X Exit        ^R Read File   ^\ Replace     ^U Uncut Text  ^T To Spell    ^_ Go To Line  M-E Redo       M-6 Copy Text
```



Testing connection with working node:

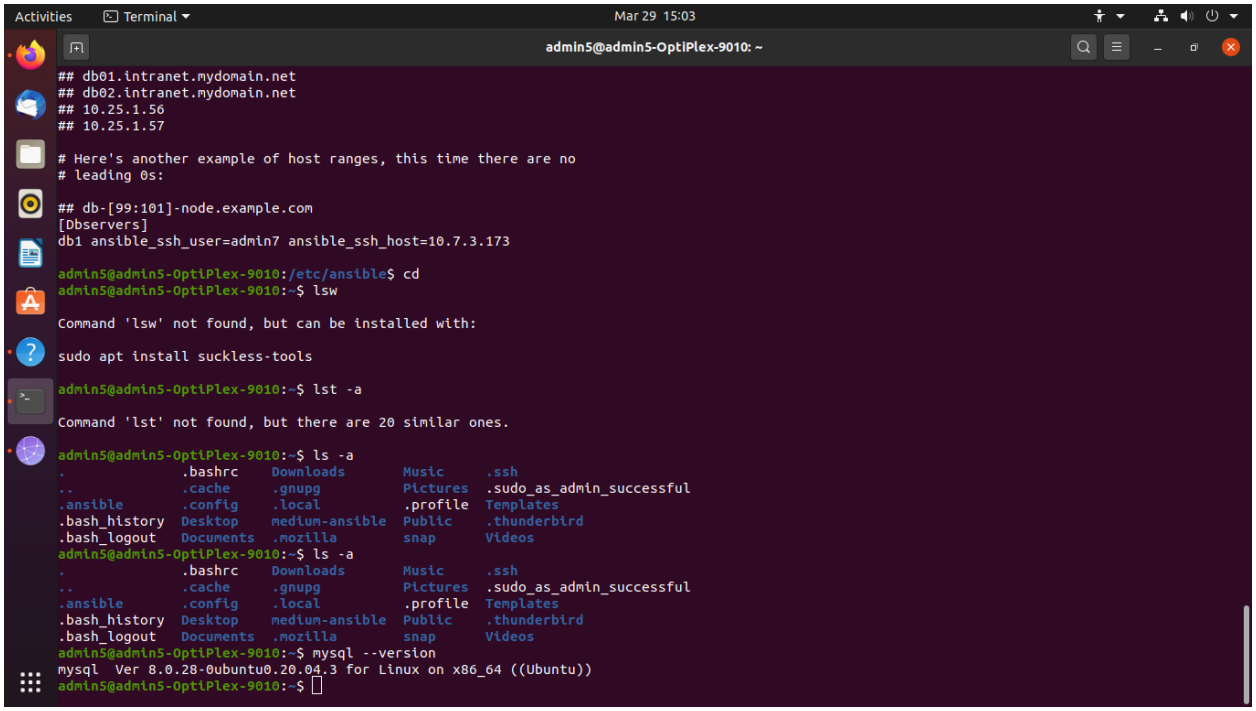
Creating playbook named test.yml file to install MySQL server on that node.

```
 GNU nano 2.9.3                        test.yml                              Modified

---
- name: Install MySQL
  hosts: 10.7.3.151
  vars:
    mysql_root_password: password
  tasks:
    - name: install mysql
      apt: name=mysql-server update_cache=yes cache_valid_time=3600 state=present
      become: yes

^G Get Help    ^O Write Out   ^W Where Is    ^K Cut Text    ^J Justify     ^C Cur Pos     M-U Undo       M-A Mark Text
^X Exit        ^R Read File   ^\ Replace     ^U Uncut Text  ^T To Spell    ^_ Go To Line  M-E Redo       M-6 Copy Text
```

Executed test.yml file for installation.

```
akshay0603@ARM631: ~
## 10.25.1.56
## 10.25.1.57

# Here's another example of host ranges, this time there are no
# leading 0s:

## db-[99:101]-node.example.com

akshay0603@ARM631:/etc/ansible$ cd
akshay0603@ARM631:~$ ls
hosts.save  test.yml
akshay0603@ARM631:~$ sudo nano test.yml
akshay0603@ARM631:~$ cd /etc/ansible
akshay0603@ARM631:/etc/ansible$ ansible all -m ping -u admin5 --ask-pass
SSH password:
10.7.3.193 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
akshay0603@ARM631:/etc/ansible$ ansible-playbook test.yml -u admin5 --ask-pass --ask-become-pass
ERROR! the playbook: test.yml could not be found
akshay0603@ARM631:/etc/ansible$ cd
akshay0603@ARM631:~$ ansible-playbook test.yml -u admin5 --ask-pass --ask-become-pass
SSH password:
BECOME password[defaults to SSH password]:

PLAY [Install MySQL] ***********************************************************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************************************************************
ok: [10.7.3.193]

TASK [install mysql] ***********************************************************************************************************************************************************
changed: [10.7.3.193]

PLAY RECAP *********************************************************************************************************************************************************************
10.7.3.193                 : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

akshay0603@ARM631:~$
Type here to search                                                                                                                                    ENG 3:01 PM 29-Mar-22
```

Tested whether the MySQL server installed on node:



Q 6. Perform below operations on your machine to check **working of Chef**

a. Install Chef
b. Create a recipe and place it in a cookbook to install MySQL db on one node.
c. Execute a recipe using knife command.