LAB3
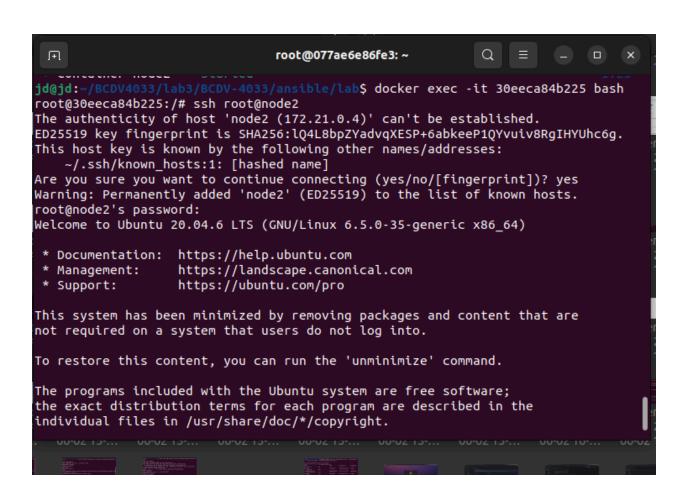
Name -jatin Deswal
Student no. 101522607

```
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker compose up -d
WARN[0000] /home/jd/BCDV4033/lab3/BCDV-4033/ansible/lab/docker-compose.yml: `ver
sion` is obsolete
[+] Running 2/2
 ! ansible Warning          pull access denied for ansi...              0.5s
 ! remote-host-one Warning pull access denied ...                       0.9s
[+] Building 259.2s (22/22) FINISHED                        docker:default
 => [ansible internal] load build definition from Dockerfile            0.3s
 => => transferring dockerfile: 159B                                    0.0s
 => [ansible internal] load .dockerignore                               0.3s
 => => transferring context: 2B                                         0.0s
 => [remote-host-one internal] load .dockerignore                       0.3s
 => => transferring context: 2B                                         0.0s
 => [remote-host-one internal] load build definition from Dockerfile    0.3s
 => => transferring dockerfile: 683B                                    0.0s
 => [ansible internal] load metadata for docker.io/library/ubuntu:latest 1.0s
 => [remote-host-one internal] load metadata for docker.io/library/ubuntu 0.0s
 => [remote-host-one  1/11] FROM docker.io/library/ubuntu:20.04         0.0s
 => [remote-host-one  2/11] RUN apt-get update && apt-get install -y op 113.3s
 => [ansible 1/3] FROM docker.io/library/ubuntu@sha256:2e863c44b718727c8 22.1s
 => => resolve docker.io/library/ubuntu@sha256:2e863c44b718727c860746568e 0.0s
 => => sha256:2e863c44b718727c860746568e1d54afd13b2fa71b1 1.13kB / 1.13kB 0.0s
 => => sha256:c920ba4cfca05503764b785c16b76d43c83a6df8d1ab107 424B / 424B 0.0s
 => => sha256:35a88802559dd2077e584394471ddaa1a2c5bfd1689 2.30kB / 2.30kB 0.0s
```
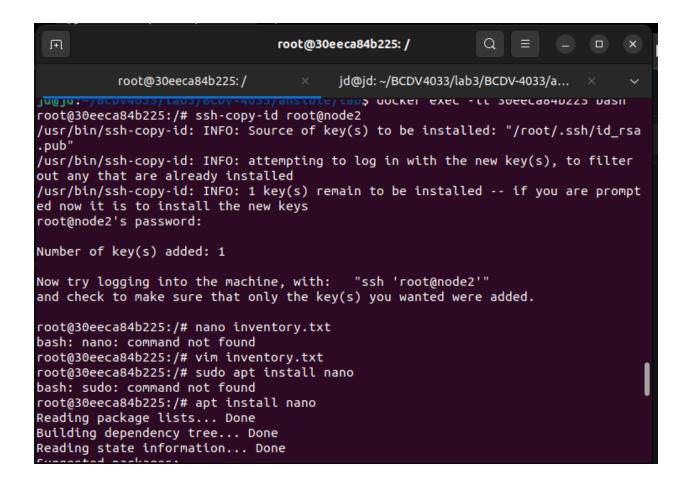
```
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker ps
CONTAINER ID    IMAGE      COMMAND                  CREATED             STATUS
          PORTS        NAMES
69c8a0fa52d5    node1      "/usr/sbin/sshd -D"     About a minute ago   Up About a m
inute    22/tcp       node1
30eeca84b225    ansible    "/bin/bash"              About a minute ago   Up About a m
inute                ansible
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# ansible --version
ansible [core 2.16.3]
  config file = None
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share
/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/co
llections
  executable location = /usr/bin/ansible
  python version = 3.12.3 (main, Apr 10 2024, 05:33:47) [GCC 13.2.0] (/usr/bin/p
ython3)
  jinja version = 3.1.2
  libyaml = True
root@30eeca84b225:/# ssh root@node1
The authenticity of host 'node1 (172.21.0.3)' can't be established.
