

# **20MCA136 –NETWORKING & SYSTEM ADMINISTRATION LAB LAB**

*Lab Report Submitted By*

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**Reg. No.:AJC21MCA-2081**

*In Partial fulfillment for the Award of the Degree Of*

**MASTER OF COMPUTER APPLICATIONS (2 Year)  
(MCA)**

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**



**AMAL JYOTHI COLLEGE OF ENGINEERING  
KANJIRAPPALLY**

[Affiliated to APJ Abdul Kalam Technological University, Kerala. Approved by AICTE,  
Accredited by NAAC with ‘A’ grade. Koovappally, Kanjirappally, Kottayam, Kerala – 686518]

**2021-2022**

**DEPARTMENT OF COMPUTER APPLICATIONS**  
**AMAL JYOTHI COLLEGE OF ENGINEERING**  
**KANJIRAPPALLY**



**CERTIFICATE**

This is to certify that the Lab report, "**20MCA136 – NETWORKING & SYSTEM ADMINISTRATION LAB**" is the bonafide work of **Neha Antony** (**Reg.No:AJC21MCA-2081**) in partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications under APJ Abdul Kalam Technological University during the year 2021-22.

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## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 1**

#### **Aim**

Familiarization of Hardware Components in a Computer.

**Name: NEHA ANTONY**  
**Roll No:23**  
**Batch:MCA-B**  
**Date:04-04-2022**

#### **Procedure**

##### **Motherboard**



A motherboard provides connectivity between the hardware components of a computer, like the processor (CPU), memory (RAM), hard drive, and video card. There are multiple types of motherboards, designed to fit different types and sizes of computers.

Each type of motherboard is designed to work with specific types of processors and memory, so they don't work with every processor and type of memory. However, hard drives are mostly universal and work with the majority of motherboards, regardless of the type or brand.

##### **NIC (Network Interface Card)**



Short for network interface card, the NIC is also referred to as an Ethernet card and network adapter. A NIC is a computer expansion card for connecting to a network (e.g., home network or Internet) using an Ethernet cable with an RJ-45 connector.

## Random Access Memory



Random access memory (RAM) is fast-access memory that is cleared when the computer is power-down. RAM attaches directly to the motherboard, and is used to store programs that are currently running. RAM is a set of integrated circuits that allow the stored data to be accessed in any order (why it is called random). There are many different types of RAM. Distinctions between these different types include: writable vs. read-only, static vs. dynamic, volatile vs. non-volatile, etc.

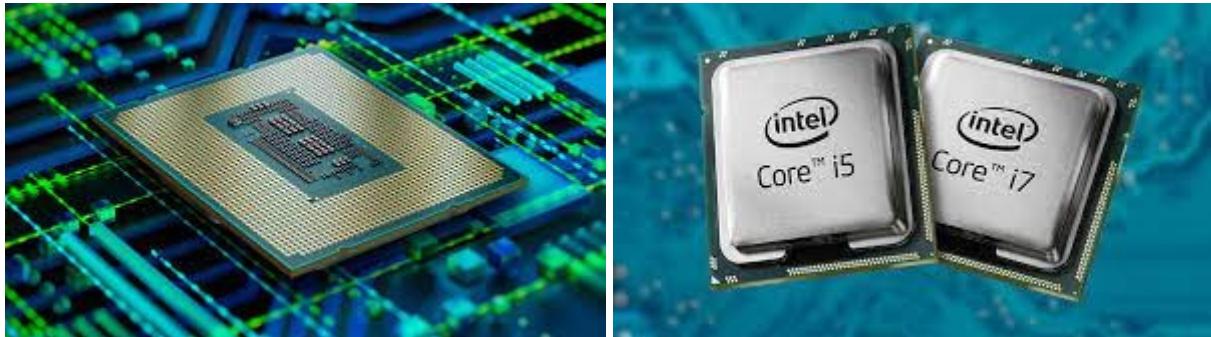
## Hard Disk Drive



A hard disk drive (HDD) is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces. Just about every new computer comes with a hard disk these days unless it comes with a new solid-state drive. Typical desktop hard disk drives store between 120 and 400GB, rotate at 7,200 rpm, and have a media transfer rate of 1 Gbit/s or higher. Hard disk drives are accessed over one of a

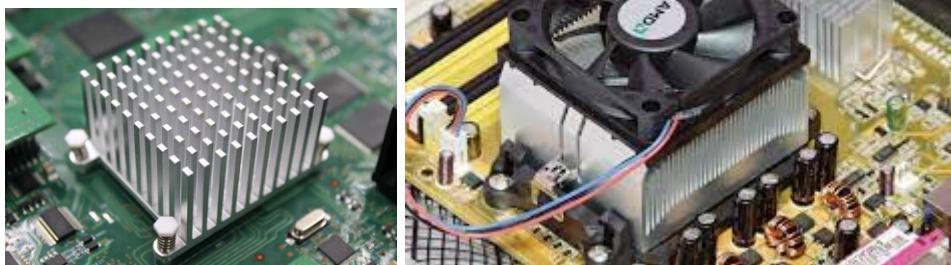
number of bus types, including parallel ATA(also called IDE), Serial ATA (SATA), SCSI, Serial Attached SCSI, and Fibre Channel.

## Processor



The processor, also called the microprocessor or CPU (for *Central Processing Unit*), is the brain of the PC. It performs all general computing tasks and coordinates tasks done by memory, video, disk storage, and other system components. The CPU is a very complex chip that resides directly on the motherboard of most PCs, but may sometimes reside on a daughter card that connects to the motherboard via a dedicated specialized slot.

## Heat sink.



This is a passive piece of hardware that draws heat away from components to regulate/reduce their temperature to help ensure they continue to function properly. Typically, a heat sink is installed directly atop the CPU, which produces the most heat among internal components.

## ROM Memory



ROM stands for a type of memory chip that can be read from but not written to.

In other words, it's a form of data storage that can't be changed after being programmed.

It's sometimes called "non-volatile" memory because the stored information will remain even when not powered up or in use.

ROM is often used to store a computer's basic start-up instructions and certain types of data, such as your car's onboard computer system and a calculator's data tables.

## Optical Drive



Optical Drives are used in PCs to read and write CDs and DVDs.

The optical drive reads the data from the disc, which can then be transformed into a digital file that is readable by the computer.

This makes it easy to backup files, play music or movies, or copy data from one disc to another.

The term "CD" refers to Compact Discs, which are the most common type of optical drive on modern computers.

## Power Supply



A power supply is an electrical appliance that provides the necessary power to operate a computer.

Computers are powered by electricity, and the power supply converts the alternating current (AC) from the electric outlet into direct current (DC).

The power supply in a computer can be an internal or external component.

It's important to make sure your power supply is functioning properly.

### **Graphics Processing Unit (GPU)**



The graphics processing unit, or GPU, has become one of the most important types of computing technology, both for personal and business computing. Designed for parallel processing, the GPU is used in a wide range of applications, including graphics and video rendering. Although they're best known for their capabilities in gaming, GPUs are becoming more popular for use in creative production and artificial intelligence (AI).

### **Solid State Drive (SSD)**



A solid-state drive (SSD) is a new generation of storage device used in computers. SSDs use flash-based memory, which is much faster than a traditional mechanical hard disk. Upgrading to an SSD is one of the best ways to speed up your computer. Learn how SSDs work and how to keep them optimized with a specialized performance-boosting tool.

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 2**

**Name: Neha Antony**

**Roll No:23**

**Batch: MCA-B**

**Date:21-03-2022**

### **Aim**

Install the latest version of Ubuntu on an Oracle VM VirtualBox.

### **Procedure**

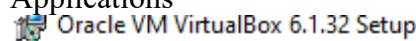
Below are the very easy steps with screenshots containing the installation procedure of Virtual Box.

### **Output Screenshot**

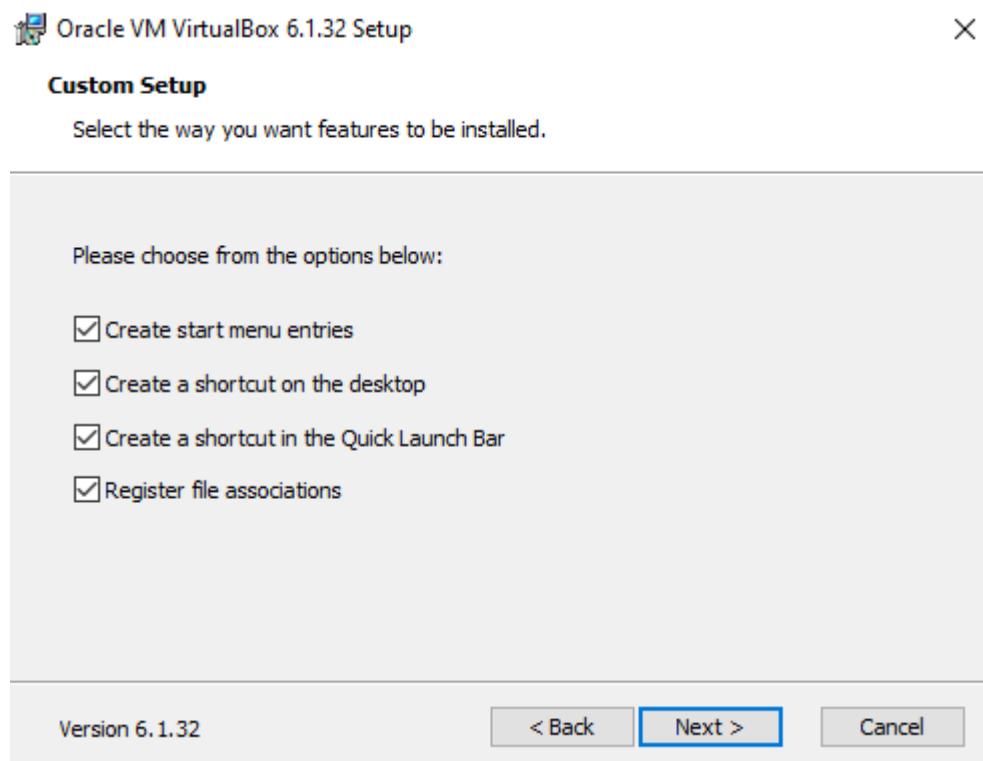
**Step 1:** Download VirtualBox for Windows and install it on the computer.



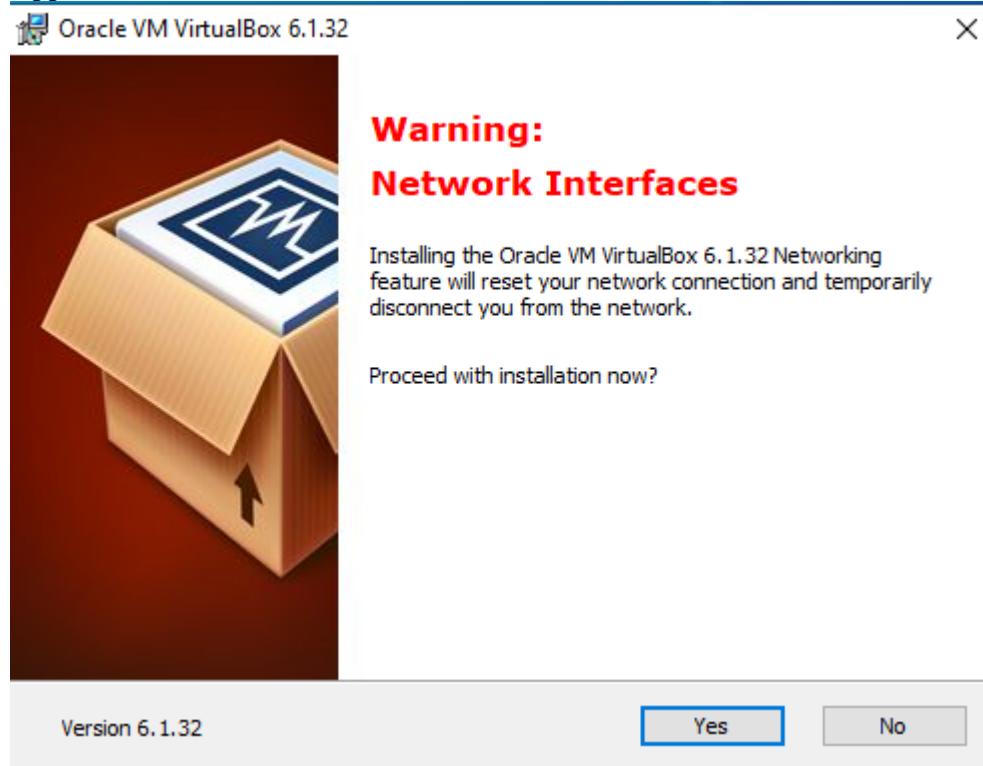
Step 2: click next



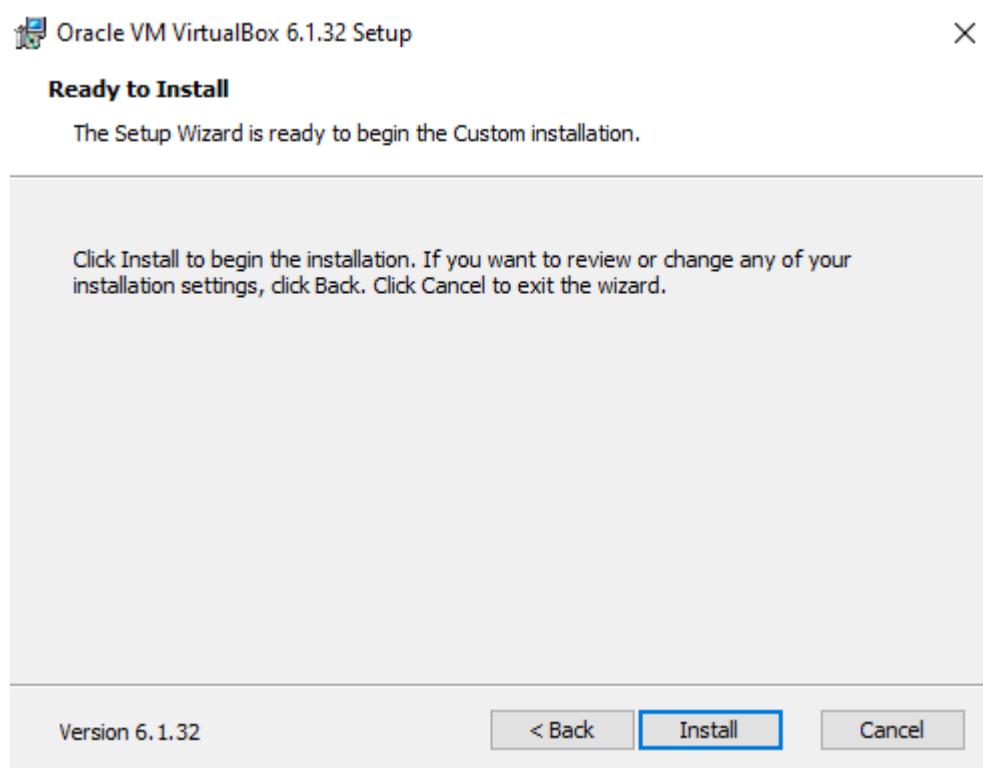
Step 3:click next

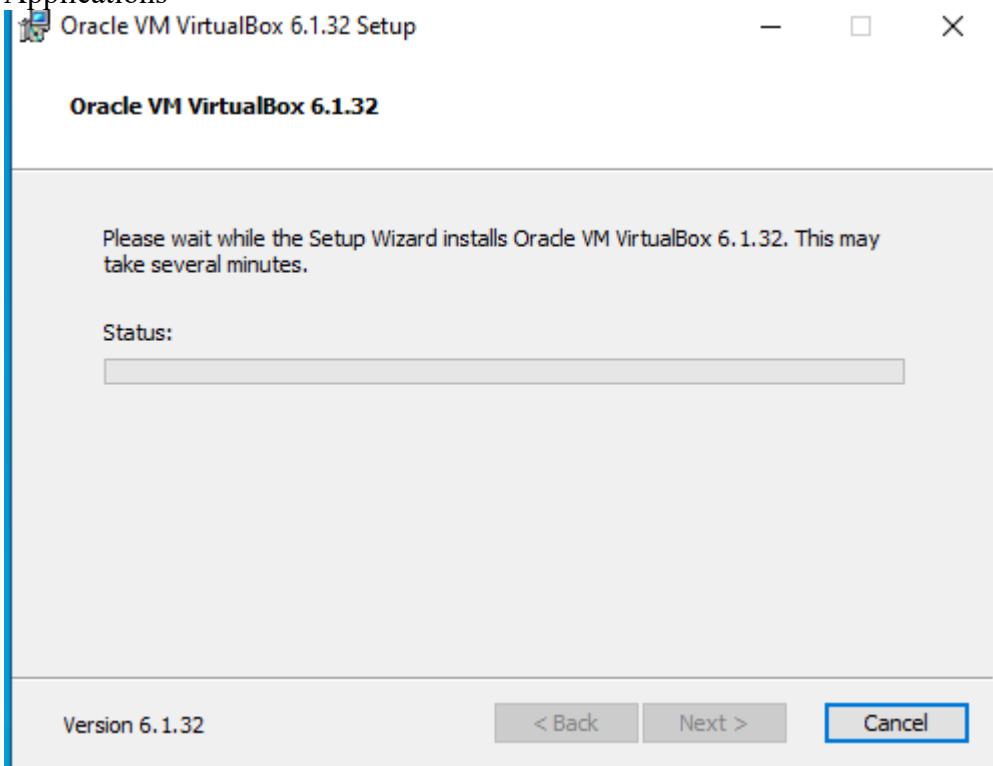


Step4:click yes

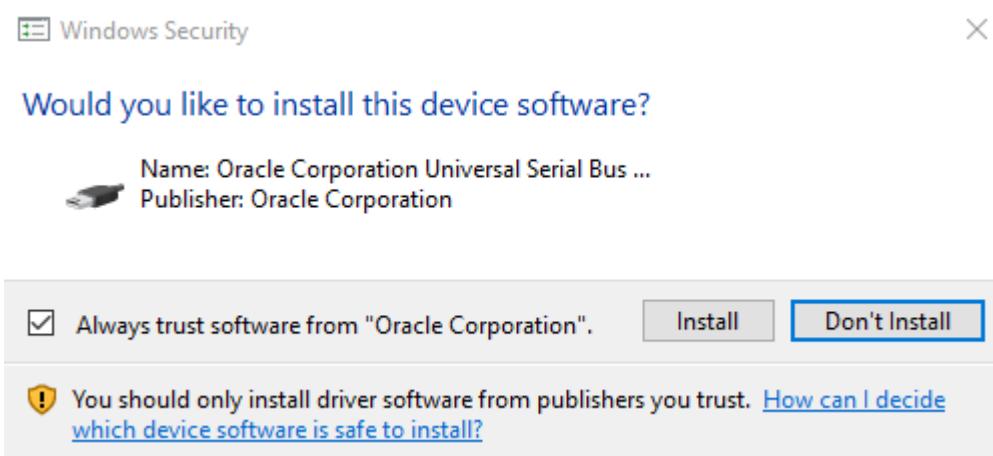


Step 5:click install





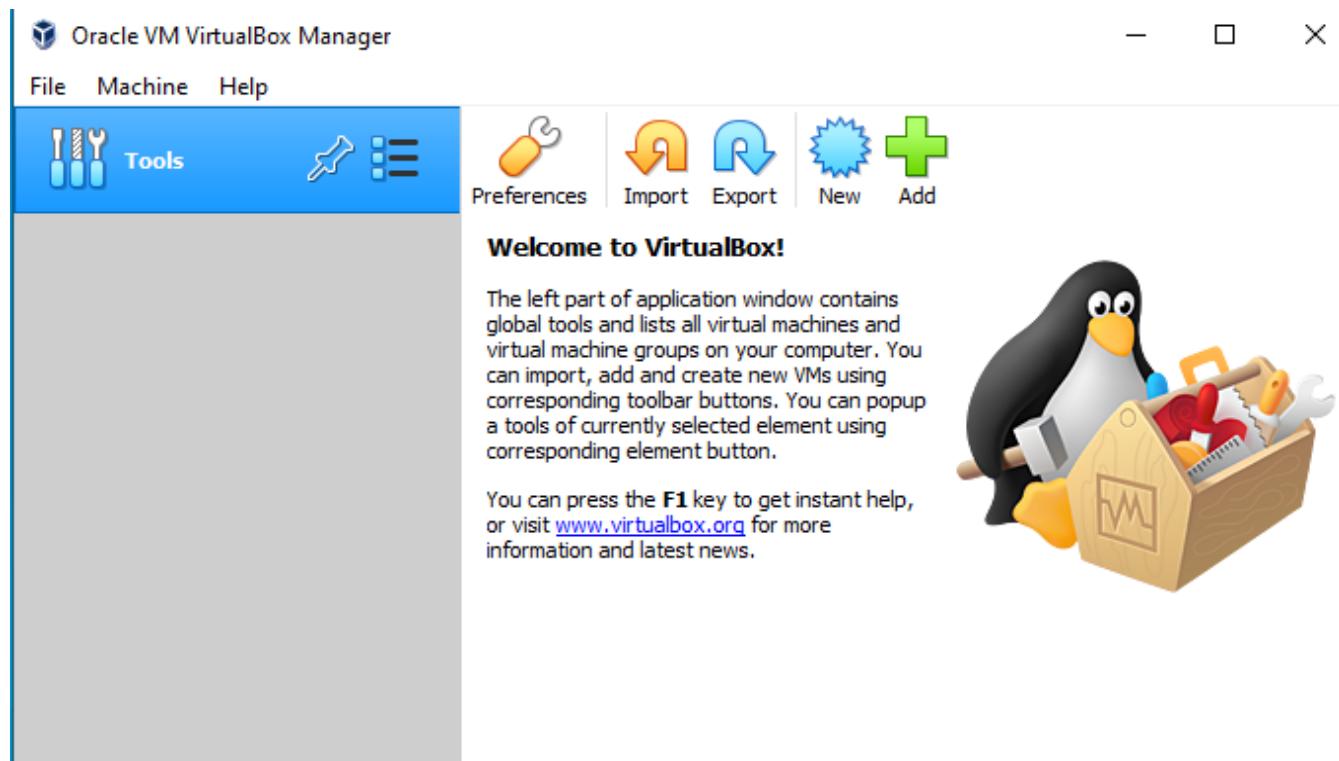
### Step 6:install



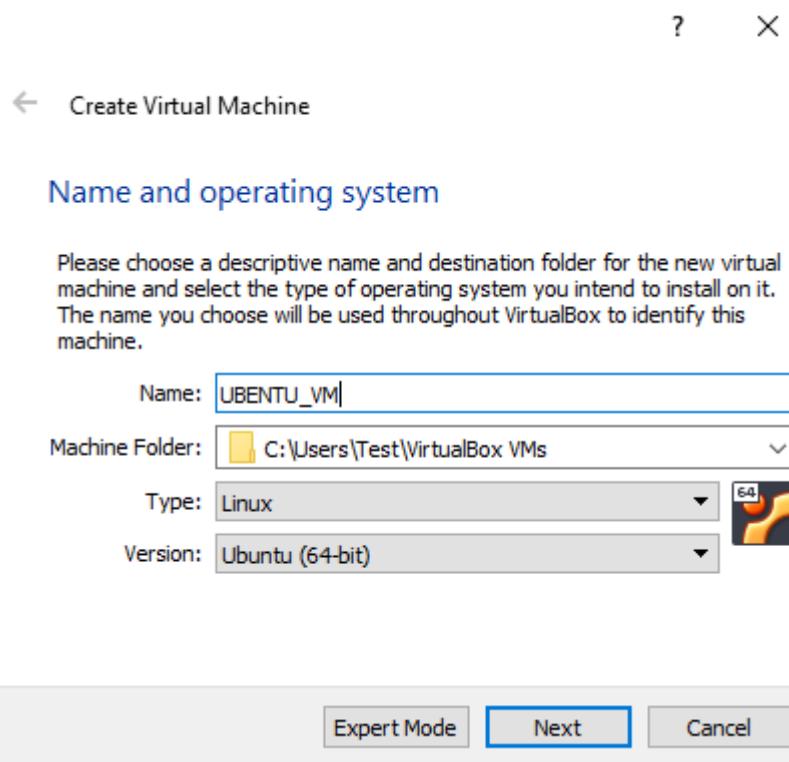
### Step 7:finish



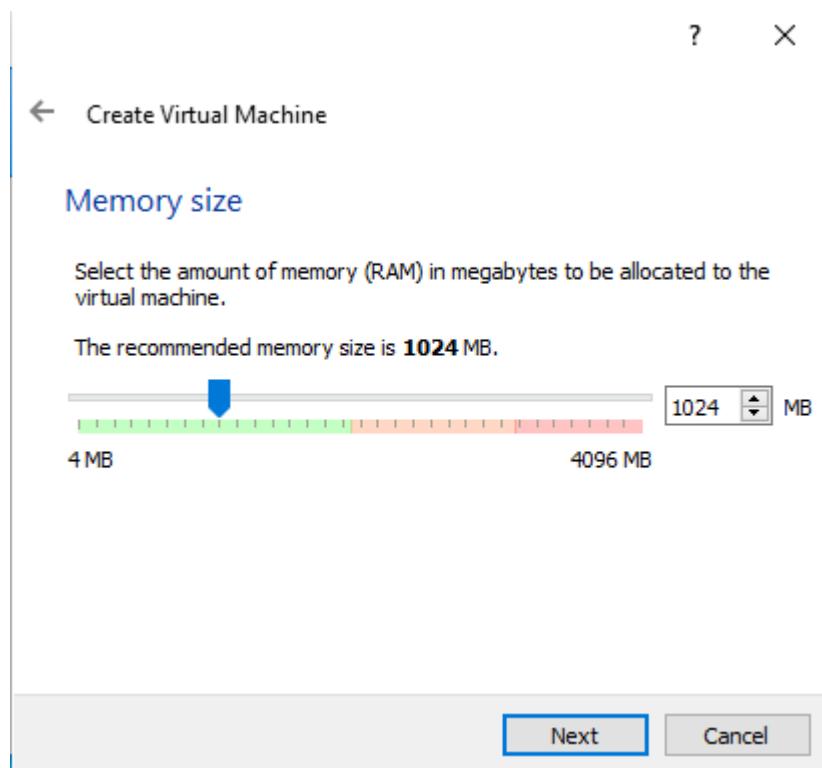
**Step8:** Click on “New” to create a virtual machine

