

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

*Lab Report Submitted By*

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**Reg. No.: AJC21-2068**

*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 JUSTIN V KALAPPURA (**Reg.No:AJC21-2068**) 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.

Jetty Benjamin

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## **NETWORKING & SYSTEM ADMINISTRATION LAB**

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

#### **Aim**

Familiarization of Hardware Components in a Computer.

**Name:** Justin v kalappura

**Roll No:** 10

**Batch:** RMCA

**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)**



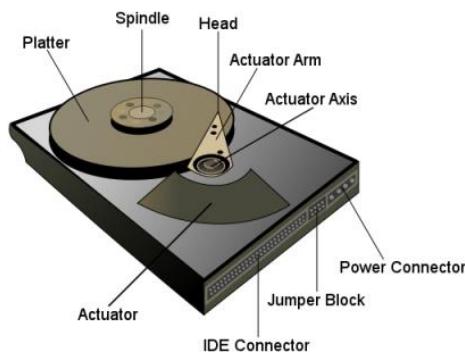
Short for network interface card, the NIC is also referred to as an Ethernet card and network adapter. A NIC is a computer expansion card for connecting to a network (e.g., home network or Internet) using an Ethernet cable with an RJ-45 connector.

## ➤ 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**



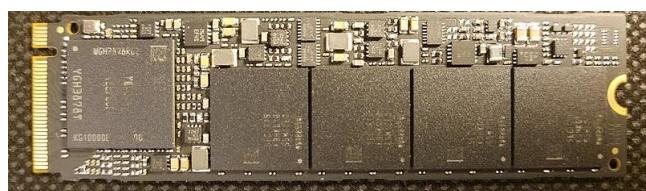
A power supply is an electrical appliance that provides the necessary power to operate a computer. Computers are powered by electricity, and the power supply converts the alternating current (AC) from the electric outlet into direct current (DC). The power supply in a computer can be an internal or external 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.

## Experiment No.: 2

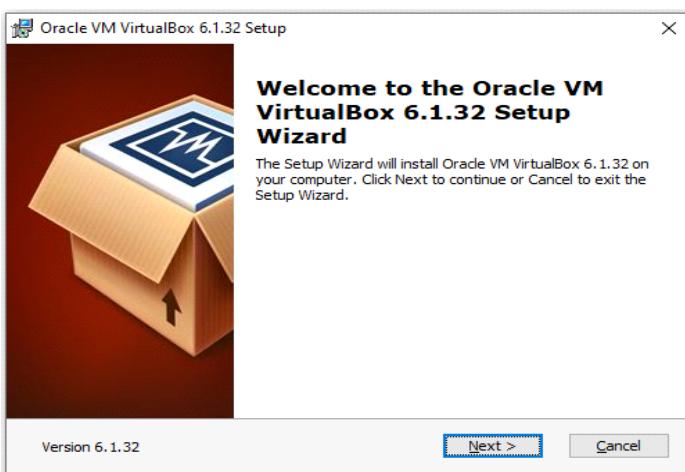
### Aim

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

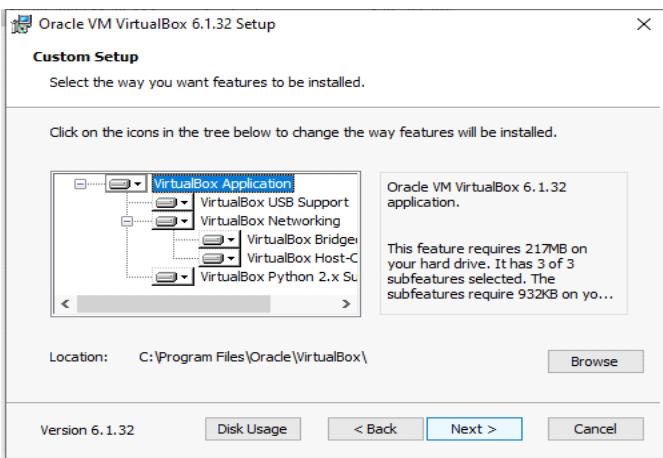
Name: Justin v kalappura  
Roll No: 10  
Batch: RMCA  
Date: 04-04-2022

### Procedure

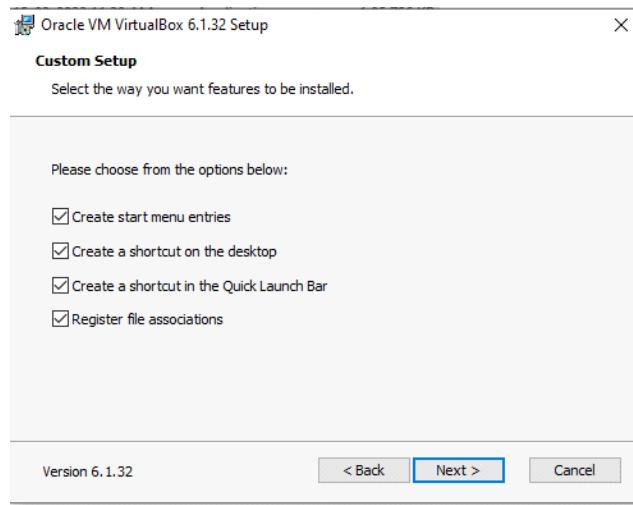
**Step 1:** Install VirtualBox, then click "Next".



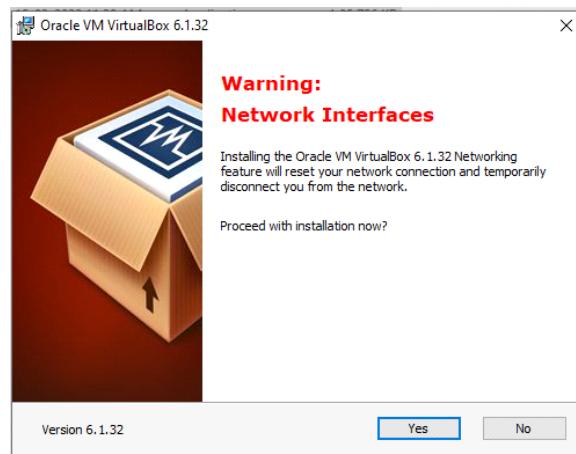
**Step 2:** Select features.



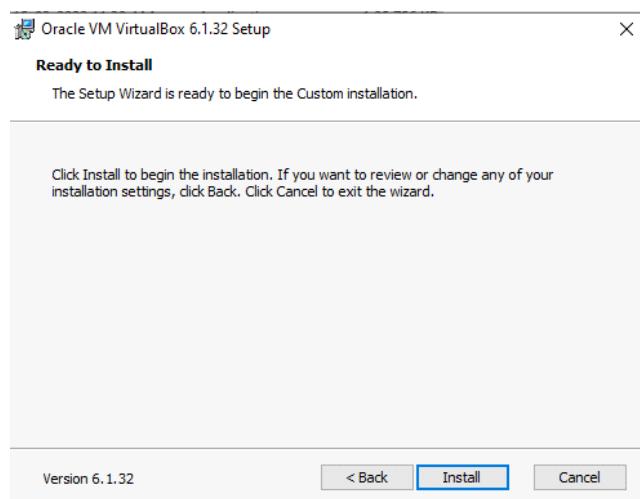
### Step 3: Choose the options.



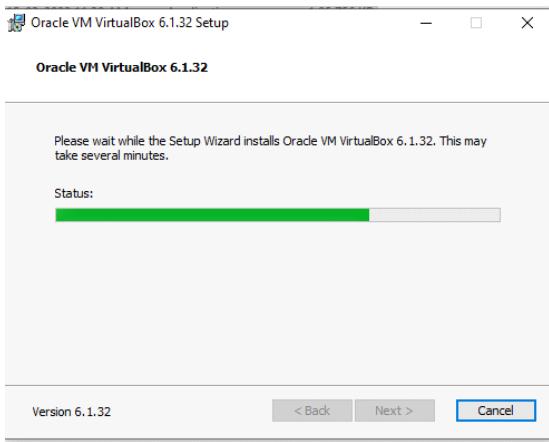
### Step 4: Proceeding installation.



### Step 5: Ready to install.



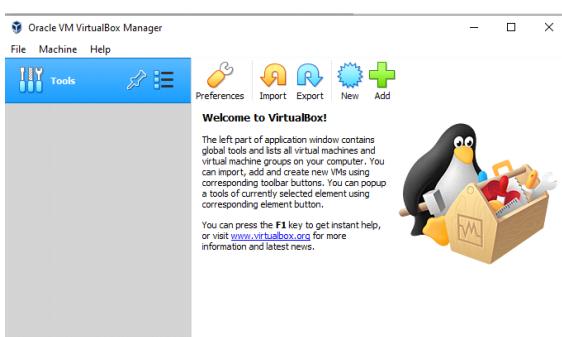
## Step 6: Installing the Oracle vm virtualBox.



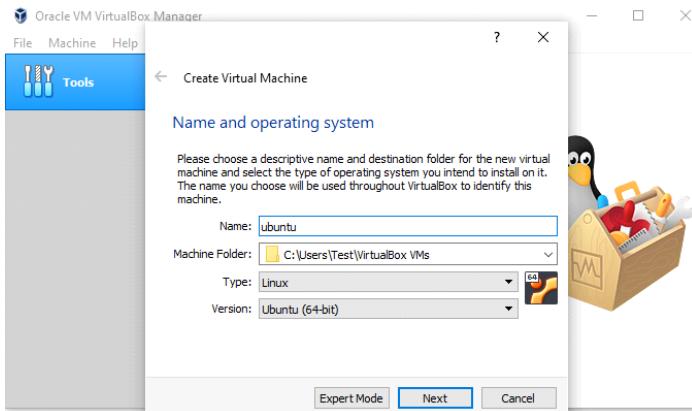
## Step 7: Installation finished.



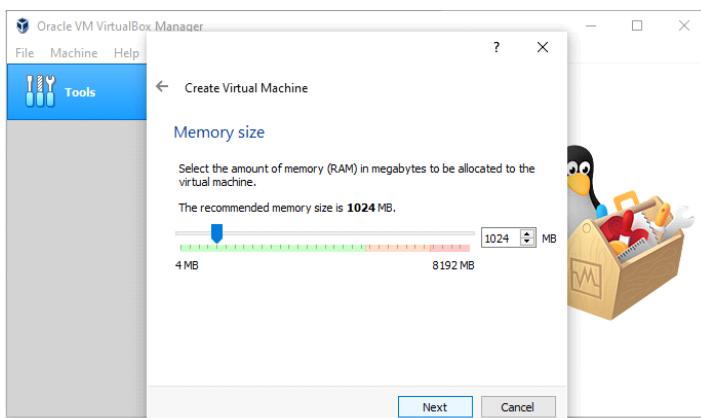
## Step 8: Open VirtualBox, then click "New" to create a virtual machine.



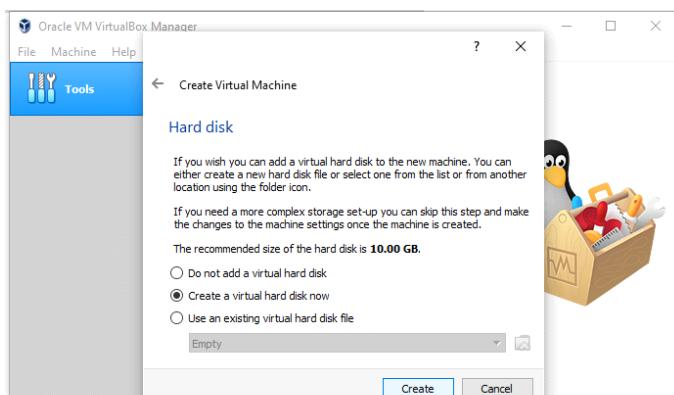
## Step 9: Enter "Ubuntu" as the name, select "Linux" as the type, and select Ubuntu (64-bit) as the version. Select any amount of memory you wish, but don't add more than 50 percent of your total RAM.



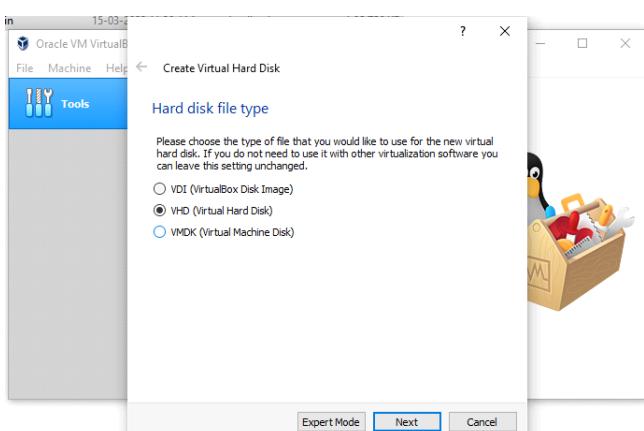
**Step 10:** We want to specify Memory size.



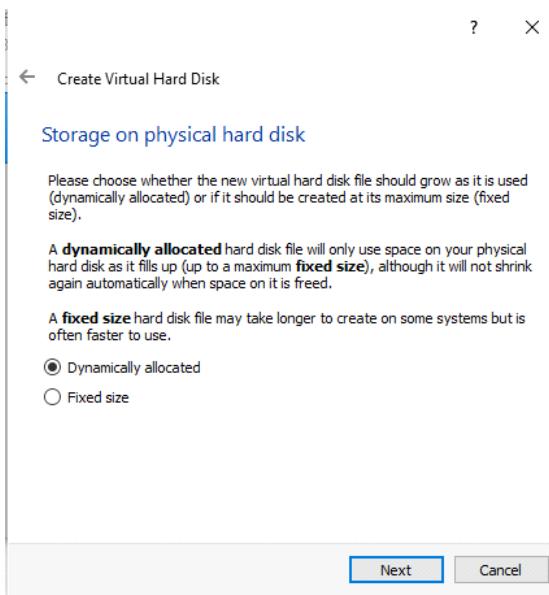
**Step 11:** Check the "Create a virtual hard disk now" option so we can later define our Ubuntu OS virtual hard disk size.



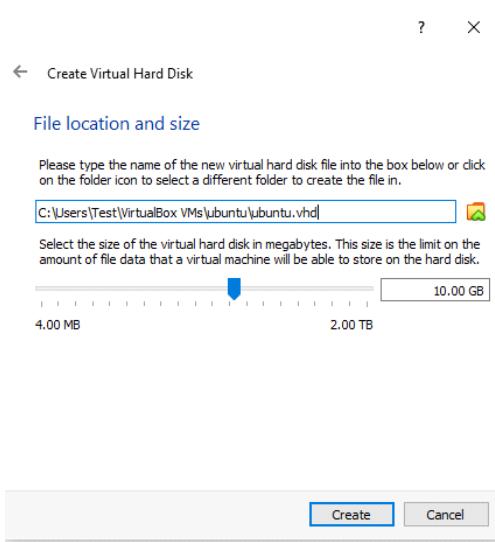
**Step 12:** Now, we want to select "VHD (Virtual Hard Disk)".



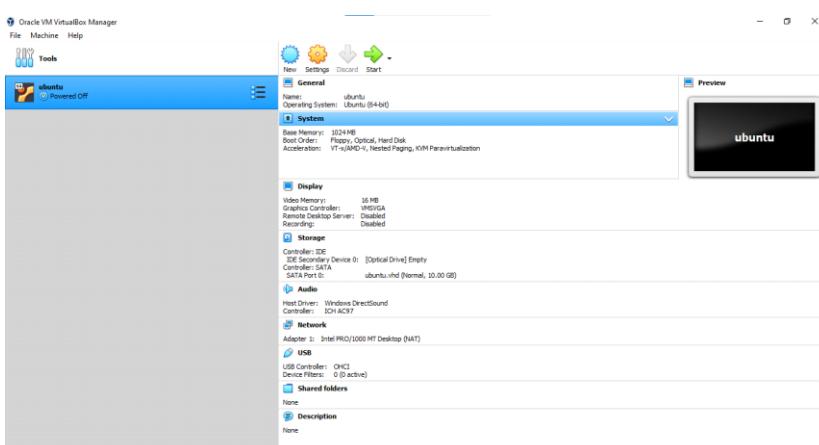
**Step 13:** Next, we'll dynamically allocate storage on our physical hard disk.



