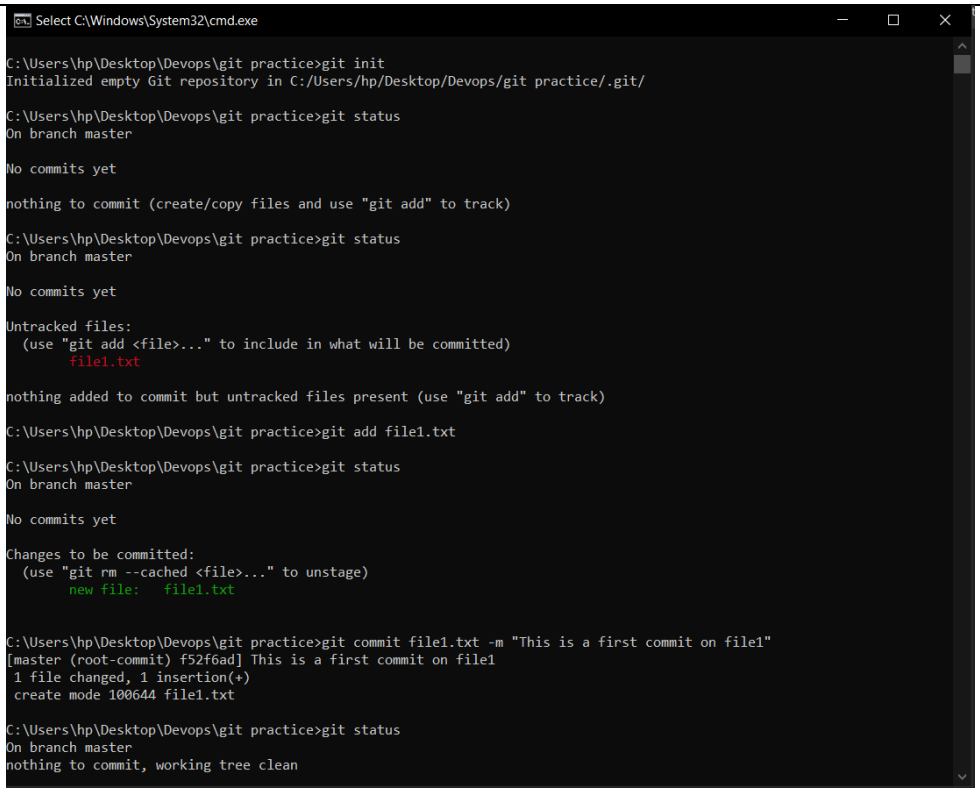
VIT Vidyalankar Institute of Technology

DEPARTMENT OF INFORMATION TECHNOLOGY ENGINEERING

Semester	BE Semester VIII – INFT
Subject	DEVOPS Lab
Subject Professor In-charge	Prof. Rohit Barve
Lab Professor In-charge	Prof. Rohit Barve

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	1	
Experiment Title	Perform Version Control using GIT,	
Resources / Apparatus Required	Hardware: Computer	Software: GIT
Procedure or Steps	Create folder Initialize git : git init Create file1.txt in same folder Check status of git : git status Add file on git : git add file1.txt Commit file : git commit file1.txt -m "This is a first commit on file1"	



Do changes in a file1

Do second commit : git commit file1.txt -m “This is a second commit on file1”

Again, do changes in a file1

Do third commit : git commit file1.txt -m “This is a third commit on file1”

```
C:\Users\hp\Desktop\Devops\git practice>git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   file1.txt

no changes added to commit (use "git add" and/or "git commit -a")

C:\Users\hp\Desktop\Devops\git practice>git commit file1.txt -m "This is a second commit in file1"
[master 0a3ed57] This is a second commit in file1
 1 file changed, 2 insertions(+), 1 deletion(-)

C:\Users\hp\Desktop\Devops\git practice>git status
On branch master
nothing to commit, working tree clean

C:\Users\hp\Desktop\Devops\git practice>git status
On branch master
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   file1.txt

no changes added to commit (use "git add" and/or "git commit -a")

C:\Users\hp\Desktop\Devops\git practice>git commit file1.txt -m "This is a third commit on file1"
[master bc3c56b] This is a third commit on file1
 1 file changed, 2 insertions(+), 1 deletion(-)

C:\Users\hp\Desktop\Devops\git practice>git status
On branch master
nothing to commit, working tree clean
```

Get logs of commit : git log

Copy id of any commit

Do hard reset : git reset –hard “f52f6adf2dbf45dea69868f0a07981879866d22d”

Now all the changes will roll back on file1 and now we are on first commit

```
C:\Users\hp\Desktop\Devops\git practice>git log
commit bc3c56be31ff031e0e2ee3bcf9f568bb6ce1ee31 (HEAD -> master)
Author: PrashikNikumbe <prashiknikumbe@gmail.com>
Date:   Wed Feb 2 23:28:55 2022 +0530

    This is a third commit on file1

commit 0a3ed574874bf94c45218e5c5b5443462bd266a2
Author: PrashikNikumbe <prashiknikumbe@gmail.com>
Date:   Wed Feb 2 23:26:50 2022 +0530

    This is a second commit in file1

commit f52f6adf2dbf45dea69868f0a07981879866d22d
Author: PrashikNikumbe <prashiknikumbe@gmail.com>
Date:   Wed Feb 2 23:19:37 2022 +0530

    This is a first commit on file1

C:\Users\hp\Desktop\Devops\git practice>git reset --hard "f52f6adf2dbf45dea69868f0a07981879866d22d"
HEAD is now at f52f6ad This is a first commit on file1
```

Create file2.txt in same folder.

Add the file2 : git add file2.txt

Commit the file2 : git commit file2.txt -m “This is a first commit on file2”

Create branch b1 : git branch b1

Create branch b2 : git branch b2

Switched to b1 : git checkout b1

Add the file2 for b1: git add file2.txt

Commit the file2 for b1 : git commit file2.txt -m “This is a first commit on file2 for b1”

Do changes in file 2

Second Commit the file2 for b1 : git commit file2.txt -m “This is a second commit on file2 for b1”

Switched to master : git checkout master

Now you will see that file2 does not have any changes because after changes in file2 , commit is done on b1.

```
C:\Users\hp\Desktop\Devops\git practice>git add file2.txt

C:\Users\hp\Desktop\Devops\git practice>git commit file2.txt -m "This is a first commit on file2"
[master f8aac67] This is a first commit on file2
 1 file changed, 1 insertion(+)
 create mode 100644 file2.txt

C:\Users\hp\Desktop\Devops\git practice>git branch b1

C:\Users\hp\Desktop\Devops\git practice>git branch b2

C:\Users\hp\Desktop\Devops\git practice>git checkout b1
Switched to branch 'b1'

C:\Users\hp\Desktop\Devops\git practice>git status
On branch b1
nothing to commit, working tree clean

C:\Users\hp\Desktop\Devops\git practice>git add file2.txt

C:\Users\hp\Desktop\Devops\git practice>git commit file2.txt -m "This is a first commit on file2 for b1"
On branch b1
nothing to commit, working tree clean

C:\Users\hp\Desktop\Devops\git practice>git status
On branch b1
Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   file2.txt

no changes added to commit (use "git add" and/or "git commit -a")

C:\Users\hp\Desktop\Devops\git practice>git commit file2.txt -m "This is a second commit of file2 for b2"
[b1 3c454ad] This is a second commit of file2 for b2
 1 file changed, 2 insertions(+), 1 deletion(-)

C:\Users\hp\Desktop\Devops\git practice>git checkout master
Switched to branch 'master'
```