ED25519 key fingerprint is SHA256:lQ4L8bpZYadvqXESP+6abkeeP1QYvuiv8RgIHYUhc6g.
```

```
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# ssh root@node2
The authenticity of host 'node2 (172.21.0.4)' can't be established.
ED25519 key fingerprint is SHA256:lQ4L8bpZYadvqXESP+6abkeeP1QYvuiv8RgIHYUhc6g.
This host key is known by the following other names/addresses:
    ~/.ssh/known_hosts:1: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'node2' (ED25519) to the list of known hosts.
root@node2's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 6.5.0-35-generic x86_64)


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


This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
```

root@30eeca84b225: /   ×   jd@jd: ~/BCDV4033/lab3/BCDV-4033/a...   ×   ∨

```
root@30eeca84b225:/# ansible all -m ping
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that
the implicit localhost does not match 'all'
root@30eeca84b225:/# ssh-keygen -t rsa -b 2048
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa
Your public key has been saved in /root/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:ysF6XXf30htZhl0FyIWEgMcc5HGq1g+orh6ZP/L5whc root@30eeca84b225
The key's randomart image is:
+---[RSA 2048]----+
|        ==o.+.+o..|
|      ..++. +   .|
|        .o       .|
|      . +       o.|
|       * S . . o =|
|    o =E+ + . . ++|
|   +.o +.. .   .oo|
|   .++o.       .o|
| .o+==.        . |
```

```
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# ssh-copy-id root@node2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.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: INFO: 1 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
root@node2's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'root@node2'"
and check to make sure that only the key(s) you wanted were added.

root@30eeca84b225:/# nano inventory.txt
bash: nano: command not found
root@30eeca84b225:/# vim inventory.txt
root@30eeca84b225:/# sudo apt install nano
bash: sudo: command not found
root@30eeca84b225:/# apt install nano
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
```

root@30eeca84b225: /   ×   jd@jd: ~/BCDV4033/lab3/BCDV-4033/a...   ×   ⌄

```
root@30eeca84b225:/# nano inventory.txt
root@30eeca84b225:/# ansible-inventory -i inventory.txt --list
{
    "_meta": {
        "hostvars": {
            "host1": {
                "ansible_host": "node1",
                "ansible_user": "root"
            },
            "host2": {
                "ansible_host": "node2",
                "ansible_user": "root"
            }
        }
    },
    "all": {
        "children": [
            "ungrouped",
            "group1"
        ]
    },
    "group1": {
        "hosts": [
            "host1",
```

        },
        "group1": {
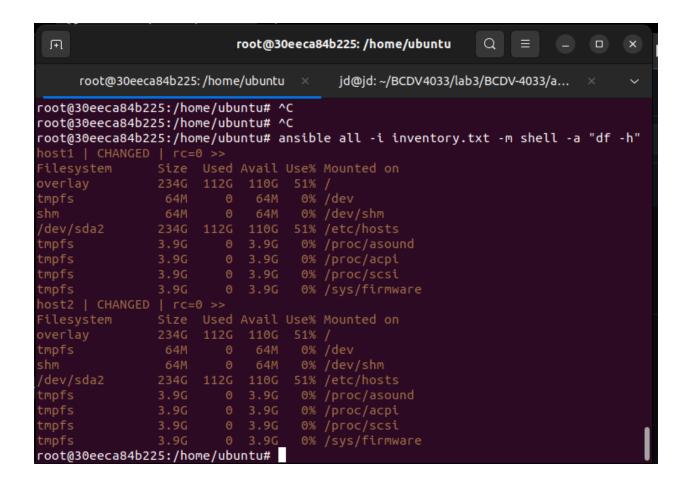   "hosts": [
                "host1",
                "host2"