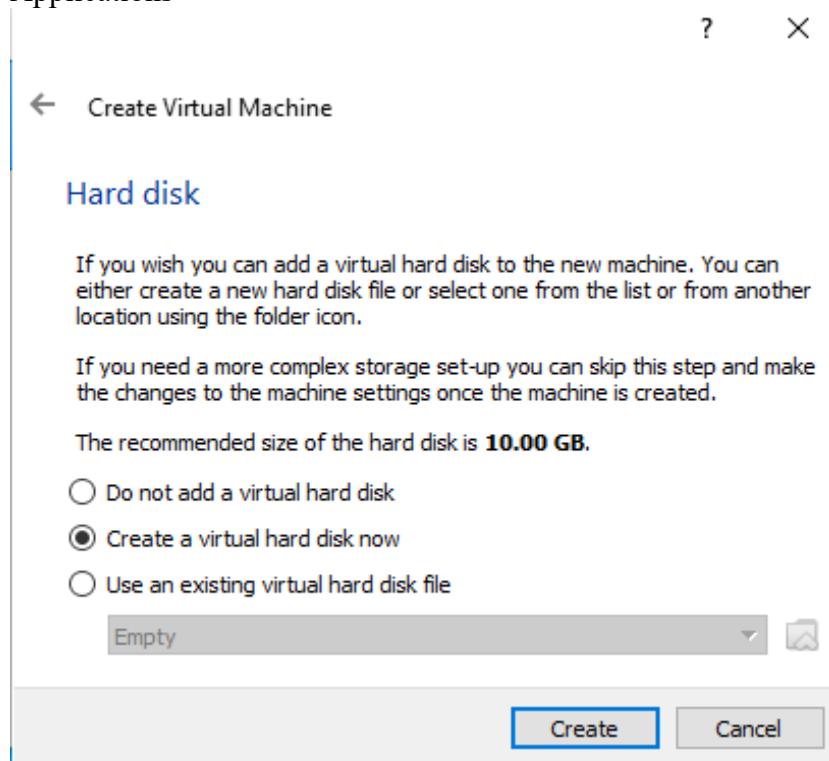


**Step 9:** Enter Name for your Virtual Machine

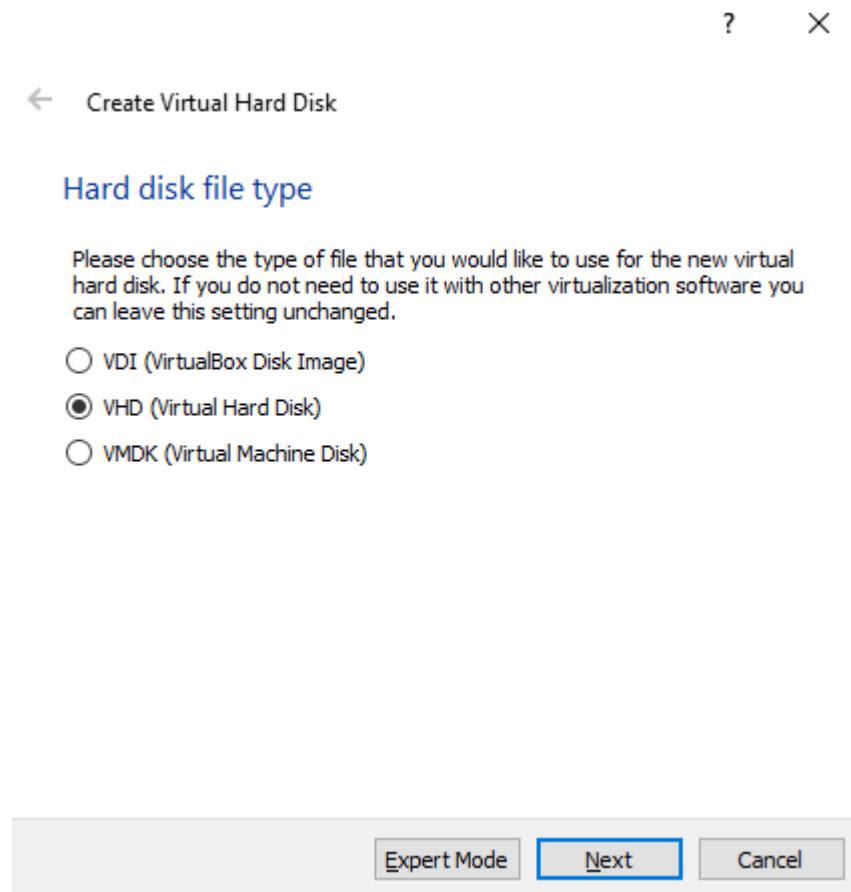


**Step10:** Enter amount of memory (RAM) =1024 MB and click “Next”





**Step11:** Click “Create” to create hard drive



Step 12:click next



### Storage on physical hard disk

Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).

A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

- Dynamically allocated  
 Fixed size

[Next](#) [Cancel](#)

**Step13:** Enter Size of Virtual Hard Drive= 20 GB and Click “Create”



### File location and size

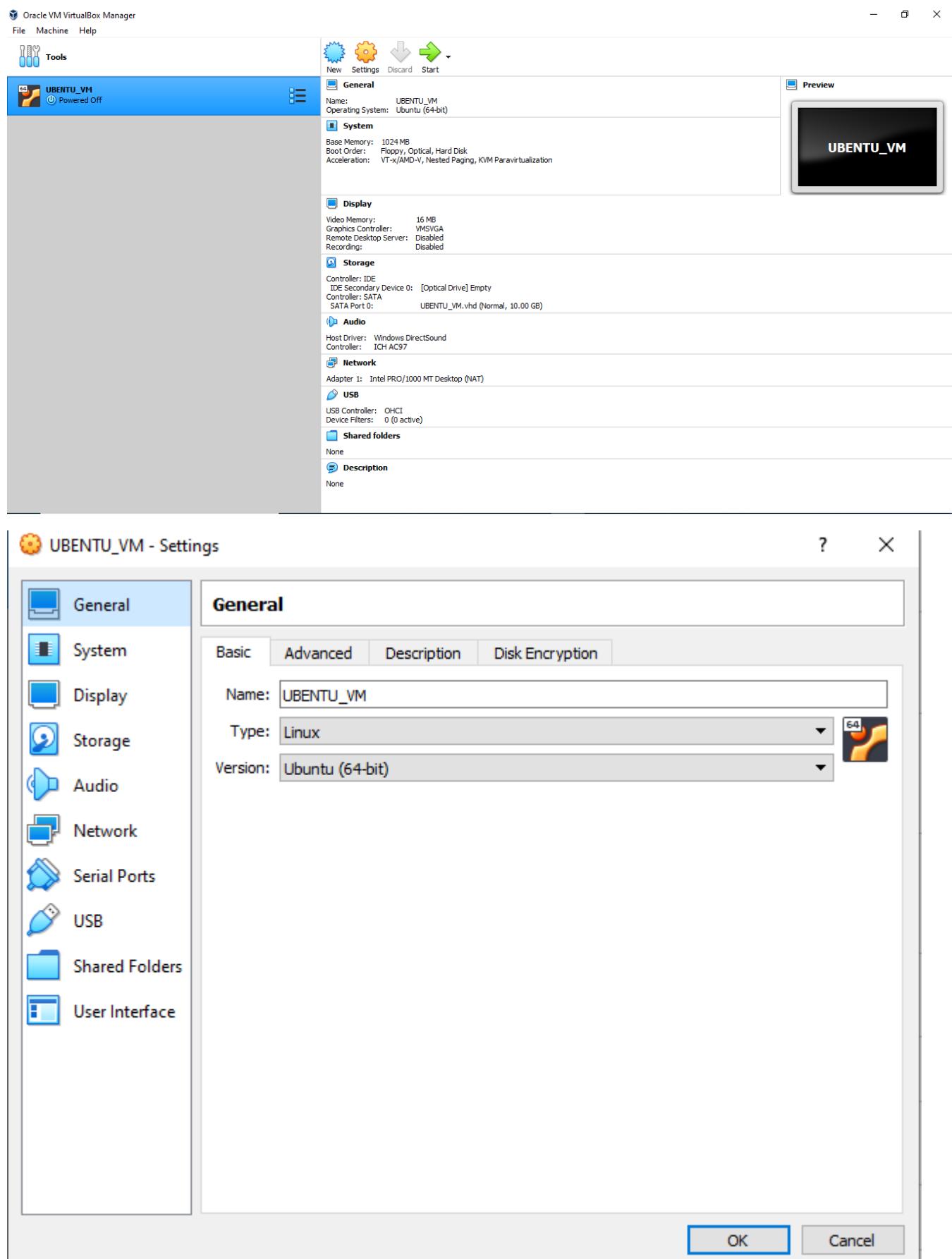
Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.

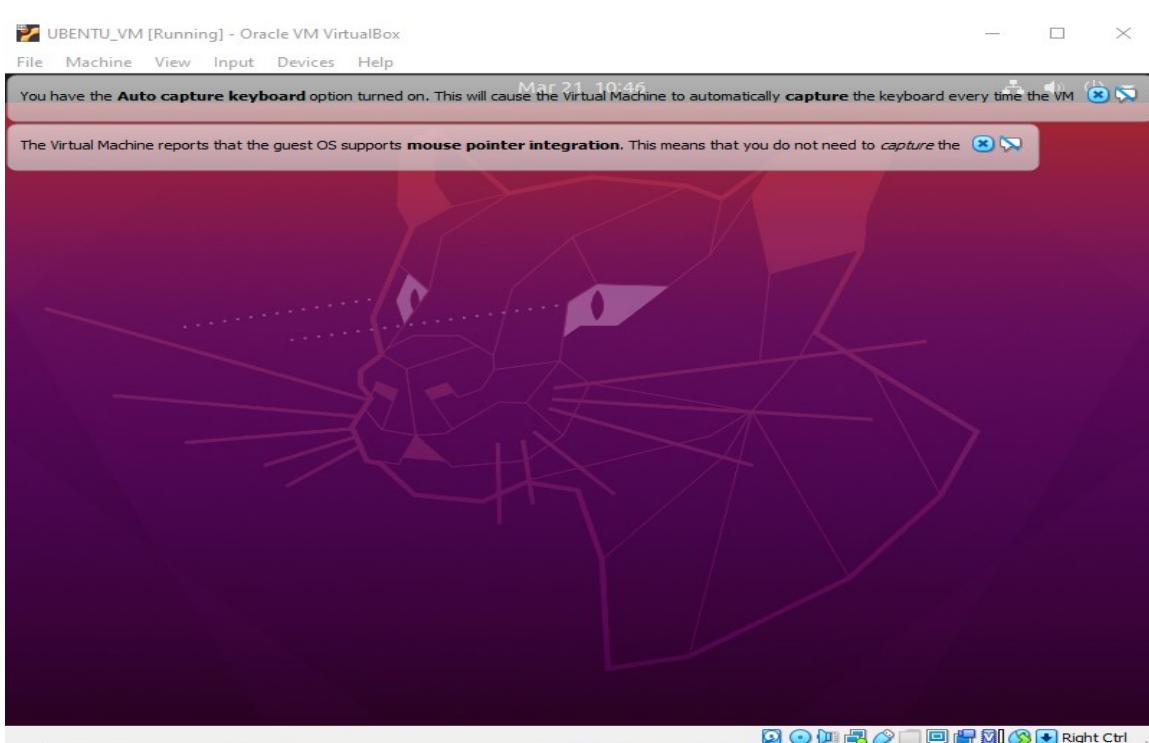
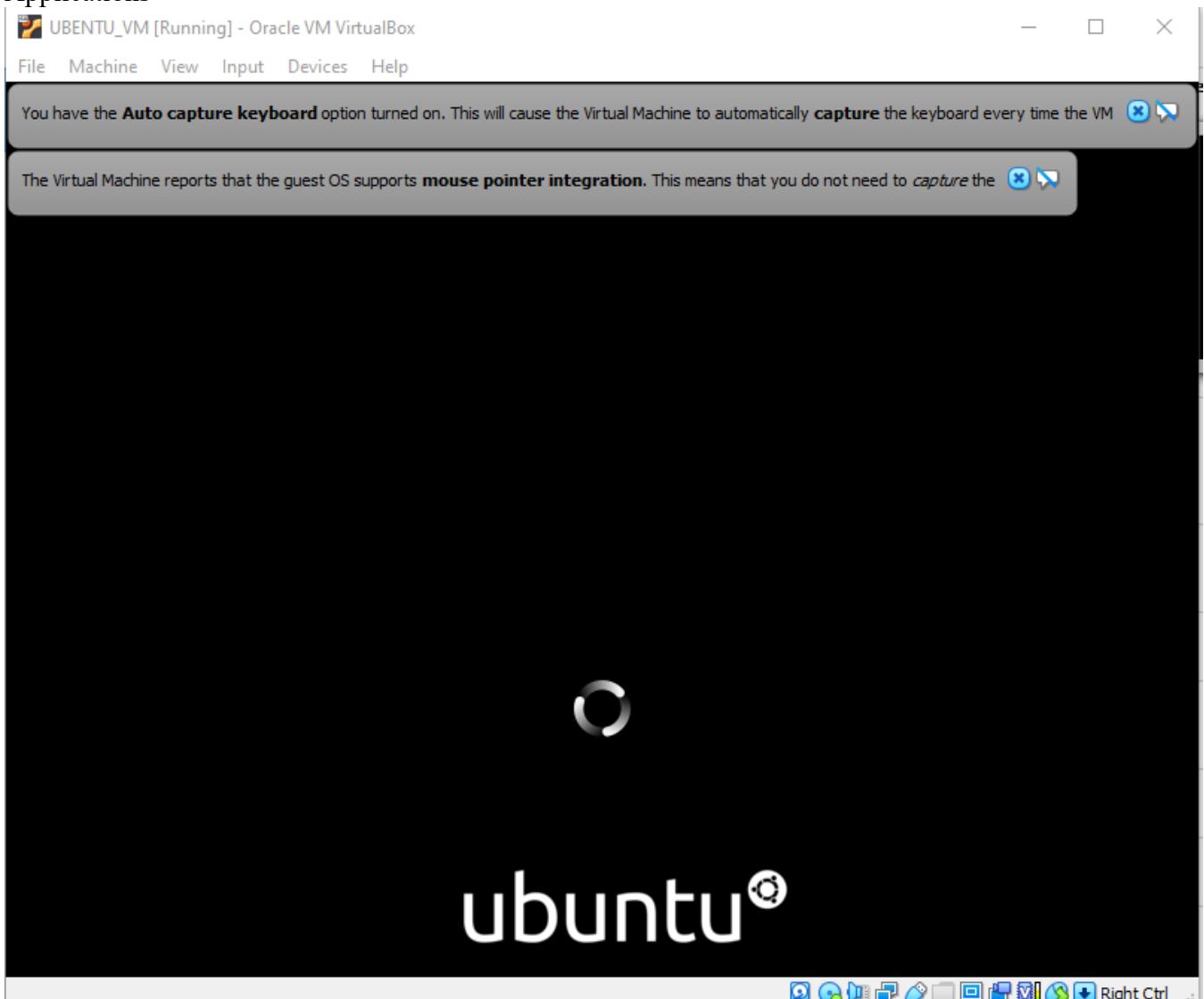
C:\Users\Test\VirtualBox VMs\UBENTU\_VM\UBENTU\_VMD.vhd

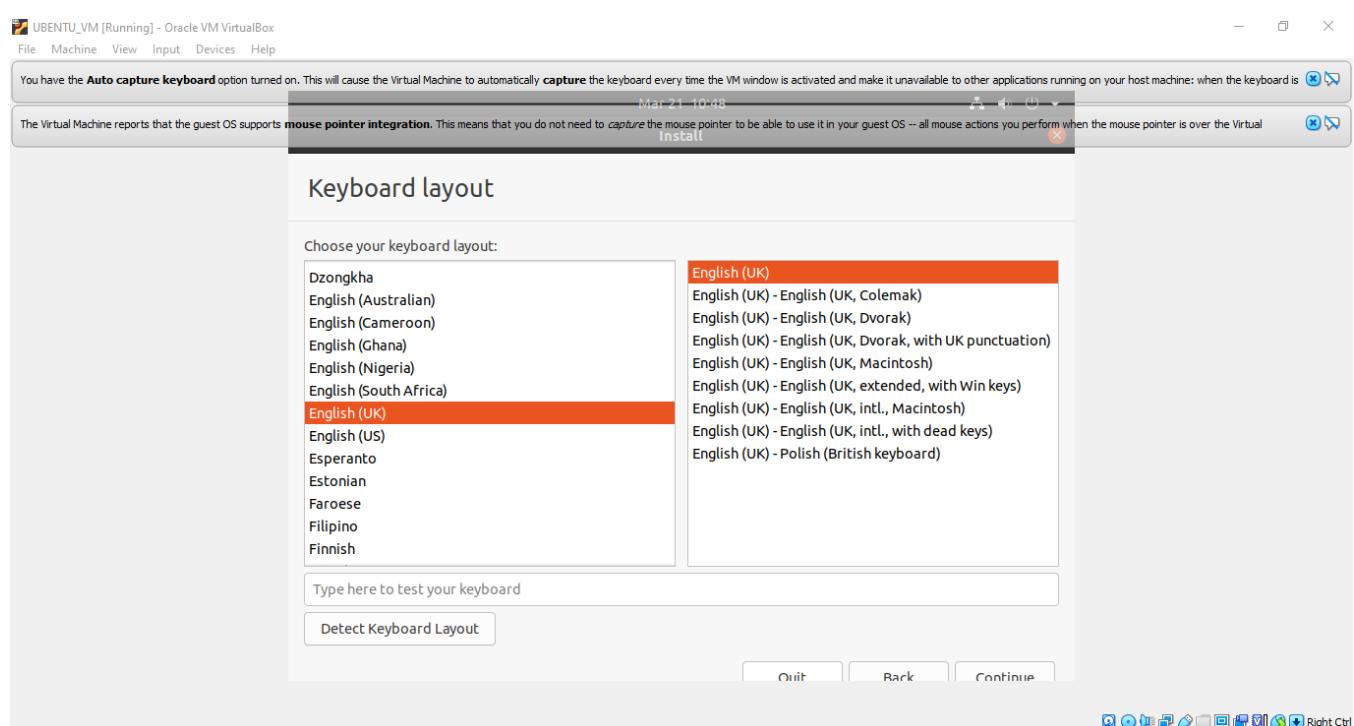
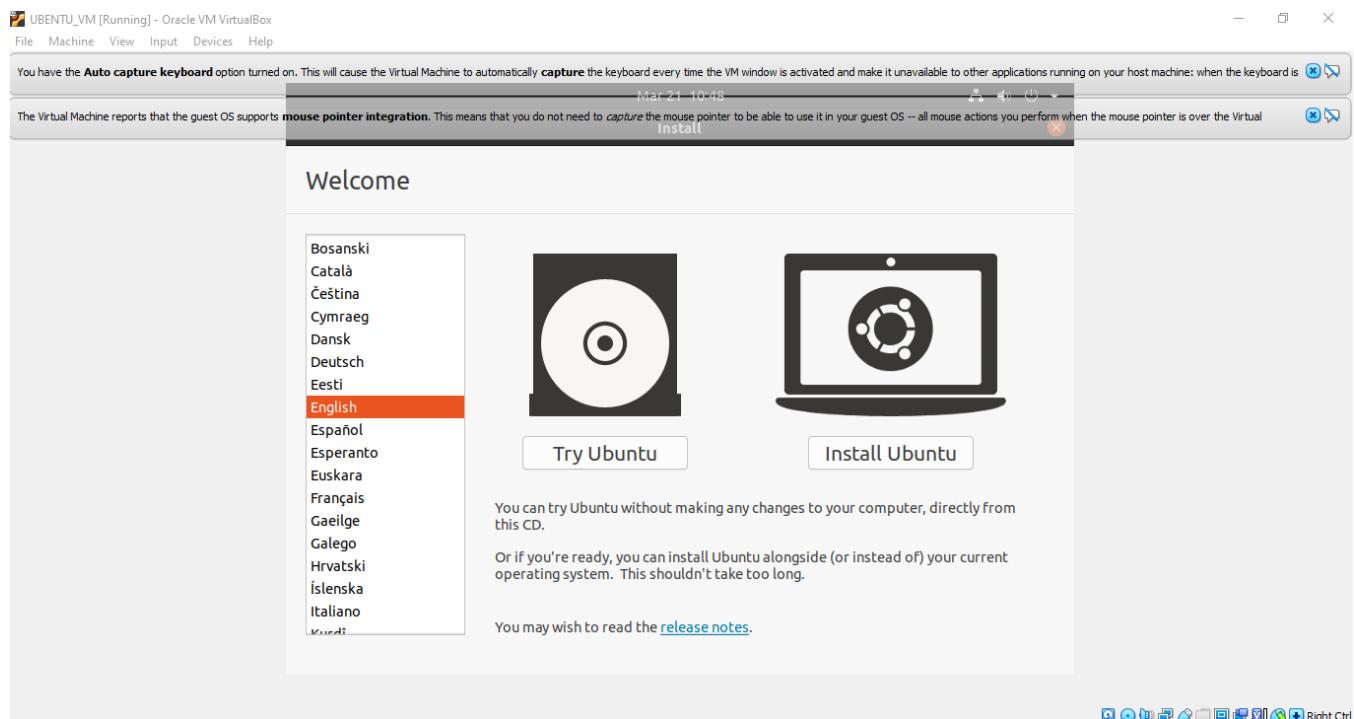
Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.