**Step 14:** We want to specify our Ubuntu OS's size. The recommended size is 10 GB, but you can increase the size if you wish.



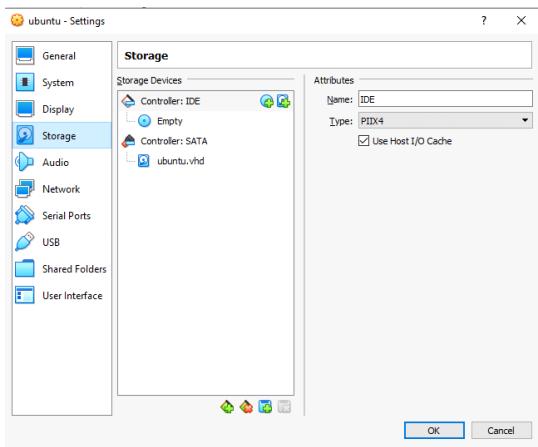
**Step 15:** After creating a virtual hard disk, you'll see Ubuntu in your dashboard.



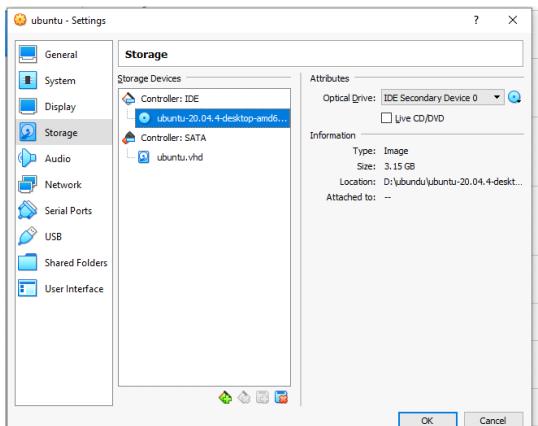
**Step 16:** Now, we have to set up the Ubuntu disk image file (.iso).

The Ubuntu disk image file can be downloaded here: Ubuntu OS download

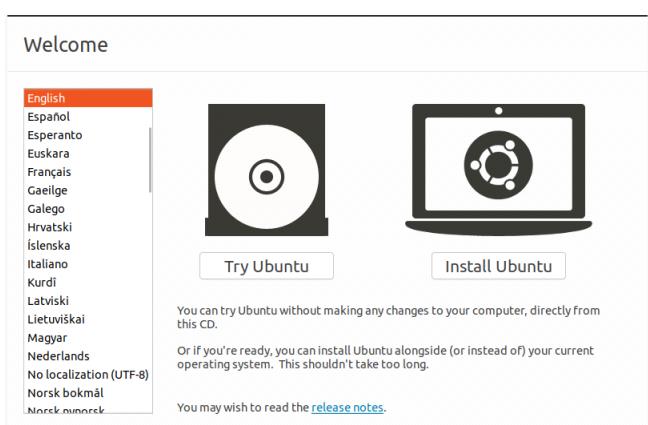
To set up the Ubuntu disk image file, go to settings and follow these steps: Click "Storage".



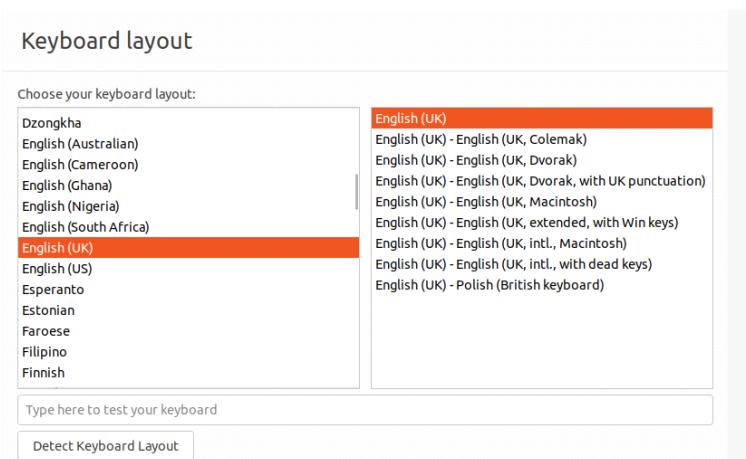
**Step 17:** In storage devices, click "Empty", then click the disk image and "Choose Virtual Optical Disk File" and Select the Ubuntu disk image file and open it. Click OK. Your Ubuntu OS is ready to install in VirtualBox. Let's start!



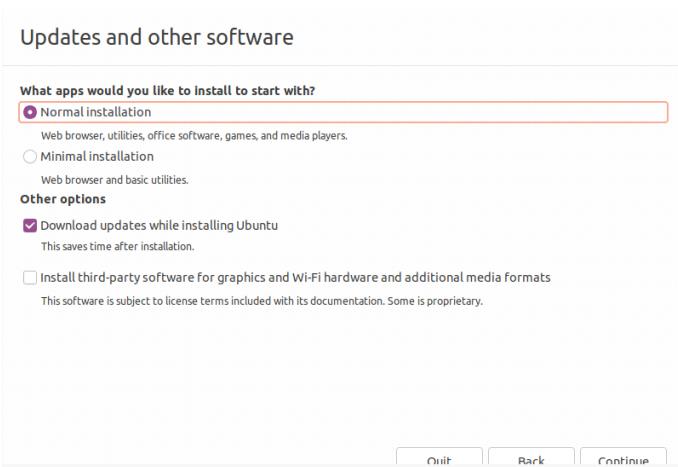
**Step 18:** Click Install Ubuntu.



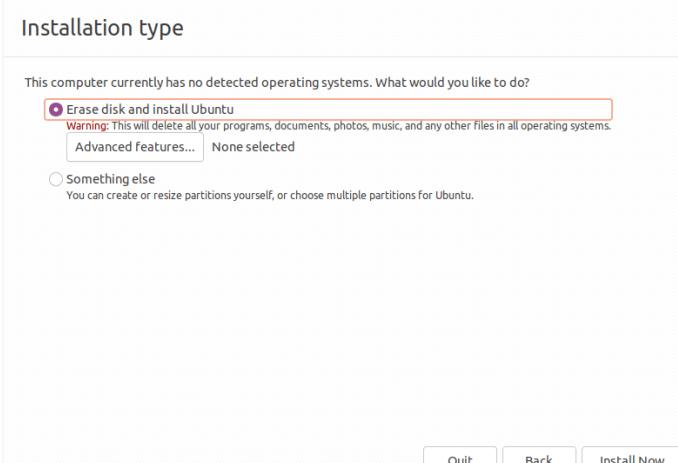
## Step 19: Select your keyboard layout.



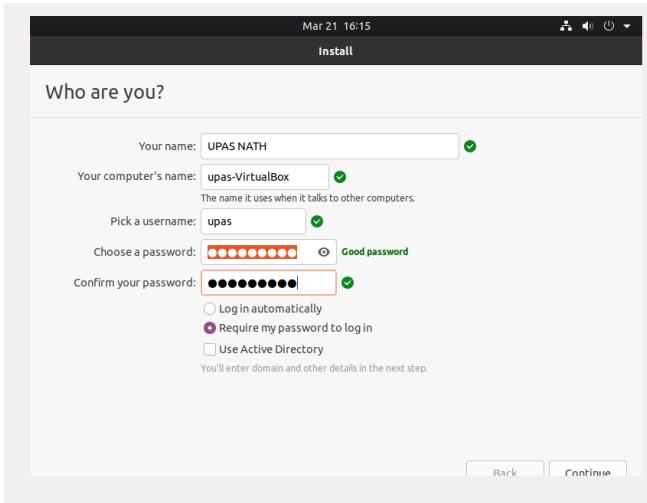
## Step 20: In the "Updates and other software" section, check "Normal installation" and continue.



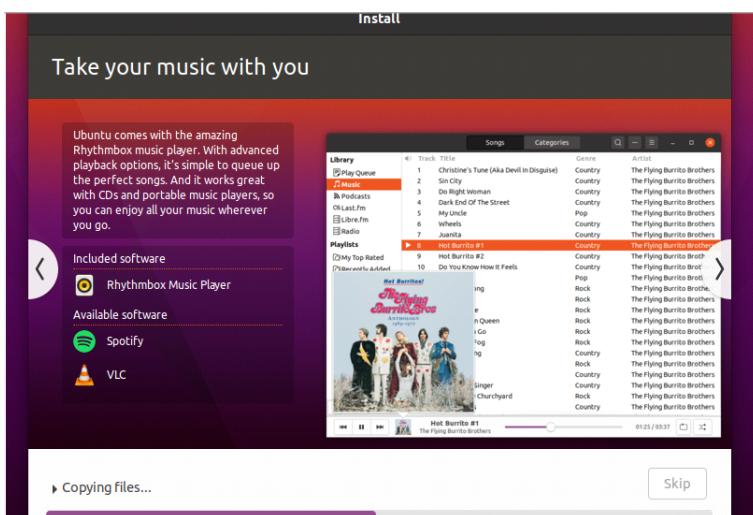
## Step 21: In "Installation type", check "Erase disk and install Ubuntu" and Click "Continue".



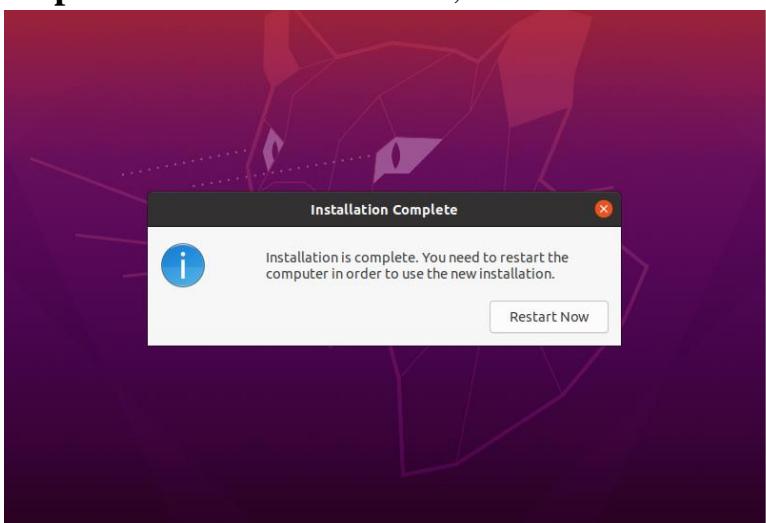
## Step 22: Now, set up your profile.



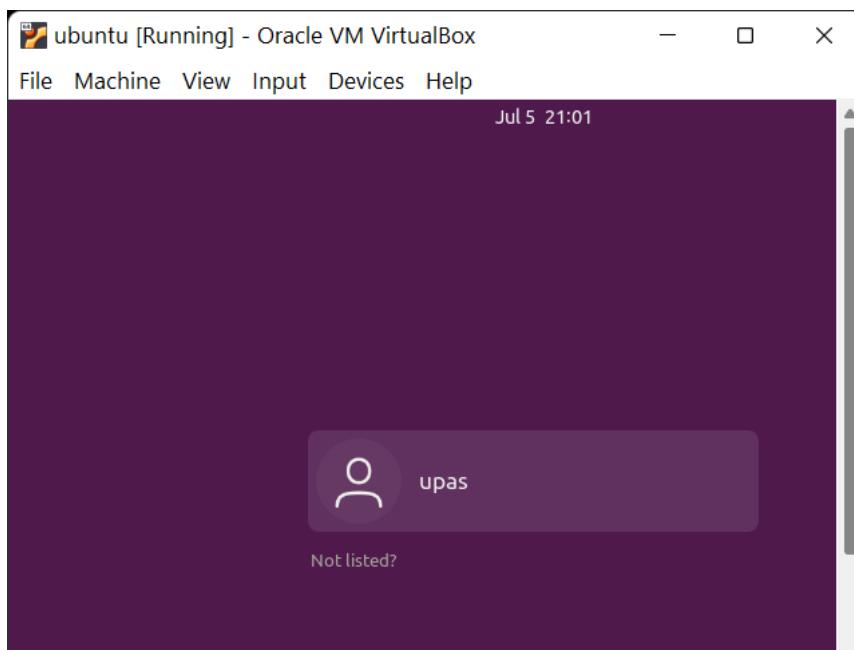
## Step 23: You'll see Ubuntu installing.



## Step 24: After the installation, restart it.

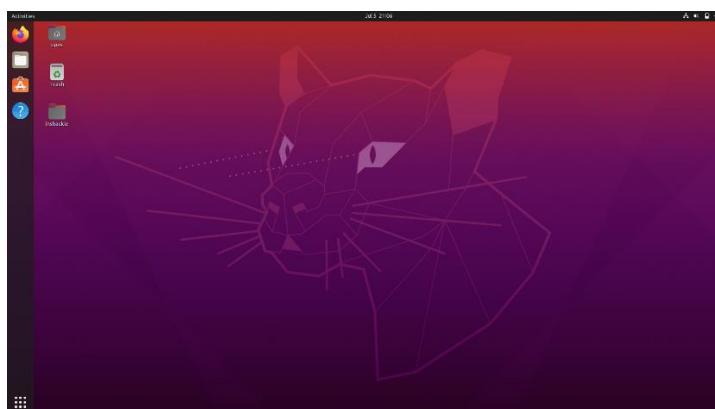


**Step 25:** After logging in, you'll see the Ubuntu desktop.



**Step 27:**

We have successfully installed Ubuntu in VirtualBox. It's ready to use for your future development projects.