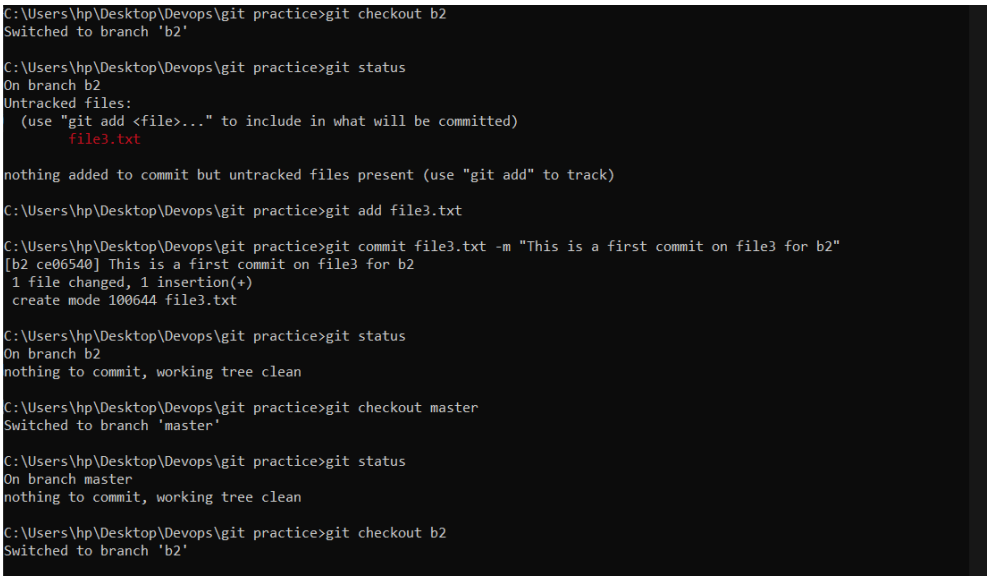
Switch to b2 : git checkout b2

Create file3.txt in same folder

Add the file3 for b2 : git add file3.txt

Commit the file3 for b2 : git commit file3.txt -m “This is a first commit on file3 for b2”

Switch to master : git checkout master

	Now you will find that file3.txt is not available in folder because for file3 add and commit is done on branch b2 and now we are on master. We can switch back to b2 so that file3 can be available.
	 
	`C:\Users\hp\Desktop\Devops\git practice>git checkout b2`
	`Switched to branch 'b2'`
	
	`C:\Users\hp\Desktop\Devops\git practice>git status`
	`On branch b2`
	`Untracked files:`
	`  (use "git add <file>..." to include in what will be committed)`
	`        file3.txt`
	
	`nothing added to commit but untracked files present (use "git add" to track)`
	
	`C:\Users\hp\Desktop\Devops\git practice>git add file3.txt`
	
	`C:\Users\hp\Desktop\Devops\git practice>git commit file3.txt -m "This is a first commit on file3 for b2"`
	`[b2 ce06540] This is a first commit on file3 for b2`
	` 1 file changed, 1 insertion(+)`
	` create mode 100644 file3.txt`
	
	`C:\Users\hp\Desktop\Devops\git practice>git status`
	`On branch b2`
	`nothing to commit, working tree clean`
	
	`C:\Users\hp\Desktop\Devops\git practice>git checkout master`
	`Switched to branch 'master'`
	
	`C:\Users\hp\Desktop\Devops\git practice>git status`
	`On branch master`
	`nothing to commit, working tree clean`
	
	`C:\Users\hp\Desktop\Devops\git practice>git checkout b2`
	`Switched to branch 'b2'`

Conclusion	We learn how to initialize git, add file on git, commit on git, create branches on git and version control.

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DEPARTMENT OF INFORMATION TECHNOLOGY ENGINEERING

Semester	BE Semester VIII – INFT
Subject	DEVOPS Lab
Subject Professor In-charge	Prof. Rohit Barve
Lab Professor In-charge	Prof. Rohit Barve

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	2	
Experiment Title	Perform Version Control using GitHub.	
Resources / Apparatus Required	Hardware: Computer	Software: GIT and GitHub
Procedure or Steps	Create folder Initialize git : git init Create File1.txt and File2.txt in same folder Check status of git : git status Add both files on git : git add . Commit file1 : git commit File1.txt -m "Commit 1 on File1.txt" Commit file2 : git commit File2.txt -m "Commit 1 on File2.txt"	

```
C:\Users\hp\Desktop\Devops\git practice>git init
Initialized empty Git repository in C:/Users/hp/Desktop/Devops/git practice/.git/

C:\Users\hp\Desktop\Devops\git practice>git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        File1.txt
        File2.txt

nothing added to commit but untracked files present (use "git add" to track)

C:\Users\hp\Desktop\Devops\git practice>git add .

C:\Users\hp\Desktop\Devops\git practice>git commit File1.txt -m "Commit 1 on File1.txt"
[master (root-commit) d7051ad] Commit 1 on File1.txt
 1 file changed, 1 insertion(+)
 create mode 100644 File1.txt

C:\Users\hp\Desktop\Devops\git practice>git commit File2.txt -m "Commit 1 on File2.txt"
[master 0f8e7f7] Commit 1 on File2.txt
 1 file changed, 1 insertion(+)
 create mode 100644 File2.txt
```

Create branch b1 : git branch b1

Create branch b2 : git branch b2

Switched to b1 : git checkout b1

Create File3.txt in same folder.

Add file3 on git : git add File3.txt

Commit file3 : git commit File3.txt -m "Commit 1 on File3.txt for b1"

Switched to b2 : git checkout b2

Create File4.txt in same folder.

Add file4 on git : git add File4.txt

Commit file4 : git commit File4.txt -m "Commit 1 on File4.txt for b2"

```
C:\Users\hp\Desktop\Devops\git practice>git branch b1

C:\Users\hp\Desktop\Devops\git practice>git branch b2

C:\Users\hp\Desktop\Devops\git practice>git checkout b1
Switched to branch 'b1'

C:\Users\hp\Desktop\Devops\git practice>git add File3.txt

C:\Users\hp\Desktop\Devops\git practice>git commit File3.txt -m "Commit 1 on File3.txt for b1"
[b1 e12fec0] Commit 1 on File3.txt for b1
 1 file changed, 1 insertion(+)
 create mode 100644 File3.txt

C:\Users\hp\Desktop\Devops\git practice>git checkout b2
Switched to branch 'b2'

C:\Users\hp\Desktop\Devops\git practice>git add File4.txt

C:\Users\hp\Desktop\Devops\git practice>git commit File4.txt -m "Commit 1 on File3.txt for b2"
[b2 1a3a94c] Commit 1 on File3.txt for b2
 1 file changed, 1 insertion(+)
 create mode 100644 File4.txt
```

Create branch b4 : git branch b4

Switched to b4 : git checkout b4

Commit file4 : git commit File4.txt -m "Commit 2 on File4.txt for b4"

Switched to b1: git checkout b1

Create branch b3 : git branch b3

Commit file3 : git commit File3.txt -m "Commit 2 on File3.txt for b3"

```
C:\Users\hp\Desktop\Devops\git practice>git branch b4

C:\Users\hp\Desktop\Devops\git practice>git checkout b4
Switched to branch 'b4'

C:\Users\hp\Desktop\Devops\git practice>git commit File4.txt -m "Commit 2 on File3.txt for b4"
[b4 4ece392] Commit 2 on File3.txt for b4
 1 file changed, 2 insertions(+), 1 deletion(-)

C:\Users\hp\Desktop\Devops\git practice>git checkout b3
error: pathspec 'b3' did not match any file(s) known to git

C:\Users\hp\Desktop\Devops\git practice>git checkout b1
Switched to branch 'b1'

C:\Users\hp\Desktop\Devops\git practice>git branch b3

C:\Users\hp\Desktop\Devops\git practice>git checkout b3
Switched to branch 'b3'

C:\Users\hp\Desktop\Devops\git practice>git commit File3.txt -m "Commit 2 on File3.txt for b3"
[b3 c83f010] Commit 2 on File3.txt for b3
 1 file changed, 2 insertions(+), 1 deletion(-)
```