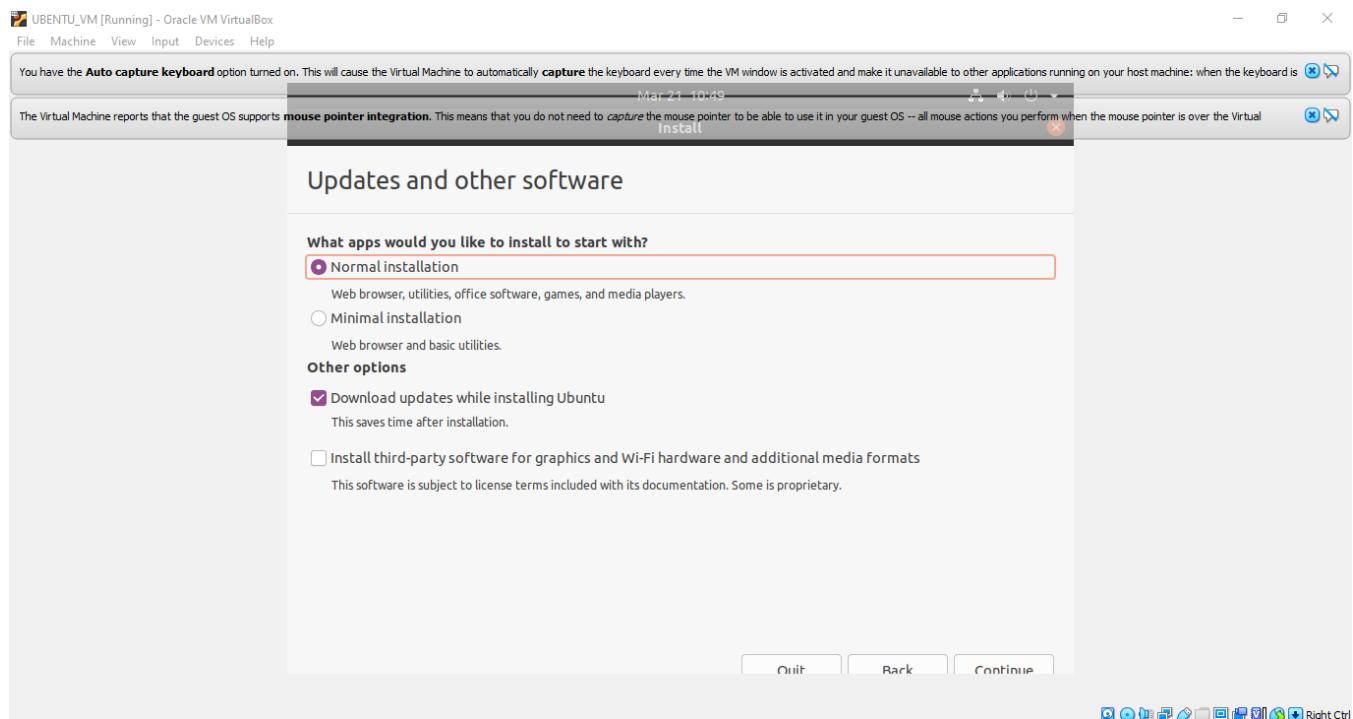
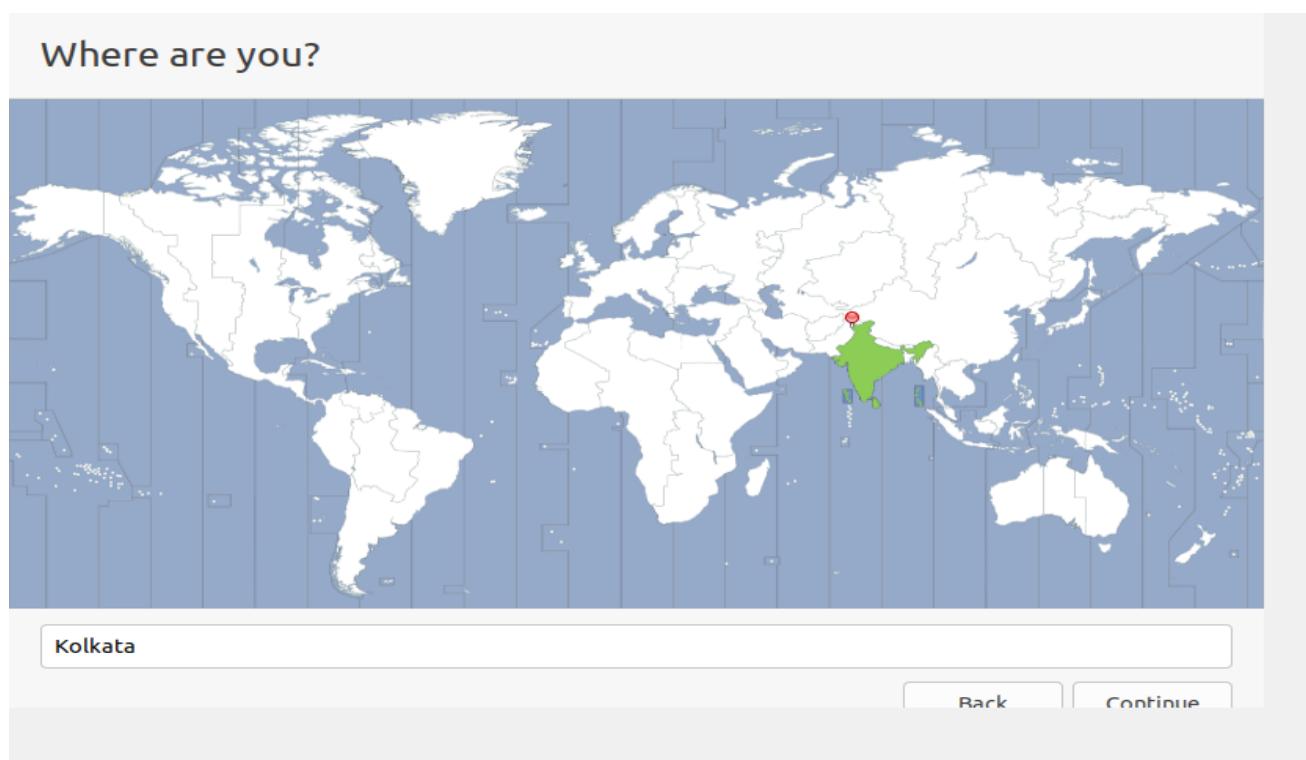


[Create](#) [Cancel](#)

**Step14:** Select Virtual Machine



**Step15:** Click “Install Ubuntu”

**Step16:** Click “Continue”**Step17:** Select location and click “Continue”

**Step18:** Fill all the details and Click “Continue”

Who are you?

Your name:  ✓

Your computer's name:  ✓  
The name it uses when it talks to other computers.

Pick a username:  ✓

Choose a password:   Fair password

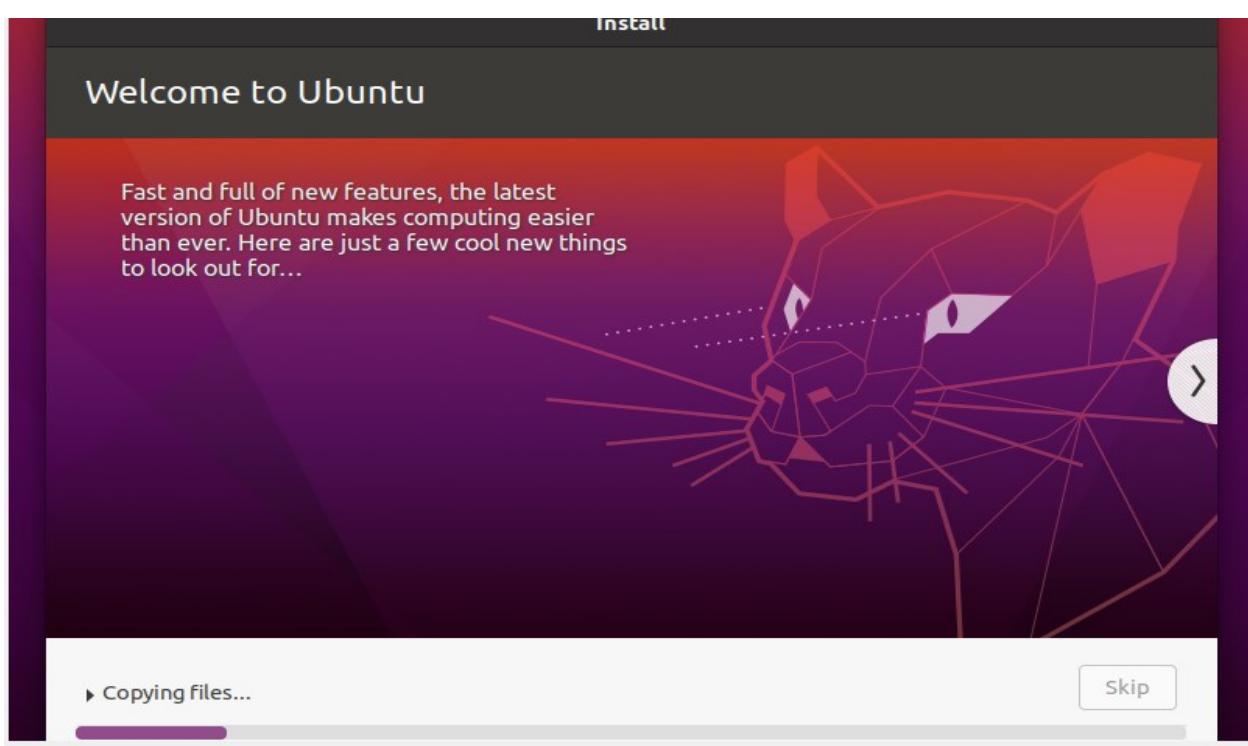
Confirm your password:  ✓

Log in automatically  
 Require my password to log in  
 Use Active Directory

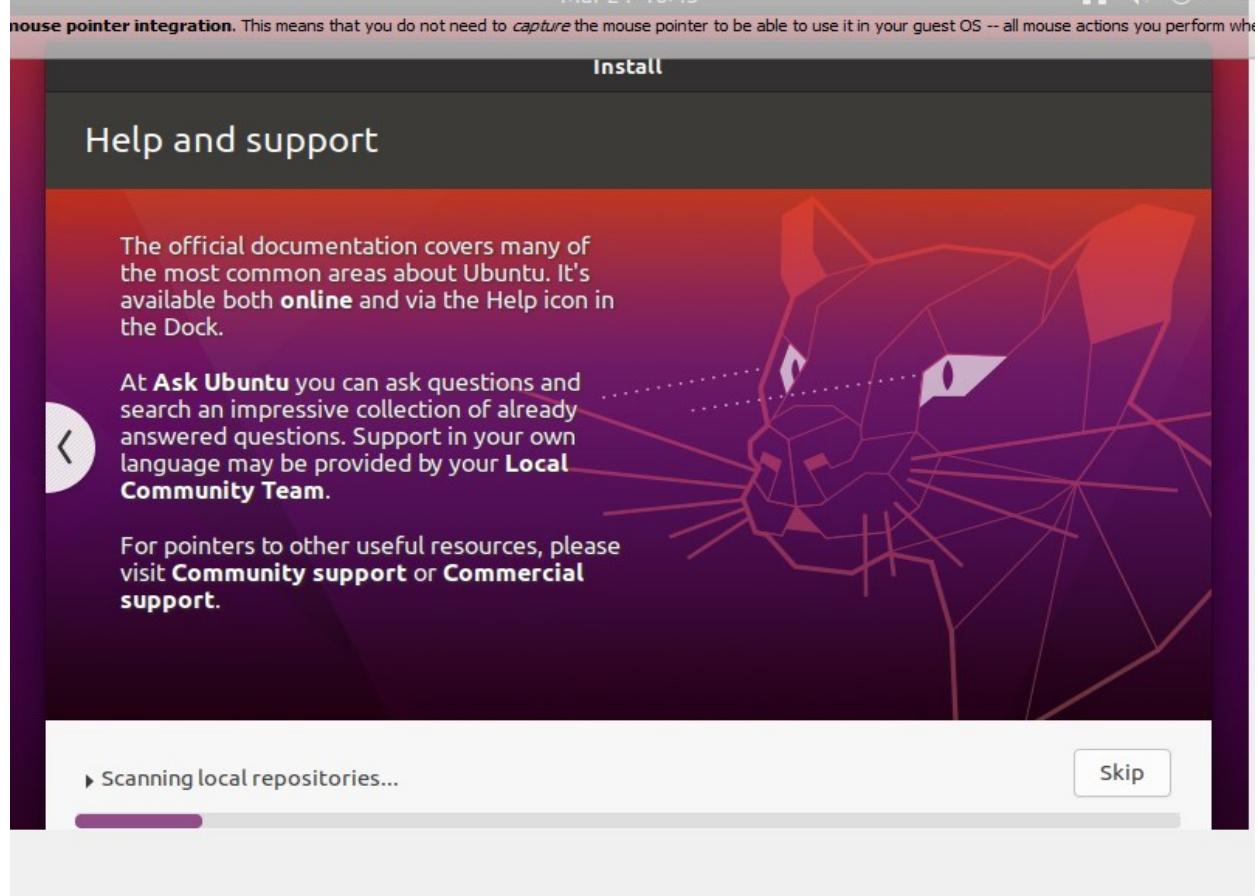
You'll enter domain and other details in the next step.

Back Continue

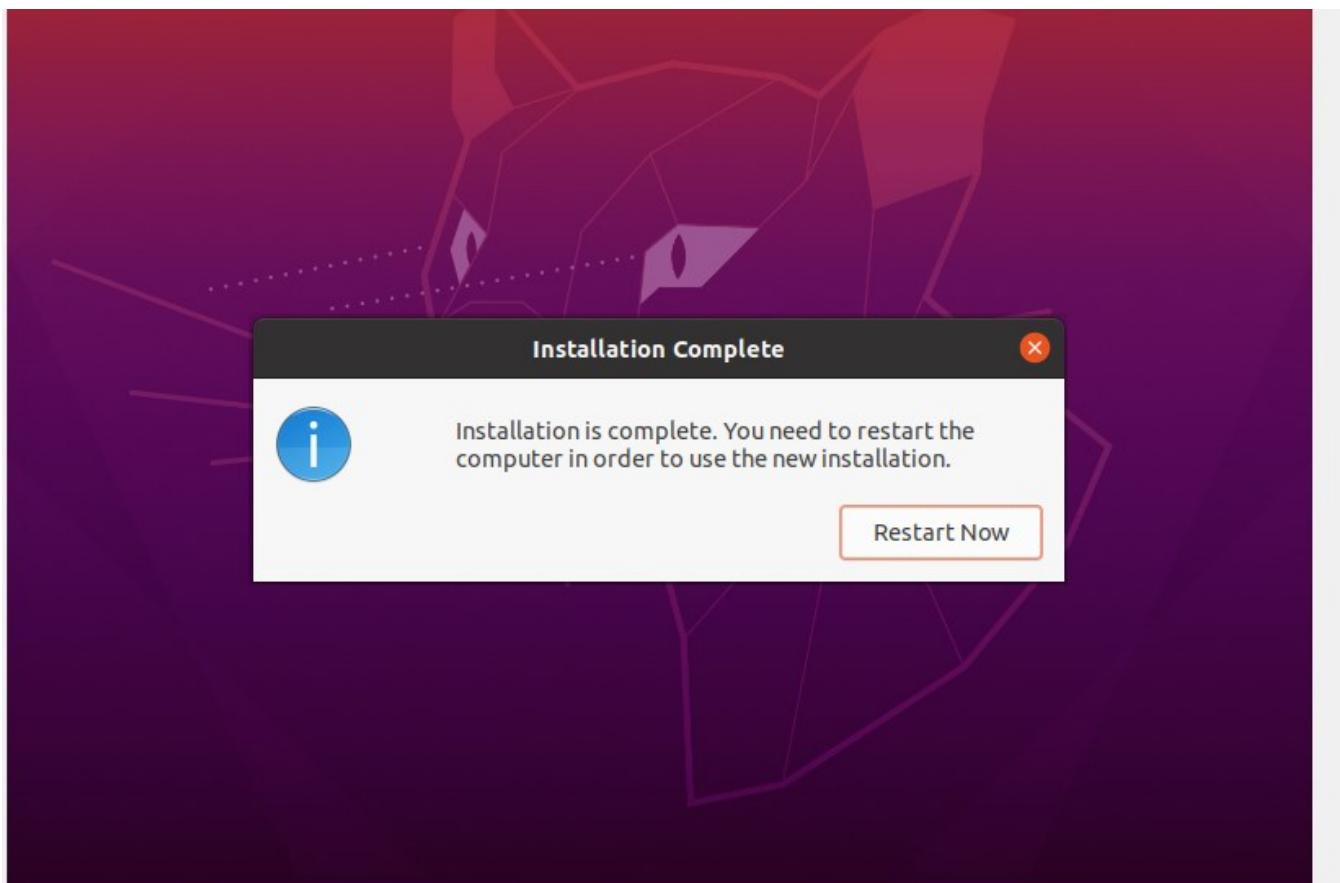
**Step19:** Now the installation process will start and installation window will appear

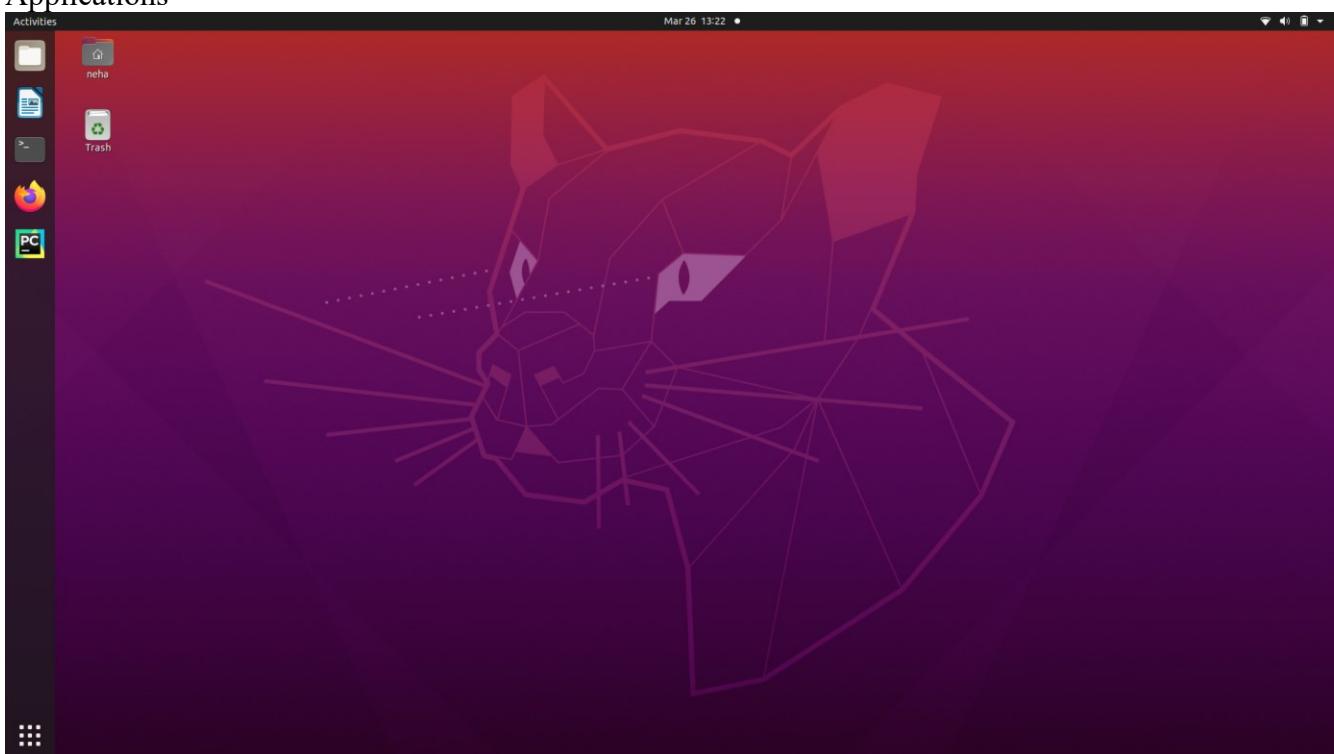


Mar 24 16:45



#### Step20: Click “Restart Now”





## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 3**

**Name: NEHA ANTONY**

**Roll No: 23**

**Batch:MCA-B**

**Date:24-03-2022**

#### **Aim**

Familiarization of the linux commands.

#### **Procedure**

##### 1. pwd

This command is used to display the location of the current working directory.

Syntax :- \$ pwd

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ pwd
/home/neha
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls
```

##### 2. mkdir

This command is used to create a new directory under any directory.

Syntax :- \$ mkdir <directory name>

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ mkdir NehaAntony
neha@neha-Lenovo-IdeaPad-S145-15API:~$ cd NehaAntony
```

##### 3. ls

This command is used to display a list of content of directory.

Syntax :- \$ ls

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls
Desktop Documents Downloads dump.sql Music odoo Pictures Public snap sources-20.03 Templates Videos wkhtmltox_0.12.5-1.bionic_amd64.deb
neha@neha-Lenovo-IdeaPad-S145-15API:~$
```

##### 4. man

This command is used to display the user manual of any command that we can run on the terminal.

Syntax :- \$ man <command name>

Output :-

```
student@S46:~$ man pwd
```

## 5. ls -l

This command is used to shows file or directory, size, modified date and time, file or folder name and owner of the file, and its permission.

Syntax :- \$ ls -l

Output:-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -l
total 93940
drwxr-xr-x  2 neha neha    4096 Mar 28 13:47 Desktop
drwxr-xr-x  3 neha neha    4096 Oct 25 04:53 Documents
drwxr-xr-x  3 neha neha   12288 Nov 10 07:31 Downloads
-rw-rw-r--  1 neha neha 80427114 Sep 28 04:14 dump.sql
drwxr-xr-x  3 neha neha    4096 Oct 11 00:59 Music
drwxr-xr-x 17 neha neha    4096 Nov  8 23:44 odoo
drwxr-xr-x  2 neha neha    4096 Mar 26 13:22 Pictures
drwxr-xr-x  2 neha neha    4096 Sep 13 2021 Public
drwx----- 5 neha neha    4096 Oct 21 01:26 snap
drwxr-xr-x  5 neha neha    4096 Feb 20 2020 sources-20.03
drwxr-xr-x  2 neha neha    4096 Sep 13 2021 Templates
drwxr-xr-x  2 neha neha    4096 Sep 13 2021 Videos
```

## 6. ls -r

This command is used to display files and directories in reverse order.

Syntax :- \$ls -r

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -r
wkhtmltox_0.12.5-1.bionic_amd64.deb Videos Templates sources-20.03 snap Public Pictures odoo Music dump.sql Downloads Documents Desktop
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -l
```

## 7. ls -a

This command is used to list all files including hidden files.

Syntax :- \$ls -a

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -a
.. .bash_logout .config Downloads .java Music Pictures .psql_history sources-20.03 Templates wkhtmltox_0.12.5-1.bionic_amd64.deb
. .bashrc Desktop dump.sql .local odoo .pk1 Public .ssh .thunderbird
.. .bash_history .cache Documents .gnugp .mozilla .pgadmin .profile snap .sudo_as_admin_successful Videos
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -r
wkhtmltox_0.12.5-1.bionic_amd64.deb Videos Templates sources-20.03 snap Public Pictures odoo Music dump.sql Downloads Documents Desktop
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -l
```

## 8. ls -al

List all the files including hidden files in the current directory

Syntax :- \$ ls -al

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -al
total 94008
drwxr-xr-x 23 neha neha 4096 Nov 12 10:57 .
drwxr-xr-x 3 root root 4096 Sep 13 2021 ..
-rw----- 1 neha neha 3871 Mar 28 13:47 .bash_history
-rw-r--r-- 1 neha neha 220 Sep 13 2021 .bash_logout
-rw-r--r-- 1 neha neha 3771 Sep 13 2021 .bashrc
drwxr-xr-x 39 neha neha 4096 Nov 12 10:58 .cache
drwx----- 20 neha neha 4096 Sep 27 07:24 .config
drwxr-xr-x 2 neha neha 4096 Mar 28 13:47 Desktop
drwxr-xr-x 3 neha neha 4096 Oct 25 04:53 Documents
drwxr-xr-x 3 neha neha 12288 Nov 10 07:31 Downloads
-rw-rw-r-- 1 neha neha 80427114 Sep 28 04:14 dump.sql
drwx----- 3 neha neha 4096 Sep 24 2021 .gnupg
drwxrwxr-x 4 neha neha 4096 Sep 13 2021 .java
drwxr-xr-x 3 neha neha 4096 Sep 13 2021 .local
drwx----- 5 neha neha 4096 Sep 13 2021 .mozilla
drwxr-xr-x 3 neha neha 4096 Oct 11 00:59 Music
drwxr-xr-x 17 neha neha 4096 Nov 8 23:44 odoo
drwx----- 4 neha neha 4096 Nov 10 12:00 .pgadmin
drwxr-xr-x 2 neha neha 4096 Mar 26 13:22 Pictures
drwx----- 3 neha neha 4096 Sep 13 2021 .pki
-rw-r--r-- 1 neha neha 807 Sep 13 2021 .profile
-rw----- 1 neha neha 12 Nov 10 11:56 .pgsql_history
drwxr-xr-x 2 neha neha 4096 Sep 13 2021 Public
drwx----- 5 neha neha 4096 Oct 21 01:26 snap
drwxr-xr-x 5 neha neha 4096 Feb 20 2020 sources-20.03
drwx----- 2 neha neha 4096 Sep 13 2021 .ssh
-rw-r--r-- 1 neha neha 0 Sep 13 2021 .sudo_as_admin_successful
drwxr-xr-x 2 neha neha 4096 Sep 13 2021 Templates
drwx----- 6 neha neha 4096 Sep 14 2021 .thunderbird
```

## 9. ls –t

This command is used to display files in the last modified order.

Syntax :- \$ ls –t

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ ls -t
Desktop Pictures Downloads odoo Documents snap Music dump.sql Public Templates Videos sources-20.03 wkhtmltox_0.12.5-1.bionic_amd64.deb
```

## 10. cd

This command is used to change the current directory.

Syntax :- \$ cd <directory name>

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ cd NehaAntony
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cat >a.txt
hello world
```

## 11. cd ..

This command is used to move to the parent directory of current directory, or the directory one level up from the current directory.

Syntax :- \$ cd ..

```
student@S64:~/neha$ cd ..  
student@S64:~$ cd -
```

12. cd –

This command is used to switch back to previous directory we were working earlier.

Syntax :- \$ cd –

Output :-

```
student@S64:~$ cd -  
/home/student/neha
```

13. cat > filename

This command is used to create a file and add contents to that file.

Syntax :- \$ cat > filename.txt

Output :-

```
student@S64:~/neha$ cat > a.txt  
hi good morning  
have a nice day  
^ZTerminal  
[1]+ Stopped cat > a.txt
```

14. cat>>filename

This command is used to add contents to an existing file.

Syntax :- \$ cat >> filename.txt

Output :-

```
student@S64:~/neha$ cat >>a.txt  
welcome to ooty  
nice to meet u  
^Z  
[2]+ Stopped cat >> a.txt
```

15. cat filename

This command is used to view the contents in the file.

Syntax :- \$ cat filename.txt

Output :-

```
student@S64:~/neha$ cat a.txt  
hi good morning  
have a nice day
```

16. cat filename1 > filename2

This command is used to copy the content from one file to another file.

Syntax :- \$ cat filename1 > filename2

Output :-

```
student@S64:~/neha$ cat a.txt >b.txt
student@S64:~/neha$ cat b.txt
hi good morning
have a nice day
welcome to ooty
nice to meet u
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Aim**

Familiarization of the linux commands.

### **Procedure**

1. cat -n

Used to display the content of the file with line numbers.