## **NETWORKING & SYSTEM ADMINISTRATION LAB**

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

#### **Aim**

Familiarization of the linux commands.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 24/03/2022**

#### **Procedure**

##### **1. pwd**

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

Syntax :-    \$ pwd

Output :-

```
student@S47:~$ pwd  
/home/student
```

##### **2. mkdir**

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

Syntax :-    \$ mkdir<directory name>

Output :-

```
student@S47:~$ mkdir mca47
```

##### **3. ls**

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

Syntax :-    \$ ls

Output :-

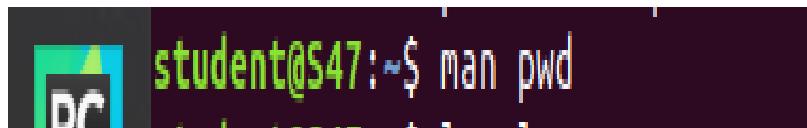
```
student@S47:~$ ls  
Desktop  Downloads  Firefox_wallpaper.png  Music  Public  snap  Videos  
Documents examples.desktop  mca47          Pictures  PycharmProjects  Templates
```

#### 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 :-



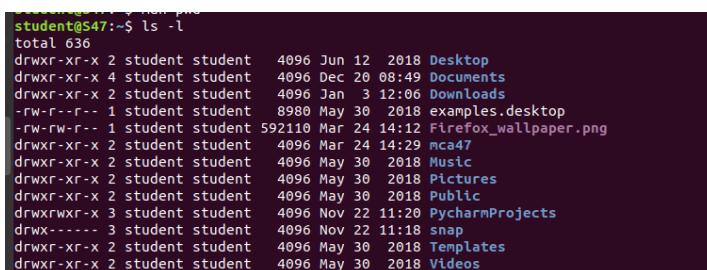
```
student@S47:~$ man pwd
```

#### 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:-



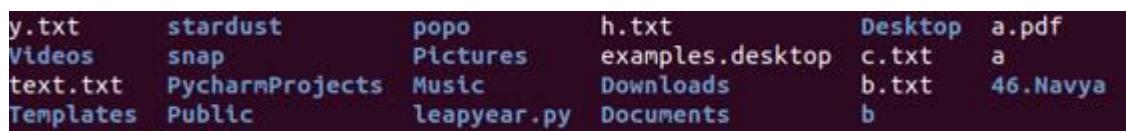
```
student@S47:~$ ls -l
total 636
drwxr-xr-x 2 student student 4096 Jun 12 2018 Desktop
drwxr-xr-x 4 student student 4096 Dec 20 08:49 Documents
drwxr-xr-x 2 student student 4096 Jan 3 12:06 Downloads
-rw-r--r-- 1 student student 8980 May 30 2018 examples.desktop
-rw-rw-r-- 1 student student 592110 Mar 24 14:12 Firefox_wallpaper.png
drwxr-xr-x 2 student student 4096 Mar 24 14:29 mca47
drwxr-xr-x 2 student student 4096 May 30 2018 Music
drwxr-xr-x 2 student student 4096 May 30 2018 Pictures
drwxr-xr-x 2 student student 4096 May 30 2018 Public
drwxrwxr-x 3 student student 4096 Nov 22 11:20 PycharmProjects
drwx----- 3 student student 4096 Nov 22 11:18 snap
drwxr-xr-x 2 student student 4096 May 30 2018 Templates
drwxr-xr-x 2 student student 4096 May 30 2018 Videos
```

#### 6. ls -r

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

Syntax :-    \$ls -r

Output :-



```
y.txt      stardust      popo      h.txt      Desktop      a.pdf
Videos      snap          Pictures  examples.desktop  c.txt      a
text.txt    PycharmProjects  Music    Downloads      b.txt      46.Navya
Templates   Public         leapyear.py  Documents      b
```

#### 7. ls -a

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

Syntax :-    \$ls -a

Output :-



```
student@S47:~$ ls -a
.           .bash_logout  .config     Downloads      .gnupg       .local     Music        .profile     snap      Videos
..          .bashrc       Desktop     examples.desktop .ICEauthority  mca47     .oracle_jre_usage  Public      .ssh
.bash_history .cache       Documents   Firefox_wallpaper.png .java       .mozilla    Pictures      PycharmProjects Templates
student@S47:~$
```

**8. ls -al**

This command is used to

Syntax :-    \$ ls -al

Output :-

```
student@S47:~$ ls -al
total 188
drwxr-xr-x 27 student student 4096 Mar 24 14:29 .
drwxr-xr-x  7 root    root    4096 Jan 13 14:42 ..
drwxrwxr-x  2 student student 4096 Feb 25 13:00 46.Navya
-rw-r--r--  1 student student   0 Jan 18 2020 a
-rw-r--r--  1 student student   0 Jan 18 2020 a.pdf
drwxr-xr-x  2 student student 4096 Jan 14 2020 b
-rw-----  1 student student 11952 Nov 24 10:07 .bash_history
-rw-r--r--  1 student student  220 Jan  3 2020 .bash_logout
-rw-r--r--  1 student student 3771 Jan  3 2020 .bashrc
-rw-r--r--  1 student student    6 Jan 14 2020 b.txt
drwx----- 20 student student 4096 Nov 18 09:38 .cache
drwx----- 19 student student 4096 Nov 22 08:55 .config
-rw-r--r--  1 student student   25 Jan 14 2020 c.txt
drwxr-xr-x  7 student student 4096 Nov 19 11:55 Desktop
drwxr-xr-x  2 student student 4096 Dec 20 10:50 Documents
```

**9. ls -t**

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

Syntax :-    \$ ls -t

Output :-

```
student@S47:~$ ls -t
mca47          Downloads PycharmProjects Desktop Pictures Templates examples.desktop
Firefox_wallpaper.png Documents snap           Music   Public   Videos
student@S47:~$ cd mca47
```

**10. cd**

This command is used to change the current directory.

Syntax :-    \$ cd <directory name>

Output :-

```
student@S47:~$ cd mca47
student@S47:~/mca47$ cd ..
```

**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 ..

**Output :-**

```
student@S47:~/mca47$ cd ..
student@S47:~$ cd .
student@S47:~$
```

## 12. cd –

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

Syntax :-    \$ cd –

**Output :-**

```
student@S47:~/mca47$ cd ..
student@S47:~$ cd .
student@S47:~/mca47$
```

## 13. cat > filename

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

Syntax :-    \$ cat > filename.txt

**Output :-**

```
student@S47:~/mca47$ cat > Bbatch.txt
B batch student welcome to our new world
^Z
[1]+ Stopped cat > Bbatch.txt
```

## 14. cat filename

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

Syntax :-    \$ cat filename.txt

**Output :-**

```
student@S47:~/mca47$ cat >> Bbatch.txt
he lo guyzz lets enjoy
^Z
[2]+ Stopped cat >> Bbatch.txt
```

## 15. cat>>filename

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

Syntax :-    \$ cat >> filename.txt

Output :-

```
student@S47:~/mca47$ cat Bbatch.txt
B batch student welcome to our new world
he lo guyzzz lets enjoy
student@S47:~/mca47$ cat Bbatch.txt > Abatch.txt
```

## 16. cat filename1 > filename2

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

Syntax :-    \$ cat filename1 > filename2

Output :-

```
student@S47:~/mca47$ cat Bbatch.txt > Abatch.txt
student@S47:~/mca47$ ^[[2~
```

## **NETWORKING & SYSTEM ADMINISTRATION LAB**

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

#### **Aim**

Familiarization of the linux commands.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 21/04/2022**

#### **Procedure**

##### **1. read**

This command is used to read the content of a line to a variable.

Syntax :-    \$ read variablename

Output :-

```
student@s40:~$ read name
My name is sreekutty
student@s40:~$ echo $name
My name is sreekutty
```

##### **4. find**

This command is used to display contents of particular directory.

Syntax :-    \$ find filename.txt

Output :-

```
student@s40:~$ find marvel2
marvel2
```

##### **5. grep**

This command will let you search through all the text in a given file.

Syntax :-    \$ grep word filename.txt

Output:-

```
student@s40:~$ grep maths mark1
maths 78
```

**grep -i**

command used for a case insensitive search

Syntax: \$ grep -i filename.txt

Output:

```
student@S40:~$ grep -i THOR marvel1
thor
```

**grep -v**

command used for inverted search.

Syntax: \$ grep -v filename.txt

Output:

```
student@S40:~$ grep -v hulk marvel1
captain america
iron man
thor
black widow
spider man
```

**grep -A1**

command used to display line after the result.

Syntax: \$ grep -A1 filename.txt

Output:

```
student@S40:~$ grep -A1 thor marvel1
thor
black widow
```

**grep -B1**

command used to display line before the result.

Syntax: \$ grep -B1 filename.txt

Output:

```
student@S40:~$ grep -B1 thor marvel1
iron man
thor
```

**grep -C1**

command used to display line before and after the result.

Syntax: \$ grep -C1 filename.txt

Output:

```
student@S40:~$ grep -C1 thor marvel1
iron man
thor
black widow
```

## 9. wc -word count

This command is used for counting purpose which is used to find the number of lines, the number of words, the number of characters and the number of bytes.

**wc -l** (count number of lines)

**wc -w** (count number of words)

**wc -c** (count number of characters)

**wc -m** (count number of bytes)

Syntax :-      \$ wc -l filename.txt

                  \$ wc -w filename.txt

                  \$ wc -c filename.txt

                  \$ wc -m filename.txt

Output :-

```
student@S40:~$ wc -l marvel1
6 marvel1
student@S40:~$ wc -w marvel1
10 marvel1
student@S40:~$ wc -c marvel1
60 marvel1
student@S40:~$ wc -m marvel1
60 marvel1
```

## 6. df

This command is used to get a report on system disc space usage.

Syntax :-      \$ df filename.txt

Output :-

```
student@S40:~$ df mark1
Filesystem      1K-blocks    Used Available Use% Mounted on
/dev/sda6      114460828  54815724  53787724  51% /
```

**7. df -m**

This command is used to see the report in mega bytes.

Syntax :-      \$ df -m filename.txt

Output :-

```
student@s40:~$ df -m mark1
Filesystem      1M-blocks  Used Available Use% Mounted on
/dev/sda6          111779  53532     52528  51% /
```

**9. wc -word count**

This command is used for counting purpose which is used to find the number of lines, the number of words, the number of characters and the number of bytes.

**wc -l** (count number of lines)

**wc -w** (count number of words)

**wc -c** (count number of characters)

**wc -m** (count number of bytes)

Syntax :-      \$ wc -l filename.txt

                  \$ wc -w filename.txt

                  \$ wc -c filename.txt

                  \$ wc -m filename.txt

Output :-

```
student@s40:~$ wc -l marvel1
6 marvel1
student@s40:~$ wc -w marvel1
10 marvel1
student@s40:~$ wc -c marvel1
60 marvel1
student@s40:~$ wc -m marvel1
60 marvel1
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 5****Name: Justin v kalappura****Roll No: 10****Batch: B****Date: 31/03/2022****Aim**

Familiarization of the linux commands.

**Procedure****26.cut -d**

This command is used to cut and display the content based on the delimiter given.

Syntax :-    \$ cut -d delimiter -fieldnumber filename

Output :-

```
student@S47:~$ cat > mark.txt
english 49
science 43
hindi 49
maths 40
cs 50
^Z
[2]+  Stopped                  cat > mark.txt
student@S47:~$ cut -d ' ' -f2 mark.txt
49
43
49
40
...
50
```

**27. cut -b**

This command is used to cut and display the content based on the specified byte number.

Syntax :-    \$ cut -b bytelenumber filename

Output :-

```
student@S47:~$ cut -b 2 mark.txt
n
c
i
a
s
```

**28. cut --complement -c**

This command is used to erase the specified character and display the remaining content of the file.

Syntax :-    \$ cut --complement -c characternumber filename.txt

Output :-

```
student@S47:~$ cut --complement -c 1 mark.txt
nglish 49
nscience 43
indi 49
aths 40
s 50
```

## 29. paste

This command is used to paste the contents from the specified file.

Syntax :-    \$ paste filename

Output :-

```
student@S47:~$ cat > marvel1.txt
captain america
iron man
thor
spider man
black widow
^Z
[3]+ Stopped cat > marvel1.txt
student@S47:~$ cut > marvel2.txt
cut: you must specify a list of bytes, characters, or fields
Try 'cut --help' for more information.
student@S47:~$ cat > marvel2.txt
nebula
banda
dr strange
hulk
^Z
[4]+ Stopped cat > marvel2.txt
```

## 30. paste file1 file2 > file3

This command is used to paste the contents from the specified files to another file.

Syntax :-    \$ paste file1 file2 > file3

Output:-

```
student@S47:~$ paste marvel1.txt marvel2.txt > marvel3.txt
student@S47:~$ cat marvel3.txt
captain america nebula
iron man banda
thor dr strange
spider man hulk
black widow
```

## 31. paste -s

This command is used to paste the contents sequentially. It reads all the lines from the file and merges all these lines into a single line with each line separated by tab.

Syntax :-    paste -s file1 file2

Output :-

```
student@S47:~$ paste -s marvel1.txt marvel2.txt
captain america iron man thor spider man black widow
nebula banda dr strange hulk
```

## 32. paste -d

This command is used to paste the contents from the given files with the delimiter given.

Syntax :- \$ paste -d delimiter file1 file2

## Output :-

```
student@S547:~$ cat marvel3.txt
captain america nebula
iron man banda
thor dr strange
spider man hulk
black widow
student@S547:~$ paste -d '-' marvel1.txt marvel2.txt
captain america-nebula
iron man-banda
thor-dr strange
spider man-hulk
black widow-
student@S547:~$
```

33. more

This command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large.

Syntax :- \$ more filename

## Output :-

**student546:**- \$ cat > space.txt  
In olden days man worshipped Sun and Moon thinking them to be scared. But the scientists proved that the Sun is a star and the moon is a planet like other planets. After the atomic age man has entered the age of space travel.  
  
In 1957 the scientists succeeded in launching the first earth satellite into the outer surface. A Russian dog called Laika was the first living being to go into space. In April 1961 Yuri Gagarin of the USSR became the first man to make an orbit of the earth. USA then sent spacemen into the space. In 1969 Russia launched Lunik I. It passed within 6500 kms of the moon. It was the first space-ship which went into its own orbit round earth. In the same year the Russians landed Lunik 3 and Americans Ranger 7 on the moon.  
  
In July 1969 the American Apollo 11 landed on the moon with Neil Armstrong, Aldrin and Collins. Neil Armstrong was the first man to step on the moon. He was joined by Edwin Aldrin. They took photographs, collected rock and soil samples and returned to the earth safely.  
After atomic age dawned the space age. Man has been now using space to a great advantage. For example, travel through space by means of aeroplanes of various types has brought the world much closer. Now we can fly from one continent to another in a few hours. The progress in space technology and travel during the last three decades has almost been miraculous. During this period, several satellites and space craft's have been launched for various purposes. The launching of satellites in the space has revolutionized the means of mass communication like radio and T.V. broadcasting, but the possibility of use of space for military purpose s has been a source of constant worry.  
  
The space age began in 1957 with the successful launching of the Russian Satellite Sputnik-I. Then Sputnik-II was sent into space carrying the dog Lika. Space travel has immensely enriched our knowledge of the solar system. It has afforded us a new scientific understanding of our own planet, the earth, through photographs taken by the astronauts. In April 1961 Russian cosmonaut Yuri Gagarin made man's first space-flight. It was a milestone in space travel. In 1962 American astronaut John Glenn made three orbits of the earth in the space.  
  
The U.S. Ranger IV was the first unmanned spacecraft to reach the moon. The moon is our nearest neighbour. Therefore, it was quite natural that space scientists tried to reach the moon first of all. It was only on July 20, 1969 that two American astronauts could reach the moon in their space-ship Apollo-II. American astronaut Neil Armstrong became the first man to walk on the moon. He was followed by his co-astronaut Edwin Buzz Aldrin. The third co-astronaut Michael Collins remained in orbit commanding the module. The two astronauts stayed on the surface of the moon for about 21 hours collecting rock samples, etc. and then returned to the earth on July 24, 1969. The U.S. made second landing on the moon on November 14, 1969.  
  
In 1970 the Russians soft landed their unmanned Luna-II on the moon and then sent a first propelled space-ship on the Venus. The Americans again landed on the moon for the third time in 1971 in their space-craft Apollo-14. Then Apollo-15 landed on the moon for the fourth time. But the conquest of the moon is not enough. Man's quest of the space knows no limits and therefore, the flights to other planets continue. The Americans landed Pioneer-I in March 1972 on 21-month mission into space past Jupiter, Saturn, Uranus, Neptune and Pluto. It became the first man made object to escape the solar system. Apollo-16 made the fifth landing on the moon in 1972. The same year Apollo-17 landed on the moon in December. The two astronauts Cernan and Schmitt stayed there for 75 hours collecting various samples.  
  
Since man's last landing on the moon there have been scores of space-flights by the U.S. and the U.S.S.R. In 1978 the U.S.S.R. sent the first international crew in the space consisting a Russian and a Czech Cosmonaut. In 1979 the Soviet  
  
Cosmonauts succeeded in growing onion sprouts on board Salyut-6. In 1977 the U.S. launched Voyager-I to probe the outer space and the solar system. The Voyager-II was sent into space the same year past the planet 5 stars.  
  
Columbia, the first space-shuttle was launched by America on April 12, 1981 which returned to the earth after 54 hours in space. It is a multi-purpose reusable space craft which take off like a satellite and a glider. It can be used to launch satellites, contact, retrieve and repair space crafts in the orbit. The U.S. space craft Pioneer-10 was launched in June 1983 to travel for over past the planets and the sun amidst the stars. In 1984 the U.S. space shuttle challenger became the first space-craft to return from space to its launching site. Again spaceship retrieved and repaired an ailing solar Satellite April, 1984.  
  
Thus, great progress has been made in space travel in these years. The day is not far when the moon may be used as a Spring-board for deep research and travel to the other planets and neighbouring stars. But it is imperative that the various countries reach an agreement at the earliest so as to confine the use of space for peaceful purposes only.  
After atomic age dawned the space age. Man has been now using space to a great advantage. For example, travel through space by means of aeroplanes of various types has brought the world much closer. Now we can fly from one continent to another in a few hours. The progress in space technology and travel during the last three decades has almost been miraculous. During this period, several satellites and space craft's have been launched for various purposes. The launching of satellites in the space has revolutionized the means of mass communication like radio and T.V. broadcasting, but the possibility of use of space for military purpose s has been a source of constant worry.  
  
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Thus, great progress has been made in space travel in these years. The day is not far when the moon may be used as a Spring-board for deep research and travel to the other planets and neighbouring stars. But it is imperative that the various countries reach an agreement at the earliest so as to confine the use of space for peaceful purposes only.

### 34. more -number

This command is used to display the lines to the specified number from head.

Syntax :- \$ more -number

**Output :-**

```
student@546:~$ more -3 space.txt
In olden days man worshipped Sun and Moon thinking them to be scared. But the scientists proved that the Sun is a star and the moon is a planet like other planets. After the atomic age man has entered the age of space travel.