Create an account on GitHub and create a new repository

Copy the repository link and run

git remote add origin "https://github.com/PrashikNikumbe/gitPractice.git"

push master branch : git push origin master

Push branch b1 : git push origin b1

Push branch b2 : git push origin b2

Push branch b3 : git push origin b3

Push branch b4 : git push origin b4

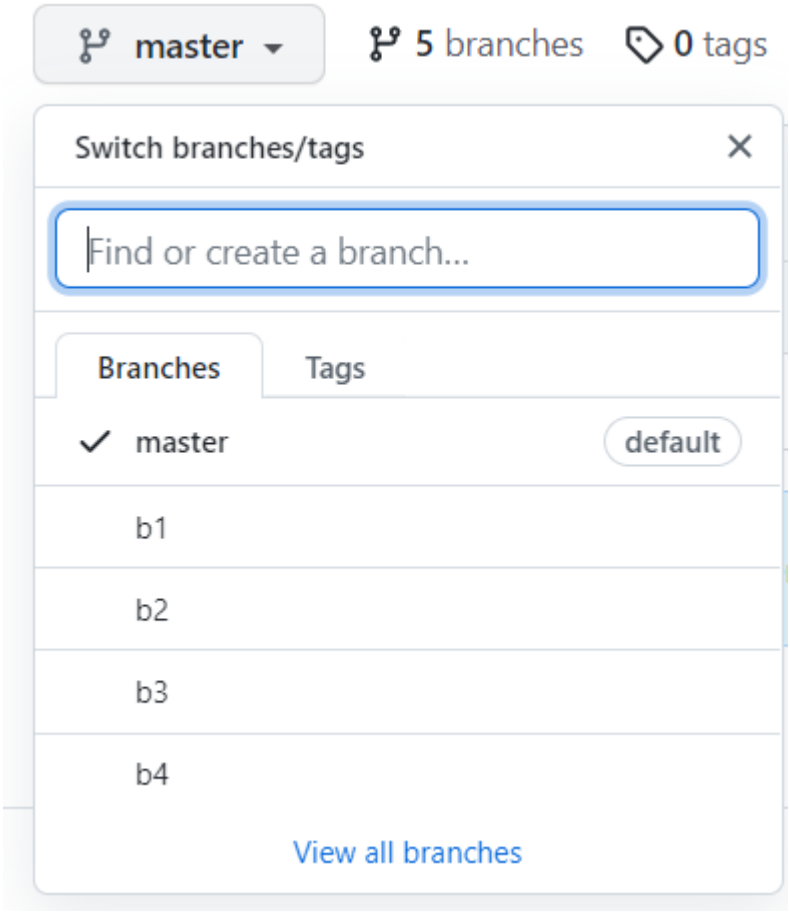
```
C:\Users\hp\Desktop\Devops\git practice>git push origin master
```

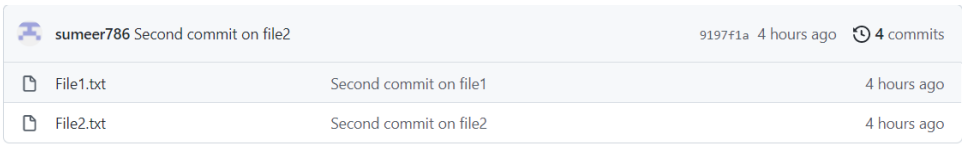
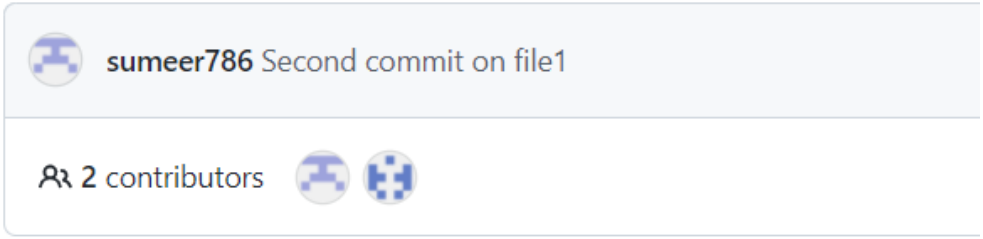
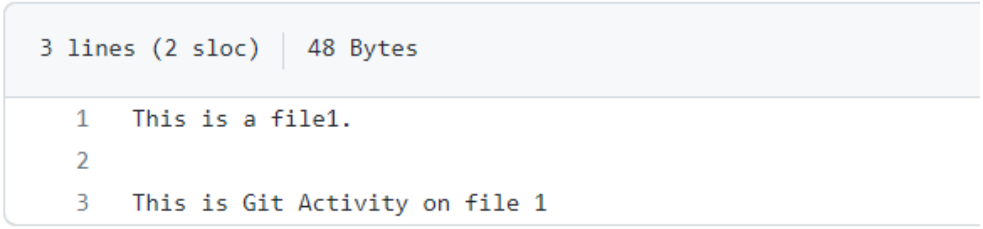
```
C:\Users\hp\Desktop\Devops\git practice>git push origin b1
```

```
C:\Users\hp\Desktop\Devops\git practice>git push origin b2
```

```
C:\Users\hp\Desktop\Devops\git practice>git push origin b3
```

```
C:\Users\hp\Desktop\Devops\git practice>git push origin b4
```



	Now we can share the repository git link with the other group members so they can clone it, change the files, commit it and push it on github. For other members to push it in our repository, we need to make them the collaborator in github setting.    As we can see that the commit is done on my repository by other member and the content is changed. Now I can clone the repository by below command, git clone "https://github.com/PrashikNikumbe/gitPractice.git"
Conclusion	We learn how to push the files on GitHub and also how to clone the GitHub repository.

Semester	BE Semester VIII – INFT
Subject	DEVOPS Lab
Subject Professor In-charge	Prof. Rohit Barve
Lab Professor In-charge	Prof. Rohit Barve

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	3	
Experiment Title	Install and Configure Docker for creating Containers	
Resources / Apparatus Required	Hardware: Computer	Software: Ubuntu and Docker

Steps

```
prashik@prashik-VirtualBox:~$ sudo apt install docker.io
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd git git-man liberror-perl libseccomp2 pigz runc
```

We need to install docker first with the above command.

```
prashik@prashik-VirtualBox:~$ sudo docker --version
Docker version 20.10.7, build 20.10.7-0ubuntu5~18.04.3
```

We can confirm it by checking version of it.

```
prashik@prashik-VirtualBox:~$ sudo docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
e0b25ef51634: Pull complete
Digest: sha256:9101220a875cee98b016668342c489ff0674f247f6ca20dfc91b91c0f28581ae
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

It will download the latest image of ubuntu

```
prashik@prashik-VirtualBox:~$ sudo docker images
REPOSITORY    TAG       IMAGE ID       CREATED       SIZE
ubuntu        latest    825d55fb6340   11 days ago   72.8MB
```

To check which images are exist in the system

```
prashik@prashik-VirtualBox:~$ sudo docker run -it -d ubuntu
[sudo] password for prashik:
ae26ee730bb591b98f6a14e20ec11c323ff51fb0f159646d7d4319c67c089a07
```

To run the image of ubuntu

```
prashik@prashik-VirtualBox:~$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED          STATUS          PORTS     N
AMES
ae26ee730bb5   ubuntu    "bash"    42 seconds ago   Up 31 seconds             w
izardly_wright
```

To see which containers are running

```
prashik@prashik-VirtualBox:~$ sudo docker exec -it ae26ee730bb5 bash
```

To enter into container that we have created

```
root@ae26ee730bb5:/# sudo
bash: sudo: command not found
root@ae26ee730bb5:/# apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package apache2
```

Above commands will not be executed cause we are in container

```
root@ae26ee730bb5:/# apt-get update
```

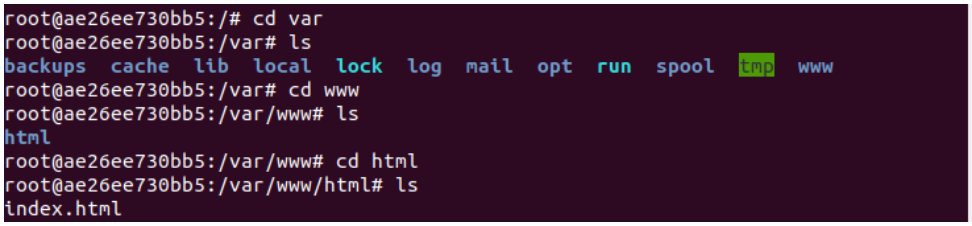
Updating for succesfully installation of apache2

```
root@ae26ee730bb5:/# apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
```

Installing apache2

```
root@ae26ee730bb5:/# service apache2 start
 * Starting Apache httpd web server apache2
AH00558: apache2: Could not reliably determine the server's fully qualified dom
ain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress
 this message
 *
```

Starting the apache2 server

	 Above command will not work cause we are in container  We can still see the file by using the above commands  Exiting the container
Conclusion	We learn how to configure, create, run and get into the container.

Semester	BE Semester VIII – INFT
Subject	DEVOPS Lab
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Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	4	
Experiment Title	Using Docker Hub for saving container repositories.	
Resources / Apparatus Required	Hardware: Computer	Software: Docker and Docker Hub.
Steps		

```
prashik@prashik-VirtualBox:~$ sudo docker ps
[sudo] password for prashik:
CONTAINER ID   IMAGE     COMMAND   CREATED          STATUS          PORTS     N
AMES
ae26ee730bb5   ubuntu    "bash"    26 minutes ago   Up 26 minutes             w
izardly_wright
```

To see the running container that we created in previous experiment.