            ]
        }
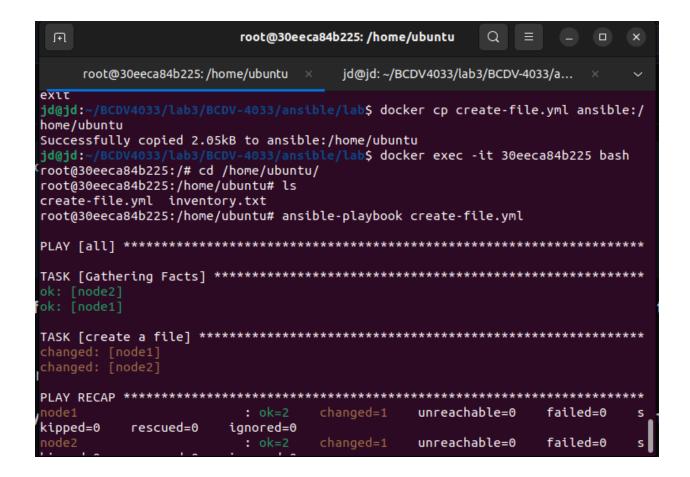}
```
root@30eeca84b225:/# ansible all -i inventory.txt -m ping
host1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
host2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
root@30eeca84b225:/#
```
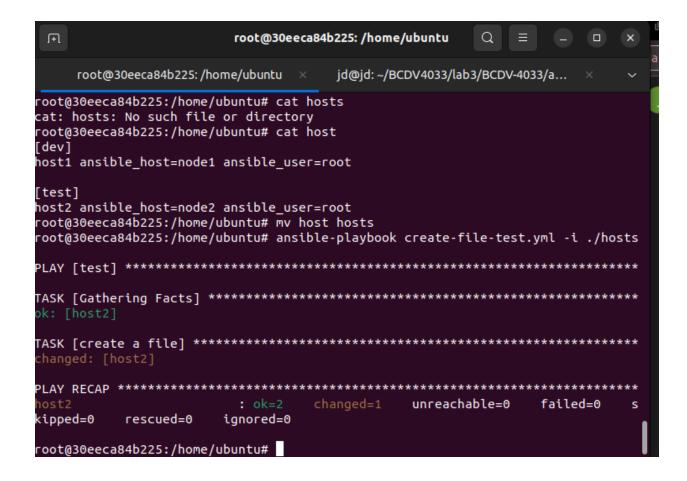
```
root@30eeca84b225:/home/ubuntu# ^C
root@30eeca84b225:/home/ubuntu# ^C
root@30eeca84b225:/home/ubuntu# ansible all -i inventory.txt -m shell -a "df -h"
host1 | CHANGED | rc=0 >>
Filesystem      Size  Used Avail Use% Mounted on
overlay         234G  112G  110G  51% /
tmpfs            64M     0   64M   0% /dev
shm              64M     0   64M   0% /dev/shm
/dev/sda2       234G  112G  110G  51% /etc/hosts
tmpfs           3.9G     0  3.9G   0% /proc/asound
tmpfs           3.9G     0  3.9G   0% /proc/acpi
tmpfs           3.9G     0  3.9G   0% /proc/scsi
tmpfs           3.9G     0  3.9G   0% /sys/firmware
host2 | CHANGED | rc=0 >>
Filesystem      Size  Used Avail Use% Mounted on
overlay         234G  112G  110G  51% /
tmpfs            64M     0   64M   0% /dev
shm              64M     0   64M   0% /dev/shm
/dev/sda2       234G  112G  110G  51% /etc/hosts
tmpfs           3.9G     0  3.9G   0% /proc/asound
tmpfs           3.9G     0  3.9G   0% /proc/acpi
tmpfs           3.9G     0  3.9G   0% /proc/scsi
tmpfs           3.9G     0  3.9G   0% /sys/firmware
root@30eeca84b225:/home/ubuntu#
```

```
tmpfs           3.9G      0  3.9G   0% /sys/firmware
root@30eeca84b225:/home/ubuntu# ansible host2 -i inventory.txt -m apt -a "name=c
url state=present" -b
host2 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "cache_update_time": 1718667621,
    "cache_updated": false,
    "changed": true,
    "stderr": "debconf: delaying package configuration, since apt-utils is not i
nstalled\n",
    "stderr_lines": [
        "debconf: delaying package configuration, since apt-utils is not install
ed"
    ],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading st
ate information...\nThe following additional packages will be installed:\n  liba
sn1-8-heimdal libbrotli1 libcurl4 libgssapi3-heimdal libhcrypto4-heimdal\n  libh
eimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal\n  libkrb5-26-heimdal l
ibldap-2.4-2 libldap-common libnghttp2-14\n  libroken18-heimdal librtmp1 libsasl
2-2 libsasl2-modules libsasl2-modules-db\n  libssh-4 libwind0-heimdal\nSuggested
 packages:\n  libsasl2-modules-gssapi-mit | libsasl2-modules-gssapi-heimdal\n  l
ibsasl2-modules-ldap libsasl2-modules-otp libsasl2-modules-sql\nThe following NE
W packages will be installed:\n  curl libasn1-8-heimdal libbrotli1 libcurl4 liba
```
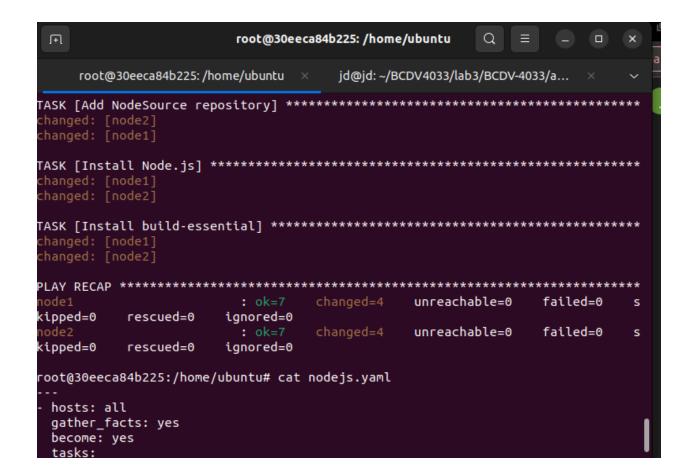
```
exit
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker cp create-file.yml ansible:/
home/ubuntu
Successfully copied 2.05kB to ansible:/home/ubuntu