--More--(1%)
[9]+ Stopped                  more -3 space.txt
```

**35. more +number**

This command use the line number from where we want to displaying the text content.

**Syntax :-** \$ more +number

**Output :-**

```
student@546:~$ more +3 space.txt
In 1957 the scientists succeeded in launching the first earth satellite into the outer surface. A Russian dog called Laika was the first living being to go into space. In April 1961 Yuri Gagarin of the USSR became the first man to make an orbit of the earth. USA then sent spacemen into the space. In 1969 Russia launched Lunik I. It passed within 6500 kms of the moon. It was the first space-ship which went into its own orbit round earth. In the same year the Russians landed Lunik 3 and Americans Ranger 7 on the moon.

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Columbia, the first space-shuttle was launched by America on April 12, 1981 which returned to the earth after 54 hours in space. It is a multi-purpose reusable space craft which takes off like a satellite and a glider. It can be used to launch satellites, contact, retrieve and repair space crafts in the orbit. The U.S. space craft Pioneer-10 was launched in June 1983 to travel for over past the planets and the sun amidst the stars. In 1984 the U.S. space shuttle Challenger became the first space-craft to return from space to its launching site. Again spaceship retrieved and repaired an ailing solar Satellite April, 1984.

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--More--(27%)
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.:6****Aim**

Familiarization of the linux commands.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 04/04/2022**

**Procedure****36. cp**

This command is used to copy the contents from an existing file to a new file.

Syntax :-    \$ cp existing\_file\_name new\_filename

Output :-

```
student@s46:~$ cat star2.txt
Sun      Nebula
Alpha Centauri  Cateye
Galaxy   Helion
Supercluster  Stardust
Twinkle  Sapphire
student@s46:~$ cp star2.txt star3.txt
student@s46:~$ cat star3.txt
Sun      Nebula
Alpha Centauri  Cateye
Galaxy   Helion
Supercluster  Stardust
Twinkle  Sapphire
```

**37. cp -r**

This command is used to copy a directory along with its subdirectories.

Syntax :-    \$ cp -r source\_directory destination\_directory

Output :-

```
student@s46:~$ mkdir swethap
student@s46:~$ cd stardust
student@S46:~/stardust$ ls
a.txt  b.txt  y.txt  z1.txt  z.txt
student@S46:~/stardust$ cd ..
student@s46:~$ cp -r stardust swethap
student@s46:~$ cd swethap
student@S46:~/swethap$ ls
stardust
student@S46:~/swethap$ cd stardust
student@S46:~/swethap/stardust$ ls
a.txt  b.txt  y.txt  z1.txt  z.txt
```

## 38. cp overwriting

This method is used to overwrite the contents of an existing file from one directory to an existing file with the same name in another directory with the cp command.

Syntax :- \$ cp filename directoryname

Output :-

```
student@S46:~$ cat > new.txt
Writing some commands
^Z
[1]+  Stopped                  cat > new.txt
student@S46:~$ cd stardust
student@S46:~/stardust$ cat > new.txt
Content is copied
^Z
[2]+  Stopped                  cat > new.txt
student@S46:~/stardust$ cd ..
student@S46:~$ cp new.txt stardust
student@S46:~$ cat new.txt
Writing some commands
```

## 39. cp-i

This command is used to ask the confirmation message once before overwriting the file. We give ‘y’ or ‘n’ as the response.

Syntax :- \$ cp -i filename destination\_directory

Output :-

```
student@S46:~$ cp -i new.txt stardust
cp: overwrite 'stardust/new.txt'? n
```

## 40. mv

This command is used to move an existing file or directory from one location to another.

Syntax :- \$ mv filename directory\_name

Output:-

```
student@S46:~$ cd stardust
student@S46:~/stardust$ ls
a.txt b.txt new.txt y.txt z1.txt z.txt
student@S46:~/stardust$ cd ..
student@S46:~$ ls
46.Navya b Desktop examples.desktop mark.txt Pictures PycharmProjects snap star2.txt starnew.txt swetha text.txt
a b.txt Documents h.txt Music popo Sapphire space.txt star3.txt star.txt swethap Travel
a.pdf c.txt Downloads leapyear.py new.txt Public Sapphire.txt star1.txt stardust s.txt Templates Videos
student@S46:~$ mv space.txt stardust
student@S46:~$ ls
46.Navya b Desktop examples.desktop mark.txt Pictures PycharmProjects snap star3.txt star.txt swethap Travel
a b.txt Documents h.txt Music popo Sapphire star1.txt stardust s.txt Templates Videos
a.pdf c.txt Downloads leapyear.py new.txt Public Sapphire.txt star2.txt starnew.txt swetha text.txt
student@S46:~$ cd stardust
student@S46:~/stardust$ ls
a.txt b.txt new.txt space.txt y.txt z1.txt z.txt
```

## 41. mv overwriting

This method is used to overwrite the contents of an existing file from one directory to an existing file with the same name in another directory with the mv command.

Syntax :-    \$ mv filename directory\_name

Output :-

```
student@S46:~$ cd stardust
student@S46:~/stardust$ cat z1.txt
Hello World
student@S46:~/stardust$ cd ..
student@S46:~$ cat z1.txt
welcome
good morning
student@S46:~$ mv z1.txt stardust
student@S46:~$ cd stardust
student@S46:~/stardust$ cat z1.txt
welcome
good morning
```

## 21. head

This command is used to display the first 10 lines of the file by default.

Syntax :- \$ head filename

Output:-

```
student@S66:~$ head s.txt
PIP
A package
Downloading
Open
Once
Import
Find
Press y
Use the list
The try
```

## 22. head -number

This command is used to display the lines of the file to the specified number from head.

Syntax :-    \$ head -number filename

Output :-

```
student@S66:~$ head -4 s.txt
PIP
A package
Downloading
Open
```

## 23. tail

This command is used to display the last 10 lines of the file by default.

Syntax :-    \$ tail filename

Output :-

```
student@s66:~$ tail s.txt
Import
Find
Press y
Use the list
The try
The except
The else

Since
Without
```

## 24. tail -number

This command is used to display the lines of the file to the specified number from tail.

Syntax :-    \$ tail -number filename

Output :-

```
student@s66:~$ tail -4 s.txt
The else

Since
Without
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 7****Aim**

Familiarization of the linux commands.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 25/04/2022**

**Procedure****1. sudo useradd**

This command is used to add new user.

Syntax :-    \$ sudo useradd username

Output :-

```
mca@s47:~$ sudo useradd upas
[sudo] password for mca:
mca@s47:~$ sudo useradd upas
useradd: user 'upas' already exists
```

**2. sudo passwd**

This command is used to add password to the user.

Syntax :-    \$ sudo passwd username

Output :-

```
mca@s47:~$ passwd upas
passwd: You may not view or modify password information for upas.
mca@s47:~$ sudo passwd upas
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
```

**4. sudo usermod**

This command is used to add members.

Syntax :-    \$sudo usermod -G groupname username

Output :-

```
mca@s40:~$ sudo usermod -G we sree
```

## 7. delete

**sudo userdel username** - used to delete user.

**sudo groupdel groupname** - used to delete group name.

Syntax :-    \$ **sudo userdel username**

                  \$ **sudo groupdel groupname**

Output :-

```
mca@S47:~$ sudo userdel upas
```

```
mca@S47:~$ sudo groupdel MCA-C
```

## 9. chmod

This command is used change directory permission of files.

**chmod +rwx**

**chmod -wx**

**chmod -rwx**

Syntax :-        \$ chmod +wx filename

                  \$ chmod -wx filename

                  \$ chmod -rwx filename

Output :-

```
mca@S47:~$ chmod +rwx a4.txt
```

```
mca@S47:~$ chmod -rwx a4.txt
```

```
mca@S47:~$ cat >>a4.txt
```

```
bash: a4.txt: Permission denied
```

```
mca@S47:~$ █
```

## 10. chown

This command is used to give ownership to user .

Syntax :-

```
$ sudo chown username filename
```

Output :-

```
mca@S40:~$ cat > ds.txt
this is my page
^Z
[2]+  Stopped                  cat > ds.txt
mca@S40:~$ sudo chown sree ds.txt
[sudo] password for mca:
```

## 11. ls -l

This command is used to show the ownership details of particular file.

Syntax :-

```
$ ls -l filename.txt
```

Output :-

```
mca@S40:~$ ls -l ds.txt
-rw-rw-r-- 1 sree mca 17 Apr 25 15:03 ds.txt
```

## 12. ssh

This command is used to provide a secure encrypted connection between two hosts over an insecure network.

Syntax :-      \$ ssh mca@ipaddress

Output :-

```
mca@S40:~$ sudo ssh mca@192.168.6.46
The authenticity of host '192.168.6.46 (192.168.6.46)' can't be established.
ECDSA key fingerprint is SHA256:hQC0bgw7WBI7zuABHq2AKWIpGnXDeBBGWGvJqDHDPNY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.6.46' (ECDSA) to the list of known hosts.
mca@192.168.6.46's password:
Welcome to Ubuntu 18.04 LTS (GNU/Linux 4.15.0-23-generic x86_64)

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

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

8 packages can be updated.
0 updates are security updates.

Last login: Mon Apr 25 15:48:44 2022 from 192.168.6.63
mca@S46:~$ █
mca@S46:~$ ls
Desktop      google-chrome-stable_current_amd64.deb  tudo.txt  onumileeeeeeee.txt  Public      s.txt      Templates
Documents    iOAPData                         LATEX    onumillaaaaaa.txt  sedlife.txt  swethaGetOut.txt  Videos
Downloads    joelottan.txt                     mozilla.pdf oodikkonam.txt  snap        swethajiiiii.txt  w.txt
examples.desktop  tudo.py                         Music    Pictures          stebin.txt  swetha.txt
mca@S46:~$ exit
logout
Connection to 192.168.6.46 closed.
mca@S40:~$ █
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 8

#### Aim

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

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 04/04/2022**

#### Procedure

##### Step 1 : Create a Shell Script

```
mca@U40:~$ sudo gedit /usr/bin/script1.sh
[sudo] password for mca:
** (gedit:6524): WARNING **: 15:09:13.171: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo gedit /usr/bin/script1.sh
** (gedit:6563): WARNING **: 15:10:13.110: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:6563): WARNING **: 15:10:13.110: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:6563): WARNING **: 15:10:16.169: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo gedit /lib/systemd/system/shellscript1.service
** (gedit:6974): WARNING **: 15:19:49.748: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:6974): WARNING **: 15:19:49.749: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:6974): WARNING **: 15:19:52.538: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo systemctl daemon-reload
mca@U40:~$ sudo systemctl enable shellscript1.service
Created symlink /etc/systemd/system/multi-user.target.wants/shellscript1.service → /lib/systemd/system/shellscript1.service.
mca@U40:~$ sudo systemctl start shellscript1.service
mca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.service)
   Active: failed (Result: exit-code) since Thu 2022-06-16 15:21:38 U40
     Process: 7702 ExecStart=/usr/bin/script1.sh (code=ex
      Main PID: 7702 (code=exited, status=203/EXEC)
Jun 16 15:21:38 U40 systemd[1]: Started My Shell Script
Jun 16 15:21:38 U40 systemd[7702]: shellscript1.servic
Jun 16 15:21:38 U40 systemd[7702]: shellscript1.servic
Jun 16 15:21:38 U40 systemd[1]: shellscript1.service:
Jun 16 15:21:38 U40 systemd[1]: shellscript1.service:
[1]+  Stopped                  sudo systemctl status shellscript1.service
```

Add the following sample script.

```
#!/bin/bash
while true
do
sleep 10
done
```

Save script and set execute permission.

```
(gedit:7872): WARNING **: 15:20:21.705: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo chmod +x /usr/bin/script1.sh
```

**Step 2:** Create A SystemD File, and add the following content and update the script filename and location. You can also change the description of the service.

```
[Unit]
Description= My Shell Script

[Service]
ExecStart=/usr/bin/script1.s

[Install]
WantedBy=multi-user.target
```

### **Step 3: Enable New Service**

```
mca@U40:~$ sudo systemctl enable shellscript1.service
mca@U40:~$ sudo systemctl start shellscript1.service
mca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
  Loaded: loaded (/lib/systemd/system/shellscript1.se
  Active: active (running) since Thu 2022-06-16 15:27
    Main PID: 7913 (script1.sh)
      Tasks: 2 (limit: 4915)
     CGroup: /system.slice/shellscript1.service
             └─7913 /bin/bash /usr/bin/script1.sh
                 ├─7919 sleep 10
```

```
nca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.se
   Active: active (running) since Thu 2022-06-16 15:27
 Main PID: 7913 (script1.sh)
    Tasks: 2 (limit: 4915)
   CGroup: /system.slice/shellscript1.service
           └─7913 /bin/bash /usr/bin/script1.sh
               ├─7919 sleep 10

Jun 16 15:27:09 U40 systemd[1]: Started My Shell Script
Lines 1-10/10 (END)...skipping...
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2022-06-16 15:27:09 IST; 9s ago
 Main PID: 7913 (script1.sh)
    Tasks: 2 (limit: 4915)
   CGroup: /system.slice/shellscript1.service
           └─7913 /bin/bash /usr/bin/script1.sh
               ├─7919 sleep 10

Jun 16 15:27:09 U40 systemd[1]: Started My Shell Script.
~
~
~
~
~
~
~
~
~
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 9****Aim**

write shell script to print details

**Program**

```
#!/bin/bash
echo "enter your name"
read name
read $name
echo "course of studing"
read course
echo $course
echo "year of studing"
read yr
echo $yr
echo "entered details is:"
echo $name $course $yr
```

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Output:**

```
mca@s40:~/Documents/shell$ ./hello.sh
enter your name
sree
sree
course of studing
MCA
MCA
year of studing
2
2
entered details is:
sree MCA 2
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 10

#### Aim

write shell script to find largest of two numbers

#### Program

```
#!/bin/bash
echo "Enter the first number"
read a
echo "enter the second number"
read b
if [ $a -gt $b ]
then
echo $a" is largest"
else
echo $b "is largest"
fi
```

#### Output:

```
student@S47:~/Documents/mca-47$ ./largestoftwono.sh
Enter the 1st no:
20
Enter the 2nd no:
10
1st number is greater than 2nd
student@S47:~/Documents/mca-47$
```

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 11****Aim**

write shell script to find largest of three numbers

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

```
#!/bin/bash

echo "Enter the first number"
read a

echo "enter the second number"
read b

echo "enter the second number"
read c

if [ $a -gt $b ] && [ $a -gt $c]
then

    echo $a" is largest"
elif [ $b -gt $c ] && [ $b -gt $c]
then
    echo $b "is largest"
else
    echo $c "is largest"
fi
```

**Output:**

```
student@S47:~/Documents/mca-47$ ./oddoreven.sh
Enter the number:
10
Entered number is EVEN!!!!
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 12

#### Aim

write shell script to print sum of two numbers

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

#### Program

```
#!/bin/bash
echo "Enter the first number"
read num1
echo "enter the second number"
read num2
sum=$((num1+num2))
echo "the sum is:$sum"
```

#### Output:

```
student@S47:~/Documents/mca-47$ ./addtwonumber.sh
Enter the first no:
20
Enter the second no:
78
The sum of num1 + num2 =98
Greater than zero
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 13

#### Aim

write shell script to print number is even or odd

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

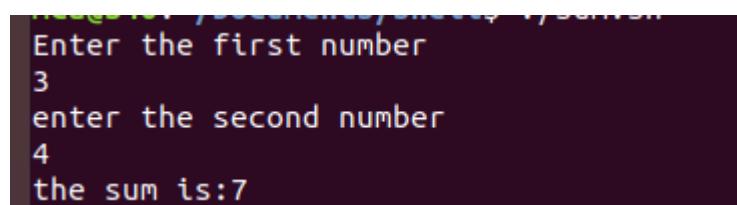
**Date: 05/05/2022**

#### Program

```
#!/bin/bash

echo "Enter the first number"
read a
r=$(( $a % 2 ))
if [ $r == 0 ]
then
echo "number is even"
else
echo "number is odd"
fi
```

#### Output:



```
Enter the first number
3
enter the second number
4
the sum is:7
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 14****Name: Justin v kalappura****Roll No: 10****Batch: B****Date: 05/05/2022****Aim**

write shell script to display current date and calender

**Program**

```
#!/bin/bash
echo "current date:"$(date)
echo "current year calender:"
cal
```

**Output:**

```
student@S40:~$ ./year.sh
current date:Mon May 9 15:15:22 IST 2022
current year 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
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 15****Aim**

write shell script to find number is greater ,less than or equal to another number.