```
prashik@prashik-VirtualBox:~$ sudo docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't
 have a Docker ID, head over to https://hub.docker.com to create one.
Username: prashik0810
Password:
WARNING! Your password will be stored unencrypted in /home/prashik/.docker/conf
ig.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

Before Login into Docker Hub first create the account on Docker Hub.

```
prashik@prashik-VirtualBox:~$ sudo docker commit ae26ee730bb5 "prashik0810/xyz"




sha256:359fba62f325708d9a3b6db6c07f8161ba7a3bf6f875af055ba45a18badb05d3
```

Commit the container

```
prashik@prashik-VirtualBox:~$ sudo docker images
REPOSITORY          TAG       IMAGE ID       CREATED         SIZE
prashik0810/xyz     latest    359fba62f325   29 seconds ago   221MB
ubuntu              latest    825d55fb6340   11 days ago      72.8MB
```

To see which all images exist

```
prashik@prashik-VirtualBox:~$ sudo docker push "prashik0810/xyz"
Using default tag: latest
The push refers to repository [docker.io/prashik0810/xyz]
81a4d988304d: Pushed
c5ec52c98b31: Mounted from library/ubuntu
latest: digest: sha256:19d556f55e5fb38d95e7829b1449d5bedb19c4034ec32e1d853b6eaa
e29e9a1c size: 741
```

To push the image on docker hub

```
prashik@prashik-VirtualBox:~$ sudo docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED          STATUS          PORTS     N
AMES
ae26ee730bb5   ubuntu    "bash"    44 minutes ago   Up 44 minutes             w
izardly_wright
```

To see all working images which are live

```
prashik@prashik-VirtualBox:~$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED          STATUS          PORTS     N
AMES
ae26ee730bb5   ubuntu    "bash"    44 minutes ago   Up 44 minutes             w
izardly_wright
```

To see all the images which are exited

```
prashik@prashik-VirtualBox:~$ sudo docker rm $(sudo docker ps -a -q)
ae26ee730bb5
```

It is used to remove all the exited containers.

```
prashik@prashik-VirtualBox:~$ sudo docker rmi $(sudo docker images -q)
Untagged: prashik0810/xyz:latest
Untagged: prashik0810/xyz@sha256:19d556f55e5fb38d95e7829b1449d5bedb19c4034ec32e
1d853b6eaae29e9a1c
Deleted: sha256:359fba62f325708d9a3b6db6c07f8161ba7a3bf6f875af055ba45a18badb05d
3
Deleted: sha256:b406f486e335275dd86c8ae627662d40fb49914b7c7fe5eb8309ca2bcb1f8d0
4
Untagged: ubuntu:latest
Untagged: ubuntu@sha256:9101220a875cee98b016668342c489ff0674f247f6ca20dfc91b91c
0f28581ae
Deleted: sha256:825d55fb6340083b06e69e02e823a02918f3ffb575ed2a87026d4645a7fd9e1
b
Deleted: sha256:c5ec52c98b3193052e15d783aca2bef10d8d829fa0d58fedfede511920b8f99
7
```

It is used to remove images

```
prashik@prashik-VirtualBox:~$ sudo docker pull prashik0810/xyz
Using default tag: latest
latest: Pulling from prashik0810/xyz
e0b25ef51634: Pull complete
c24daac24583: Pull complete
Digest: sha256:19d556f55e5fb38d95e7829b1449d5bedb19c4034ec32e1d853b6eaae29e9a1c
Status: Downloaded newer image for prashik0810/xyz:latest
docker.io/prashik0810/xyz:latest
```

It pulls the image repository

```
prashik@prashik-VirtualBox:~$ sudo docker images
REPOSITORY        TAG       IMAGE ID       CREATED          SIZE
prashik0810/xyz   latest    359fba62f325   26 minutes ago   221MB
```

To check which all images exist

```
prashik@prashik-VirtualBox:~$ sudo docker run -it -d -p 82:80 prashik0810/xyz
ae9fceb2c757660b0f3b74e150743b192ba45c3a09947b1cdf51ee8b929ca432
```

Run the container with port forwarding from 80 to 82.

```
prashik@prashik-VirtualBox:~$ sudo docker ps
CONTAINER ID   IMAGE             COMMAND   CREATED          STATUS         PORT
S                                NAMES
ae9fceb2c757   prashik0810/xyz   "bash"    12 seconds ago   Up 9 seconds   0.0.
0.0:82->80/tcp, :::82->80/tcp    relaxed_rhodes
```

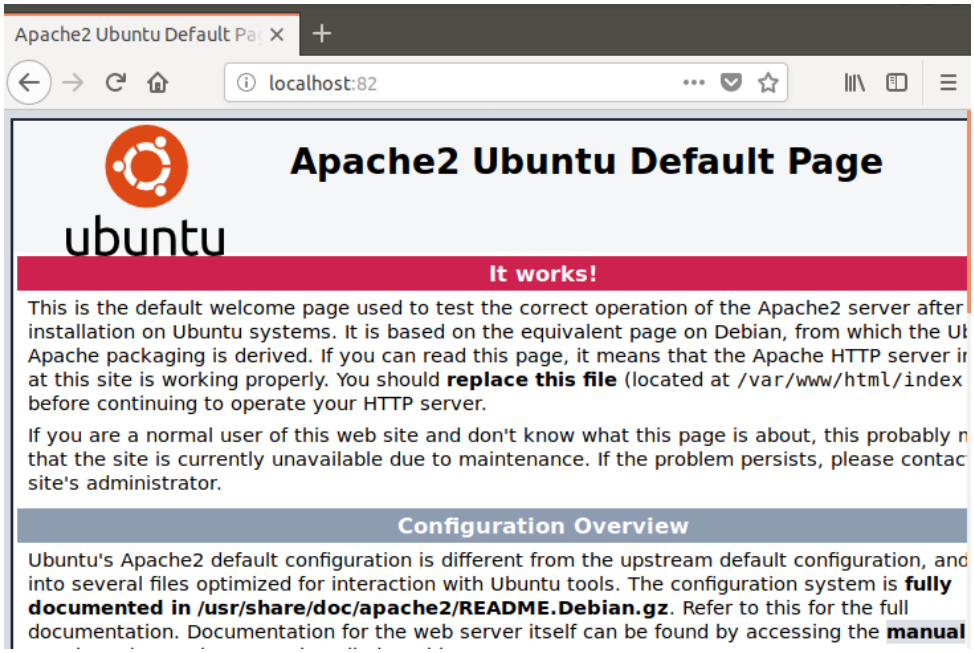
Check the running containers

```
prashik@prashik-VirtualBox:~$ sudo docker exec -it ae9fceb2c757 bash
```

It will execute the pull imaged

```
root@ae9fceb2c757:/# service apache2 start
 * Starting Apache httpd web server apache2
AH00558: apache2: Could not reliably determine the server's fully qualified dom
ain name, using 172.17.0.2. Set the 'ServerName' directive globally to suppress
 this message
 *
```

Start apache2 server

	 We can see the running container by typing “localhost:82” in the browser  We can exit the container now.
Conclusion	We learn how to push and pull the container on Docker Hub.

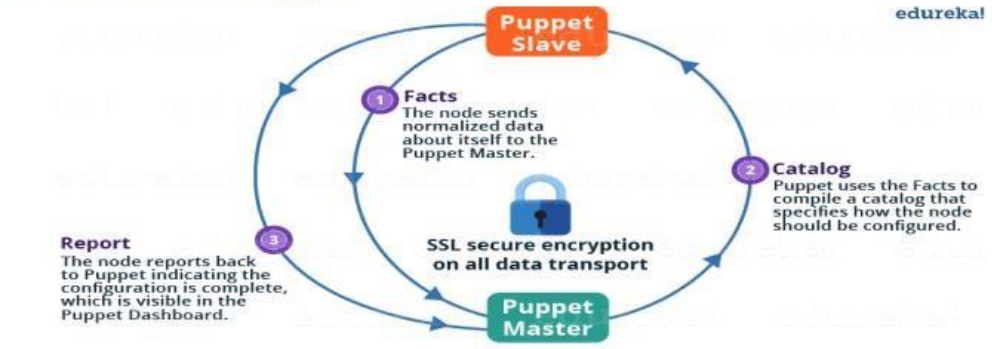
DEPARTMENT OF INFORMATION TECHNOLOGY

Semester	B.E. Semester VIII – Information Technology Engineering
Subject	DevOps Lab
Subject Professor In-charge	Prof. Rohit Barve
Laboratory	

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	5	
Experiment Title	To install Puppet for software configuration management.	
Resources / Apparatus Required	Hardware: ● Intel Core i3/i5/i7 Processor with Intel VT-X support. ● 4 GB RAM ● 500 GB Hard disk	Software: Operating systems: Linux Desktop OS for Client machines.
Theory/ Procedure/ Algorithm	**Puppet:** Puppet is a Configuration Management tool that is used for deploying, configuring and managing servers. It's most commonly used on Linux and Windows to pull the strings on multiple application servers at once. It performs the following functions: ● Defining distinct configurations for each and every host, and continuously checking and confirming whether the required configuration is in place and is not altered (if altered Puppet will revert back to the required configuration) on the host. ● Dynamic scaling-up and scaling-down of machines. ● Providing control over all your configured machines, so a centralized (masterserver or repo-based) change gets propagated to all, automatically.	