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# cd /home/ubuntu/
root@30eeca84b225:/home/ubuntu# ls
create-file.yml  inventory.txt
root@30eeca84b225:/home/ubuntu# ansible-playbook create-file.yml

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

TASK [Gathering Facts] ********************************************************
ok: [node2]
ok: [node1]

TASK [create a file] *********************************************************
changed: [node1]
changed: [node2]

PLAY RECAP ********************************************************************
node1                      : ok=2    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
node2                      : ok=2    changed=1    unreachable=0    failed=0    s
```

```
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ nano delete-file.yml
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker cp delete-file.yml ansible:/
home/ubuntu
Successfully copied 2.05kB to ansible:/home/ubuntu
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# cd /home/ubuntu
root@30eeca84b225:/home/ubuntu# ls
create-file.yml  delete-file.yml  inventory.txt
root@30eeca84b225:/home/ubuntu# ansible-playbook delete-file.yml

PLAY [Delete the file on both nodes] *******************************************

TASK [Gathering Facts] *********************************************************
ok: [node2]
ok: [node1]

TASK [Remove the test file] ****************************************************
ok: [node2]
ok: [node1]

PLAY RECAP *********************************************************************
node1                      : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0     rescued=0    ignored=0
node2                      : ok=2    changed=0    unreachable=0    failed=0    s
```

```
root@30eeca84b225:/home/ubuntu# nano host
root@30eeca84b225:/home/ubuntu# ls
create-file.yml  delete-file.yml  host  inventory.txt
root@30eeca84b225:/home/ubuntu# exit
exit
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker cp create-file-dev.yml ansib
le:/home/ubuntu
Successfully copied 2.05kB to ansible:/home/ubuntu
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# cd /home/ubuntu/
root@30eeca84b225:/home/ubuntu# ls
create-file-dev.yml  create-file.yml  delete-file.yml  host  inventory.txt
root@30eeca84b225:/home/ubuntu# nano create-file-dev.yml
root@30eeca84b225:/home/ubuntu# mv create-file-dev.yml create-file-test.yml
root@30eeca84b225:/home/ubuntu# ls
create-file-test.yml  create-file.yml  delete-file.yml  host  inventory.txt
root@30eeca84b225:/home/ubuntu# cat create-file-test.yml
---
- hosts: test
  tasks:
    - name: create a file
      file:
        path: /tmp/file-playbook1
        state: touch
```

```
root@30eeca84b225:/home/ubuntu# cat hosts
cat: hosts: No such file or directory
root@30eeca84b225:/home/ubuntu# cat host
[dev]
host1 ansible_host=node1 ansible_user=root

[test]