Syntax :- \$ cat -n filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cat -n a.txt
 1 hello world
 2 how are u?
 3 nice to meet u!
 4 hope o meet u soon
 5 where are u
 6 did u had ur dinner
```

2. cat -b

This command is used to remove empty lines from the file

Syntax :- \$ cat -b filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cat -b a.txt
 1 hello world
 2 how are u?
 3 nice to meet u!
 4 hope o meet u soon
 5 where are u
 6 did u had ur dinner
```

3. touch

The touch command is used to create a file. It can be anything, from an empty txt file to an empty zip file.

Syntax :- \$ touch filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ touch demo.txt
```

4. echo

**Name: NEHA ANTONY**

**Roll No: 23**

**Batch:MCA-B**

**Date:28-03-2022**

The "echo" command helps us move some data, usually text into a file. For example, if you want to create a new text file or add to an already made text file, you just need to type in, "echo hello, my name is alok >> new.txt". You do not need to separate the spaces by using the backward slash here, because we put in two triangular brackets when we finish what we need to write.

Syntax :- \$ echo hai dear >> filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ echo hai hello >>demo.txt
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cat demo.txt
hai hello
```

#### 5. head

This command is used to display the first N number of lines

Syntax :- \$ head filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ head a.txt
hello world
how are u?
nice to meet u!
hope o meet u soon
where are u
did u had ur dinner
hai hello beautiful
```

#### 6. head -4

This command is used to display the first 4 number of lines

Syntax :- \$ head -4 filename.txt

Output:-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ head -4 a.txt
hello world
how are u?
nice to meet u!
hope o meet u soon
```

#### 7. tail

This command is used to display the last N number of lines

Syntax :- \$tail filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ tail a.txt
hello world
how are u?
nice to meet u!
hope o meet u soon
where are u
did u had ur dinner
hai hello beautiful
```

### 8. cut -d- -f1

. **-f (field)**: -c option is useful for fixed-length lines. Most unix files doesn't have fixed-length lines. To extract the useful information you need to cut by fields rather than columns. List of the fields number specified must be separated by comma. *Ranges are not described with -f option.* **cut** uses **tab** as a default field delimiter but can also work with other delimiter by using -d option.

Syntax :- \$ cut -d- -f1 filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cat >>demo.txt
eng -57
maths-59
science-78
gk -67
history-90
^Z
[3]+ Stopped cat >> demo.txt
```

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cut -d- -f1 demo.txt
hai hello
eng
maths
science
gk
history
```

### 9. cut -d- -f2

This command is used to display files in the last modified order.

Syntax :- \$ cut -d- -f2 filename.txt

Output :-

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/NehaAntony$ cut -d- -f2 demo.txt
hai hello
57
59
78
67
90
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Aim**

Familiarization of the linux commands.

**Name: NEHA ANTONY**

**Roll No: 23**

**Batch: B**

**Date: 01/04/2022**

### **Procedure**

#### **1 cut -d ‘ ’**

If -d option is used then it considered space as a field separator or delimiter:

Syntax :- \$ cut -d ' ' f2 filename

Output :-

```
student@T70:~$ cut -d ' ' -f2 mark1
67
69
76
```

#### **2. cut -b**

To extract the specific bytes, you need to follow -b option with the list of byte numbers separated by comma. Range of bytes can also be specified using the hyphen(-). It is necessary to specify list of byte numbers otherwise it gives error. **Tabs and backspaces** are treated like as a character of 1 byte.

Syntax :- \$ cut -b 2 filename

Output :-

```
student@T70:~$ cut -b 2 mark1
n
a
c
```

#### **3. cut –complement**

As the name suggests it complement the output. This option can be used in the combination with other options either with -f or with -c.

Syntax :- \$ cut –complement -c 1 filename

Output :-

```
student@T70:~$ cut --complement -c 1 mark1
nglish 67
aths 69
cience 76
```

#### 4. paste

Paste command is one of the useful commands in Unix or Linux operating system. It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by **tab** as delimiter, to the standard output.

Syntax :-            \$ paste file1 file2

Output :-

```
student@T70:~$ cat > marvel1
captain america
iron man
black widow
hulk
spidermam
groot
^Z
[2]+  Stopped                  cat > marvel1
student@T70:~$
student@T70:~$ marvel2
marvel2: command not found
student@T70:~$ cat > marvel2
choota bheem
jackichan
pink pander
12 dancing princess
^Z
[3]+  Stopped                  cat > marvel2
student@T70:~$ paste marvel1 marvel2
captain america choota bheem
iron man      jackichan
black widow   pink pander
hulk       12 dancing princess
spidermam
groot
```

#### 5. Paste -d (delimiter):

Paste command uses the tab delimiter by default for merging the files. The delimiter can be changed to any other character by using the **-d** option. If more than one character is specified as delimiter then paste uses it in a circular fashion for each file line separation.

Syntax : \$paste -d ‘-‘ file1 file2

Output:-

```
student@T70:~/NehaAntony$ paste -d '-' marvel1 marvel2
captain america-choota bheem
iron man-jackichan
black widow-pink pander
hulk-12 dancing princess
spidermam-
groot-
student@T70:~/NehaAntony$ paste -d '%|' marvel1 marvel2 marvel1
captain america%choota bheem|captain america
iron man%jackichan|iron man
black widow%pink pander|black widow
hulk%12 dancing princess|hulk
spidermam%|spidermam
groot%|groot
```

## 6.Paste -s (serial):

We can merge the files in sequentially manner using the -s option. It reads all the lines from a single file and merges all these lines into a single line with each line separated by tab. And these single lines are separated by newline.

Syntax : \$paste -s file1 file2

Output:-

```
student@T70:~/NehaAntony$ paste -s marvel1 marvel2
captain america iron man      black widow      hulk      spidermam      groot
choota bheem    jackichan      pink pander     12 dancing princess
```

## 7. paste file1 file2 > file3

First and second files are merged into a third file.

Output:-

```
student@T70:~$ paste marvel1 marvel2 > marvel3
student@T70:~$ cat marvel3
captain america choota bheem
iron man      jackichan
black widow    pink pander
hulk      12 dancing princess
spidermam
groot
```

## 8. more :

more command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large (For example log files). The more command also allows the user do scroll up and down through the page.

**B Key** act as a PREVIOUS button.

**ENTER key** is used to view line by line.

Syntax :- \$more filename

Output :-

```
student@T70:~/NehaAntony$ more princess
Twelve princesses sleep in twelve beds in the same room. Every night, their doors are securely locked by their father. But in the morning, their dancing shoes are found to be worn through as if they had been dancing all night. The king, perplexed, asks his daughters to explain, but they refuse. The king then promises his kingdom and each daughter to any man who can discover the princesses' midnight secret within three days and three nights, but those who fail within the set time limit will be sentenced to death.

An old soldier returned from war comes to the king's call after several princes have failed in the attempt. Whilst traveling through a wood he comes upon an old woman, who gives him an enchanted cloak that he can use to observe the king's unaware daughters and tells him not to eat or drink anything given to him in the evening by any of the princesses and to pretend to be fast asleep until they leave.

The soldier is well received at the palace just as the others had been and indeed, in the evening, the princess royal (the eldest daughter) comes to his chamber and offers him a cup of wine. The soldier, remembering the old woman's advice, secretly throws it away and begins to snore loudly as if asleep.

The twelve princesses, assured that the soldier is asleep, dress themselves in fine dancing gowns and escape from their room by a trap door in the floor. The soldier, seeing this, puts on his magic cloak and follows them. He steps on the go
wn of the youngest princess, whose cry of alarm to her sisters is rebuffed by the eldest. The passageway leads them to three groves of trees;
--More--(26%)
```

## 9. more -s :

This option squeezes multiple blank lines into one single blank line.

Syntax :- \$more -s filename

Output :-

```
The soldier is well received at the palace just as the others had been and indeed, in the evening, the princess royal (the eldest daughter) comes to his chamber and offers him a cup of wine. The soldier, remembering the old woman's advice, secretly throws it away and begins to snore loudly as if asleep.

The twelve princesses, assured that the soldier is asleep, dress themselves in fine dancing gowns and escape from their room by a trap door in the floor. The soldier, seeing this, puts on his magic cloak and follows them. He steps on the go
wn of the youngest princess, whose cry of alarm to her sisters is rebuffed by the eldest. The passageway leads them to three groves of trees; the first having leaves of silver, the second of gold, and the third of glittering diamonds. The soldier, wishing for a token, breaks off a twig of each as evidence. They walk on until they come upon a great clear lake. Twelve boats, with twelve princes, appear where the twelve princesses are waiting. Each princess gets into one, and the soldier steps into the same boat with the twelfth and youngest princess. The youngest princess complains that the prince is not rowing fast enough, not knowing the soldier is in the boat. On the other side of the lake stands a castle, into which all the princesses go and dance the night away.

The twelve princesses happily dance all night until their shoes are worn through and they are obliged to leave. The strange adventure continues on the second and third nights, and everything happens just as before, except that on the third night the soldier carries away a golden cup as a token of where he has been. When it comes time for him to declare the princesses' secret, he goes before the king with the three branches and the golden cup, and tells the king about all he has seen. The princesses know that there is no use in denying the truth, and confess. The soldier chooses the eldest princess as his bride for he is not a very young man, and is made the King's heir. The twelve princes are put under a curse for as many nights as they danced with the princesses.

Twelve princesses sleep in twelve beds in the same room. Every night, their doors are securely locked by their father. But in the morning, their dancing shoes are found to be worn through as if they had been dancing all night. The king, perplexed, asks his daughters to explain, but they refuse. The king then promises his kingdom and each daughter to any man who can discover the princesses' midnight secret within three days and three nights, but those who fail within the set time limit will be sentenced to death.

An old soldier returned from war comes to the king's call after several princes have failed in the attempt. Whilst traveling through a wood he comes upon an old woman, who gives him an enchanted cloak that he can use to observe the king's unaware daughters and tells him not to eat or drink anything given to him in the evening by any of the princesses and to pretend to be fast asleep until they leave.

The soldier is well received at the palace just as the others had been and indeed, in the evening, the princess royal (the eldest daughter) comes to his chamber and offers him a cup of wine. The soldier, remembering the old woman's advice, secretly throws it away and begins to snore loudly as if asleep.

The twelve princesses, assured that the soldier is asleep, dress themselves in fine dancing gowns and escape from their room by a trap door in
--More--(72%)
```

### 10. more +n :

This option displays the text after the specified number of lines of the document.

Syntax :- \$ more +n filename

Output :-

```
An old soldier returned from war comes to the king's call after several princes have failed in the attempt. Whilst traveling through a wood he comes upon an old woman, who gives him an enchanted cloak that he can use to observe the king's unaware daughters and tells him not to eat or drink anything given to him in the evening by any of the princesses and to pretend to be fast asleep until they leave.

The soldier is well received at the palace just as the others had been and indeed, in the evening, the princess royal (the eldest daughter) comes to his chamber and offers him a cup of wine. The soldier, remembering the old woman's advice, secretly throws it away and begins to snore loudly as if asleep.

The twelve princesses, assured that the soldier is asleep, dress themselves in fine dancing gowns and escape from their room by a trap door in the floor. The soldier, seeing this, puts on his magic cloak and follows them. He steps on the gown of the youngest princess, whose cry of alarm to her sisters is rebuffed by the
--More-- (26%)
```

### 11. more -n :

type the number of lines that you want to display per screen.

Syntax :- \$ more -n filename

Output :-

```
Twelve princesses sleep in twelve beds in the same room. Every night, their doors are securely locked by their father. But in the morning, their dancing shoes are found to be worn through as if they had been dancing all night. The king, perplexed, asks his daughters to explain, but they refuse. The king then promises his kingdom and each daughter to any man who can discover the princesses' midnight secret within three days and three nights, but those who fail within the set time limit will be sentenced to death.

An old soldier returned from war comes to the king's call after several princes have failed in the attempt. Whilst traveling through a wood he comes upon an old woman, who gives him an enchanted cloak that he can use to observe the king's unaware daughters and tells him not to eat or drink anything given to him in the evening by any of the princesses and to pretend to be fast asleep until they leave.

The soldier is well received at the palace just as the others had been and indeed, in the evening, the princess royal (the eldest daughter) comes to his chamber and offers him a cup of wine. The soldier, remembering the old woman's advice, secretly throws it away and begins to snore loudly as if asleep.
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Aim**

Familiarization of the linux commands

### **Procedure**

#### **1. cp**

cp command is used to copy a file or a directory.

Syntax:

\$cp sourcefile destinationfile

Output :

```
student@S53:~$ cd neha23
student@S53:~/neha23$ ls
basic dd1 dd.txt dest doc.txt master.txt sample snap
student@S53:~/neha23$ cp basic destination
student@S53:~/neha23$ cat destination
hi
peace
```

#### **2. cp -r**

To copy a directory along with its sub directories.

Syntax :

\$cp -r sourcedirectory destinationdirectory

Output :

```
student@S53:~/neha23$ cd ..
student@S53:~$ ls
a.txt Desktop mark1 Music PycharmProjects Videos
b.txt Documents marvel1 neha23 sample vishnuv
content Downloads marvel2 Pictures snap
demo examples.desktop marvel3 Public Templates
student@S53:~$ cp -r Music neha23
student@S53:~$ cd neha23
student@S53:~/neha23$ ls
basic dd1 dd.txt dest destination doc.txt master.txt Music sample snap
```

#### **3. cp -i**

The cp '-i' option allows you to confirm once before overwriting your file.

Syntax :

\$cp -i filename directory

Output :

Name: NEHA ANTONY

Roll No:23

Batch:MCA-B

Date:04-04-2022

```
student@S53:~/neha23$ cd snap
student@S53:~/neha23/snap$ ls
dd1 dest doc.txt gnome-calculator neha23 pycharm-community
student@S53:~/neha23/snap$ cd ..
student@S53:~/neha23$ cp -i dd1 snap
cp: overwrite 'snap/dd1'? y
student@S53:~/neha23$
student@S53:~/neha23$ cd snap
student@S53:~/neha23/snap$ cat dd1
good morning
```

#### 4. mv

**mv** stands for **move**. **mv** is used to move one or more files or directories from one place to another in a file system like UNIX. It has two distinct functions:

- (i) It renames a file or folder.
- (ii) It moves a group of files to a different directory.

Syntax :

\$ mv sourcefile destinationfile

Output :

```
student@S53:~/neha23/snap$ cd ..
student@S53:~/neha23$ mv basic dd1
student@S53:~/neha23$ cat dd1
hi
peace
```

#### 5. mv -i

The **-i** option makes the command ask the user for confirmation before moving a file that would overwrite an existing file

Syntax :

\$mv -i sourcefile destinationdirectory

Output:

```
student@S53:~/neha23$ cat dd1
hi
peace
student@S53:~/neha23$ mv -i dd1 snap
mv: overwrite 'snap/dd1'? y
student@S53:~/neha23$ cat dd1
cat: dd1: No such file or directory
student@S53:~/neha23$ cd snap
student@S53:~/neha23/snap$ cat dd1
hi
peace
```

#### 6. mv -f

The **-f** option overrides this minor protection and overwrites the destination file forcefully and deletes the source file.

Syntax :

\$mv -f sourcefile destinationfile

Output :

```
student@S53:~/neha23/snap$ cd ..
student@S53:~/neha23$ mv -f dest origin
student@S53:~/neha23$ cat origin
hi
peace
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Aim**

Familiarization of linux commands

### **Procedure**

#### **1. read**

The Linux **read** command is used to read the contents of a line into a variable.

Syntax

```
$read variable_name
```

```
student@S66:~/neha$ read name
my name is neha
student@S66:~/neha$ echo $name
my name is neha
student@S66:~/neha$ █
```

Name: Neha Antony

Roll No:23

Batch:MCA -B

Date:21-04-2022

#### **2. locate**

The locate command and [find](#) command is used to search a file by name. But, the difference between both commands is that locate command is a background process and searches the file in the database whereas, find command searches in the filesystem. The locate command is much faster than find command.

Syntax

```
$locate filename.txt
```

```
student@S66:~/neha$ locate file1.txt
/home/student/neha/file1.txt
```

#### **3. locate -i**

It is used to ignore case sensitivity of the specified patterns.

Syntax

```
$locate -i filename.txt
```

```
student@S66:~/neha$ locate -i FILE1.TXT
/home/student/neha/file1.txt
```

#### **4 find**

The find command helps us to find a particular file within a directory. It is used to find the list of files for the various conditions like permission, user ownership, modification, date/time, size, and more.

Syntax

\$find filename.txt

```
student@S66:~/neha$ find file1.txt
file1.txt
student@S66:~/neha$ cd --
student@S66:~$ find file1.txt
find: 'file1.txt': No such file or directory
```

## 5.grep

The 'grep' command stands for "**g**lobal **r**egular **e**xpression **p**rint". grep command filters the content of a file which makes our search easy.

Syntax

\$grep word filename.txt

```
student@S66:~/neha$ cat > file2.txt
My name is neha
MCA student
Amal Jyothi college of engineering
doing my pg in MCA
^Z
[2]+  Stopped                  cat > file2.txt
student@S66:~/neha$ grep MCA file2.txt
MCA student
doing my pg in MCA
```

## 6. grep -i

The 'grep -i' command filters output in a case-insensitive way.

Syntax

\$grep -i word filename.txt

```
student@S66:~/neha$ grep -i mca file2.txt
MCA student
doing my pg in MCA
```

## 7 grep -v

The 'grep -v' command displays lines not matching to the specified word.

Syntax

```
student@S66:~/neha$ grep -v MCA file2.txt
My name is neha
Amal Jyothi college of engineering
```

## 8. grep -A

grep -A command is used to display the line after the result.

Syntax

```
$grep -A word file.txt
```

```
student@S66:~/neha$ grep -A1 MCA file2.txt
MCA student
Amal Jyothi college of engineering
doing my pg in MCA
student@S66:~/neha$ grep -B1 MCA file2.txt
```

## 9. grep -B

grep -B command is used to display the line before the result.

Syntax

```
$grep -B word file.txt
```

```
student@S66:~/neha$ grep -B1 MCA file2.txt
My name is neha
MCA student
Amal Jyothi college of engineering
doing my pg in MCA
```

## 10.grep -C

grep -C command is used to display the line after and line before the result.

Syntax

```
$grep -C word file.txt
```

```
student@S66:~/neha$ grep -C1 MCA file2.txt
My name is neha
MCA student
Amal Jyothi college of engineering
doing my pg in MCA
```

## 11. df

Linux df command is used to display the disk space used in the file system. The 'df' stands for "disk filesystem." It defines the number of blocks used, the number of blocks available, and the directory where the file system is mounted.

### Syntax

\$du

| Filesystem  | 1K-blocks | Used     | Available | Use% | Mounted on                     |
|-------------|-----------|----------|-----------|------|--------------------------------|
| udev        | 3989660   | 0        | 3989660   | 0%   | /dev                           |
| tmpfs       | 803832    | 1812     | 802020    | 1%   | /run                           |
| /dev/sda6   | 114460828 | 31067176 | 77536272  | 29%  | /                              |
| tmpfs       | 4019148   | 26940    | 3992208   | 1%   | /dev/shm                       |
| tmpfs       | 5120      | 4        | 5116      | 1%   | /run/lock                      |
| tmpfs       | 4019148   | 0        | 4019148   | 0%   | /sys/fs/cgroup                 |
| /dev/loop0  | 541312    | 541312   | 0         | 100% | /snap/pycharm-community/267    |
| /dev/loop4  | 144128    | 144128   | 0         | 100% | /snap/gnome-3-26-1604/98       |
| /dev/loop6  | 46080     | 46080    | 0         | 100% | /snap/gtk-common-themes/1440   |
| /dev/loop16 | 160512    | 160512   | 0         | 100% | /snap/gnome-3-28-1804/110      |
| /dev/loop22 | 1024      | 1024     | 0         | 100% | /snap/gnome-logs/81            |
| /dev/loop1  | 2688      | 2688     | 0         | 100% | /snap/gnome-system-monitor/174 |
| /dev/loop3  | 2560      | 2560     | 0         | 100% | /snap/gnome-calculator/884     |
| /dev/loop7  | 302848    | 302848   | 0         | 100% | /snap/vlc/2344                 |
| /dev/loop8  | 56960     | 56960    | 0         | 100% | /snap/core18/2284              |
| /dev/loop9  | 168832    | 168832   | 0         | 100% | /snap/gnome-3-28-1804/161      |
| /dev/loop10 | 66816     | 66816    | 0         | 100% | /snap/gtk-common-themes/1519   |
| /dev/loop11 | 253952    | 253952   | 0         | 100% | /snap/gnome-3-38-2004/87       |
| /dev/loop13 | 768       | 768      | 0         | 100% | /snap/gnome-characters/741     |
| /dev/loop17 | 113536    | 113536   | 0         | 100% | /snap/core/12725               |
| /dev/loop14 | 128       | 128      | 0         | 100% | /snap/bare/5                   |
| /dev/loop19 | 144128    | 144128   | 0         | 100% | /snap/gnome-3-26-1604/104      |
| /dev/loop15 | 2688      | 2688     | 0         | 100% | /snap/gnome-system-monitor/169 |
| /dev/loop21 | 2688      | 2688     | 0         | 100% | /snap/gnome-calculator/920     |
| /dev/loop25 | 207872    | 207872   | 0         | 100% | /snap/vlc/1397                 |
| /dev/loop27 | 224256    | 224256   | 0         | 100% | /snap/gnome-3-34-1804/77       |
| /dev/loop26 | 63488     | 63488    | 0         | 100% | /snap/core20/1361              |
| /dev/loop23 | 224256    | 224256   | 0         | 100% | /snap/gnome-3-34-1804/72       |
| /dev/loop12 | 640       | 640      | 0         | 100% | /snap/gnome-logs/106           |
| /dev/loop5  | 768       | 768      | 0         | 100% | /snap/gnome-characters/761     |
| /dev/loop18 | 254848    | 254848   | 0         | 100% | /snap/gnome-3-38-2004/99       |
| tmpfs       | 803828    | 16       | 803812    | 1%   | /run/user/120                  |
| tmpfs       | 803828    | 80       | 803748    | 1%   | /run/user/1001                 |
| /dev/loop28 | 63488     | 63488    | 0         | 100% | /snap/core20/1405              |
| /dev/loop29 | 56960     | 56960    | 0         | 100% | /snap/core18/2344              |
| /dev/loop2  | 113280    | 113280   | 0         | 100% | /snap/core/12834               |

### 12. df -m

it is used to see the report in mega byte

### Syntax

\$df -m

| Filesystem  | 1M-blocks | Used  | Available | Use% | Mounted on                     |
|-------------|-----------|-------|-----------|------|--------------------------------|
| udev        | 3897      | 0     | 3897      | 0%   | /dev                           |
| tmpfs       | 785       | 2     | 784       | 1%   | /run                           |
| /dev/sda6   | 111779    | 30340 | 75719     | 29%  | /                              |
| tmpfs       | 3925      | 27    | 3899      | 1%   | /dev/shm                       |
| tmpfs       | 5         | 1     | 5         | 1%   | /run/lock                      |
| tmpfs       | 3925      | 0     | 3925      | 0%   | /sys/fs/cgroup                 |
| /dev/loop0  | 529       | 529   | 0         | 100% | /snap/pycharm-community/267    |
| /dev/loop4  | 141       | 141   | 0         | 100% | /snap/gnome-3-26-1604/98       |
| /dev/loop6  | 45        | 45    | 0         | 100% | /snap/gtk-common-themes/1440   |
| /dev/loop16 | 157       | 157   | 0         | 100% | /snap/gnome-3-28-1804/110      |
| /dev/loop22 | 1         | 1     | 0         | 100% | /snap/gnome-logs/81            |
| /dev/loop1  | 3         | 3     | 0         | 100% | /snap/gnome-system-monitor/174 |
| /dev/loop3  | 3         | 3     | 0         | 100% | /snap/gnome-calculator/884     |
| /dev/loop7  | 296       | 296   | 0         | 100% | /snap/vlc/2344                 |
| /dev/loop8  | 56        | 56    | 0         | 100% | /snap/core18/2284              |
| /dev/loop9  | 165       | 165   | 0         | 100% | /snap/gnome-3-28-1804/161      |
| /dev/loop10 | 66        | 66    | 0         | 100% | /snap/gtk-common-themes/1519   |
| /dev/loop11 | 248       | 248   | 0         | 100% | /snap/gnome-3-38-2004/87       |
| /dev/loop13 | 1         | 1     | 0         | 100% | /snap/gnome-characters/741     |
| /dev/loop17 | 111       | 111   | 0         | 100% | /snap/core/12725               |
| /dev/loop14 | 1         | 1     | 0         | 100% | /snap/bare/5                   |
| /dev/loop19 | 141       | 141   | 0         | 100% | /snap/gnome-3-26-1604/104      |
| /dev/loop15 | 3         | 3     | 0         | 100% | /snap/gnome-system-monitor/169 |
| /dev/loop21 | 3         | 3     | 0         | 100% | /snap/gnome-calculator/920     |
| /dev/loop2  | 203       | 203   | 0         | 100% | /snap/vlc/1397                 |
| /dev/loop27 | 219       | 219   | 0         | 100% | /snap/gnome-3-34-1804/77       |
| /dev/loop26 | 62        | 62    | 0         | 100% | /snap/core20/1361              |
| /dev/loop23 | 219       | 219   | 0         | 100% | /snap/gnome-3-34-1804/72       |
| /dev/loop12 | 1         | 1     | 0         | 100% | /snap/gnome-logs/106           |
| /dev/loop5  | 1         | 1     | 0         | 100% | /snap/gnome-characters/761     |
| /dev/loop18 | 249       | 249   | 0         | 100% | /snap/gnome-3-38-2004/99       |
| tmpfs       | 785       | 1     | 785       | 1%   | /run/user/120                  |
| tmpfs       | 785       | 1     | 785       | 1%   | /run/user/1001                 |

### 13. du

To check how much space a file or directory take.

Syntax

\$du

```
student@S66:~/neha$ du
12
.
```

### 14.wc

Linux wc command helps in counting the lines, words, and characters in a file. It displays the number of lines, number of characters, and the number of words in a file. Mostly, it is used with pipes for counting operation.

\$wc filename.txt

```
student@S66:~/neha$ wc file2.txt
 4 16 82 file2.txt
```

-l, --lines: It is used to print the newline counts.

-w, --words: It is used to print the word counts.

-c, --bytes: It is used to print the byte counts.

-m, --chars: It is used to print the character counts.