Architecture of Puppet:



The following functions are performed in the above image:

- The Puppet Agent sends the Facts to the Puppet Master. Facts are basically key/value data pair that represents some aspect of Slave state, such as its IP address, up-time, operating system, or whether it's a virtual machine. I will explain Facts in detail later in the blog.
- Puppet Master uses the facts to compile a Catalog that defines how the Slave should be configured. Catalog is a document that describes the desired state for each resource that Puppet Master manages on a Slave. I will explain catalogs and resources in detail later.

Output:

Puppet Master

Install wget

```
root@09e4408aeae4:/# apt install wget
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
The following additional packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix
The following NEW packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix wget
0 upgraded, 6 newly installed, 0 to remove and 2 not upgraded.
Need to get 2598 kB of archives.
After this operation, 7222 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

wget http://apt.puppetlabs.com/puppet-release-bionic.deb

```
root@09e4408aeae4:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
--2022-04-06 13:24:54--  http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com) ... 108.159.80.32, 2600:9000:238c:c200:1d:fc37:1cc0:93a1, 2600:9000:238c:9000:1d:fc37:1cc0:93a1,
 ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|108.159.80.32|:80 ... connected.
HTTP request sent, awaiting response ... 200 OK
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bionic.deb       100%[===================>]  11.46K  --.-KB/s    in 0.002s

2022-04-06 13:24:55 (4.73 MB/s) - 'puppet-release-bionic.deb' saved [11736/11736]

root@09e4408aeae4:/#
```

dpkg –i puppet-release-bionic.deb

```
root@09e4408aeae4:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4470 files and directories currently installed.)
Preparing to unpack puppet-release-bionic.deb ...
Unpacking puppet-release (1.0.0-14bionic) ...
Setting up puppet-release (1.0.0-14bionic) ...
root@09e4408aeae4:/#
```

apt install puppetmaster

```
root@09e4408aeae4:/# apt-get install puppetmaster
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
The following additional packages will be installed:
  augeas-lenses debconf-utils distro-info-data facter file fonts-lato hiera javascript-common krb5-locales libasn1-8-heimdal libaugeas0
  libboost-filesystem1.71.0 libboost-locale1.71.0 libboost-log1.71.0 libboost-program-options1.71.0 libboost-regex1.71.0 libboost-thread1.71.0
  libbrotli1 libcpp-hocon0.1.7 libcurl4 libexpat1 libfacter3.11.0 libgdbm-compat4 libgdbm6 libgssapi-krb5-2 libgssapi3-heimdal
  libhcrypto4-heimdal libheimbase1-heimdal libheimntlm0-heimdal libhx509-5-heimdal libicu66 libjs-jquery libk5crypto3 libkeyutils1
  libkrb5-26-heimdal libkrb5-3 libkrb5support0 libldap-2.4-2 libldap-common libleatherman1.4.2 libmagic-mgc libmagic1 libmpdec2 libnghttp2-14
  libpython3-stdlib libpython3.8-minimal libpython3.8-stdlib libreadline8 libroken18-heimdal librtmp1 libruby2.7 libsasl2-2 libsasl2-modules
  libsasl2-modules-db libsqlite3-0 libssh-4 libwind0-heimdal libxml2 libyaml-0-2 libyaml-cpp0.6 lsb-release mime-support puppet puppet-master
  python3 python3-minimal python3.8 python3.8-minimal rake readline-common ruby ruby-augeas ruby-deep-merge ruby-minitest ruby-net-telnet
  ruby-power-assert ruby-selinux ruby-shadow ruby-sync ruby-test-unit ruby-xmlrpc ruby2.7 rubygems-integration tzdata unzip xz-utils zip
```

apt install systemctl

```
root@09e4408aeae4:/# apt install systemctl
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
Suggested packages:
  tini | dumb-init
The following NEW packages will be installed:
  systemctl
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 75.5 kB of archives.
After this operation, 275 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 systemctl all 1.4.3424-2 [75.5 kB]
Fetched 75.5 kB in 1s (75.0 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package systemctl.
(Reading database ... 11306 files and directories currently installed.)
Preparing to unpack .../systemctl_1.4.3424-2_all.deb ...
Unpacking systemctl (1.4.3424-2) ...
Setting up systemctl (1.4.3424-2) ...
root@09e4408aeae4:/#
```

systemctl start puppet-master.service

```
root@09e4408aeae4:/# systemctl start puppet-master.service
root@09e4408aeae4:/# cd etc
root@09e4408aeae4:/etc# cd hosts
bash: cd: hosts: Not a directory
root@09e4408aeae4:/etc# cat hosts
127.0.0.1       localhost
::1     localhost ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
172.17.0.2      09e4408aeae4
root@09e4408aeae4:/etc#
```

Puppet Slave

Install wget

```
root@fee3da376acf:/# apt install wget
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
The following additional packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix
The following NEW packages will be installed:
  ca-certificates libpsl5 libssl1.1 openssl publicsuffix wget
0 upgraded, 6 newly installed, 0 to remove and 2 not upgraded.
```

wget http://apt.puppetlabs.com/puppet-release-bionic.deb

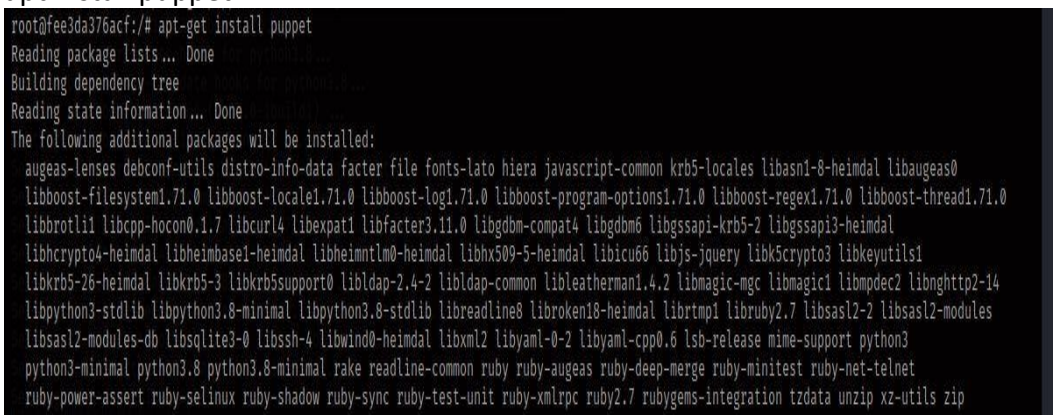
```
root@fee3da376acf:/# wget http://apt.puppetlabs.com/puppet-release-bionic.deb
--2022-04-06 13:38:01--  http://apt.puppetlabs.com/puppet-release-bionic.deb
Resolving apt.puppetlabs.com (apt.puppetlabs.com)... 108.159.80.20, 2600:9000:238c:7000:1d:fc37:1cc0:93a1, 2600:9000:238c:4000:1d:fc37:1cc0:93a1,
 ...
Connecting to apt.puppetlabs.com (apt.puppetlabs.com)|108.159.80.20|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11736 (11K) [application/x-debian-package]
Saving to: 'puppet-release-bionic.deb'

puppet-release-bionic.deb       100%[===================>]  11.46K  --.-KB/s    in 0.002s