host2 ansible_host=node2 ansible_user=root
root@30eeca84b225:/home/ubuntu# mv host hosts
root@30eeca84b225:/home/ubuntu# ansible-playbook create-file-test.yml -i ./hosts

PLAY [test] ********************************************************************

TASK [Gathering Facts] *******************************************************
ok: [host2]

TASK [create a file] *********************************************************
changed: [host2]

PLAY RECAP *******************************************************************
host2                      : ok=2    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

root@30eeca84b225:/home/ubuntu#
```

```
root@30eeca84b225:/home/ubuntu# nano nodejs.yaml
root@30eeca84b225:/home/ubuntu# ansible-playbook nodejs.yaml

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

TASK [Gathering Facts] ********************************************************
ok: [node2]
ok: [node1]

TASK [Update apt cache] *******************************************************
ok: [node2]
ok: [node1]

TASK [Install Node.js dependencies] *******************************************
ok: [node1] => (item=curl)
ok: [node2] => (item=curl)
ok: [node2] => (item=software-properties-common)
ok: [node1] => (item=software-properties-common)

TASK [Add NodeSource repository GPG key] **************************************
changed: [node2]
changed: [node1]

TASK [Add NodeSource repository] **********************************************
```

```
TASK [Add NodeSource repository] *******************************************
changed: [node2]
changed: [node1]

TASK [Install Node.js] *****************************************************
changed: [node1]
changed: [node2]

TASK [Install build-essential] *********************************************
changed: [node1]
changed: [node2]

PLAY RECAP *****************************************************************
node1                      : ok=7    changed=4    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
node2                      : ok=7    changed=4    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

root@30eeca84b225:/home/ubuntu# cat nodejs.yaml
---
- hosts: all
  gather_facts: yes
  become: yes
  tasks:
```

```
update_cache: yes

  - name: Install Node.js dependencies
    apt:
      name: "{{ item }}"
      state: present
    loop:
      - curl
      - software-properties-common
  - name: Add NodeSource repository GPG key
    apt_key:
      url: https://deb.nodesource.com/gpgkey/nodesource.gpg.key
      state: present
  - name: Add NodeSource repository
    apt_repository:
      repo: "deb https://deb.nodesource.com/node_14.x {{ ansible_distribution_release }} main"
      state: present
      update_cache: yes
      filename: nodesource

  - name: Install Node.js
    apt:
      name: nodejs
      state: present
```

root@69c8a0fa52d5: ~   ×   jd@jd: ~/BCDV4033/lab3/BCDV-4033/a...   ×   ⌄