```
student@S66:~/neha$ wc -l file2.txt
4 file2.txt
student@S66:~/neha$ wc -w file2.txt
16 file2.txt
student@S66:~/neha$ wc -c file2.txt
82 file2.txt
student@S66:~/neha$ wc -m file2.txt
82 file2.txt
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Aim**

Familiarization of linux commands

**Name: Neha Antony**

**Roll No:23**

**Batch: MCA -B**

**Date:25-04-2022**

### **Procedure**

#### **1. useradd**

useradd is a command in Linux that is used to add user accounts to your system

Output

```
mca@S66:~$ sudo useradd neha
[sudo] password for mca:
mca@S66:~$ sudo useradd neha
useradd: user 'neha' already exists
```

#### **2. passwd**

passwd command in Linux is used to change the user account passwords. The root user reserves the privilege to change the password for any user on the system, while a normal user can only change the account password for his or her own account.

Syntax:

passwd [options] [username]

Output

```
mca@S66:~$ sudo passwd neha
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
```

#### **3. groupadd**

groupadd command is used to create a new user group.

Syntax:

groupadd [option] group\_name

Output

```
mca@S66:~$ sudo groupadd -g 1219 Superstar
mca@S66:~$ sudo groupadd -g 1219 Superstar
groupadd: group 'Superstar' already exists
```

#### 4. usermod

usermod command or modify user is a command in Linux that is used to change the properties of a user in Linux through the command line

Output

```
mca@S66:~$ sudo usermod -G Superstar neha
mca@S66:~$ cat /etc/group
root:x:0:
```

#### 5. compgen

compgen is a bash built-in command which is used to list all the commands that could be executed in the Linux system. This command could also be used to count the total number of commands present in the terminal or even to look for a command with the specific keyword.

Output

```
mca@S66:~$ sudo groupadd -g 1210 Megastar
mca@S66:~$ sudo groupadd -g 1218 Star
mca@S66:~$ compgen -g
root
```

```
gdm
mca
sambashare
mysql
android
mongodb
student
exam
neha
Superstar
Megastar
Star
```

#### 6. userdel

userdel command in Linux system is used to delete a user account and related files. This command basically modifies the system account files, deleting all the entries which refer to the username LOGIN. It is a low-level utility for removing the users.

Output

```
mca@s66:~$ sudo userdel neha
mca@s66:~$ sudo userdel neha
userdel: user 'neha' does not exist
```

## 7.groupdel

groupdel command is used to delete a existing group. It will delete all entry that refers to the group, modifies the system account files, and it is handled by superuser or root user.

Output

```
mca@s66:~$ sudo groupdel Star
```

## 8.chmod

the chmod command is used to change the access mode of a file.  
The name is an abbreviation of change mode.

Output

```
mca@s66:~$ cat >a.txt
hi how are
welcome to ooty
^Z
[1]+  Stopped                  cat > a.txt
mca@s66:~$ chmod +rwx a.txt
mca@s66:~$ chmod -wx a.txt
mca@s66:~$ cat >>a.txt
bash: a.txt: Permission denied
mca@s66:~$ chmod -rwx a.txt
mca@s66:~$ cat a.txt
cat: a.txt: Permission denied
```

## 9 chown

chown command is used to change the file Owner or group. Whenever you want to change ownership you can use chown command.

Output

```
mca@s66:~$ sudo chown john a.txt
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 4**

#### **Aim**

Shell scripting: study bash syntax, environment variables, variables, control constructs such as if, for and while, aliases and functions, accessing command line arguments passed to shell scripts. Study of startup scripts, login and logout scripts, familiarity with systemd and system 5 init scripts is expected.

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA -B**

**Date:05-05-2022**

#### **Question**

Shell program to print a value

#### **Procedure**

```
#!/bin/bash
# This is my first shell
echo "Hello World"
```

#### **Output**

```
nca@U23:~$ bash hello.sh
Hello World
nca@U23:~$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Shell program to add 2 numbers

### **Procedure**

```
#!/bin/bash
```

```
echo "enter the value 1"
```

```
read a
```

```
echo "enter the value 2"
```

```
read b
```

```
d=$((a + b))
```

```
echo "sum=\"$d"
```

### **Output**

```
student@S66:~/shellscrip$ gedit first.sh
student@S66:~/shellscrip$ bash first.sh
enter the value 1
5
enter the value 2
6
sum=11
student@S66:~/shellscrip$ █
```

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA -B**

**Date:05-05-2022**

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Shell program to check largest of 2 numbers

### **Procedure**

```
#!/bin/bash
echo "enter 2 numbers"
read a
read b
echo $a $b
if [ $a -gt $b ]
then
echo "$a is greater"
else
echo "$b is greater"
fi
```

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA -B**

**Date:05-05-2022**

### **Output**

```
student@S66:~/shellscript$ gedit largest.sh
student@S66:~/shellscript$ bash largest.sh
enter 2 numbers
78
66
78 66
78 is greater
student@S66:~/shellscript$
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Shell program to check largest of 3 numbers

### **Procedure**

```
#!/bin/bash
echo "enter 3 numbers"
read a
read b
read c
if [ $a -gt $b -a $a -gt $c ]
then
echo "$a is greater"
elif [ $b -gt $a -a $b -gt $c ]
then
echo "$b is greater"
else
echo "$c is greater"
fi
```

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA -B**

**Date:05-05-2022**

### **Output**

```
student@S66:~/shellscript$ gedit largest3.sh
student@S66:~/shellscript$ bash largest3.sh
enter 3 numbers
3
4
5
5 is greater
student@S66:~/shellscript$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Shell program to check given number is odd or even

### **Procedure**

```
#!/bin/bash
echo "enter the value"
read a
if [ $(($a % 2)) -eq 0 ]
then
echo "even"
else
echo "odd"
fi
```

### **Output**

```
student@S66:~/shellscript$ bash oddeven.sh
enter the value
7
odd
student@S66:~/shellscript$ gedit oddeven.sh
student@S66:~/shellscript$ bash oddeven.sh
enter the value
4
even
```

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA -B**

**Date:05-05-2022**

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Write a shellscript to display current date and calendar

### **Procedure**

```
#!/bin/bash
echo " Todays date="
echo $(date)
echo "Calender="
cal
```

**Name: Neha Antony**

**Roll No:23**

**Batch: MCA -B**

**Date:09-05-2022**

### **Output**

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/Downloads$ bash datecal.sh
Todays date=
Mon 09 May 2022 03:11:10 PM EDT
Calender=
      May 2022
Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6  7
 8  9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
```

```
neha@neha-Lenovo-IdeaPad-S145-15API:~/Downloads$
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Write a shellscript to check a number is greater than or less than or equal to another number

**Name: Neha Antony**

**Roll No:23**

**Batch: MCA -B**

**Date:09-05-2022**

### **Procedure**

```
#!/bin/bash

echo "enter the two numbers"

read a

read b

if [ $a -gt $b ]

then

echo "$a is greater than $b"

elif [ $a -lt $b ]

then

echo "$a is less than $b"

elif [ $a -eq $b ]

then

echo "$a is equal to $b"

else

echo "invalid"

fi
```

### **Output**

```
nca@S66:~/Documents/neha/ShellScripting$ bash checkno.sh
enter the two numbers
2
3
2 is less than 3
nca@S66:~/Documents/neha/ShellScripting$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Find the sum of first 10 numbers

### **Procedure**

```
#!/bin/bash
i=1
summ=0
while [ $i -le 10 ]
do
    summ=$((summ+i))
    i=$((i+1))
done
echo "sum of first 10 numbers = $summ"
```

**Name: NEHA ANTONY**  
**Roll No:23**  
**Batch:MCA-B**  
**Date:09-05-2022**

### **Output Screenshot**

```
mca@S66:~/Documents/neha/ShellScripting$ bash sumof.sh
sum of first 10 numbers = 55
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Write a shellscript to find the sum ,average and product of 4 numbers

**Name: NEHA ANTONY**

**Roll No:23**

**Batch:MCA-B**

**Date:09-05-2022**

### **Procedure**

```
#!/bin/bash
echo "enter 4 numbers"
read a
read b
read c
read d
sum1=$((a+b+c+d))
p=`expr $a \* $b \* $c \* $d`
avg=$((sum1/4| bc -l))
echo "Sum=$sum1"
echo "product= $p"
echo "average=$avg"
```

### **Output Screenshot**

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ gedit operation.sh
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash operation.sh
enter 4 numbers
1
2
3
4
Sum=10
product= 24
average=2
neha@neha-Lenovo-IdeaPad-S145-15API:~$
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Find the factorial of the given number

### **Procedure**

```
#!/bin/bash
fact=1
echo "enter the number"
read n
for (( i=2 ; i<=n ; i++ ))
do
fact=`expr $fact \* $i`
done
echo "$n != $fact"
```

**Name: NEHA ANTONY**

**Roll No:23**

**Batch:MCA-B**

**Date:09-05-2022**

### **Output Screenshot**

```
mca@S66:~/Documents/neha/ShellScripting$ bash fact.sh
enter the number
5
5 != 120
mca@S66:~/Documents/neha/ShellScripting$
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Find the palindrome of a given number

### **Procedure**

```
#!/bin/bash
echo "enter the number"
read n
a=$n
rev=0
while [ $n -gt 0 ]
do
r=$((n%10))
rev=`expr $rev \* 10 + $r`
n=`expr $n / 10 `
done
if [ $a -eq $rev ]
then
echo "palindrome"
else
echo "not palindrome"
fi
```

**Name: NEHA ANTONY**

**Roll No:23**

**Batch:MCA-B**

**Date:09-05-2022**

### **Output Screenshot**

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ gedit palindrome.sh
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash palindrome.sh
enter the number
121
palindrome
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash palindrome.sh
enter the number
123
not palindrome
neha@neha-Lenovo-IdeaPad-S145-15API:~$
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Check whether the given year is leap year or not

### **Procedure**

```
#!/bin/bash
echo "enter the year"
read y
if [ $((y%4)) == 0 ] && [ $((y%100)) != 0 ] || [ $((y%400)) == 0 ]
then
echo "$y is a leap year"
else
echo "$y is not a leap year"
fi
```

**Name: NEHA ANTONY**

**Roll No:23**

**Batch:MCA-B**

**Date:09-05-2022**

### **Output Screenshot**

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ gedit leap.sh
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash leap.sh
enter the year
2020
2020 is a leap year
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash leap.sh
enter the year
2021
2021 is not a leap year
neha@neha-Lenovo-IdeaPad-S145-15API:~$
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Question

Write a shellscript program to find the sum of all the digits in a number

Name: Neha Antony

Roll No:23

Batch:MCA-B

Date:12-05-2022

### Procedure

```
#!/bin/bash
echo "Enter the number"
read a
while [ $a -ne 0 ]
do
r=$((a%10))
s=$((s+r))
a=$((a/10))
done
echo "Sum of digit = "$s
```

### Output Screenshot

```
mca@T70:~/Documents/Neha Antony/shellscript$ bash sumofdigit.sh
Enter the number
123
Sum of digit = 6
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Write a shellscript program to find the sum and average of numbers in command line

### **Procedure**

```
#!/bin/bash
i=0
echo "enter the size"
read n
echo "enter the numbers"
while [ $i -lt $n ]
do
read a
sum=$((sum+a))
avg=$((sum/n))
i=$((i+1))
done
echo "sum=$sum"
echo "average= $avg"
```

**Name: Neha Antony**

**Roll No:23**

**Batch:MCA-B**

**Date:12-05-2022**

### **Output Screenshot**

```
mca@T70:~/Documents/Neha Antony/shellscript$ gedit commandline.sh
mca@T70:~/Documents/Neha Antony/shellscript$ bash commandline.sh
enter the size
5
enter the numbers
1
2
3
4
5
sum=15
average= 3
mca@T70:~/Documents/Neha Antony/shellscript$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Question**

Write a shellscript program to do mathematical calculations using switch case

### **Procedure**

```
#!/bin/bash
echo "enter two number"
read a
read b
echo " 1.Addition "
echo " 2.Subtraction "
echo " 3.Multiplication "
echo "4.Division"
echo "5.Exit"
s=1
while [ $s == 1 ]
do
echo "Enter the choice"
read ch
case $ch in
1)
echo "sum= $"((a+b))
;;
2)
echo "Substraction=" $"((a-b))
;;
3)
echo "Multiplication=" $"((a*b))
;;
esac
```

**Name: Neha Antony**

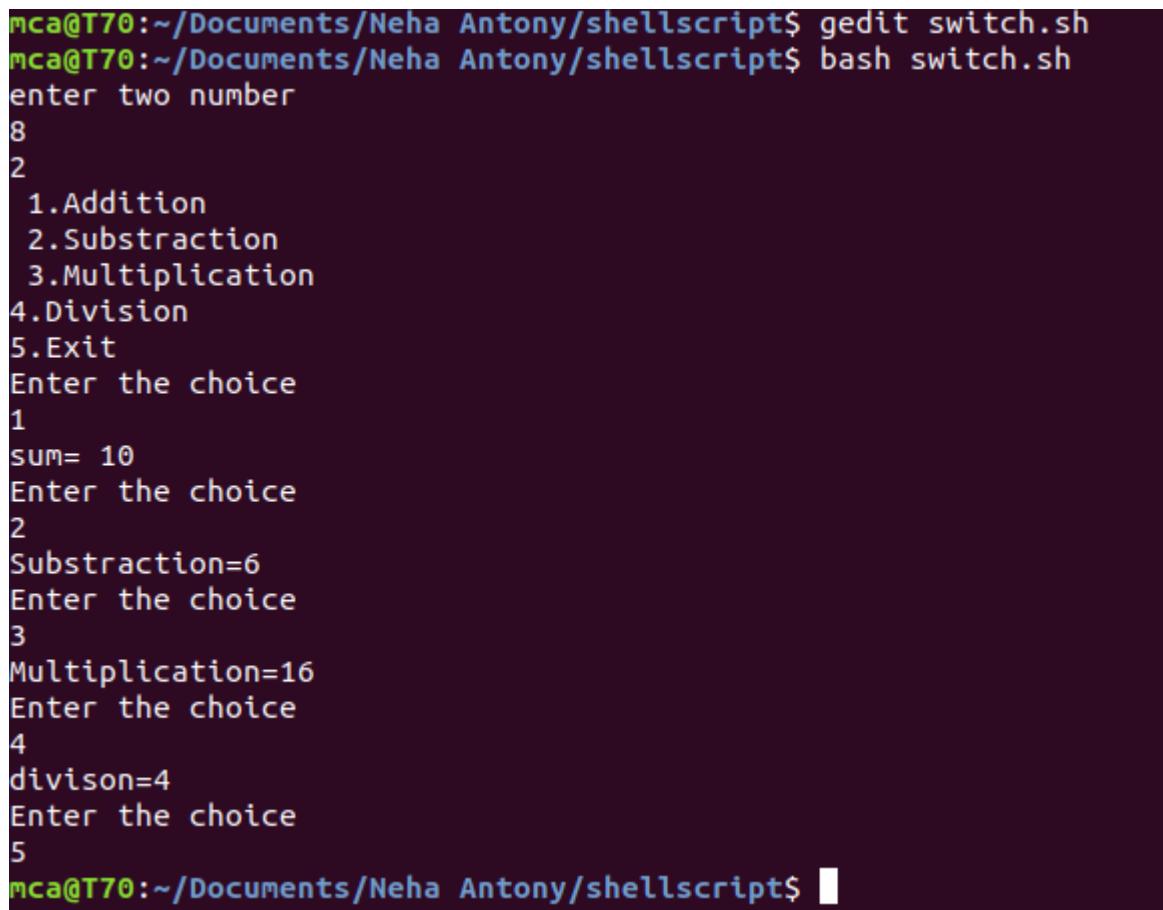
**Roll No:23**

**Batch:MCA-B**

**Date:12-05-2022**

```
echo "divison=$((a/b))\n";;\n5)exit\n;;\n*)\necho "invalid"\n;;\nesac\ndone
```

## Output Screenshot



A terminal window showing the execution of a shell script named switch.sh. The user enters two numbers (8 and 2), chooses option 1 (Addition), and the result (sum= 10) is displayed. The user then chooses option 2 (Subtraction) and the result (Substraction=6) is displayed. The user chooses option 3 (Multiplication) and the result (Multiplication=16) is displayed. The user chooses option 4 (Division) and the result (divison=4) is displayed. Finally, the user chooses option 5 (Exit).

```
mca@T70:~/Documents/Neha Antony/shellscript$ gedit switch.sh\nmca@T70:~/Documents/Neha Antony/shellscript$ bash switch.sh\nenter two number\n8\n2\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division\n5.Exit\nEnter the choice\n1\nsum= 10\nEnter the choice\n2\nSubstraction=6\nEnter the choice\n3\nMultiplication=16\nEnter the choice\n4\ndivison=4\nEnter the choice\n5\nmca@T70:~/Documents/Neha Antony/shellscript$ █
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Question

Accessing command line arguments passed to shell

### Procedure

```
#!/bin/bash
echo "Average of four numbers="$1 $2 $3 $4
sum=$(($1+$2+$3+$4))
avg=$((sum/4|bc-l))
echo "AVerage=" $avg
```

**Name: Neha Antony**  
**Roll No:23**  
**Batch: MCA -B**  
**Date:07-06-2022**

### Output

```
neha@neha-Lenovo-IdeaPad-S145-15API:~$ gedit commandAvg.sh
neha@neha-Lenovo-IdeaPad-S145-15API:~$ bash commandAvg.sh 5 6 7 8
Average of four numbers=5 6 7 8
AVerage= 6
neha@neha-Lenovo-IdeaPad-S145-15API:~$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 5**

#### **Aim**

Installation and configuration of LAMP stack.

Deploy an open source application such as phpmyadmin and Wordpress.

**Name: Neha Antony**  
**Roll No:23**  
**Batch:MCA-B**  
**Date:07-06-2022**

#### **Procedure**

### **INSTALLING APACHE**

#### **Step 1 :Installing Apache and Updating the Firewall**

The Apache web server is a popular open source web server that can be used along with PHP to host dynamic websites.

First, make sure your apt cache is updated with:

Syntax: \$ sudo apt update

#### **Output:**

```
mca@ajce:~$ sudo apt update
[sudo] password for mca:
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1,544 kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security/main i386 Packages [452 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [264 kB]
Get:8 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [40.7 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [1,001 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [142 kB]
Get:11 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [66.2 kB]
Get:12 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [2,464 B]
Fetched 3,626 kB in 2s (1,480 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
502 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

#### **Step2 :Install Apache 2**

Once the cache has been updated, you can install Apache with:

Syntax: \$ sudo apt update

Press Y and hit ENTER to confirm, and the installation will proceed.

#### **Output:**

```
mca@ajce:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap liblua5.2-0
0 upgraded, 9 newly installed, 0 to remove and 602 not upgraded.
Need to get 1,820 kB of archives.
After this operation, 7,945 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

### Step 3 :Adjust the Firewall to Allow Web Traffic

Next, assuming that you have followed the initial server setup instructions and enabled the UFW firewall, make sure that your firewall allows HTTP and HTTPS traffic. You can check that UFW has an application profile for Apache.

#### Output:

```
mca@ajce:~$ sudo ufw app list
Available applications:
  Apache
  Apache Full
  Apache Secure
  CUPS
```

### Step 4 :Check Apache Full

Apache Full profile details, you'll see that it enables traffic to ports 80 and 443:

Syntax: sudoufw app info "Apache Full"

#### Output:

```
mca@ajce:~$ sudo ufw app info "Apache Full"
Profile: Apache Full
Title: Web Server (HTTP,HTTPS)
Description: Apache v2 is the next generation of the omnipresent Apache web
server.

Ports:
  80,443/tcp
```

To allow incoming HTTP and HTTPS traffic for this server, run

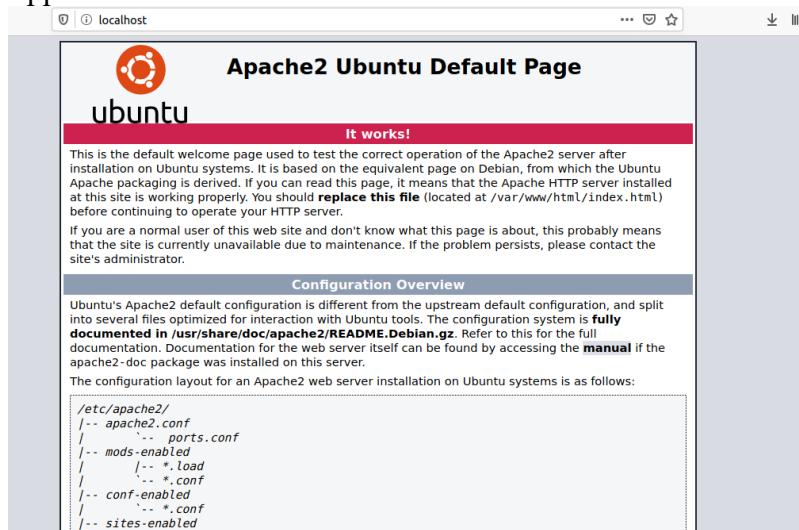
Syntax: sudoufw allow "Apache Full"

#### Output:

```
mca@ajce:~$ sudo ufw allow "Apache Full"
Rules updated
Rules updated (v6)
```

**Step 5:**A spot check right away to verify that everything went as planned by visiting your server's public IP address in your web browser

#### Output:



## Installing MySQL

**Step 1:** In this case, you do not have to run sudo apt update prior to the command. This is because you recently ran it in the commands above to install Apache. The package index on your computer should already be up-to-date.

Syntax: \$ sudo apt install mysql-server

### **Output:**

```
mca@ajce:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
libaio1 libcgil-fast-perl libfcgi-pm-perl libevent-core-2.1-7
libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libmecab2
mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
mysql-client-core-8.0 mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
libipc-sharedcache-perl mailx tinyca
The following NEW packages will be installed:
libaio1 libcgil-fast-perl libfcgi-pm-perl libevent-core-2.1-7
libevent-pthreads-2.1-7 libfcgi-perl libhtml-template-perl libmecab2
mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
mysql-client-core-8.0 mysql-server mysql-server-8.0 mysql-server-core-8.0
0 upgraded, 16 newly installed, 0 to remove and 602 not upgraded.
Need to get 31.2 MB of archives.
After this operation, 261 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-core-8.0 amd64 8.0.29-0ubuntu0.20.04.3 [4,416 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-8.0 amd64 8.0.29-0ubuntu0.20.04.3 [22.0 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libaio1 amd64 0.3.112-5 [7,184 B]
Get:4 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libevent-core-2.1-7 amd64 2.1.11-stable-1 [89.1 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libevent-pthreads-2.1-7 amd64 2.1.11-stable-1 [7,372 B]
Get:6 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libmecab2 amd64 0.996-10build1 [233 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-server-core-8.0 amd64 8.0.29-0ubuntu0.20.04.3 [18.1 MB]
```

### **Step 2 :**

This will connect to the MySQL server as the administrative database user root, which is inferred by the use of sudo when running this command.

Syntax: \$ sudomysql

### **Output:**

```
mca@ajce:~$ sudo mysql
[sudo] password for mca:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.29-0ubuntu0.20.04.3 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| sys            |
+-----+
4 rows in set (0.01 sec)

mysql> exit
Bye
```

## Installing PHP

In addition to the php package, you'll also need libapache2-mod-php to integrate PHP into Apache, and the php-mysql package to allow PHP to connect to MySQL databases. Run the following command to install all three packages and their dependencies.

### Step 1 :Installation

Syntax: sudo apt install php libapache2-mod-php php-mysql

#### Output:

```
mca@ajce:~$ sudo apt install php libapache2-mod-php php-mysql
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libapache2-mod-php7.4 php-common php7.4 php7.4-cli php7.4-common
  php7.4-json php7.4-mysql php7.4-opcache php7.4-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  libapache2-mod-php libapache2-mod-php7.4 php php-common php-mysql php7.4
  php7.4-cli php7.4-common php7.4-json php7.4-mysql php7.4-opcache
  php7.4-readline
0 upgraded, 12 newly installed, 0 to remove and 602 not upgraded.
Need to get 4,149 kB of archives.
After this operation, 18.5 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 php-common all 2:75 [11.9 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-common amd64 7.4.3-4ubuntu2.10 [981 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-json amd64 7.4.3-4ubuntu2.10 [19.2 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-opcache amd64 7.4.3-4ubuntu2.10 [198 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-readline amd64 7.4.3-4ubuntu2.10 [12.6 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 php7.4-cli amd64 7.4.3-4ubuntu2.10 [1,422 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libapache2-mod-php7.4 amd64 7.4.3-4ubuntu2.10 [1,365 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libapache2-mod-php all 2:7.4+75 [2,836 B]
```

### Step 2 :Restart

Syntax: sudo systemctl restart apache2

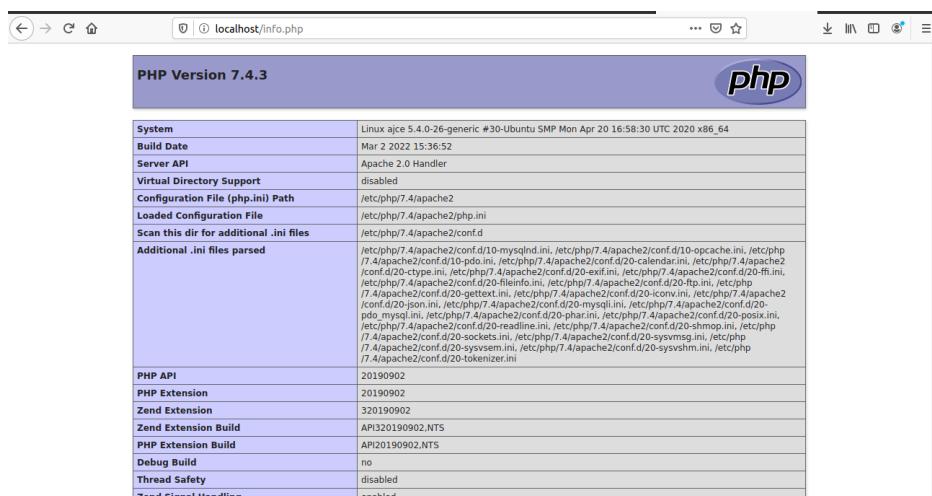
#### Output:

```
mca@ajce:~$ sudo systemctl restart apache2
mca@ajce:~$
```

### Step 3 :Testing PHP Processing on your Web Server

#### Output:

```
mca@ajce:~$ sudo gedit /var/www/html/info.php
(gedit:21368): Tepl-WARNING ***: 15:10:04.836: GVfs metadata is not supported. Fallback to TeplMetadataManager. Either GVfs is not correctly installed or GVfs metadata are not supported on this platform. In the latter case, you should configure Tepl with --disable-gvfs-metadata.
mca@ajce:~$
```



## Install WordPress with LAMP on Ubuntu 18.04

### Step 1: Download WordPress

Syntax: \$ wget -c http://wordpress.org/latest.tar.gz  
\$ tar -xvf latest.tar.gz

### Output:

```
mca@ajce:~$ wget -c http://wordpress.org/latest.tar.gz
--2022-06-13 15:20:08--  http://wordpress.org/latest.tar.gz
Resolving wordpress.org (wordpress.org)... 198.143.164.252
Connecting to wordpress.org (wordpress.org)|198.143.164.252|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://wordpress.org/latest.tar.gz [following]
--2022-06-13 15:20:08--  https://wordpress.org/latest.tar.gz
Connecting to wordpress.org (wordpress.org)|198.143.164.252|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 21166276 (20M) [application/octet-stream]
Saving to: 'latest.tar.gz'

latest.tar.gz    100%[=====] 21166276  --:-- ETA
```

```
mca@ajce:~$ tar -xvf latest.tar.gz
wordpress/
wordpress/xmlrpc.php
wordpress/wp-blog-header.php
wordpress/readme.html
wordpress/wp-signup.php
wordpress/index.php
wordpress/wp-cron.php
wordpress/wp-config-sample.php
wordpress/wp-login.php
wordpress/wp-settings.php
wordpress/license.txt
wordpress/wp-content/
wordpress/wp-content/themes/
wordpress/wp-content/themes/twentytwentyone/
wordpress/wp-content/themes/twentytwentyone/footer.php
wordpress/wp-content/themes/twentytwentyone/template-parts/
wordpress/wp-content/themes/twentytwentyone/template-parts/content/
wordpress/wp-content/themes/twentytwentyone/template-parts/content/content-excerpt.php
wordpress/wp-content/themes/twentytwentyone/template-parts/content/content-page.php
wordpress/wp-content/themes/twentytwentyone/template-parts/content/content-none.php
wordpress/wp-content/themes/twentytwentyone/template-parts/content/content.php
wordpress/wp-content/themes/twentytwentyone/template-parts/content/content-single.php
wordpress/wp-content/themes/twentytwentyone/template-parts/header/
```

### Step 2 :Creating a MySQL Database and User for WordPress

The first step you'll take is a preparatory one. Even though MySQL is already installed, you still need to create a database to manage and store the user information for WordPress to use. To get started, log into the MySQL root (administrative) account by issuing the following command:

Syntax: \$ sudomysql

You will be prompted for the password you set for the MySQL root account when you installed the software. However, if you have password authentication enabled for your root user, you can run the following command and enter your password information when prompted:

Syntax: \$ mysql -u root -p

### Output:

```
mca@ajce:~$ sudo mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.29-0ubuntu0.20.04.3 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> mysql -u root -p
-> [REDACTED]
```

### Step 3 :Create the database for WordPress

### Output:

```
mca@ajce:~$ sudo mysql
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.29-0ubuntu0.20.04.3 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci' at line 1
mysql> sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci' at line 1
mysql> sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci' at line 1
mysql> sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'sudo CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci' at line 1
mysql> CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci;
ERROR 1007 (HY000): Can't create database 'wordpress'; database exists
mysql> show databases
-> show databases;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'show databases' at line 2
mysql> show databases;

mysql> GRANT ALL ON wordpress.* TO 'wordpressuser'@'localhost' IDENTIFIED BY 'sree17';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'IDENTIFIED BY 'sree17'' at line 1
mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.04 sec)

mysql> exit;
Bye
```

```
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax
to use near 'show databases' at line 2
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
| wordpress |
+-----+
5 rows in set (0.00 sec)
```

## Step 2 :

Go the /var/www/html/ directory and rename existing wp-config-sample.php to wpconfig.php. Also, make sure to remove the default Apache index page.

Syntax: sudo mv wp-config-sample.php wpconfig.php

sudorm -rf index.html

## Output:

```
mca@ajce:/var/www/html$ sudo mv wp-config-sample.php wp-config.php
[sudo] password for mca:
mca@ajce:/var/www/html$ sudo rm -rf index.html
mca@ajce:/var/www/html$ █
```

**Step 3 :** Then update it with your database information under the MySQL settings section (refer to the highlighted boxes in the image below): This setting can be added after the database connection settings, or anywhere else in the file:..

Syntax:

```
define('DB_NAME', 'wordpress');

/** MySQL database username */
define('DB_USER', 'wordpressuser');
/** MySQL database password */
define('DB_PASSWORD', 'password');

...
define('FS_METHOD', 'direct');
```

## Output:

```
mca@ajce:/var/www/html$ sudo mv wp-config-sample.php wp-config.php
[sudo] password for mca:
mca@ajce:/var/www/html$ sudo rm -rf index.html
mca@ajce:/var/www/html$ chmod +rwx index.html
chmod: cannot access 'index.html': No such file or directory
mca@ajce:/var/www/html$ sudo chmod +rwx wp-config.php
mca@ajce:/var/www/html$ sudo gedit wp-config.php
```

Save and close the file when you are finished.

**Step 4:** Restart the web server and mysql service

Syntax: \$sudosystemctl restart apache2.service

\$ sudosystemctl restart mysql.service

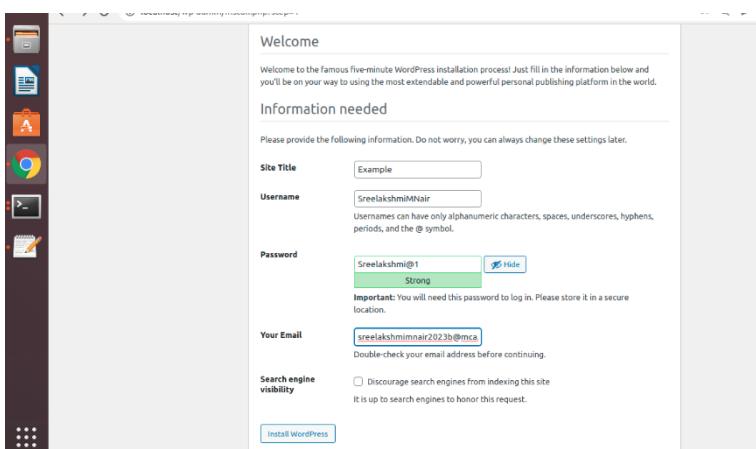
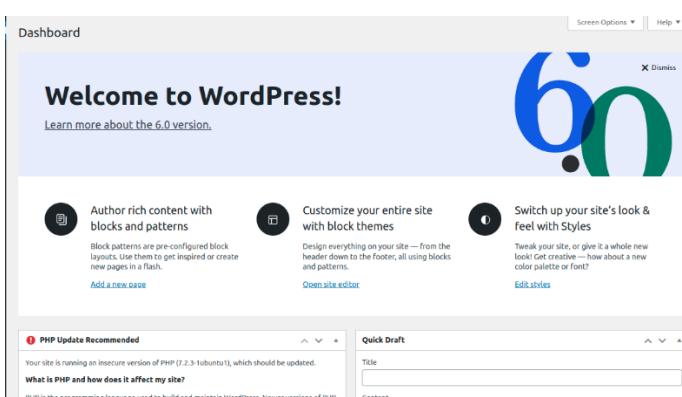
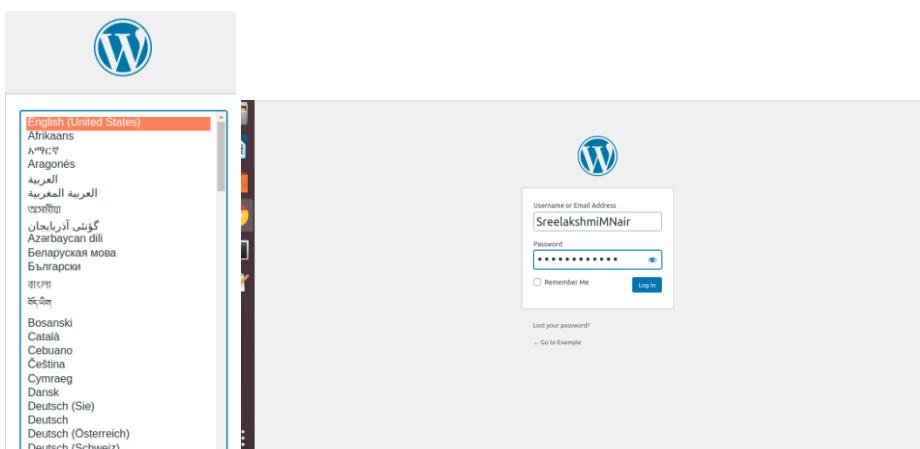
## Output:

```
a@ajce:~/var/www/html$ sudo systemctl restart apache2.service
a@ajce:~/var/www/html$ sudo systemctl restart mysql.service
a@ajce:~/var/www/html$
```

## Step 5: Completing the Installation Through the Web Interface

The server configuration is complete, you can complete the installation through the web interface. In your web browser, navigate to your server's domain name or public IP address

### Output:



## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 6**

**Name: Neha Antony**

**Roll No:23**

**Batch: MCA -B**

**Date:06-06-2022**

#### **Aim**

Build and install software from source code, familiarity with make and cmake utilities expected.

#### **Procedure**

1. We can obtain information of a package and its dependencies using the apt command. Doing that for cmake:

**\$ apt show cmake**

```
mca@S66:~/Documents/neha/CMake$ apt show cmake
Package: cmake
Version: 3.10.2-1ubuntu2
Priority: optional
Section: devel
Origin: Ubuntu
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Original-Maintainer: Debian CMake Team <pkg-cmake-team@lists.alioth.debian.org>
Bugs: https://bugs.launchpad.net/ubuntu/+filebug
Installed-Size: 17.3 MB
Depends: cmake-data (= 3.10.2-1ubuntu2), procps, libarchive13 (>= 3.0.4), libc6 (>= 2.15), libcurl4 (>= 7.16.2), libexpat1 (>= 2.0.1), libgcc1 (>= 1:3.0), libjsoncpp1 (>= 1.7.4), librhash0 (>= 1.2.6), libstdc++6 (>= 5.2), libuv1 (>= 1.4.2), zlib1g (>= 1:1.2.3.3)
Recommends: gcc, make
Suggests: cmake-doc, ninja-build
Homepage: https://cmake.org/
Supported: 5y
Download-Size: 3,138 kB
APT-Sources: http://in.archive.ubuntu.com/ubuntu bionic/main amd64 Packages
Description: cross-platform, open-source make system
CMake is used to control the software compilation process using simple platform and compiler independent configuration files. CMake generates native makefiles and workspaces that can be used in the compiler environment of your choice. CMake is quite sophisticated: it is possible to support complex environments requiring system configuration, pre-processor generation, code generation, and template instantiation.

.
CMake was developed by Kitware as part of the NLM Insight Segmentation and Registration Toolkit project. The ASCI VIEWS project also provided support in the context of their parallel computation environment. Other sponsors include the Insight, VTK, and VXL open source software communities.
```

2. To install cmake , g++ and make using the apt command, type:

**\$ sudo apt install cmake g++ make**

```
mca@S66:~/Documents/neha/CMake$ sudo apt install cmake g++ make
[sudo] password for mca:
Reading package lists... Done
Building dependency tree
Reading state information... Done
g++ is already the newest version (4:7.3.0-3ubuntu2).
make is already the newest version (4.1-9.1ubuntu1).
make set to manually installed.
The following additional packages will be installed:
 cmake-data libcurl4 libjsoncpp1 librhash0 libuv1
Suggested packages:
 cmake-doc ninja-build
The following NEW packages will be installed:
 cmake cmake-data libcurl4 libjsoncpp1 librhash0 libuv1
0 upgraded, 6 newly installed, 0 to remove and 1 not upgraded.
3 not fully installed or removed.
Need to get 4,900 kB of archives.
After this operation, 25.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 cmake-data all 3.10.2-1ubuntu2 [1,331 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 libcurl4 amd64 7.58.0-2ubuntu3 [214 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 libjsoncpp1 amd64 1.7.4-3 [73.6 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 librhash0 amd64 1.3.6-2 [78.1 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 libuv1 amd64 1.18.0-3 [64.4 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 cmake amd64 3.10.2-1ubuntu2 [3,138 kB]
Fetched 4,900 kB in 1s (6,840 kB/s)
Selecting previously unselected package cmake-data.
(Reading database ... 171165 files and directories currently installed.)
Preparing to unpack .../0-cmake-data_3.10.2-1ubuntu2_all.deb ...
Unpacking cmake-data (3.10.2-1ubuntu2) ...
Selecting previously unselected package libcurl4:amd64.
Preparing to unpack .../1-libcurl4_7.58.0-2ubuntu3_amd64.deb ...
Unpacking libcurl4:amd64 (7.58.0-2ubuntu3) ...
Selecting previously unselected package libjsoncpp1:amd64.
Preparing to unpack .../2-libjsoncpp1_1.7.4-3_amd64.deb ...
Unpacking libjsoncpp1:amd64 (1.7.4-3) ...
```

### A Sample CMake project

```
mca@S66:~/Documents/neha/CMake$ mkdir Myproject
mca@S66:~/Documents/neha/CMake$ cd Myproject
mca@S66:~/Documents/neha/CMake/Myproject$ gedit hello_world.cpp
```

```
#include <iostream>
int main() {
    std::cout<<"Hello World!"<<std::endl;
    return 0 ;
}
```

create configuration text file

```
cmake_minimum_required(VERSION 3.10)
project(MyProject)
add_executable(hello hello_world.cpp)
```

A directory to which CMake was executed is called “Built Directory”

```
mca@S66:~/Documents/neha/CMake/Myproject$ mkdir build
mca@S66:~/Documents/neha/CMake/Myproject$ cd build
```

```
mca@S66:~/Documents/neha/CMake/Myproject/build$ cmake ..  
-- The C compiler identification is GNU 7.3.0  
-- The CXX compiler identification is GNU 7.3.0  
-- Check for working C compiler: /usr/bin/cc  
-- Check for working C compiler: /usr/bin/cc -- works  
-- Detecting C compiler ABI info  
-- Detecting C compiler ABI info - done  
-- Detecting C compile features  
-- Detecting C compile features - done  
-- Check for working CXX compiler: /usr/bin/c++  
-- Check for working CXX compiler: /usr/bin/c++ -- works  
-- Detecting CXX compiler ABI info  
-- Detecting CXX compiler ABI info - done  
-- Detecting CXX compile features  
-- Detecting CXX compile features - done  
-- Text Editor configuration done  
-- Generating done  
-- Build files have been written to: /home/mca/Documents/neha/CMake/Myproject/build  
mca@S66:~/Documents/neha/CMake/Myproject/build$ cmake --build
```

```
mca@S66:~/Documents/neha/CMake/Myproject/build$ cmake --build .  
Scanning dependencies of target hello  
[ 50%] Building CXX object CMakeFiles/hello.dir/hello_world.cpp.o  
[100%] Linking CXX executable hello
```

```
mca@S66:~/Documents/neha/CMake/Myproject/build$ ./hello
```

```
Hello World!
```

```
mca@S66:~/Documents/neha/CMake/Myproject/build$ █
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 7**

**Name: NEHA ANTONY**

**Roll No:23**

**Batch:MCA-B**

**Date:02-06-2022**

#### **Aim**

Introduction to command line tools for networking IPv4 networking, network commands: ping route traceroute, nslookup, ip.

#### **Procedure**

##### **Ipconfig**

"Ipconfig" often comes up as the most-used networking command on Windows. Not only is it useful for the information it provides, but you can combine it with a couple of switches to execute certain tasks.

```
C:\WINDOWS\System32>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix  . :
  Link-local IPv6 Address . . . . . : fe80::30ae:2407:38c4:773%4
  IPv4 Address . . . . . : 192.168.6.66
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.6.100

Tunnel adapter Teredo Tunneling Pseudo-Interface:

  Connection-specific DNS Suffix  . :
  IPv6 Address . . . . . : 2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e
  Link-local IPv6 Address . . . . . : fe80::1cb9:12f3:8a3e:b01e%9
  Default Gateway . . . . . : ::
```

```
Windows IP Configuration

Host Name . . . . . : S66
Primary Dns Suffix . . . . . : mca.com
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : mca.com

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix  . :
  Description . . . . . : Realtek PCIe GBE Family Controller
  Physical Address . . . . . : 1C-87-2C-71-89-3E
  DHCP Enabled. . . . . : No
  Autoconfiguration Enabled . . . . . : Yes
  Link-local IPv6 Address . . . . . : fe80::30ae:2407:38c4:773%4(Preferred)
  IPv4 Address . . . . . : 192.168.6.66(Preferred)
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.6.100
  DHCPv6 IAID . . . . . : 162532988
  DHCPv6 Client DUID. . . . . : 00-01-00-01-25-4B-EE-CF-1C-87-2C-71-89-3E
  DNS Servers . . . . . : 192.168.6.254
                           8.8.8.8
  NetBIOS over Tcpip. . . . . : Enabled

Tunnel adapter Teredo Tunneling Pseudo-Interface:

  Connection-specific DNS Suffix  . :
  Description . . . . . : Microsoft Teredo Tunneling Adapter
  Physical Address . . . . . : 00-00-00-00-00-00-E0
  DHCP Enabled. . . . . : No
  Autoconfiguration Enabled . . . . . : Yes
  IPv6 Address. . . . . : 2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e(Preferred)
  Link-local IPv6 Address . . . . . : fe80::1cb9:12f3:8a3e:b01e%9(Preferred)
  Default Gateway . . . . . : ::

  DHCPv6 IAID . . . . . : 167772169
  DHCPv6 Client DUID. . . . . : 00-01-00-01-25-4B-EE-CF-1C-87-2C-71-89-3E
  NetBIOS over Tcpip. . . . . : Disabled
```

"Nslookup" stands for Name Server Lookup. It packs a lot of power, but most users won't need that power. For regular folks like you and me, its main use is finding out the IP address behind a certain domain name.

```
C:\WINDOWS\System32>nslookup
Default Server: UnKnown
Address: 192.168.6.254

> www.google.com
Server: UnKnown
Address: 192.168.6.254

Non-authoritative answer:
Name: www.google.com
Addresses: 2404:6800:4007:826::2004
          142.250.195.164

> www.amazon.com
Server: UnKnown
Address: 192.168.6.254

Non-authoritative answer:
Name: d3ag4hukkh62yn.cloudfront.net
Address: 52.84.12.185
Aliases: www.amazon.com
          tp.47cf2c8c9-frontier.amazon.com
```

## Ping

"Ping" is one of the most basic yet useful network commands to utilize in the command prompt application. It tells you whether your computer can reach some destination IP address or domain name, and if it can, how long it takes data to travel there and back again.

```
C:\WINDOWS\System32>ping 142.250.195.164

Pinging 142.250.195.164 with 32 bytes of data:
Reply from 142.250.195.164: bytes=32 time=20ms TTL=59

Ping statistics for 142.250.195.164:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
        Minimum = 20ms, Maximum = 20ms, Average = 20ms
```

## Tracert

"Tracert" stands for Trace Route. And much like "ping," it sends out a data packet as a way to troubleshoot any network issues you might have, but it instead tracks the route of the packet as it hops from server to server.

```
C:\WINDOWS\System32>tracert 142.250.195.164

Tracing route to maa03s41-in-f4.1e100.net [142.250.195.164]
over a maximum of 30 hops:

 1    <1 ms      <1 ms      <1 ms  192.168.6.100
 2     2 ms       3 ms       1 ms  172.24.9.34
 3     *         *         * Request timed out.
 4     *         *         * Request timed out.
 5   17 ms      17 ms      17 ms  72.14.218.250
 6   18 ms      18 ms      17 ms  216.239.43.133
 7   15 ms      15 ms      15 ms  142.251.55.91
 8   20 ms      20 ms      20 ms  maa03s41-in-f4.1e100.net [142.250.195.164]

Trace complete.
```

## Netstat

"Netstat" is a tool for network statistics, diagnostics, and analysis. It's powerful and complex but can be simple enough if you ignore the advanced aspects that you don't need to know about (assuming you aren't managing a massive business or campus network, for example).

The -f option clears the routing tables of all gateway entries. If you use the -f option in conjunction with one of the commands, the tables are cleared before you run the command.

By default, routes are not preserved when you restart the system. Use the -p option with the add command to make a route persistent. Use the -p option with the print command to view the list of registered persistent routes.

```
C:\WINDOWS\System32>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.6.66:7680      S26:1177             ESTABLISHED
  TCP    192.168.6.66:7680      S52:2371             ESTABLISHED
  TCP    192.168.6.66:7680      STDRJUBYMATHEW:55692  ESTABLISHED
  TCP    192.168.6.66:25090     20.198.162.76:https  ESTABLISHED
  TCP    192.168.6.66:25116     si-in-f188:5228      ESTABLISHED
  TCP    192.168.6.66:25155     si-in-f188:5228      ESTABLISHED
  TCP    192.168.6.66:25272     a184-86-248-178:https CLOSE_WAIT
  TCP    192.168.6.66:25273     a184-86-248-178:https CLOSE_WAIT
  TCP    192.168.6.66:25274     a104-85-134-163:https ESTABLISHED
  TCP    192.168.6.66:25275     49.44.194.16:https  CLOSE_WAIT
  TCP    192.168.6.66:25279     49.44.194.16:https  CLOSE_WAIT
  TCP    192.168.6.66:25282     a104-85-134-163:https ESTABLISHED
  TCP    192.168.6.66:25283     maa05s23-in-f10:https ESTABLISHED
  TCP    192.168.6.66:25286     52.137.110.235:https ESTABLISHED
  TCP    192.168.6.66:25287     s3:https            CLOSE_WAIT
  TCP    192.168.6.66:25288     s3:https            CLOSE_WAIT
  TCP    192.168.6.66:25289     maa05s26-in-f14:https ESTABLISHED
  TCP    192.168.6.66:25292     S22:ms-do           ESTABLISHED
  TCP    [2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e]:25182  [2001:0:2851:fcb0:387d:96d7:985e:9cf9]:ms-do  ESTABLISHED
  TCP    [2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e]:25293  [2001:0:2851:fcb0:2b:3856:8a3e:b01e]:ms-do  SYN_SENT
  TCP    [2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e]:25294  [2001:0:2851:fcb0:184c:383e:f174:159d]:ms-do  SYN_SENT

C:\WINDOWS\System32>
```

You can use the route command to view, add and delete routes on a Microsoft Windows NT server that runs Cisco ICM. You can use these options with the route command

```
C:\WINDOWS\System32>route print
=====
Interface List
  4...1c 87 2c 71 89 3e ....Realtek PCIe GBE Family Controller
  1.....Software Loopback Interface 1
  9...00 00 00 00 00 00 e0 Microsoft Teredo Tunneling Adapter
=====

IPv4 Route Table
=====
Active Routes:
Network Destination      Netmask     Gateway       Interface Metric
          0.0.0.0        0.0.0.0   192.168.6.100  192.168.6.66    281
         127.0.0.0      255.0.0.0   On-link        127.0.0.1     331
         127.0.0.1      255.255.255.255  On-link        127.0.0.1     331
  127.255.255.255      255.255.255.255  On-link        127.0.0.1     331
         192.168.6.0      255.255.255.0   On-link        192.168.6.66    281
         192.168.6.66      255.255.255.255  On-link        192.168.6.66    281
         192.168.6.255     255.255.255.255  On-link        192.168.6.66    281
         224.0.0.0        240.0.0.0   On-link        127.0.0.1     331
         224.0.0.0        240.0.0.0   On-link        192.168.6.66    281
        255.255.255.255     255.255.255.255  On-link        127.0.0.1     331
        255.255.255.255     255.255.255.255  On-link        192.168.6.66    281
=====
Persistent Routes:
 Network Address      Netmask     Gateway Address Metric
          0.0.0.0        0.0.0.0   192.168.6.100 Default
=====

IPv6 Route Table
=====
Active Routes:
 If Metric Network Destination      Gateway
  9    331 ::/0                      On-link
  1    331 ::1/128                  On-link
  9    331 2001::/32                On-link
  9    331 2001:0:2851:fcb0:1cb9:12f3:8a3e:b01e/128
                                         On-link
  4    281 fe80::/64                On-link
  9    331 fe80::/64                On-link
  9    331 fe80::1cb9:12f3:8a3e:b01e/128
                                         On-link
  4    281 fe80::30ae:2407:38c4:773/128
```

# NETWORKING & SYSTEM ADMINISTRATION LAB

## **Experiment No.: 8**

## Aim

Analyzing network packet stream using tcpdump and wireshark. Perform basic network service tests using nc.