2022-04-06 13:38:01 (6.31 MB/s) - 'puppet-release-bionic.deb' saved [11736/11736]
root@fee3da376acf:/#
```

dpkg –i puppet-release-bionic.deb

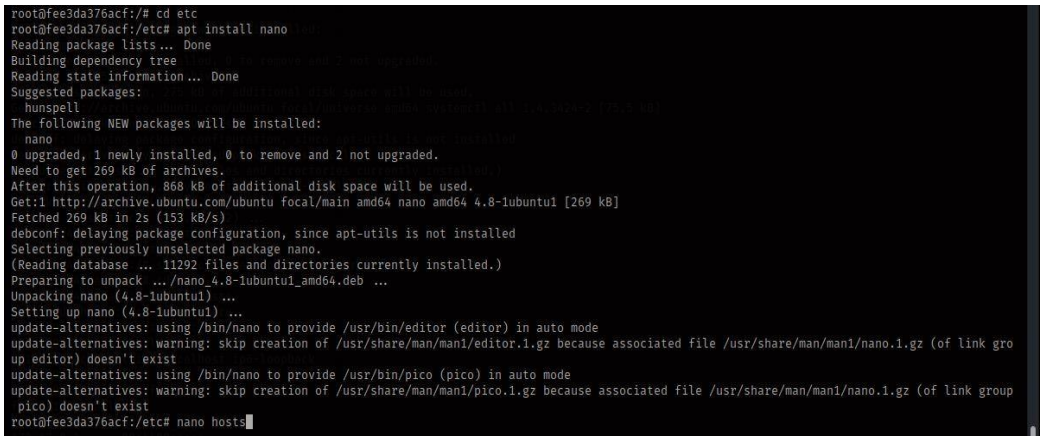
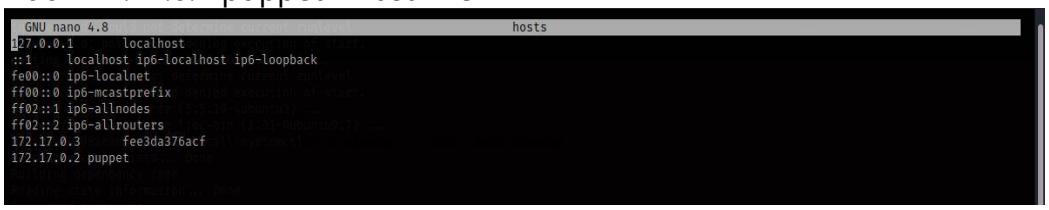
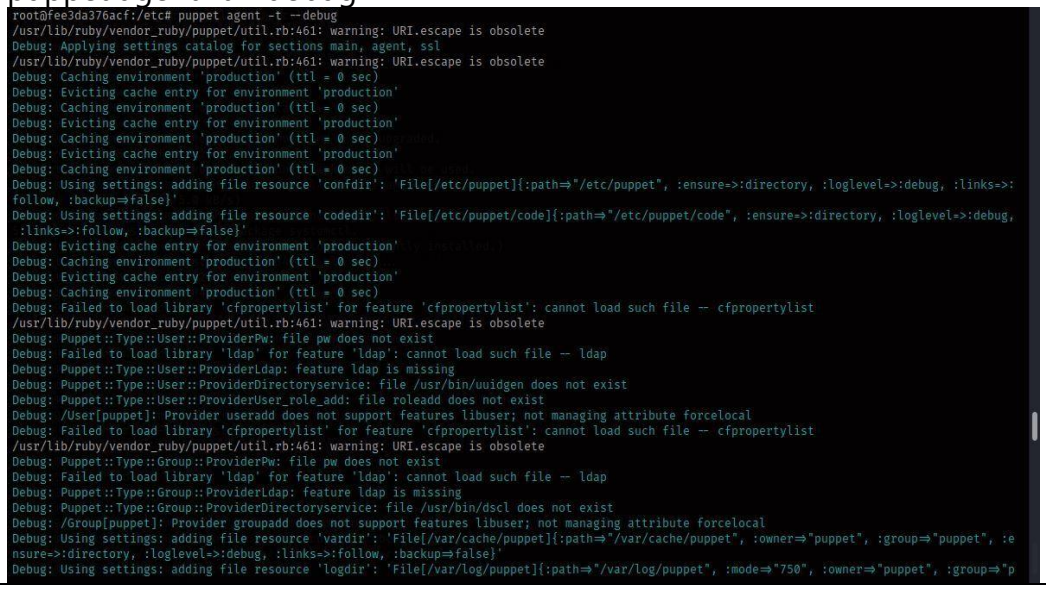
```
root@fee3da376acf:/# dpkg -i puppet-release-bionic.deb
Selecting previously unselected package puppet-release.
(Reading database ... 4470 files and directories currently installed.)
Preparing to unpack puppet-release-bionic.deb ...
Unpacking puppet-release (1.0.0-14bionic) ...
Setting up puppet-release (1.0.0-14bionic) ...
root@fee3da376acf:/#
```

	apt install puppet 
Conclusion	We come to know about how to install puppet for software configuration management.

VIT Vidyalankar Institute of Technology www.vit.edu.in	***DEPARTMENT OF INFORMATION TECHNOLOGY***
Semester	B.E. Semester VIII – Information Technology Engineering
Subject	DevOps Lab
Subject Professor In-charge	Prof. Rohit Barve
Laboratory	

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

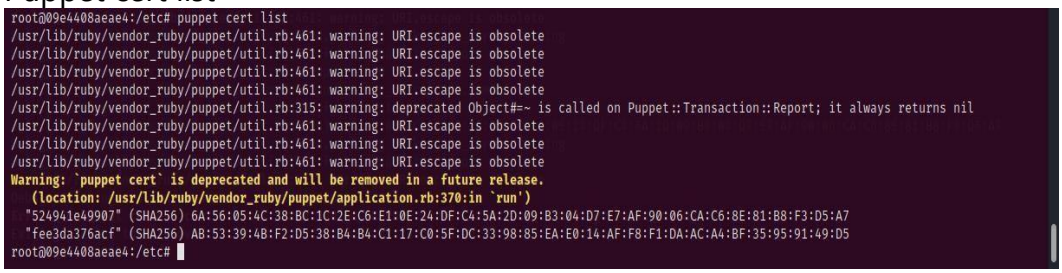
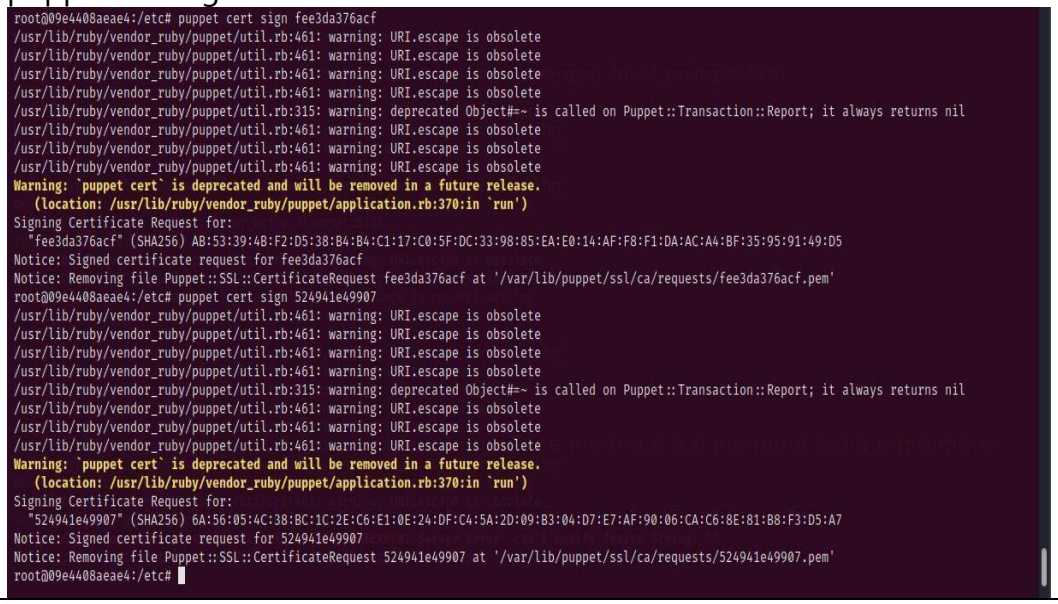
Experiment Number	6	
Experiment Title	To perform Software Configuration Management using Puppet.	
Resources / Apparatus Required	Hardware: • Intel Core i3/i5/i7 Processor with Intel VT-X support. • 4 GB RAM • 500 GB Hard disk	Software: Operating systems: Linux Desktop OS for Client machines.
Theory/ Procedure/ Algorithm	**Puppet Master and Slave Communication** Puppet Master and Slave communicates through a secure encrypted channel with the help of SSL. The diagram below depicts the same: As you can see from the above Image: 	

	• Puppet Slave asks for Puppet Master certificate. • After receiving Puppet Master certificate, Master requests for Slave certificate. Once Master has signed the Slave certificate, Slave requests for configuration/data. • Finally, Puppet Master will send the configuration to Puppet Slave.
Output:	**Puppet Slave** cd etc apt install nano nano hosts  Add 172.17.0.2 puppet in last line  puppet agent -t --debug 