**Program**

```
#!/bin/bash

echo "Enter first number :"

read num1

echo "Enter second number :"

read num2

if [ $num1 -gt $num2 ]

then

echo "First Number is Greatest!!"

elif [ $num1 -lt $num2 ]

then

echo "Second Number is greatest!!"

elif [ $num1 -eq $num2 ]

then

echo "First and Second Number is Equal.."

fi
```

**Output:**

```
student@S47:~/Documents/mca-47$ ./checkanum.sh
Enter 1st number:
20
Enter 2nd number:
10
./checkanum.sh: line 13: syntax error near unexpected token `elif'
./checkanum.sh: line 13: `elif [ $a -eq $b ]'
student@S47:~/Documents/mca-47$ ./checkanum.sh
Enter 1st number:
20
Enter 2nd number:
20
20 is equal to 20
[1]+  Killed                  gedit checkanum.sh
student@S47:~/Documents/mca-47$ ./checkanum.sh
Enter 1st number:
10
Enter 2nd number:
20
10 is lesser than 20
student@S47:~/Documents/mca-47$ ./checkanum.sh
Enter 1st number:
30
Enter 2nd number:
20
30 is greater than 20
student@S47:~/Documents/mca-47$
```

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 16****Aim**

write shell script to find sum of first 10 numbers.

**Program**

```
#!/bin/bash

echo "Enter Size(N)"

read N

i=1

sum=0

echo "Enter Numbers"

while [ $i -le $N ]

do

    read num      #get number

    sum=$((sum + num)) #sum+=num

    i=$((i + 1))

done

echo $sum

fi
```

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Output:**

```
Enter Size(N)
10
Enter Numbers
1
2
3
4
5
6
7
8
9
10
55
```

# NETWORKING & SYSTEM ADMINISTRATION LAB

## **Experiment No.: 17**

## Aim

write shell script to find the sum ,the average and the product of the four numbers.

**Name: Justin v kalappura**

Roll No: 10

**Batch: B**

Date: 05/05/2022

## Program

```
#!/bin/bash

echo "enter four integers"

read a b c d

sum=$(echo "$a + $b + $c + $d" | bc -l)

average=$(echo "$sum / 4" | bc -l)

product=$(echo "$a * $b * $c * $d" | bc -l)

echo "sum = $sum"

echo "Average = $average"

echo "Product = $product"
```

## Output:

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 18****Name: Justin v kalappura****Roll No: 10****Batch: B****Date: 05/05/2022****Aim**

write shell script to find factorial of a given number

**Program**

```
#!/bin/bash
echo "Enter a number"
read num

fact=1

while [ $num -gt 1 ]
do
    fact=$((fact * num)) #fact = fact * num
    num=$((num - 1))     #num = num - 1
done

echo $fact
```

**Output:**

```
student@S47:~/Documents/mca-47$ gedit factorial.sh
student@S47:~/Documents/mca-47$ chmod +x factorial.sh
student@S47:~/Documents/mca-47$ ./factorial.sh
Enter a number
21
factorial of 21 number is -4249290049419214848
student@S47:~/Documents/mca-47$ █
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 19****Aim**

write shell script to check whether the number is palindrome or not .

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

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

**Output:**

```
student@S47:~/Documents/mca-47$ ./palindrom.sh
Enter the number
234
432
Number is not palindrome
student@S47:~/Documents/mca-47$ ./palindrom.sh
Enter the number
212
212
Number is palindrome
student@S47:~/Documents/mca-47$
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 20****Aim**

write shell script to check whether the given year is leap year or not .

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

```
echo "enter the year :"
read y
a=`expr $y % 4`
b=`expr $y % 100`
c=`expr $y % 400`
# -eq is for equal to
#-ne is for not equal to
if [ $a -eq 0 -a $b -ne 0 -o $c -eq 0 ]
then
echo "$y is leap year"
else
echo "$y is not leap year"
fi
```

**Output:**

```
student@S47:~/Documents/mca-47$ ./leapyear.sh
LEAP YEAR
Enter a year:2023
2023 is not a leap year
student@S47:~/Documents/mca-47$ ./leapyear.sh
LEAP YEAR
Enter a year:2020
2020 is a leap year
student@S47:~/Documents/mca-47$
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 21****Aim**

write shell script to find sum of all digits in a number.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

```
#!/bin/bash
echo "Enter a number"
read num
s=0
while [ $num -gt 0 ]
do
mod=$((num % 10))
s=$((s +mod))
num=$((num / 10))
done
echo $s
```

**Output:**

```
student@S40:~/sum.sh
Enter a number
255
12
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 22****Aim**

write shell script to find the average of number of numbers entered in a given line.

**Name:Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

```
#!/bin/bash
echo "Enter size"
read size
i=1
s=0
echo "Enter Numbers"
while [ $i -le $size ]
do
read num
s=$((s+num))
i=$((i+1))
done
avg=$(echo $s / $size | bc -l)
echo $avg
```

**Output:**

```
Enter size
3
Enter Numbers
1
2
3
2.00000000000000000000000000000000
```

**NETWORKING & SYSTEM ADMINISTRATION LAB****Experiment No.: 23****Aim**

write shell script to find addition using switch case.

**Name:Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 05/05/2022**

**Program**

```
#!/bin/bash
echo "Enter two numbers"
read a
read b
echo "Enter choice :"
echo "1. addition"
echo "2.Substraction"
echo "3.Multiplication"
echo "4.Division"
read ch
case $ch in
    1)res=`echo $a + $b | bc`;;
    2)res=`echo $a - $b | bc`;;
    3)res=`echo $a \* $b | bc`;;
    4)res=`echo "scale=2; $a / $b" | bc`;;
esac
echo "Result : $res"
```

## Output:

```
student@S47:~/Documents/mca47$ ./switchcase.sh
Enter Two numbers :
2
3
Enter Choice :
1. Addition
2. Subtraction
3. Multiplication
4. Division
1
Result is : 5
student@S47:~/Documents/mca47$ ./switchcase.sh
Enter Two numbers :
2
3
Enter Choice :
1. Addition
2. Subtraction
3. Multiplication
4. Division
2
Result is : -1
student@S47:~/Documents/mca47$ ./switchcase.sh
Enter Two numbers :
2
3
Enter Choice :
1. Addition
2. Subtraction
3. Multiplication
4. Division
3
Result is : 6
student@S47:~/Documents/mca47$ ./switchcase.sh
Enter Two numbers :
2
2
3
Enter Choice :
1. Addition
2. Subtraction
3. Multiplication
4. Division
4
Result is : .66
student@S47:~/Documents/mca47$ █
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 24

#### Aim

Install Linux, Apache, MySQL, PHP (LAMP) stack on Ubuntu 18.04

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 13/06/2022**

#### 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
602 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

#### **Step 2 : 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: sudo ufw 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

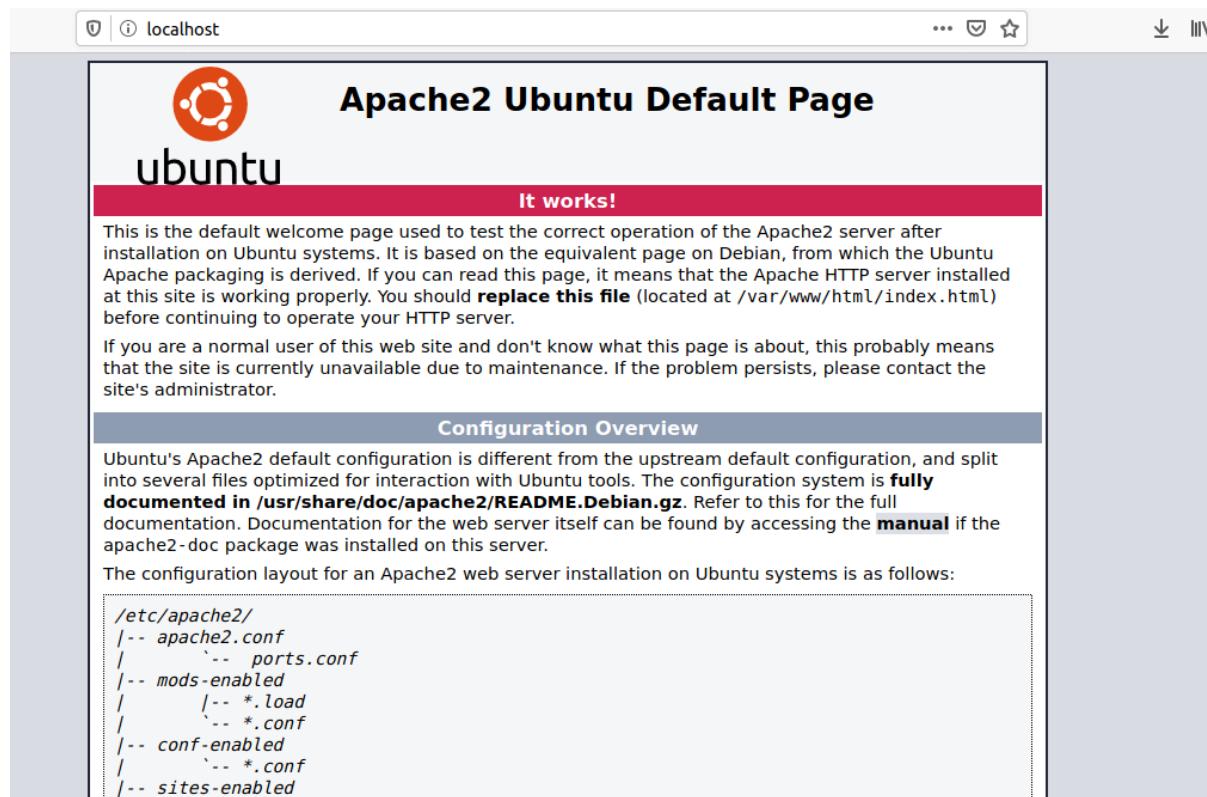
Syntax: sudo ufw allow "Apache Full"

## 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 libcgifast-perl libcgipm-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 libcgifast-perl libcgipm-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: \$ sudo mysql

## 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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affiliates. Other names may be trademarks of their respective
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-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 2:7.5 [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 in
stalled or GVfs metadata are not supported on this platform. In the latter case, you should configure Tepl with --disable-gvfs-metadata.
mca@ajce:~$ █
```

System	Linux ajce 5.4.0-26-generic #30-Ubuntu SMP Mon Apr 20 16:58:30 UTC 2020 x86_64
<b>Build Date</b>	Mar 2 2022 15:36:52
<b>Server API</b>	Apache 2.0 Handler
<b>Virtual Directory Support</b>	disabled
<b>Configuration File (php.ini) Path</b>	/etc/php/7.4/apache2
<b>Loaded Configuration File</b>	/etc/php/7.4/apache2/php.ini
<b>Scan this dir for additional .ini files</b>	/etc/php/7.4/apache2/conf.d
<b>Additional .ini files parsed</b>	/etc/php/7.4/apache2/conf.d/10-mysqli.ini, /etc/php/7.4/apache2/conf.d/10-opcache.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-finfo.ini, /etc/php/7.4/apache2/conf.d/20-ftp.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-json.ini, /etc/php/7.4/apache2/conf.d/20-mysqli.ini, /etc/php/7.4/apache2/conf.d/20-posix.ini, /etc/php/7.4/apache2/conf.d/20-phar.ini, /etc/php/7.4/apache2/conf.d/20-readline.ini, /etc/php/7.4/apache2/conf.d/20-shmop.ini, /etc/php/7.4/apache2/conf.d/20-sockets.ini, /etc/php/7.4/apache2/conf.d/20-sysmsg.ini, /etc/php/7.4/apache2/conf.d/20-sysvsem.ini, /etc/php/7.4/apache2/conf.d/20-sysvshm.ini, /etc/php/7.4/apache2/conf.d/20-tokenizer.ini
<b>PHP API</b>	20190902
<b>PHP Extension</b>	20190902
<b>Zend Extension</b>	320190902
<b>Zend Extension Build</b>	API320190902.NTS
<b>PHP Extension Build</b>	API20190902.NTS
<b>Debug Build</b>	no
<b>Thread Safety</b>	disabled
<b>Thread Signal Handling</b>	disabled

## 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%[=====] 2.08M/s
```

```
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: \$ sudo mysql

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
-> 
```

## 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> CREATE DATABASE wordpress DEFAULT CHARACTER SET utf8 COLLATE utf8_unicode_ci;
ERROR 1067 (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 wp-config.php

sudo rm -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: \$sudo systemctl restart apache2.service  
\$ sudo systemctl restart mysql.service

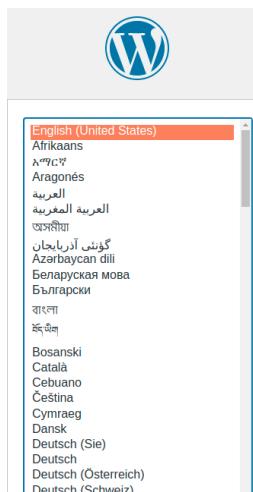
#### Output:

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



Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

**Information needed**

Please provide the following information. Do not worry, you can always change these settings later.

**Site Title** Example

**Username** Upasnath

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

**Password** Upasnath@#@  
Strong

**Your Email** Upasnath@gmail.com

Important: You will need this password to log in. Please store it in a secure location.

**Search engine visibility**  Discourage search engines from indexing this site  
It is up to search engines to honor this request.

Activities

Mon 16:42

localhost/wp-login.php

Username or Email Address  
Upasnath@gmail.com

Password

Remember Me

Log In

Lost your password?  
.. Go to Example

Dashboard

Welcome to WordPress!

Learn more about the 6.0 version.

**Author rich content with blocks and patterns**

Block patterns are pre-configured block layouts. Use them to get inspired or create new pages in a flash.

[Add a new page](#)

**Customize your entire site with block themes**

Design everything on your site — from the header down to the footer, all using blocks and patterns.

[Open site editor](#)

**Switch up your site's look & feel with Styles**

Tweak your site, or give it a whole new look! Get creative — how about a new color palette or font?

[Edit styles](#)

**PHP Update Recommended**

Your site is running an insecure version of PHP (7.2.3-1ubuntu1), which should be updated.

**What is PHP and how does it affect my site?**

PHP is the programming language used to build and maintain WordPress. Newer versions of PHP

**Quick Draft**

Title

Content

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 25

#### Aim

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

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 04/04/2022**

#### Procedure

##### **Step 1 : Create a Shell Script**

```
mca@U40:~$ sudo gedit /usr/bin/script1.sh
[sudo] password for mca:
** (gedit:6524): WARNING **: 15:09:13.171: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo gedit /usr/bin/script1.sh
** (gedit:6563): WARNING **: 15:10:13.110: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:6563): WARNING **: 15:10:13.110: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:6563): WARNING **: 15:10:16.169: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo gedit /lib/systemd/system/shellscript1.service
** (gedit:6974): WARNING **: 15:19:49.748: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:6974): WARNING **: 15:19:49.749: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:6974): WARNING **: 15:19:52.535: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo systemctl daemon-reload
mca@U40:~$ sudo systemctl enable shellscript1.service
Created symlink /etc/systemd/system/multi-user.target.wants/shellscript1.service → /lib/systemd/system/shellscript1.service.
mca@U40:~$ sudo systemctl start shellscript1.service
mca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.se
   Active: failed (Result: exit-code) since Thu 2022-0
     Process: 7702 ExecStart=/usr/bin/script1.ah (code=ex
Main PID: 7702 (code=exited, status=203/EXEC)

Jun 16 15:21:38 U40 systemd[1]: Started My Shell Script
Jun 16 15:21:38 U40 systemd[7702]: shellscript1.servic
Jun 16 15:21:38 U40 systemd[7702]: shellscript1.servic
Jun 16 15:21:38 U40 systemd[1]: shellscript1.service:
Jun 16 15:21:38 U40 systemd[1]: shellscript1.service:

[1]+  Stopped                  sudo systemctl status shellscript1.service
```

Add the following sample script.