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Roll No:23

**Batch:b**

Date:23-05-2022

### Procedure

## 1. How to Install tcpdump in Linux

Many Linux distributions already shipped with the `tcpdump` tool, if in case you don't have it on a system, you can install it using the command.

- \$ sudo apt-get install tcpdump [On Debian, Ubuntu and Mint]

```
mca@m66:~$ sudo apt update && sudo apt install tcpdump
[sudo] password for mca:
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 https://dl.google.com/linux/chrome/deb stable InRelease
Err:3 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403 Forbidden [IP: 185.125.190.52 80]
Ign:4 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 InRelease
Hit:5 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease
Get:6 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release [2,495 B]
Get:7 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg [801 B]
Err:7 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg
  The following signatures were invalid: EXPKEYSIG 58712A2291FA4AD5 MongoDB 3.6 Release Signing Key <packaging@mongodb.com>
Reading package lists... Done
E: Failed to fetch http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu/dists/bionic/InRelease  403  Forbidden [IP: 185.125.190.52 80]
E: The repository 'http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: ht
tps://repo.mongodb.org/apt/ubuntu/mongodb-org/3.6 Release: The following signatures were invalid: EXPKEYSIG 58712A2291FA4AD5 MongoDB 3.
6 Release Signing Key <packaging@mongodb.com>
```

## 2. Display Available Interfaces

To list the number of available interfaces on the system, run the following command with -D option.

```
mca@S66:~$ sudo tcpdump -D
1.enp3s0 [Up, Running]
2.any (Pseudo-device that captures on all interfaces) [Up, Running]
3.lo [Up, Running, Loopback]
4.docker0 [Up]
5.nflog (Linux netfilter log (NFLOG) interface)
6.nfqueue (Linux netfilter queue (NFQUEUE) interface)
7.usbmon1 (USB bus number 1)
8.usbmon2 (USB bus number 2)
9.usbmon3 (USB bus number 3)
10.usbmon4 (USB bus number 4)
```

## 3. Capture Packets from Specific Interface

The command screen will scroll up until you interrupt and when we execute the `tcpdump` command it will captures from all the interfaces, however with -i switch only capture from the desired interface.

```
mca@S66:~$ sudo tcpdump -l enp3s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:50:51.049423 ARP, Request who-has 192.168.6.129 tell _gateway, length 46
14:50:51.050719 IP S66.58959 > dns.google.domain: 65361+ [1au] PTR? 129.6.168.192.in-addr.arpa. (55)
14:50:51.065706 IP dns.google.domain > S66.58959: 65361 NXDomain 0/0/1 (55)
14:50:51.067564 IP S66.57195 > dns.google.domain: 55961+ [1au] PTR? 100.6.168.192.in-addr.arpa. (55)
14:50:51.0682544 IP dns.google.domain > S66.57195: 55961 NXDomain 0/0/1 (55)
14:50:51.084331 IP S66.51765 > dns.google.domain: 42819+ [1au] PTR? 66.6.168.192.in-addr.arpa. (54)
14:50:51.100902 IP dns.google.domain > S66.51765: 42819 NXDomain 0/0/1 (54)
14:50:51.172312 ARP, Request who-has 192.168.6.92 tell 192.168.6.91, length 46
14:50:51.172719 IP S66.54283 > dns.google.domain: 31086+ [1au] PTR? 92.6.168.192.in-addr.arpa. (54)
14:50:51.187599 IP dns.google.domain > S66.54283: 31086 NXDomain 0/0/1 (54)
14:50:51.188298 IP S66.46752 > dns.google.domain: 62750+ [1au] PTR? 91.6.168.192.in-addr.arpa. (54)
14:50:51.202418 IP dns.google.domain > S66.46752: 62750 NXDomain 0/0/1 (54)
14:50:51.255146 IP 192.168.6.59.49719 > 239.255.255.250.1900: UDP, length 172
14:50:51.256240 IP S66.33091 > dns.google.domain: 44586+ [1au] PTR? 59.6.168.192.in-addr.arpa. (54)
14:50:51.258319 IP 192.168.6.83.60366 > 239.255.255.250.1900: UDP, length 174
14:50:51.272796 IP dns.google.domain > S66.33091: 44586 NXDomain 0/0/1 (54)
14:50:51.273877 IP S66.39602 > dns.google.domain: 4567+ [1au] PTR? 83.6.168.192.in-addr.arpa. (54)
14:50:51.288554 IP dns.google.domain > S66.39602: 4567 NXDomain 0/0/1 (54)
14:50:51.412232 IP 192.168.6.236.52332 > 239.255.255.250.1900: UDP, length 174
14:50:51.412253 IP 192.168.6.236.52329 > 239.255.255.250.1900: UDP, length 175
14:50:51.412563 IP S66.38699 > dns.google.domain: 52710+ [1au] PTR? 236.6.168.192.in-addr.arpa. (55)
14:50:51.429559 IP dns.google.domain > S66.38699: 52710 NXDomain 0/0/1 (55)
14:50:51.496305 IP 192.168.6.236.50872 > 192.168.6.255.6806: UDP, length 395
14:50:51.496757 IP S66.54608 > dns.google.domain: 37534+ [1au] PTR? 255.6.168.192.in-addr.arpa. (55)
14:50:51.512693 IP dns.google.domain > S66.54608: 37534 NXDomain 0/0/1 (55)
14:50:51.552703 ARP, Request who-has 192.168.6.168 tell _gateway, length 46
14:50:51.553036 IP S66.42661 > dns.google.domain: 29228+ [1au] PTR? 168.6.168.192.in-addr.arpa. (55)
14:50:51.569979 IP dns.google.domain > S66.42661: 29228 NXDomain 0/0/1 (55)
```

## 4. Capture Only N Number of Packets

When you run the `tcpdump` command it will capture all the packets for the specified interface, until you hit the cancel button. But using -c option, you can capture a specified number of packets.

```
# tcpdump -c 5 -i enp3s0
```

```
mca@S66:~$ sudo tcpdump -c 4 -i enp3s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:52:06.492213 IP 192.168.6.91.netbios-ns > 192.168.6.255.netbios-ns: NBT UDP PACKET(137): QUERY; REQUEST; BROADCAST
14:52:06.492753 IP S66.45675 > dns.google.domain: 62104+ [1au] PTR? 255.6.168.192.in-addr.arpa. (55)
14:52:06.507376 IP dns.google.domain > S66.45675: 62104 NXDomain 0/0/1 (55)
14:52:06.508369 IP S66.35678 > dns.google.domain: 32209+ [1au] PTR? 91.6.168.192.in-addr.arpa. (54)
4 packets captured
7 packets received by filter
0 packets dropped by kernel
```

## 5. Display Captured Packets in HEX and ASCII

The following command with option -XX capture the data of each packet, including its link level header in HEX and ASCII format

```
mca@S66:~$ sudo tcpdump -XX -i enp3s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:53:25.604279 ARP, Request who-has 192.168.6.92 tell 192.168.6.91, length 46
 0x0000: ffff ffff ffff 0c9d 920e 8dea 0806 0001 .....
  0x0010: 0800 0604 0001 0c9d 920e 8dea c0a8 065b .....
  0x0020: 0000 0000 0000 c0a8 065c 0000 0000 0000 .....
  0x0030: 0000 0000 0000 0000 0000 0000 0000 0000 .....
14:53:25.605431 IP S66.39677 > dns.google.domain: 37631+ [iau] PTR? 92.6.168.192.in-addr.arpa. (54)
 0x0000: 001a 8c6b 54cf 1c87 2c71 893e 0800 4500 ...kT...q>..E.
  0x0010: 0052 5e7c 4000 4011 0525 c0a8 0642 0808 .R^|@..%..B..
  0x0020: 0808 9af9 0035 003e 7457 92ff 0100 0001 ....5.>tW....
  0x0030: 0000 0000 0001 0239 3201 3603 3136 3803 .....92.6.168.
  0x0040: 3139 3207 696e 2d61 6464 7204 6172 7061 192.in-addr.arpa
  0x0050: 0000 0c00 0100 0029 0200 0000 0000 0000 .....
14:53:25.620006 IP dns.google.domain > S66.39677: 37631 NXDomain 0/0/1 (54)
 0x0000: 1c87 2c71 893e 001a 8c6b 54cf 0800 4500 ...q>...kT...E.
  0x0010: 0052 2a86 0000 3c11 7d1b 0808 0808 c0a8 .R*...<].....
  0x0020: 0642 0035 9af9 003e f3d3 92ff 8183 0001 .B.5...>.....
  0x0030: 0000 0000 0001 0239 3201 3603 3136 3803 .....92.6.168.
  0x0040: 3139 3207 696e 2d61 6464 7204 6172 7061 192.in-addr.arpa
  0x0050: 0000 0c00 0100 0029 0200 0000 0000 0000 .....
14:53:25.621529 IP S66.34818 > dns.google.domain: 37952+ [iau] PTR? 91.6.168.192.in-addr.arpa. (54)
 0x0000: 001a 8c6b 54cf 1c87 2c71 893e 0800 4500 ...kT...q>..E.
  0x0010: 0052 5e7e 4000 4011 0523 c0a8 0642 0808 .R^~@..#..B..
  0x0020: 0808 8802 0035 003e 8711 9440 0100 0001 ....5.>..0...
  0x0030: 0000 0000 0001 0239 3101 3603 3136 3803 .....91.6.168.
  0x0040: 3139 3207 696e 2d61 6464 7204 6172 7061 192.in-addr.arpa
  0x0050: 0000 0c00 0100 0029 0200 0000 0000 0000 .....
14:53:25.638802 IP dns.google.domain > S66.34818: 37952 NXDomain 0/0/1 (54)
 0x0000: 1c87 2c71 893e 001a 8c6b 54cf 0800 4500 ...q>...kT...E.
  0x0010: 0052 18dc 0000 3c11 8ec5 0808 0808 c0a8 .R...<.....
  0x0020: 0642 0035 8802 003e 068e 9440 8183 0001 .B.5...>..0...
  0x0030: 0000 0000 0001 0239 3101 3603 3136 3803 .....91.6.168.
```

## 6. Capture and Save Packets in a File

As we said, that tcpdump has a feature to capture and save the file in a .pcap format, to do this just execute the command with -w option.

```
mca@S66:~$ sudo tcpdump -i enp3s0 -c 10 -w icmp.pcap
tcpdump: listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
10 packets captured
12 packets received by filter
0 packets dropped by kernel
```

## 7. Capture Packet from Specific Port

Let's say you want to capture packets for specific port 80, execute the below command by specifying port number 80 as shown below.

```
mca@S66:~$ sudo tcpdump -i enp3s0 -c 5 port 80
[sudo] password for mca:
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:18:09.213493 IP S66.59252 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 18809714, win 29200, options [mss 1460,sackOK,TS val 1175571752 ecr 0,nop,wscale 7], length 0
14:18:10.244247 IP S66.59252 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 18809714, win 29200, options [mss 1460,sackOK,TS val 1175572783 ecr 0,nop,wscale 7], length 0
14:18:10.489618 IP 32.121.122.34.bc.googleusercontent.com.http > S66.59252: Flags [S.], seq 131097005, ack 18809715, win 64768, options [mss 1420,sackOK,TS val 1175572783,nop,wscale 7], length 0
14:18:10.489703 IP S66.59252 > 32.121.122.34.bc.googleusercontent.com.http: Flags [.], ack 1, win 229, options [nop,nop,TS val 1175573028 ecr 3319464738], length 0
14:18:10.489864 IP S66.59252 > 32.121.122.34.bc.googleusercontent.com.http: Flags [P.], seq 1:88, ack 1, win 229, options [nop,nop,TS val 1175573028 ecr 3319464738], length 87: HTTP: GET / HTTP/1.1
5 packets captured
5 packets received by filter
0 packets dropped by kernel
```

## 8. Read Captured Packets File

To read and analyze captured packet 0001.pcap file use the command with -r option.

```
mca@S66:~$ sudo tcpdump -r icmp.pcap
reading from file icmp.pcap, link-type EN10MB (Ethernet)
14:19:22.189957 ARP, Reply 192.168.1.1 is-at 04:09:73:99:63:ac (oui Unknown), length 46
14:19:22.190160 ARP, Reply 192.168.1.1 is-at 04:09:73:fd:e4:7c (oui Unknown), length 46
14:19:22.195693 ARP, Reply 192.168.1.1 is-at 04:09:73:99:e3:b0 (oui Unknown), length 46
14:19:22.216587 IP 192.168.6.204.32925 > 239.255.255.250.1900: UDP, length 172
14:19:22.586506 ARP, Request who-has 192.168.6.185 tell _gateway, length 46
14:19:22.595038 STP 802.1w, Rapid STP, Flags [Forward], bridge-id 8000.44:31:92:f1:0c:45.8012, length 47
14:19:23.157167 ARP, Reply 192.168.1.1 is-at 04:09:73:fd:e4:7c (oui Unknown), length 46
14:19:23.157170 ARP, Reply 192.168.1.1 is-at 04:09:73:99:e3:b0 (oui Unknown), length 46
14:19:23.157196 ARP, Reply 192.168.1.1 is-at 04:09:73:99:63:ac (oui Unknown), length 46
14:19:23.169605 IP 192.168.6.236.57786 > 192.168.6.255.6866: UDP, length 395
```

## wire shark

Installing Wireshark on Ubuntu 20.04

The Wireshark utility is available on all major desktop platforms, i.e., Linux, Microsoft Windows, FreeBSD, MacOS, Solaris, and many more. Follow the steps below to install Wireshark on Ubuntu 20.04.

STEP1 : Update APT

First, as always, update and upgrade your APT through the following command.

Syntax:

**\$ sudo apt update**

```
mca@S66:~$ sudo apt update
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 https://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Ign:3 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 InRelease
Err:4 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403 Forbidden [IP: 185.125.190.52 80]
Get:5 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,097 B]
Hit:6 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease
Get:7 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release [2,495 B]
Get:8 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg [801 B]
Err:8 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg
  The following signatures were invalid: EXPKEYSIG 58712A2291FA4ADS MongoDB 3.6 Release Signing Key <packaging@mongodb.com>
Reading package lists... Done
E: Failed to fetch http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu/dists/bionic/InRelease 403 Forbidden [IP: 185.125.190.52 80]
E: The repository 'http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: ht
tps://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release: The following signatures were invalid: EXPKEYSIG 58712A2291FA4ADS MongoDB 3.
6 Release Signing Key <packaging@mongodb.com>
```

Step 2: Download and Install Wireshark

Now that Wireshark's latest version has been added to the APT, you can download and install it with the following command.

syntax

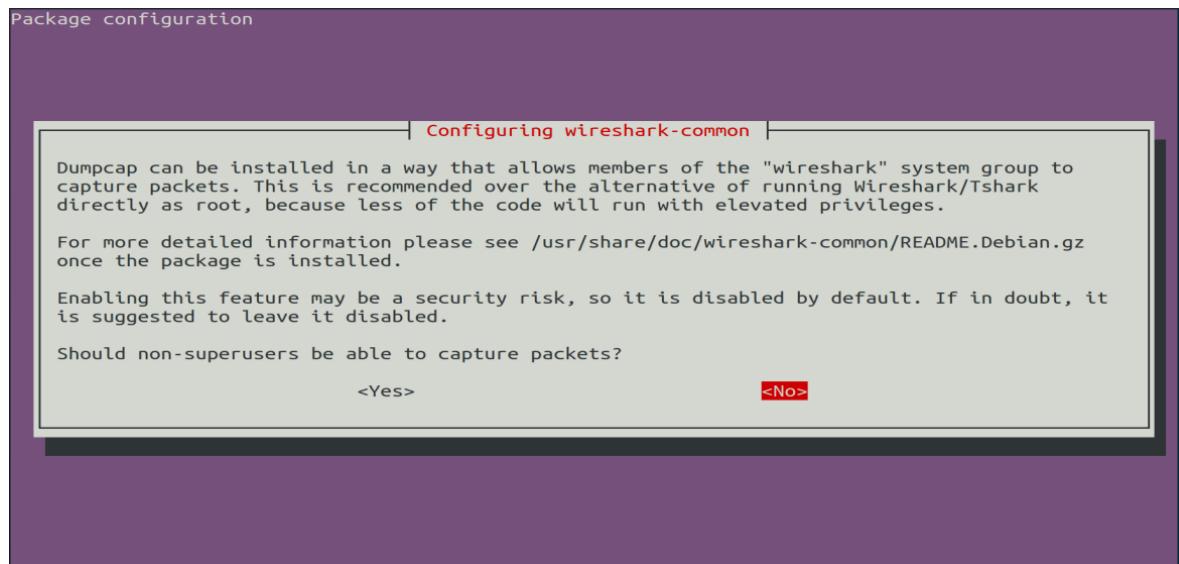
**\$ sudo apt install wireshark**

```
mca@S66:~$ sudo apt install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  geoip-database-extra javascript-common libc-ares2 libjs-openlayers libnl-route-3-200 libqt5multimedia5 libsmi2ldbl libsnappy1v5
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark10 libwiretap7 libwscodecs1 libwsutil8 wireshark-common wireshark-qt
Suggested packages:
  snmp-mibs-downloader wireshark-doc
The following NEW packages will be installed:
  geoip-database-extra javascript-common libc-ares2 libjs-openlayers libnl-route-3-200 libqt5multimedia5 libsmi2ldbl libsnappy1v5
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark10 libwiretap7 libwscodecs1 libwsutil8 wireshark wireshark-common wireshark-qt
0 upgraded, 18 newly installed, 0 to remove and 1 not upgraded.
2 not fully installed or removed.
Need to get 31.3 MB of archives.
After this operation, 139 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 geoip-database-extra all 20180315-1 [11.1 MB]
0% [1 geoip-database-extra 14.2 kB/11.1 MB 0%]

Get:2 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 javascript-common all 11 [6,066 B]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libnl-route-3-200 amd64 3.2.29-0ubuntu3 [146 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libqt5multimedia5 amd64 5.9.5-0ubuntu1 [293 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libsmi2ldbl amd64 0.4.8+dfsg2-15 [100 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libspandsp2 amd64 0.0.6+dfsg-0.1 [273 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libssh-gcrypt-4 amd64 0.8.0-20170825.94fa1e38-1build1 [171 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwireshark-data all 2.4.5-1 [958 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libc-ares2 amd64 1.14.0-1 [37.1 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libsnappy1v5 amd64 1.1.7-1 [16.0 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwsutil8 amd64 2.4.5-1 [50.2 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwiretap7 amd64 2.4.5-1 [172 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwscodecs1 amd64 2.4.5-1 [16.6 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwireshark10 amd64 2.4.5-1 [13.5 MB]
Get:15 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 wireshark-common amd64 2.4.5-1 [369 kB]
Get:16 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 wireshark-qt amd64 2.4.5-1 [3,357 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 wireshark amd64 2.4.5-1 [4,484 B]
```

### Step 3: Enable Root Privileges

When Wireshark installs on your system, you will be prompted by the following window. As Wireshark requires superuser/root privileges to operate, this option asks to enable or disable permissions for all every user on the system. Press the “Yes” button to allow other users, or press the “No” button to restrict other users from using Wireshark.



### Step 4:

You must add a username to the Wireshark group so that this user can use Wireshark. To do this, execute the following command, adding your required username after “wireshark” in the command.

Syntax:

**\$ sudo adduser \$user wireshark**

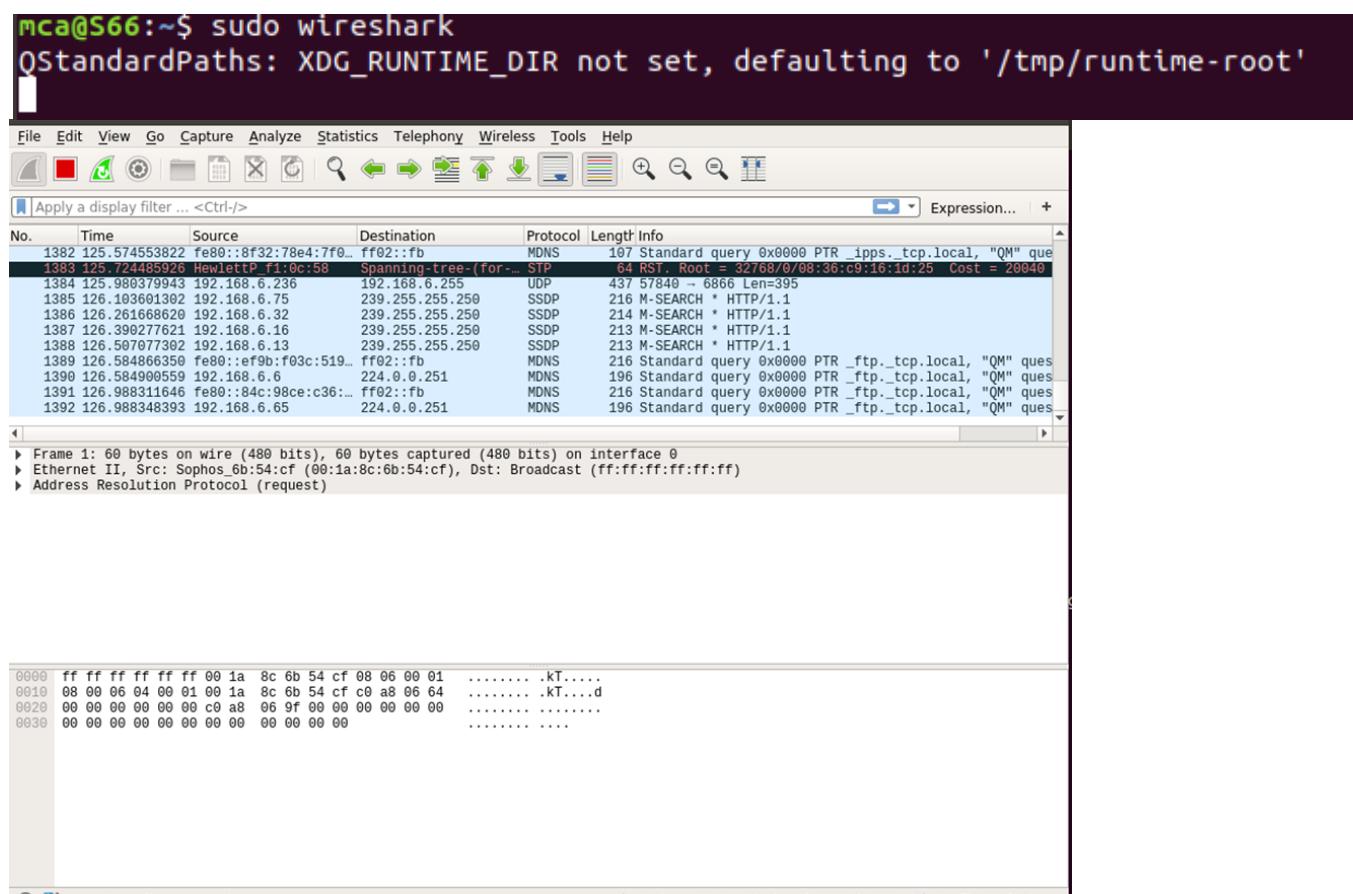
```
mca@S66:~$ sudo adduser $mca wireshark
adduser: The group `wireshark' already exists.
```

### Step 5: Launch Wireshark

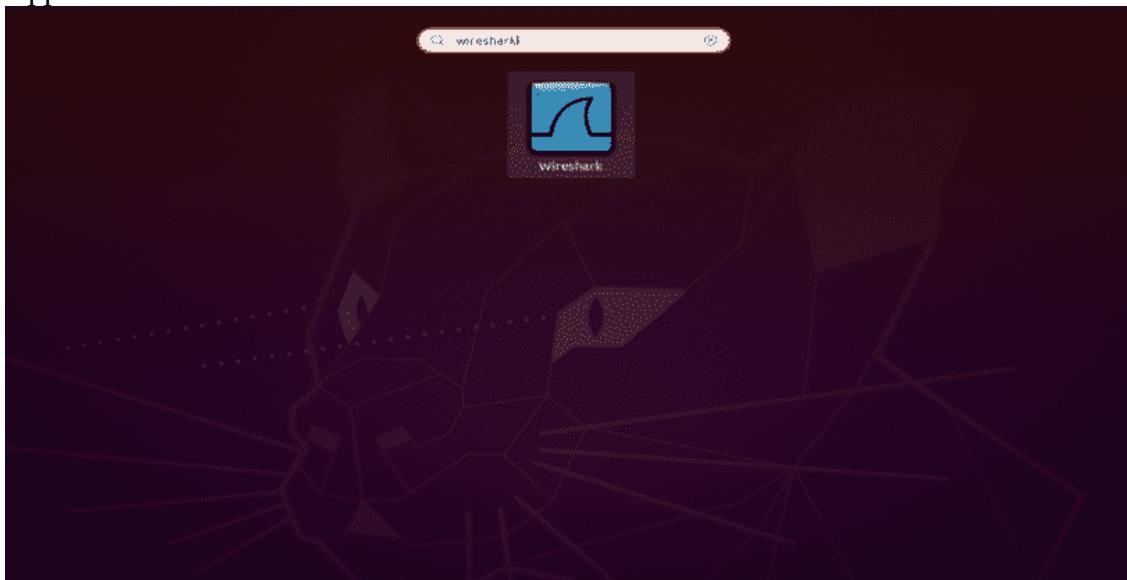
In the terminal window, type the following command to start the Wireshark application.