```
root@fee3da376acf:/# cd etc
root@fee3da376acf:/etc# apt install nano
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
Suggested packages:
  hunspell
The following NEW packages will be installed:
  nano
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 269 kB of archives.
After this operation, 868 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 nano amd64 4.8-1ubuntu1 [269 kB]
Fetched 269 kB in 2s (153 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package nano.
(Reading database ... 11292 files and directories currently installed.)
Preparing to unpack .../nano_4.8-1ubuntu1_amd64.deb ...
Unpacking nano (4.8-1ubuntu1) ...
Setting up nano (4.8-1ubuntu1) ...
update-alternatives: using /bin/nano to provide /usr/bin/editor (editor) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/editor.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link gro
up editor) doesn't exist
update-alternatives: using /bin/nano to provide /usr/bin/pico (pico) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/pico.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group
 pico) doesn't exist
root@fee3da376acf:/etc# nano hosts
```

```
  GNU nano 4.8                                                    hosts
127.0.0.1       localhost
::1     localhost ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
172.17.0.3      fee3da376acf
172.17.0.2 puppet
```

```
root@fee3da376acf:/etc# puppet agent -t --debug
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Applying settings catalog for sections main, agent, ssl
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Using settings: adding file resource 'confdir': 'File[/etc/puppet]{:path⇒"/etc/puppet", :ensure=>:directory, :loglevel=>:debug, :links=>:
follow, :backup⇒false}'
Debug: Using settings: adding file resource 'codedir': 'File[/etc/puppet/code]{:path⇒"/etc/puppet/code", :ensure=>:directory, :loglevel=>:debug,
 :links=>:follow, :backup⇒false}'
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Evicting cache entry for environment 'production'
Debug: Caching environment 'production' (ttl = 0 sec)
Debug: Failed to load library 'cfpropertylist' for feature 'cfpropertylist': cannot load such file -- cfpropertylist
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Puppet::Type::User::ProviderPw: file pw does not exist
Debug: Failed to load library 'ldap' for feature 'ldap': cannot load such file -- ldap
Debug: Puppet::Type::User::ProviderLdap: feature ldap is missing
Debug: Puppet::Type::User::ProviderDirectoryservice: file /usr/bin/uuidgen does not exist
Debug: Puppet::Type::User::ProviderUser_role_add: file roleadd does not exist
Debug: /User[puppet]: Provider useradd does not support features libuser; not managing attribute forcelocal
Debug: Failed to load library 'cfpropertylist' for feature 'cfpropertylist': cannot load such file -- cfpropertylist
/usr/lib/ruby/vendor_ruby/puppet/util.rb:461: warning: URI.escape is obsolete
Debug: Puppet::Type::Group::ProviderPw: file pw does not exist
Debug: Failed to load library 'ldap' for feature 'ldap': cannot load such file -- ldap
Debug: Puppet::Type::Group::ProviderLdap: feature ldap is missing
Debug: Puppet::Type::Group::ProviderDirectoryservice: file /usr/bin/dscl does not exist
Debug: /Group[puppet]: Provider groupadd does not support features libuser; not managing attribute forcelocal
Debug: Using settings: adding file resource 'vardir': 'File[/var/cache/puppet]{:path⇒"/var/cache/puppet", :owner⇒"puppet", :group⇒"puppet", :e
nsure=>:directory, :loglevel=>:debug, :links=>:follow, :backup⇒false}'
Debug: Using settings: adding file resource 'logdir': 'File[/var/log/puppet]{:path⇒"/var/log/puppet", :mode⇒"750", :owner⇒"puppet", :group⇒"p
```

	Puppet Master systemctl start puppet-master.service  Puppet cert list  puppet cert sign **fee3da376acf** puppet cert sign **524941e49907** 
Conclusion	We come to know about how to perform software configuration management using puppet.

VIT Vidyalankar Institute of Technology ACCREDITED A+ BY NAAC	**Department of Information Technology**

Semester	BE Semester VIII– INFT Engineering
Subject	Devops Lab
Lab Professor In-charge	Prof. Rohit Barve

Student Name	Prashik Nikumbe	
Roll Number	18101A0040	
Grade and Subject Teacher's Signature		

Experiment Number	7	
Experiment Title	To install and configure Jenkins to test.	
Resources / Apparatus Required	**Hardware :** Laptop / Desktop	**Software :** Linux Operating System
Theory	**JENKINS** Jenkins is an open source automation tool written in Java programming language that allows continuous integration. Jenkins **builds** and **tests** our software projects which continuously making it easier for developers to integrate changes to the project, and making it easier for users to obtain a fresh build. It also allows us to continuously **deliver** our software by integrating with a large number of testing and deployment technologies. Jenkins offers a straightforward way to set up a continuous integration or continuous delivery environment for almost any combination of languages and source code repositories using pipelines, as well as automating other routine development tasks. With the help of Jenkins, organizations can speed up the software	

	development process through automation. Jenkins adds development life-cycle processes of all kinds, including build, document, test, package, stage, deploy static analysis and much more. Jenkins achieves CI (Continuous Integration) with the help of plugins. Plugins is used to allow the integration of various DevOps stages. If you want to integrate a particular tool, you have to install the plugins for that tool. For example: Maven 2 Project, Git, HTML Publisher, Amazon EC2, etc.

Commands	**INSTALLATION OF JENKINS**
	
	STEP 1 : sudo apt-get install docker.io
	
	The sudo command is used to ensure that the command runs with root access.
	
	Apt -get This method installs packages from the Internet on to the Linux system.
	
	`tanaya@tanaya-VirtualBox:~$ sudo apt-get install docker.io`
	`Reading package lists... Done`
	`Building dependency tree... Done`
	`Reading state information... Done`
	`The following additional packages will be installed:`
	`  bridge-utils containerd git git-man liberror-perl pigz runc ubuntu-fan`
	`Suggested packages:`
	`  ifupdown aufs-tools btrfs-progs cgroupfs-mount | cgroup-lite debootstrap`
	`  docker-doc rinse zfs-fuse | zfsutils git-daemon-run | git-daemon-sysvinit`
	`  git-doc git-email git-gui gitk gitweb git-cvs git-mediawiki git-svn`
	`The following NEW packages will be installed:`
	`  bridge-utils containerd docker.io git git-man liberror-perl pigz runc`
	`  ubuntu-fan`
	`0 upgraded, 9 newly installed, 0 to remove and 179 not upgraded.`
	`Need to get 76.4 MB of archives.`
	`After this operation, 345 MB of additional disk space will be used.`
	`Do you want to continue? [Y/n] Y`
	`Get:1 http://in.archive.ubuntu.com/ubuntu impish/universe amd64 pigz amd64 2.6-1 [63.6 kB]`
	`Get:2 http://in.archive.ubuntu.com/ubuntu impish/main amd64 bridge-utils amd64 1.7-1ubuntu2 [34.4 kB]`
	`Get:3 http://in.archive.ubuntu.com/ubuntu impish/main amd64 runc amd64 1.0.1-0ubuntu2 [3,260 kB]`
	`Get:4 http://in.archive.ubuntu.com/ubuntu impish-updates/main amd64 containerd amd64 1.5.5-0ubuntu3.1 [27.9 MB]`
	`Get:5 http://in.archive.ubuntu.com/ubuntu impish-updates/universe amd64 docker.io amd64 20.10.7-0ubuntu5.1 [41.1 MB]`

STEP 2 : sudo docker pull jenkins/jenkins

Pulls the Jenkins from the public repo using the following command.