```
        name: nodejs
        state: present

    - name: Install build-essential
      apt:
        name: build-essential
        state: present
root@30eeca84b225:/home/ubuntu# node -v
bash: node: command not found
root@30eeca84b225:/home/ubuntu# ssh root@node1
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 6.5.0-35-generic x86_64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.
Last login: Tue Jun 18 01:03:16 2024 from 172.21.0.2
root@69c8a0fa52d5:~# node -v
v14.21.3
root@69c8a0fa52d5:~#
```

```
To restore this content, you can run the 'unminimize' command.
Last login: Tue Jun 18 01:03:16 2024 from 172.21.0.2
root@69c8a0fa52d5:~# node -v
v14.21.3
root@69c8a0fa52d5:~# exit
logout
Connection to node1 closed.
root@30eeca84b225:/home/ubuntu# ssh root@node2
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 6.5.0-35-generic x86_64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.
Last login: Tue Jun 18 01:03:16 2024 from 172.21.0.2
root@077ae6e86fe3:~# node -v
v14.21.3
root@077ae6e86fe3:~# npm -v
6.14.18
root@077ae6e86fe3:~#
```

example-node.yaml

```yaml
 1    ---
 2    - hosts: localhost
 3      become: yes
 4      gather_facts: no
 5      vars:
 6          git_repo_url: https://github.com/jdjatin/BCDV4033-Lab1.git
 7          repo_path: /your/local/repo/path
 8          repo_branch: master
 9      tasks:
10      - name: Run the equivalent of "apt-get update" as a separate step
11        apt:
12          update_cache: yes
13      - name: Ansible shell module multiple commands
14        shell: 'curl -fsSL https://deb.nodesource.com/setup_14.x | sudo -
15      - name: Install reqired packages
16        apt: name={{ item }} state=present
17        with items:
```

```
exit
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker cp example-node.yaml ansible
:/home/ubuntu
Successfully copied 2.56kB to ansible:/home/ubuntu
jd@jd:~/BCDV4033/lab3/BCDV-4033/ansible/lab$ docker exec -it 30eeca84b225 bash
root@30eeca84b225:/# cd /home/ubuntu
root@30eeca84b225:/home/ubuntu# ls
create-file-test.yml   delete-file.yml      hosts             nodejs.yaml
create-file.yml        example-node.yaml    inventory.txt
```



```
root@30eeca84b225:/home/ubuntu# nano example-node.yml
root@30eeca84b225:/home/ubuntu# ansible-playbook example-node.yml

PLAY [localhost] ***************************************************************

TASK [Clone the repository] ***************************************************
ok: [localhost]

TASK [Add NodeSource repository GPG key] **************************************
ok: [localhost]

TASK [Ansible shell module multiple commands] ********************************
changed: [localhost]

TASK [Install packages based on package.json using npm] **********************
ok: [localhost]

TASK [Build app] *************************************************************
```