Syntax:

```
$ wireshark
```



You can also open Wireshark through the Graphical User Interface (GUI) by opening the activities on the Ubuntu desktop, and in the search bar, type “Wireshark,” and click on the application result.



## netcat

STEP1 : Update APT

First, as always, update and upgrade your APT through the following command.

Syntax:

**\$ sudo apt update**

```
mca@U23:~$ sudo apt-get update
[sudo] password for mca:
Hit:1 http://ppa.launchpad.net/codeblocks-devs/release/ubuntu bionic InRelease
Get:2 https://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Hit:3 http://archive.ubuntu.com/ubuntu bionic InRelease
Err:4 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403 Forbidden [IP: 185.125.190.52 80]
Get:5 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,097 B]
Hit:6 http://ppa.launchpad.net/pasgui/ppa/ubuntu bionic InRelease
Hit:7 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease
Reading package lists... Done
E: Failed to fetch http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu/dists/bionic/InRelease 403 Forbidden [IP: 185.125.190.52 80]
E: The repository 'http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease' is no longer signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
```

step 2: Install netcat

```
mca@U23:~$ sudo apt-get install netcat
Reading package lists... Done
Building dependency tree
Reading state information... Done
netcat is already the newest version (1.10-41.1).
The following packages were automatically installed and are no longer required:
  debhelper dh-autoreconf dh-strip-nondeterminism libarchive-cpio-perl
  libfile-stripnondeterminism-perl libmail-sendmail-perl libpcre16-3
  libpcre3-dev libpcre32-3 libpcrecpp0v5 libssl-dev libssl-doc
  libsys-hostname-long-perl po-debconf shtool
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 6 not upgraded.
```

## working with netcat security tool

To start listening on a port ,first open 2 window terminals

Terminal 1 for listening

```
mca@U23:~$ nc -l -p 1234
Hi buddy how are
nice to meet u
```

Terminal 2 sending requesting

```
mca@U23:~$ ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
                ether 02:42:60:8b:1f:bd txqueuelen 0 (Ethernet)
                RX packets 0 bytes 0 (0.0 B)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 0 bytes 0 (0.0 B)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp5s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.6.193 netmask 255.255.255.0 broadcast 192.168.6.255
        inet6 fe80::a0fd:1fa9:856d:5ce1 prefixlen 64 scopeid 0x20<link>
                ether 0c:9d:92:0e:92:12 txqueuelen 1000 (Ethernet)
                RX packets 142103 bytes 176542175 (176.5 MB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 36029 bytes 13803699 (13.8 MB)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
                loop txqueuelen 1000 (Local Loopback)
                RX packets 620 bytes 48633 (48.6 KB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 620 bytes 48633 (48.6 KB)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
mca@U23:~$ nc 192.168.6.193 1234
Hi buddy how are
nice to meet u
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

### **Experiment No.: 9**

#### **Aim**

Introduction to Hypervisors and VMs: KVM installation and commands

**Name: Neha Antony**  
**Roll No:23**  
**Batch:MCA-B**  
**Date:07-06-2022**

#### **Procedure**

##### **Step 1:** Update the repositories

```
mca@U40:~$ sudo apt update
[sudo] password for mca:
Get:1 https://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Get:2 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,101 B]
Hit:3 http://archive.ubuntu.com/ubuntu bionic InRelease
Hit:4 http://ppa.launchpad.net/codeblocks-devs/release/ubuntu bionic InRelease
Err:5 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403  Forbidden [IP: 185.125.190.52 80]
Hit:6 http://ppa.launchpad.net/pasgui/ppa/ubuntu bionic InRelease
Hit:7 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease
Reading package lists... Done
E: Failed to fetch http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu/dists/bionic/InRelease  403  Forbidden [IP: 185.125.190.52 80]
E: The repository 'http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease' is no longer signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
```

##### **Step 2:** Install essential KVM packages

Install virt-manager, a tool for creating and managing VMs

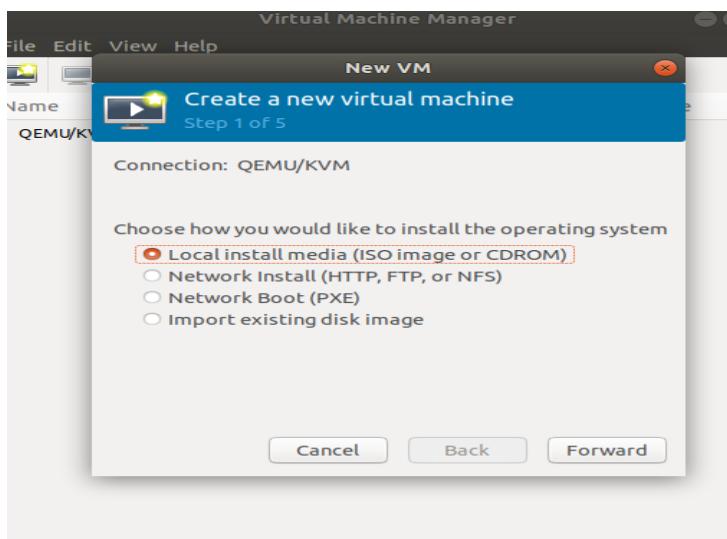
```
mca@U40:~$ sudo apt install qemu-kvm libvirt-daemon-system libvirt-clients bridge-utils virt-manager
Reading package lists... Done
Building dependency tree
Reading state information... Done
qemu-kvm is already the newest version (1:2.11+dfsg-1ubuntu7.4).
The following additional packages will be installed:
  augeas-lenses dmeventd ebtables gir1.2-appindicator3-0.1 gir1.2-gtk-vnc-2.0
  gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0 gir1.2-spiceclientglib-2.0
  gir1.2-spiceclientgtk-3.0 libaugeasd libdevmapper-event1.02.1
  libgovirt-common libgovirt2 libgtk-vnc-2.0-0 libgvnc-1.0-0 liblvm2app2.2
  liblvm2cmd2.02 libnetcf1 libosinfo-1.0-0 libphodav-2.0-0
  libphodav-2.0-common libspice-client-glib-2.0-8 libspice-client-gtk-3.0-5
  libusbredirhost1 libvirt-daemon libvirt-daemon-driver-storage-rbd
  libvirt-glib-1.0-0 libvirt0 libxml2-utils lvm2 osinfo-db python-asn1crypto
  python-certifi python-cffi-backend python-chardet python-cryptography
  python-dbus python-enum34 python-gi python-gi-cairo python-idna
  python-ipaddr python-ipaddress python-libvirt python-libxml2 python-openssl
  python-pkg-resources python-requests python-six python-urllib3
  spice-client-glib-usb-acl-helper virt-viewer virtinst
Suggested packages:
  augeas-doc augeas-tools libosinfo-l10n gstreamer1.0-plugins-bad
  gstreamer1.0-libav libvirt-daemon-driver-storage-gluster
  libvirt-daemon-driver-storage-sheepdog libvirt-daemon-storage-zfs
```

##### **Step 3:** Start virt-manager with

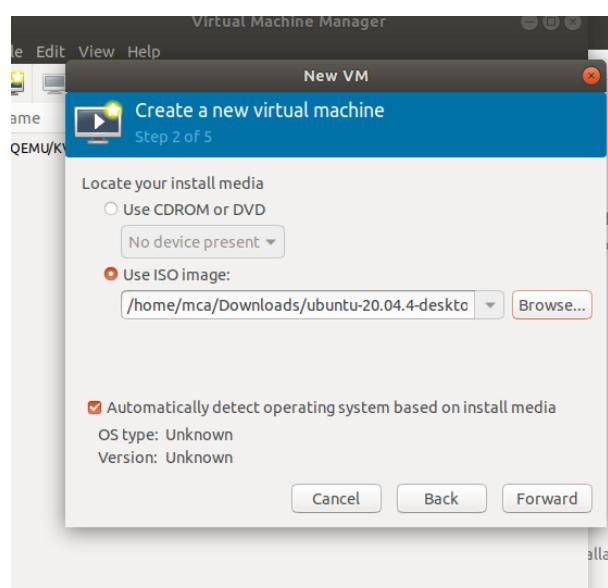
```
mca@U40:~$ sudo virt-manager
mca@U40:~$ █
```

##### **Step 4:** In the first window, click the computer icon in the upper-left corner,

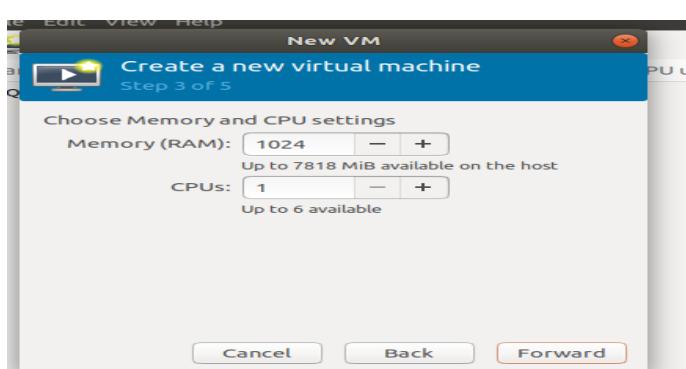
In the dialogue box that opens, select the option to install the VM using an ISO image. Then click **Forward**.



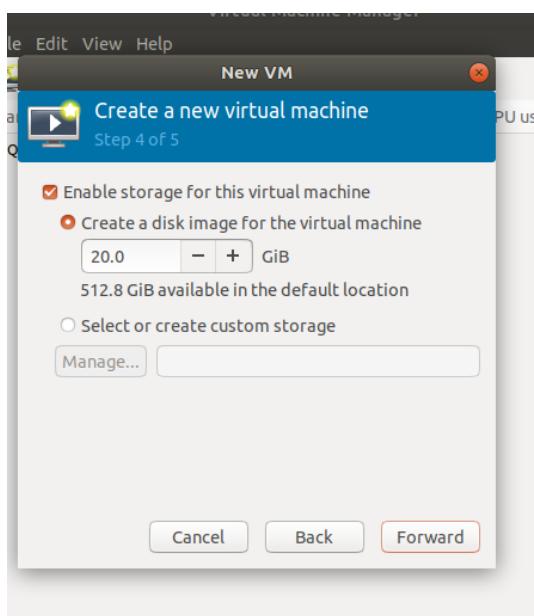
### Step 5: Choose ISO, click Forward



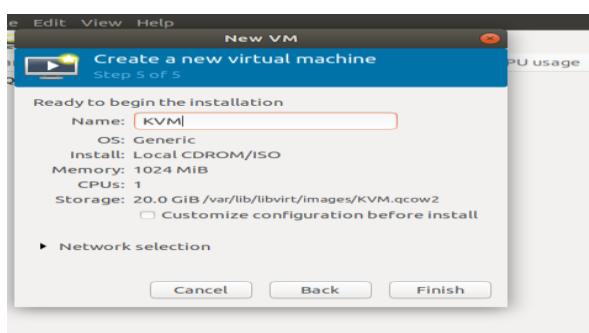
### Step 6: Enter the amount of RAM and the number of CPUs you wish to allocate to the VM and proceed to the next step.



**Step 7:** Allocate hard disk space to the VM. Click **Forward** to go to the last step.



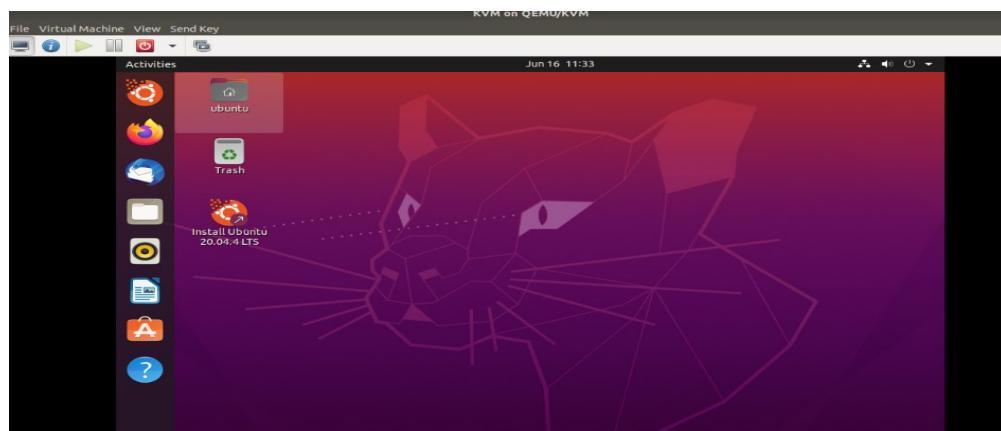
**Step 8:** Specify the name for your VM and click **Finish** to complete the setup.



**Step 9: Select language**

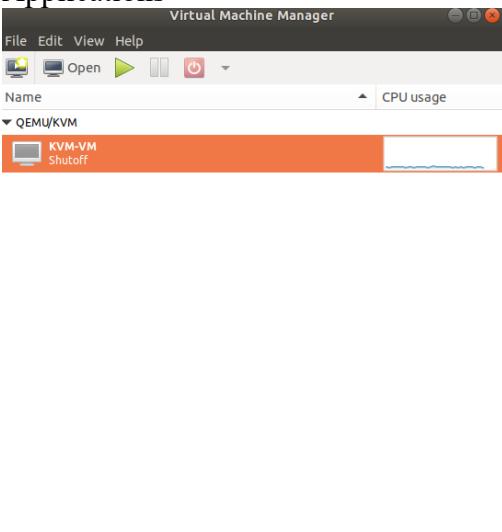


**Step 10:** The VM starts automatically, prompting you to start installing the OS that's on the ISO file.



**Step 11: Check the state of KVM**

```
mca@U40:~$ sudo virsh list --all
  Id  Name           State
-----+
   1  KVM           running
mca@U40:~$
```



```
mca@U40:~$ sudo virsh list --all
 Id  Name          State
 -   KVM           shut off
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 10

#### Aim

Installation of Docker on Ubuntu

#### Procedure

step 1: Open the terminal on Ubuntu.

step 2: Remove any Docker files that are running in the system, using the following command:

**\$ sudo apt-get remove docker docker-engine docker.io**

```
mca@S66:~$ sudo apt-get remove docker docker-engine docker.io
[sudo] password for mca:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package 'docker-engine' is not installed, so not removed
Package 'docker' is not installed, so not removed
Package 'docker.io' is not installed, so not removed
The following packages were automatically installed and are no longer required:
  debhelper dh-autoreconf dh-strip-nondeterminism libarchive-cpio-perl
  libfile-stripnondeterminism-perl libmail-sendmail-perl libpcre16-3
  libpcre3-dev libpcre32-3 libpcrecpp0v5 libssl-dev libssl-doc
  libsys-hostname-long-perl php-common php-pear php-xml php7.2-cli
  php7.2-common php7.2-json php7.2-opcache php7.2-readline php7.2-xml
  pkg-php-tools po-debconf shtool
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
mca@S66:~$
```

**Name: Neha Antony**

**Roll No:23**

**Batch:b**

**Date:23-05-2022**

step 3: Check if the system is up-to-date using the following command:

**\$ sudo apt-get update**

```
mca@S66:~$ sudo apt-get update
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 https://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Err:3 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403 Forbidden [IP: 185.125.190.52 80]
Ign:4 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 InRelease
Get:5 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,103 B]
Get:6 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease [15.4 kB]
Get:7 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release [2,495 B]
Get:8 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg [801 B]
Err:8 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg
  The following signatures were invalid: EXPKEYSIG 58712A2291FA4AD5 MongoDB 3.6 Release Signing Key <packaging@mongodb.com>
Reading package lists... Done
E: Failed to fetch http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu/dists/bionic/InRelease 403 Forbidden [IP: 185.125.190.52 80]
E: The repository 'http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
E: Repository 'http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease' changed its 'Label' value from 'Oracle Java (JDK) 8 / 9 Installer PPA' to 'Oracle Java (JDK) 8 Installer PPA (DISCONTINUED)'
N: This must be accepted explicitly before updates for this repository can be applied. See apt-secure(8) manpage for details.
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release: The following signatures were invalid: EXPKEYSIG 58712A2291FA4AD5 MongoDB 3.6 Release Signing Key <packaging@mongodb.com>
mca@S66:~$
```

Step 4: Install Docker using the following command:

**\$ sudo apt install docker.io**

```
mca@S66:~$ sudo apt install docker.io
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  debhelper dh-autoreconf dh-strip-nondeterminism libarchive-cpio-perl libfile-stripnondeterminism-perl libmail-sendmail-perl libpcre16-3
  libpcre3-dev libpcre32-3 libpcrecpp0v5 libssl-dev libssl-doc libsys-hostname-long-perl php-common php-pear php-xpm php7.2-cli
  php7.2-common php7.2-json php7.2-opcache php7.2-readline php7.2-xml pkg-php-tools po-debconf shtool
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  bridge-utils cgroupfs-mount ubuntu-fan
Suggested packages:
  aufs-tools btrfs-tools debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils cgroupfs-mount docker.io ubuntu-fan
0 upgraded, 4 newly installed, 0 to remove and 1 not upgraded.
Need to get 30.1 MB of archives.
After this operation, 137 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 bridge-utils amd64 1.5-15ubuntu1 [30.1 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu/universe amd64 cgroupfs-mount all 1.4 [6,320 B]
Get:3 http://in.archive.ubuntu.com/ubuntu/bionic/universe amd64 docker.io amd64 17.12.1-0ubuntu1 [30.1 MB]
Get:4 http://in.archive.ubuntu.com/ubuntu/bionic/main amd64 ubuntu-fan all 0.12.10 [34.7 kB]
Fetched 30.1 MB in 0s (25.2 MB/s)
Preconfiguring packages ...
Selecting previously unselected package bridge-utils.
(Reading database ... 173727 files and directories currently installed.)
Preparing to unpack .../bridge-utils_1.5-15ubuntu1_amd64.deb ...
Unpacking bridge-utils (1.5-15ubuntu1) ...
Selecting previously unselected package cgroupfs-mount.
Preparing to unpack .../cgroupfs-mount_1.4_all.deb ...
Unpacking cgroupfs-mount (1.4) ...
Selecting previously unselected package docker.io.
Preparing to unpack .../docker.io_17.12.1-0ubuntu1_amd64.deb ...
Unpacking docker.io (17.12.1-0ubuntu1) ...
Selecting previously unselected package ubuntu-fan.
Preparing to unpack .../ubuntu-fan_0.12.10_all.deb ...
Unpacking ubuntu-fan (0.12.10) ...
```

Step 5: Install all the dependency packages using the following command:

**\$ sudo snap install docker**

```
mca@S66:~$ sudo snap install docker
snap "docker" is already installed, see 'snap help refresh'
```

Step 6: Before testing Docker, check the version installed using the following command:

**\$ docker --version**

```
mca@S66:~$ docker --version
Docker version 17.12.1-ce, build 7390fc6
```

Step 7: Pull an image from the Docker hub using the following command:

**\$ sudo docker run hello-world**

```
mca@S66:~$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:80f31da1ac7b312ba29d65080fddf797dd76acfb870e677f390d5acba9741b17
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
 https://hub.docker.com/

For more examples and ideas, visit:
 https://docs.docker.com/get-started/
```

Step 8: Check if the docker image has been pulled and is present in your system using the following command:

**\$ sudo docker images**

```
mca@S66:~$ sudo docker images
REPOSITORY      TAG          IMAGE ID      CREATED       SIZE
hello-world    latest        feb5d9fea6a5   8 months ago  13.3kB
```

Step 9: To display all the containers pulled, use the following command:

**\$ sudo docker ps -a**

```
nca@S66:~$ sudo docker ps -a
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
caf96eb1efaa        hello-world        "/hello"           6 minutes ago     Exited (0) 6 minutes ago
nca@S66:~$
```

Step 10: To check for containers in a running state, use the following command:

```
$ sudo docker ps
```

```
mca@s66:~$ sudo docker ps
CONTAINER ID        IMAGE               COMMAND       CREATED          STATUS          PORTS          NAMES
mca@s66:~$
```

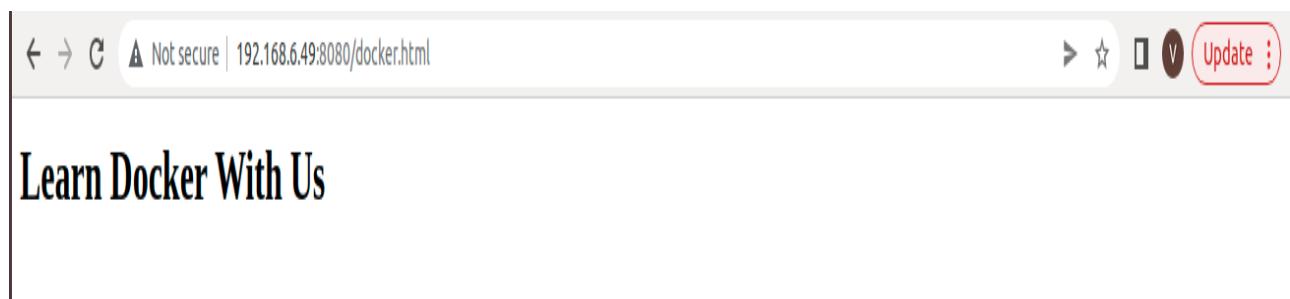
```
step 11: sudo docker run -dit --name tecmint-web -p 8080:80 -v /home/user/website/:/usr/local/apache2/htdocs/ httpd:2.4
```

```
mca@T70:~$ sudo docker run -dit --name tecmint-web -p 8080:80 -v /home/user/website/:/usr/local/apache2/htdocs/ httpd:2.4
Unable to find image 'httpd:2.4' locally
2.4: Pulling from library/httpd
214ca5fb9032: Pull complete
7cf31a2eeec6: Pull complete
bf666e57b9f2: Pull complete
c15a4e94ae6b: Pull complete
dc25474c7f97: Pull complete
Digest: sha256:2d1f8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Status: Downloaded newer image for httpd:2.4
044e5fb945bf052ca05398fcad9e5b47ad46de63d78a1318faf4d2ca633df622
```

step 12: **\$ sudo docker ps**

```
mca@T70:~$ sudo docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS
AMES
044e5fb945bf      httpd:2.4          "httpd-foreground"   2 minutes ago    Up 2 minutes       0.0.0.0:8080->80/tcp, :::8080->80/tcp
ecmint-web
```

step 13 : \$ sudo gedit /home/user/website/docker.html



```
mca@T70:~$ sudo docker rm tecmint-web
tecmint-web
```

step 15: \$ sudo docker rm tecmint-web

```
mca@T70:~$ sudo docker rm tecmint-web
tecmint-web
```

step 16: \$ sudo docker image remove httpd:2.4

```
mca@T70:~$ sudo docker image remove httpd:2.4
Untagged: httpd:2.4
Untagged: httpd@sha256:2d1f8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Deleted: sha256:c58ef9bfbb5789a9882cee610ba778b1368d21b513d6caf32e3075542e13fe81
Deleted: sha256:312672a18b7ce4fbbaa736a0e87a4a1cef47e3341b50cb3a0c5a865457347c10
Deleted: sha256:d67e67a5fbad035b2603029110722ed2af07c5ae52e741663c2d09cf6cc90e2c
Deleted: sha256:eb38b82c45692bc0a2e14adece681e2673d35f9ee5d047f498d0077d17a3bf68
Deleted: sha256:c21e2c36645f68249254b6d72c2ae0af5c1ba110a92d7b7b05c67ee4705cea49
Deleted: sha256:fd95118eade99a75b949f634a0994e0f0732ff18c2573fabdfc8d4f95b092f0e
mca@T70:~$ 
```