```
tanaya@tanaya-VirtualBox:~$ sudo docker pull jenkins/jenkins
Using default tag: latest
latest: Pulling from jenkins/jenkins
dbba69284b27: Pull complete
6c3a072e9d16: Pull complete
04fbda9c2d8a: Pull complete
8c5a208f0b2a: Pull complete
8955615fe0c0: Pull complete
3938c85ee158: Pull complete
03a79dcd645c: Pull complete
1ac5b0ffdc73: Pull complete
b10d483965a5: Pull complete
bcfc5e1d7cda: Pull complete
efe2bd60b1c0: Pull complete
7bacf74e8698: Pull complete
8d01c56dacb0: Pull complete
b620cf1f130d: Pull complete
eeb50c5d939c: Pull complete
756243c680bd: Pull complete
da88933e9bbe: Pull complete
Digest: sha256:763961aafce81e104bcafaf354817a4ab671eaf0e68d45b4354c366410338658
Status: Downloaded newer image for jenkins/jenkins:latest
docker.io/jenkins/jenkins:latest
```

STEP 3 : sudo docker images

This command is used to display all the images currently installed on the system.

```
tanaya@tanaya-VirtualBox:~$ sudo docker images
REPOSITORY        TAG       IMAGE ID       CREATED         SIZE
jenkins/jenkins   latest    d7eeb548721f   23 hours ago    460MB
```

STEP 4 : sudo docker run -it -d -p 82:8080 jenkins/jenkins

This command launchs the Jenkins Docker container.

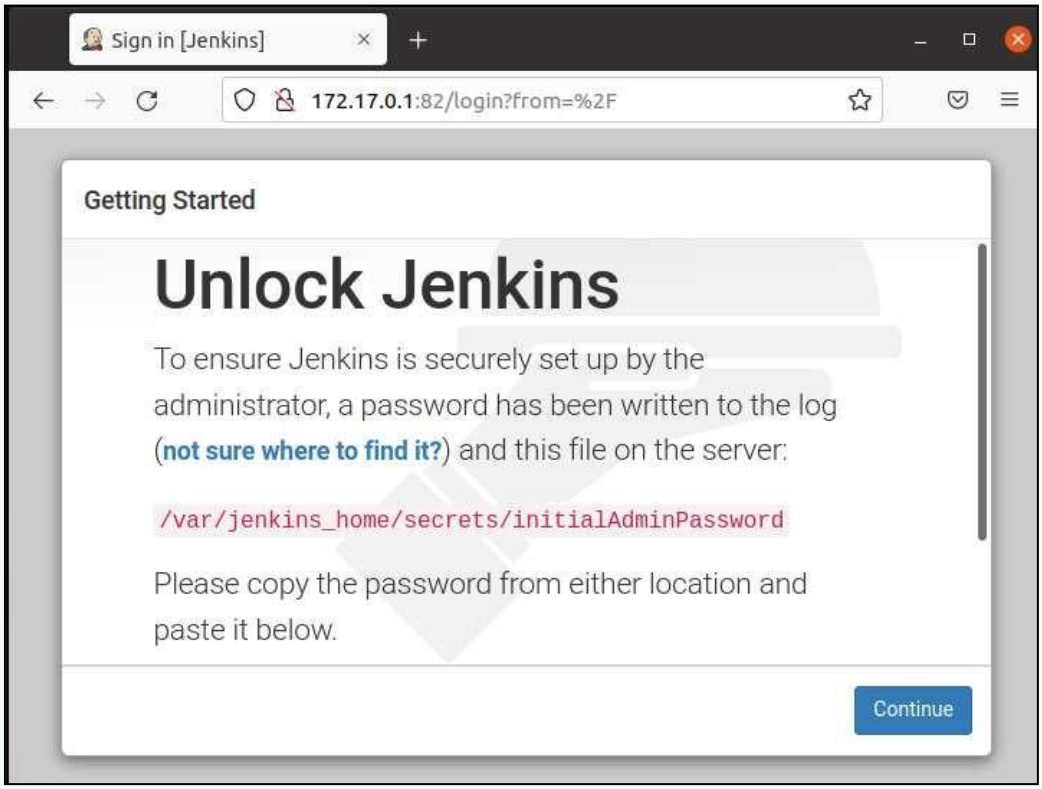
```
tanaya@tanaya-VirtualBox:~$ sudo docker run -it -d -p 82:8080 jenkins/jenkins
9da999b6af7ac5eba87341a9c9fe74f45787d73253abc31db8f7c7bc7ea4497f
```

STEP 5 : sudo docker ps

This command is used to list the running containers.

```
tanaya@tanaya-VirtualBox:~$ sudo docker ps
CONTAINER ID   IMAGE             COMMAND                  CREATED         STATU
S         PORTS                                              NAMES
9da999b6af7a   jenkins/jenkins   "/sbin/tini -- /usr/…"   5 minutes ago   Up 5
minutes   50000/tcp, 0.0.0.0:82->8080/tcp, :::82->8080/tcp   ecstatic_feynman
```

STEP 6 : Go to browser and type IP address along with :82 to open Jenkins web page.



STEP 6 : sudo docker exec -it 9da999b6af7a bash

This command is used to access the running container.

```
tanaya@tanaya-VirtualBox:~$ sudo docker exec -it 9da999b6af7a bash
```

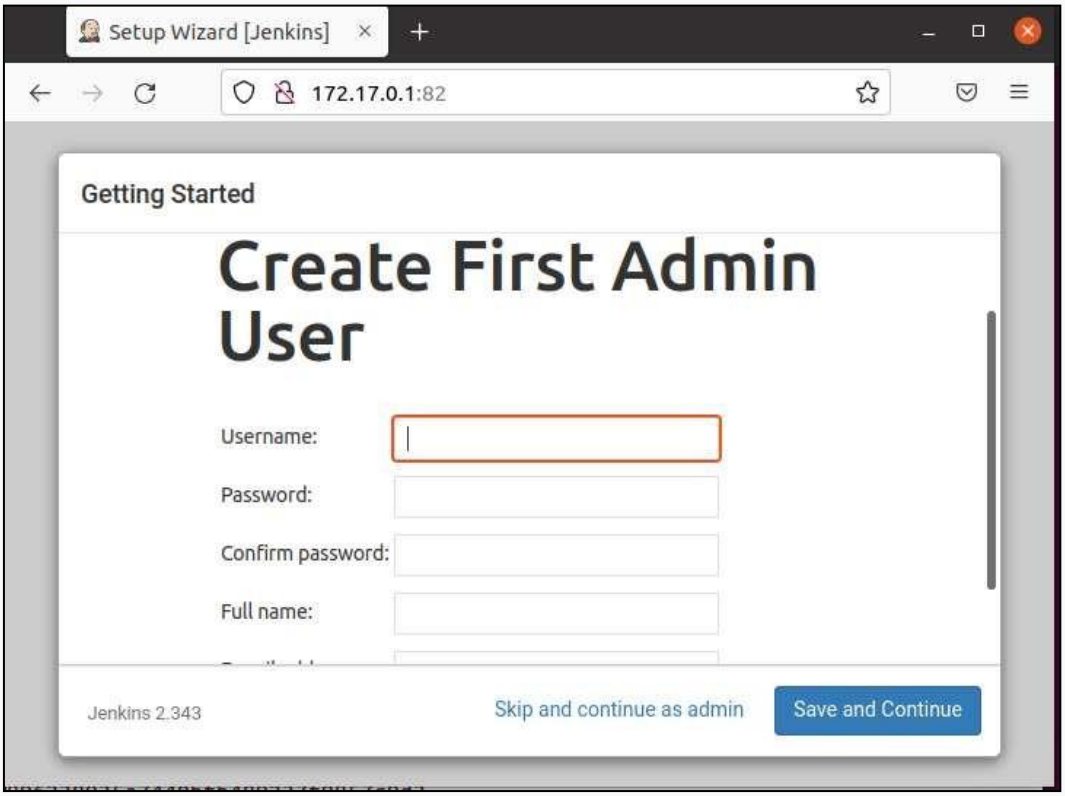
STEP 7 :cat /var/Jenkins_home/secrets/initialAdminPassword

This command will give you Admin Password to enter in Jenkins web page.

```
jenkins@9da999b6af7a:/$ cat /var/jenkins_home/secrets/initialAdminPassword
896238935a7440bfb489237f9857c9d3
```

STEP 8 : Enter the Password in webpage and click on Continue.

STEP 9 : Enter the details and Click on Save and continue.



STEP 10 : Install Jenkins.