```
#!/bin/bash
while true
do
sleep 10
done
```

Save script and set execute permission.

```
(gedit:7872): WARNING **: 15:20:21.705: Set document metadata failed: Setting attribute metadata::gedit-position not supported
mca@U40:~$ sudo chmod +x /usr/bin/script1.sh
```

**Step 2:** Create A SystemD File, and add the following content and update the script filename and location. You can also change the description of the service.

```
[Unit]
Description= My Shell Script

[Service]
ExecStart=/usr/bin/script1.sh

[Install]
WantedBy=multi-user.target
```

#### Step 4: Enable New Service

```
mca@U40:~$ sudo systemctl enable shellscript1.service
mca@U40:~$ sudo systemctl start shellscript1.service
mca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.se
   Active: active (running) since Thu 2022-06-16 15:27
 Main PID: 7913 (script1.sh)
    Tasks: 2 (limit: 4915)
   CGroup: /system.slice/shellscript1.service
           └─7913 /bin/bash /usr/bin/script1.sh
               ├─7919 sleep 10
```

```
mca@U40:~$ sudo systemctl status shellscript1.service
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.se
   Active: active (running) since Thu 2022-06-16 15:27:09 IST; 9s ago
 Main PID: 7913 (script1.sh)
    Tasks: 2 (limit: 4915)
   CGroup: /system.slice/shellscript1.service
           └─7913 /bin/bash /usr/bin/script1.sh
               ├─7919 sleep 10

Jun 16 15:27:09 U40 systemd[1]: Started My Shell Script.
lines 1-10/10 (END)...skipping...
● shellscript1.service - My Shell Script
   Loaded: loaded (/lib/systemd/system/shellscript1.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2022-06-16 15:27:09 IST; 9s ago
 Main PID: 7913 (script1.sh)
    Tasks: 2 (limit: 4915)
   CGroup: /system.slice/shellscript1.service
           └─7913 /bin/bash /usr/bin/script1.sh
               ├─7919 sleep 10

Jun 16 15:27:09 U40 systemd[1]: Started My Shell Script.
~
~
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 26

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 02-06-2022**

### Aim

Familiarization of basic network commands in windows

### Procedure

#### 1. ipconfig

This command in windows allows you to see a summarized information of your network such as ip address, subnet mask , server address etc.

**Syntax :-** \$ ipconfig

**Output :-**

```
C:\Users\Student>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 4:

  Connection-specific DNS Suffix  . :
  Link-local IPv6 Address . . . . . : fe80::142f:9783:684f:a27d%7
  IPv4 Address . . . . . : 192.168.6.46
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.6.100

Ethernet adapter VirtualBox Host-Only Network:

  Connection-specific DNS Suffix  . :
  Link-local IPv6 Address . . . . . : fe80::60c6:9871:f4d0:b304%3
  IPv4 Address . . . . . : 192.168.56.1
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . :

Tunnel adapter Teredo Tunneling Pseudo-Interface:

  Connection-specific DNS Suffix  . :
  IPv6 Address . . . . . : 2001:0:2851:fcb0:d3:14b6:8a3e:b01e
  Link-local IPv6 Address . . . . . : fe80::d3:14b6:8a3e:b01e%12
  Default Gateway . . . . . : ::
```

## 2. ipconfig/all

To see the network information in detail. It is an extension of ipconfig command

**Syntax :-** \$ ipconfig/all

**Output :-**

```
C:\Users\Student>ipconfig/all

Windows IP Configuration

Host Name . . . . . : S46
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 4:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Realtek PCIe GBE Family Controller #2
Physical Address. . . . . : 78-24-AF-BA-C2-13
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::142f:9783:684f:a27d%7(PREFERRED)
IPv4 Address. . . . . : 192.168.6.46(PREFERRED)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.6.100
DHCPv6 IAID . . . . . : 410526895
DHCPv6 Client DUID. . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
DNS Servers . . . . . : 192.168.6.254
                                         8.8.8.8
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter VirtualBox Host-Only Network:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : VirtualBox Host-Only Ethernet Adapter
Physical Address. . . . . : 0A-00-27-00-00-03
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::60c6:9871:f4d0:b304%3(PREFERRED)
IPv4 Address. . . . . : 192.168.56.1(PREFERRED)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 470417447
DHCPv6 Client DUID. . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                                         fec0:0:0:ffff::2%1
                                         fec0:0:0:ffff::3%1
```

```

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:d3:14b6:8a3e:b01e(Preferred)
Link-local IPv6 Address . . . . . : fe80::d3:14b6:8a3e:b01e%12(Preferred)
Default Gateway . . . . . : ::1
DHCPv6 IAID . . . . . : 167772160
DHCPv6 Client DUID. . . . . : 00-01-00-01-22-BD-FA-08-F0-79-59-8F-00-CC
NetBIOS over Tcpip. . . . . : Disabled

```

### 3. nslookup

To show the server to which the system is connected by default. If we want to find the ip address of a particular domain name, we can also use nslookup

**Syntax :-** \$ nslookup

**Output :-**

```

C:\Users\Student>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

```

### 4. ping

The command used to check the availability of a host. The response shows the URL you are pinging, the ip address associated with the URL and the size of packets being sent on the first line . The next four lines shows the replies from each individual packets including the time(in milliseconds) for the response and the time to live(TLL) of the packet, that is the amount of time that must pass before the packet discarded.

**Syntax :-** \$ ping <IP\_address>

**Output :-**

```
C:\Users\Student>ping 192.168.6.254

Pinging 192.168.6.254 with 32 bytes of data:
Reply from 192.168.6.254: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.6.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Student>

C:\Users\Student>ping 2404:6800:4007:826::2004

Pinging 2404:6800:4007:826::2004 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 2404:6800:4007:826::2004:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Student>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
```

## 5. tracert

The command used to show the packets that are passed through the router to which our system is connected to.

**Syntax :-** \$ tracert <ip\_address\_of\_system>

**Output :-**

```
C:\Users\Student>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
                [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d                  Do not resolve addresses to hostnames.
    -h maximum_hops     Maximum number of hops to search for target.
    -j host-list        Loose source route along host-list (IPv4-only).
    -w timeout          Wait timeout milliseconds for each reply.
    -R                  Trace round-trip path (IPv6-only).
    -S srcaddr          Source address to use (IPv6-only).
    -4                  Force using IPv4.
    -6                  Force using IPv6.

C:\Users\Student>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      1 ms      1 ms      5 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    17 ms      19 ms      18 ms   216.239.43.133
 7    16 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.
```

**6. route print**

The command used to display and updates network routing table

**Syntax :-** \$ route print

**Output :-**

```
C:\Users\Student>route print
=====
Interface List
 7...78 24 af ba c2 13 ..... Realtek PCIe GBE Family Controller #2
 3...0a 00 27 00 00 03 ..... VirtualBox Host-Only Ethernet Adapter
 1..... Software Loopback Interface 1
12...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   192.168.6.46    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      192.168.6.46    281
         192.168.6.46 255.255.255.255  On-link      192.168.6.46    281
 192.168.6.255  255.255.255.255  On-link      192.168.6.46    281
         192.168.56.0 255.255.255.0       On-link      192.168.56.1    281
         192.168.56.1 255.255.255.255  On-link      192.168.56.1    281
 192.168.56.255  255.255.255.255  On-link      192.168.56.1    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      192.168.56.1    281
         224.0.0.0    240.0.0.0       On-link      192.168.6.46    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      192.168.56.1    281
 255.255.255.255  255.255.255.255  On-link      192.168.6.46    281
=====
Persistent Routes:
 Network Address      Netmask  Gateway Address Metric
      0.0.0.0      0.0.0.0  192.168.6.100 Default
      0.0.0.0      0.0.0.0  192.168.6.100 Default
=====
```

```
IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
12    331 ::/0                      On-link
 1    331 ::1/128                   On-link
12    331 2001:::/32                 On-link
12    331 2001:0:2851:fcb0:d3:14b6:8a3e:b01e/128
                                         On-link
 3    281 fe80::/64                  On-link
 7    281 fe80::/64                  On-link
12    331 fe80::/64                  On-link
12    331 fe80::d3:14b6:8a3e:b01e/128
                                         On-link
 7    281 fe80::142f:9783:684f:a27d/128
                                         On-link
 3    281 fe80::60c6:9871:f4d0:b304/128
                                         On-link
 1    331 ff00::/8                   On-link
 3    281 ff00::/8                   On-link
 7    281 ff00::/8                   On-link
12    331 ff00::/8                   On-link
=====
Persistent Routes:
  None
```

## 7. netstat

The network statistics or netstat command is a networking tool used for troubleshooting and configuration that can also serve a monitoring tool for the connections over the network.

**Syntax :-** netstat

**Output :-**

Active Connections			
Proto	Local Address	Foreign Address	State
TCP	192.168.6.46:2754	20.198.162.76:https	ESTABLISHED
TCP	192.168.6.46:2795	a104-104-60-83:https	CLOSE_WAIT
TCP	192.168.6.46:2829	117.18.237.29:http	CLOSE_WAIT
TCP	192.168.6.46:2941	maa03s37-in-f3:https	TIME_WAIT
TCP	192.168.6.46:2942	maa05s20-in-f5:https	TIME_WAIT
TCP	192.168.6.46:2943	maa05s15-in-f10:https	TIME_WAIT
TCP	192.168.6.46:2944	maa03s47-in-f14:https	TIME_WAIT
TCP	192.168.6.46:2945	maa03s34-in-f1:https	TIME_WAIT
TCP	192.168.6.46:2946	maa03s45-in-f3:https	TIME_WAIT
TCP	192.168.6.46:2947	maa03s43-in-f10:https	TIME_WAIT
TCP	192.168.6.46:2948	maa03s38-in-f14:https	TIME_WAIT
TCP	192.168.6.46:2949	maa05s22-in-f14:https	TIME_WAIT
TCP	192.168.6.46:2950	maa03s47-in-f14:https	TIME_WAIT
TCP	192.168.6.46:2951	maa03s34-in-f1:https	TIME_WAIT
TCP	192.168.6.46:2952	maa03s47-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2953	maa03s34-in-f1:https	ESTABLISHED
TCP	192.168.6.46:2954	maa05s24-in-f13:https	ESTABLISHED
TCP	192.168.6.46:2955	123:http	ESTABLISHED
TCP	192.168.6.46:2956	maa05s19-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2957	maa05s19-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2960	maa05s16-in-f10:https	ESTABLISHED
TCP	192.168.6.46:2961	maa05s20-in-f5:https	ESTABLISHED
TCP	192.168.6.46:2962	maa03s40-in-f11:https	ESTABLISHED
TCP	192.168.6.46:2963	maa05s10-in-f10:https	ESTABLISHED
TCP	192.168.6.46:2964	maa03s41-in-f4:https	ESTABLISHED
TCP	192.168.6.46:2965	si-in-f188:5228	ESTABLISHED
TCP	192.168.6.46:2966	maa03s37-in-f3:https	ESTABLISHED
TCP	192.168.6.46:2967	sf-in-f139:https	ESTABLISHED
TCP	192.168.6.46:2968	maa05s12-in-f10:https	ESTABLISHED
TCP	192.168.6.46:2969	maa05s22-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2973	maa05s24-in-f3:https	ESTABLISHED
TCP	192.168.6.46:2977	maa03s38-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2978	maa03s46-in-f10:https	ESTABLISHED
TCP	192.168.6.46:2982	maa05s10-in-f3:https	ESTABLISHED
TCP	192.168.6.46:2986	maa05s19-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2987	maa05s21-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2988	maa05s12-in-f14:https	ESTABLISHED
TCP	192.168.6.46:2989	maa05s12-in-f14:https	ESTABLISHED

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 27

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 06/06/2022**

#### Aim

TCPDUMP installation.

#### Procedure

##### **1. update and install**

This command is used to install and update tcpdump.

Syntax :-    \$ sudo apt update && sudo apt install tcpdump

Output :-

```
mca@U40:~$ sudo apt update && sudo apt install tcpdump
[sudo] password for mca:
Hit:1 http://archive.ubuntu.com/ubuntu bionic InRelease
Get:2 https://dl.google.com/linux/chrome/deb stable InRelease [1,811 B]
Hit:3 http://ppa.launchpad.net/codeblocks-devs/release/ubuntu bionic InRelease
Err:4 http://ppa.launchpad.net/jonathonf/python-3.6/ubuntu bionic InRelease
  403 Forbidden [IP: 185.125.190.52 80]
Hit:5 http://ppa.launchpad.net/pasgui/ppa/ubuntu bionic InRelease
Get:6 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,097 B]
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.
```

##### **2. sudo tcpdump**

This command is used to show all the interfaces connected to the internet packets.

Syntax :-    \$ sudo tcpdump

Output :-

```
mca@U40:~$ sudo tcpdump
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:41:40.642326 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 10:4f:58:ce:5d:c0 (oui Unknown), length 314
14:41:40.747700 IP 192.168.6.173.mdns > 224.0.0.251.mdns: 0 [2q] PTR (QM)? _ipps._tcp.local. PTR (QM)? _ipp._tcp.local. (45)
14:41:40.748388 IP U40.39381 > dns.google.domain: 35828+ [1au] PTR? 251.0.0.224.in-addr.arpa. (53)
14:41:40.765137 IP dns.google.domain > U40.39381: 35828 NXDomain 0/1/1 (110)
14:41:40.765322 IP U40.39381 > dns.google.domain: 35828+ PTR? 251.0.0.224.in-addr.arpa. (42)
14:41:40.781915 IP dns.google.domain > U40.39381: 35828 NXDomain 0/1/0 (99)
14:41:40.783216 IP 0.0.0.0.bootpc > dns.google.domain: 15151+ [1au] PTR? 173.6.168.192.in-addr.arpa. (55)
14:41:40.797936 IP dns.google.domain > U40.39496: 15151 NXDomain 0/0/1 (55)
14:41:40.813971 IP U40.56838 > dns.google.domain: 24793+ [1au] PTR? 8.8.8.8.in-addr.arpa. (49)
14:41:40.878491 ARP, Request who-has 192.168.6.69 tell _gateway, length 46
14:41:40.879114 IP U40.57816 > dns.google.domain: 31237+ [1au] PTR? 69.6.168.192.in-addr.arpa. (54)
14:41:40.897444 IP dns.google.domain > U40.57816: 31237 NXDomain 0/0/1 (54)
14:41:40.897656 IP U40.57816 > dns.google.domain: 31237+ PTR? 69.6.168.192.in-addr.arpa. (43)
14:41:40.915891 IP dns.google.domain > U40.57816: 31237 NXDomain 0/0/0 (43)
14:41:40.917041 IP U40.47245 > dns.google.domain: 6207+ [1au] PTR? 100.6.168.192.in-addr.arpa. (55)
```

### 3. -D

This command is used to find specific interfaces.

Syntax :-    \$ sudo tcpdump -D

Output :-

```
mca@U40:~$ sudo tcpdump -D
1.enp5s0 [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)
```

### 4. -i

This command is used to find the interface which is connected to our system.

Syntax :-    \$ sudo tcpdump -i enp5s0

Output :-

```
mca@U40:~$ sudo tcpdump -i enp5s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:44:17.386312 ARP, Request who-has 192.168.6.10 tell _gateway, length 46
14:44:17.386321 ARP, Request who-has 192.168.6.68 tell _gateway, length 46
14:44:17.386831 IP U40.46342 > dns.google.domain: 44636+ [1au] PTR? 10.6.168.192.in-addr.arpa. (54)
14:44:17.402901 IP 192.168.6.223.50706 > 239.255.255.250.1900: UDP, length 174
14:44:17.403029 IP dns.google.domain > U40.46342: 44636 NXDomain 0/0/1 (54)
14:44:17.403174 IP U40.46342 > dns.google.domain: 44636+ PTR? 10.6.168.192.in-addr.arpa. (43)
14:44:17.419100 IP dns.google.domain > U40.46342: 44636 NXDomain 0/0/0 (43)
14:44:17.457759 IP U40.50528 > dns.google.domain: 60661+ [1au] PTR? 68.6.168.192.in-addr.arpa. (54)
14:44:17.488794 IP U40.51273 > dns.google.domain: 13472+ [1au] PTR? 210.6.168.192.in-addr.arpa. (55)
14:44:17.524847 IP U40.57419 > dns.google.domain: 46240+ [1au] PTR? 223.6.168.192.in-addr.arpa. (55)
14:44:17.611474 IPv6 fe80::41ec:a1cb:b979:8145 > ip6-allrouters: ICMP6, router solicitation, length 8
14:44:17.897858 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from f8:60:f0:22:69:c0 (oui Unknown), length 256
14:44:17.920005 IPv6 fe80::124f:58ff:fece:f860.dhcpv6-client > ff02::1:2.dhcpv6-server: dhcp6 solicit
14:44:18.090247 ARP, Request who-has 192.168.6.127 tell _gateway, length 46
```

### 5. -c 5 -i

This command is used to access only 5 packets.

Syntax :-    \$ sudo tcpdump -c 5 -i enp5s0

Output:-

```
mca@U40:~$ sudo tcpdump -c 5 -i enp5s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:46:14.699046 ARP, Request who-has 192.168.6.6 tell _gateway, length 46
14:46:14.700355 IP U40.33625 > dns.google.domain: 11194+ [1au] PTR? 6.6.168.192.in-addr.arpa. (53)
14:46:14.707067 IP 10.10.10.111.54630 > 239.255.255.250.1900: UDP, length 174
14:46:14.716513 IP dns.google.domain > U40.33625: 11194 NXDomain 0/0/1 (53)
14:46:14.716699 IP U40.33625 > dns.google.domain: 11194+ PTR? 6.6.168.192.in-addr.arpa. (42)
5 packets captured
24 packets received by filter
15 packets dropped by kernel
```

## 6. -xx -i

This command is used to show all information in ASCII value.

Syntax :-    \$ sudo tcpdump -xx -i enp5s0

Output :-

```
mca@U40:~$ sudo tcpdump -xx -i enp5s0
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:46:52.564359 IP 192.168.6.211.64096 > 239.255.255.250.1900: UDP, length 175
    0x0000: 0100 5e7f fffa 0c9d 920e 9223 0800 4500
    0x0010: 00cb a4fd 0000 0111 5caf c0a8 06d3 efff
    0x0020: fffa fa60 076c 00b7 caa2 4d2d 5345 4152
    0x0030: 4348 202a 2048 5454 502f 312e 310d 0a48
    0x0040: 4f53 543a 2032 3339 2e32 3535 2e32 3535
    0x0050: 2e32 3530 3a31 3930 300d 0a4d 414e 3a20
    0x0060: 2273 7364 703a 6469 7363 6f76 6572 220d
    0x0070: 0a4d 583a 2031 0d0a 5354 3a20 7572 6e3a
    0x0080: 6469 616c 2d6d 756c 7469 7363 7265 656e
    0x0090: 2d6f 7267 3a73 6572 7669 6365 3a64 6961
    0x00a0: 6c3a 310d 0a55 5345 522d 4147 454e 543a
    0x00b0: 204d 6963 726f 736f 6674 2045 6467 652f
    0x00c0: 3130 322e 302e 3132 3435 2e33 3320 5769
    0x00d0: 6e64 6f77 730d 0a0d 0a
```

## 7. sudo tcpdump -i enp5s0 -c 5 port 80

This command is used to show a specified number of packets in that particular port number.

Syntax :-    \$ sudo tcpdump -i enp5s0 -c 5 port 80

Output :-

```
mca@U40:~$ sudo tcpdump -i enp5s0 -c 5 port 80
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:50:51.497892 IP U40.36602 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 256728349, win 29200, options [mss 1460,sackOK,TS v al 1440343939 ecr 0,nop,wscale 7], length 0
14:50:52.528826 IP U40.36602 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 256728349, win 29200, options [mss 1460,sackOK,TS v al 1440344970 ecr 0,nop,wscale 7], length 0
14:50:54.540842 IP U40.36602 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 256728349, win 29200, options [mss 1460,sackOK,TS v al 1440346982 ecr 0,nop,wscale 7], length 0
14:50:58.700817 IP U40.36602 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 256728349, win 29200, options [mss 1460,sackOK,TS v al 1440351142 ecr 0,nop,wscale 7], length 0
14:51:06.892829 IP U40.36602 > 32.121.122.34.bc.googleusercontent.com.http: Flags [S], seq 256728349, win 29200, options [mss 1460,sackOK,TS v al 1440359334 ecr 0,nop,wscale 7], length 0
5 packets captured
5 packets received by filter
0 packets dropped by kernel
```

## 8. sudo tcpdump -i enp5s0 icmp

Syntax :-    \$ sudo tcpdump -i enp5s0 icmp

Output :-

```
mca@U40:~$ sudo tcpdump -i enp5s0 icmp
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
^Z
[4]+ Stopped                  sudo tcpdump -i enp5s0 icmp
```

## 9. sudo tcpdump -i enp5s0 -c 10 -w icmp.filename

This command is used to capturing packets and stored in a pcap file.

Syntax :-    \$ sudo tcpdump -i enp5s0 -c 10 -w icmp.filename

Output :-

```
mca@U40:~$ sudo tcpdump -i enp5s0 -c 10 -w icmp.pcap
[sudo] password for mca:
tcpdump: listening on enp5s0, link-type EN10MB (Ethernet), capture size 262144 bytes
10 packets captured
41 packets received by filter
0 packets dropped by kernel
```

## 10. sudo tcpdump -r icmp.filename

This command use to read that particular file using -r flag.

Syntax :-    \$ sudo tcpdump -r icmp.filename

Output :-

```
mca@U40:~$ sudo tcpdump -r icmp.pcap
reading from file icmp.pcap, link-type EN10MB (Ethernet)
15:35:04.463485 IP 192.168.6.80.netbios-ns > 192.168.6.255.netbios-ns: NBT UDP PACKET(137): QUERY; REQUEST; BROADCAST
15:35:04.504514 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1243
15:35:04.504533 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504538 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504542 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504547 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504551 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504556 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504560 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
15:35:04.504564 IP U40.40945 > maa05s24-in-f14.1e100.net.443: UDP, length 1250
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 28

#### Aim

Install and use the latest version of Wireshark on Ubuntu

**Name: Justin v kalappura**

**Roll No:10**

**Batch: B**

**Date: 06/06/2022**

#### Procedure

**Step 1 :** First update APT package repository.

Syntax: \$ sudo apt update

#### **Output:**

```
mca@546:~$ 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]
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 [1,097 B]
Hit:6 http://ppa.launchpad.net/ubuntu-mozilla-security/ppa/ubuntu bionic InRelease
Get:7 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release [2,495 B]
Hit:8 http://ppa.launchpad.net/webupd8team/java/ubuntu bionic InRelease
Get:9 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 Release.gpg [801 B]
Err:9 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 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.
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 58712A2291FA4AD5 MongoDB 3.
6 Release Signing Key <packaging@mongodb.com>
```

**Step 2 : Install wireshark**

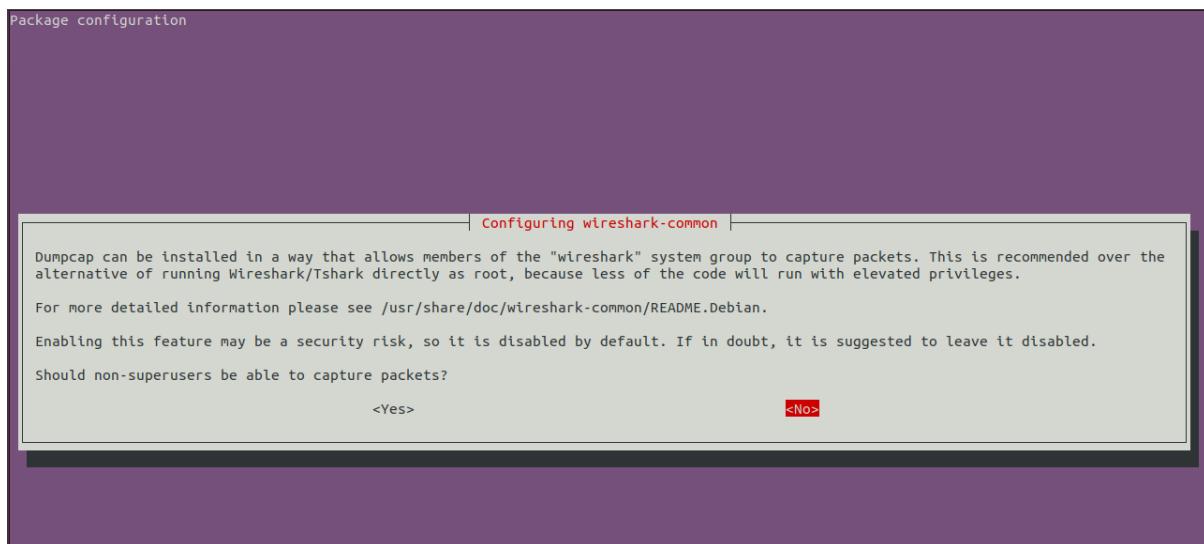
Syntax: \$ sudo apt install wireshark

Now press **y** and then press **Enter**.

#### **Output:**

```
mca@546:~$ sudo apt install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libpcres2-3 libpcres2-dev libpcres2-3 libpcrescpp0v5 libssl-dev libssl-doc php-common php-pear php-xml php7.2-cli php7.2-common
  php7.2-opcache php7.2-readline php7.2-xml pkg-php-tools shtool
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  geoip-database-extra libc-ares2 libjs-openlayers libqt5multimedia5 libsmi2l dbus libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwire
  libwireshark10 libwireshark7 libwscodecs1 libwsutil18 wireshark-common wireshark-qt
Suggested packages:
  snmp-mibs-downloader wireshark-doc
The following NEW packages will be installed:
  geoip-database-extra libc-ares2 libjs-openlayers libqt5multimedia5 libsmi2l dbus libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwire
  libwireshark10 libwireshark7 libwscodecs1 libwsutil18 wireshark wireshark-common wireshark-qt
0 upgraded, 16 newly installed, 0 to remove and 13 not upgraded.
Need to get 31.1 MB of archives.
After this operation, 138 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 geotp-database-extra all 20180315-1 [11.1 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libqt5multimedia5 amd64 5.9.5-0ubuntu1 [293 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libsmi2l dbus amd64 0.4.8+dfsg2-15 [100 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libspandsp2 amd64 0.0.6+dfsg-0.1 [273 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libssh-gcrypt-4 amd64 0.8.0-20170825.94fa1e38-1build1 [171 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwireshark-data all 2.4.5-1 [956 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libc-ares2 amd64 1.14.0-1 [37.1 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 libsnappy1v5 amd64 1.1.7-1 [16.0 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwsutil18 amd64 2.4.5-1 [56.2 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwireshark7 amd64 2.4.5-1 [172 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwscodecs1 amd64 2.4.5-1 [16.6 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 libwireshark10 amd64 2.4.5-1 [13.5 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 wireshark-common amd64 2.4.5-1 [369 kB]
```

**Step 3 :** By default, Wireshark must be started as root privileges in order to work. If you want to run Wireshark without root privileges or without sudo, then select **Yes** and press **Enter**.



Wireshark should be installed.

**Step 4 :** To add user to the wireshark group:

Syntax: sudo adduser \$mca wireshark

**Output:**

```
mca@s46:~$ sudo adduser $mca wireshark
adduser: The group `wireshark' already exists.
```

**Step 5 :** Now that Wireshark is installed, you can start Wireshark from the Application Menu of Ubuntu.

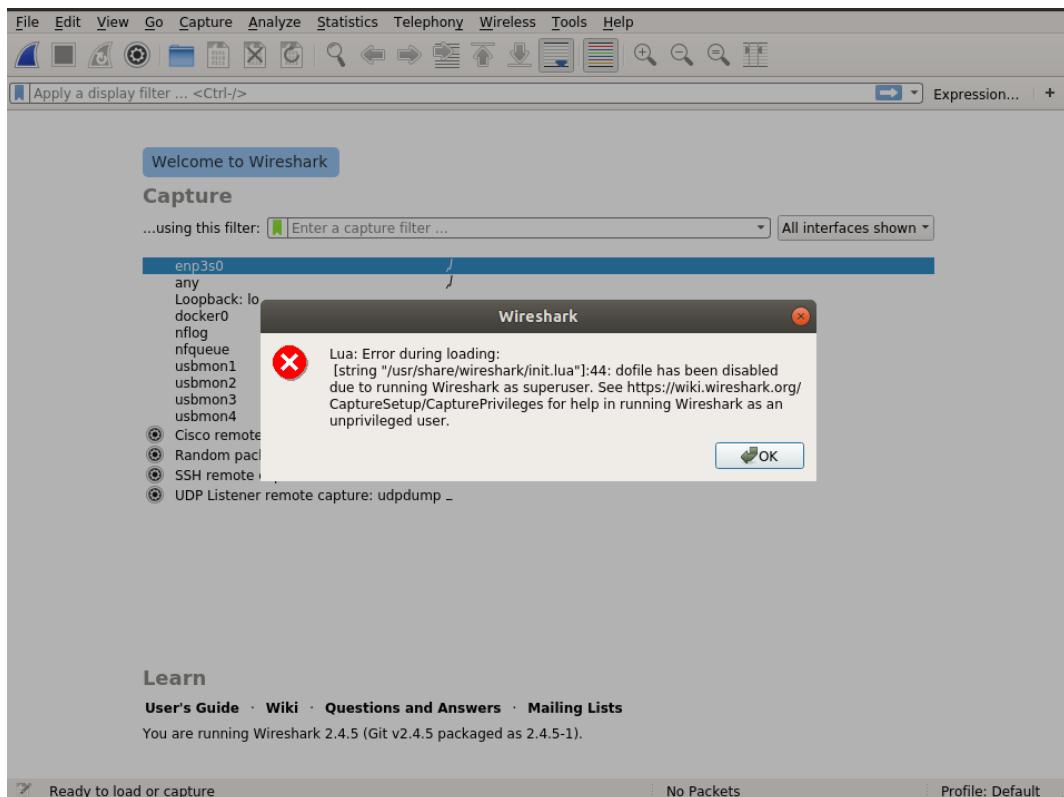
If you did not enable Wireshark to run without **root** privileges or **sudo**, then the command should be:

**Syntax:** sudo wireshark

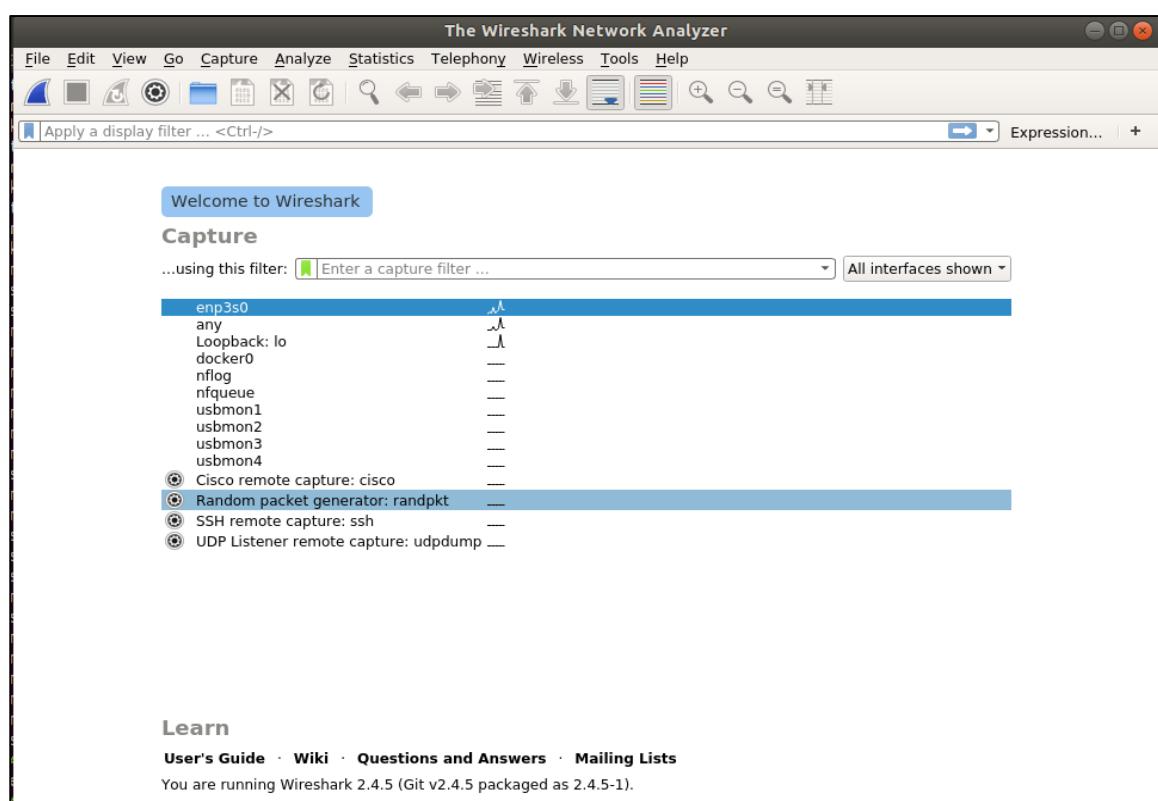
**Output:**

```
mca@s46:~$ sudo wireshark
QStandardPaths: XDG_RUNTIME_DIR not set, defaulting to '/tmp/runtime-root'
```

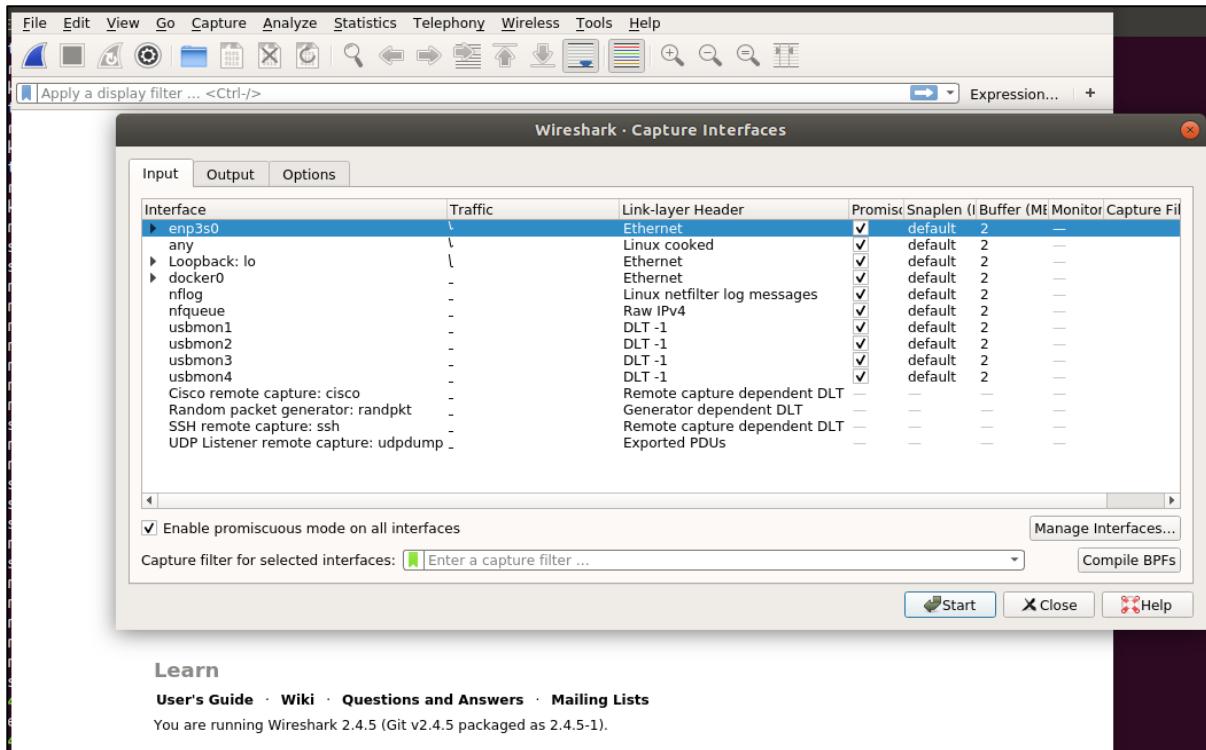
Wireshark should start.



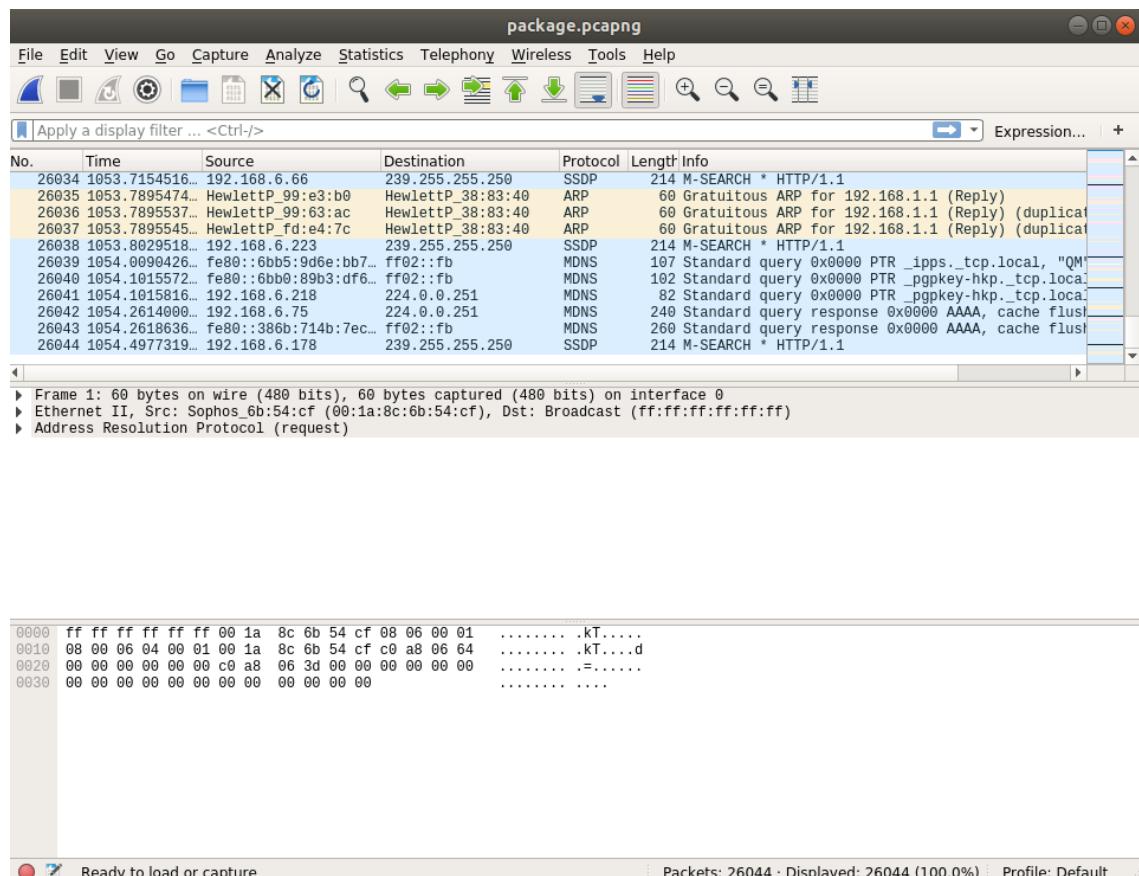
When we start Wireshark, you will see a list of interfaces that you can capture packets to and from.



Now to start capturing packets, just select the interface and click on the start capturing packets icon above.



We can capture packets on any network interface.



## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 29

#### Aim

KVM Installation.

**Name: Justin v kalappura**

**Roll No: 10**

**Batch: B**

**Date: 23/05/2022**

#### 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/pasqui/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

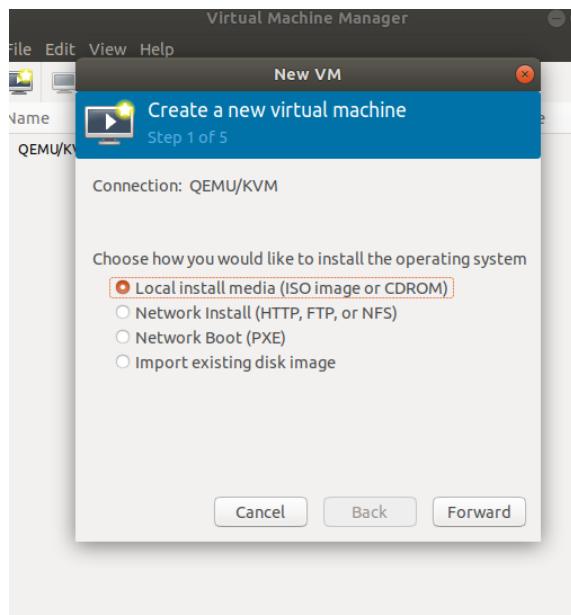
```
mca@U40:~$ sudo apt install qemu-kvm libvirt-daemon-system libvirt-clients bridge-utils virt-manager
Reading package lists... Done
Building dependency tree
Reading state information... Done
qemu-kvm is already the newest version (1:2.11+dfsg-1ubuntu7.4).
The following additional packages will be 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 libaugeas0 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-storage-gluster
  libvirt-daemon-storage-sheepdog libvirt-daemon-storage-zfs
```

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

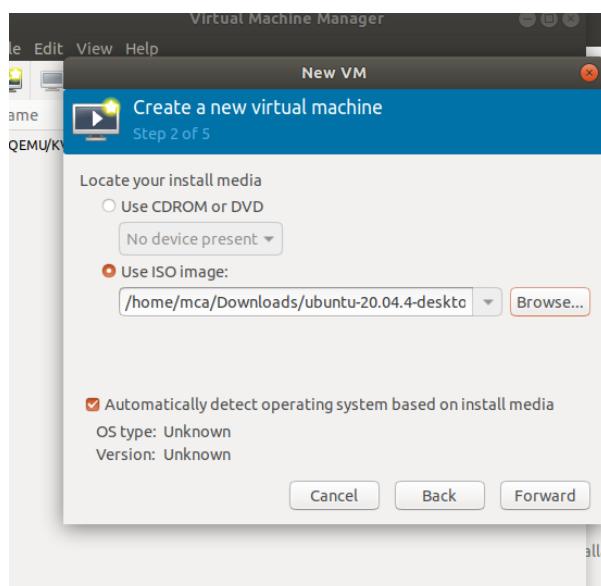
```
mca@U40:~$ sudo virt-manager
mca@U40:~$ █
```

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

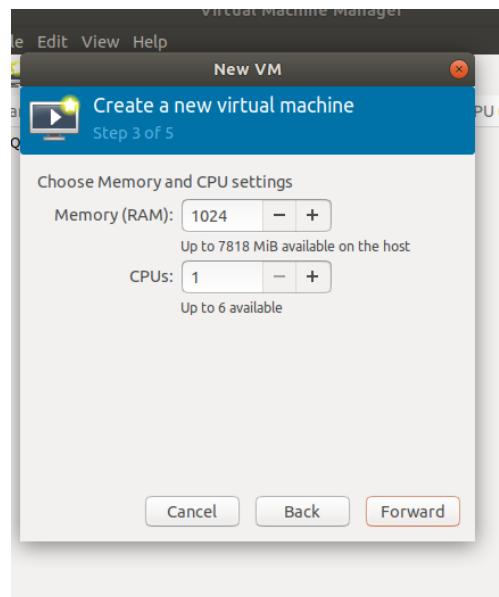
In the dialogue box that opens, select the option to install the VM using an ISO image. Then click Forward.



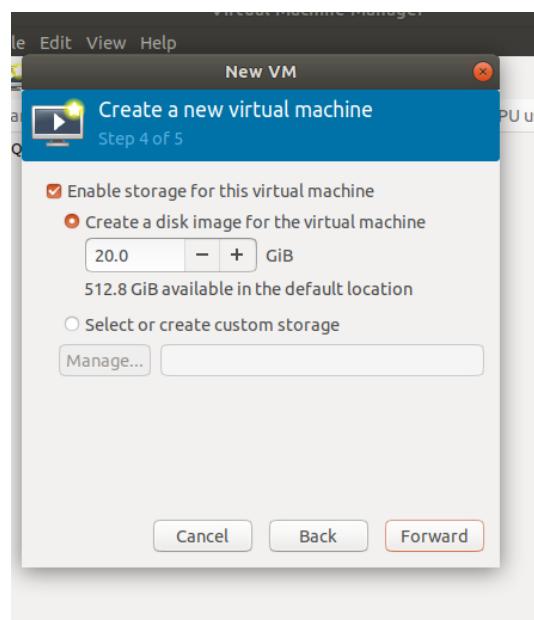
**Step 5:** Choose ISO, click Forward



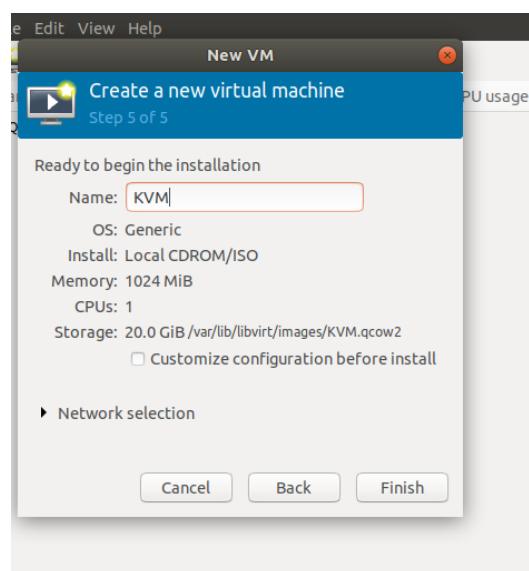
**Step 6:** Enter the amount of RAM and the number of CPUs you wish to allocate to the VM and proceed to the next step.



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



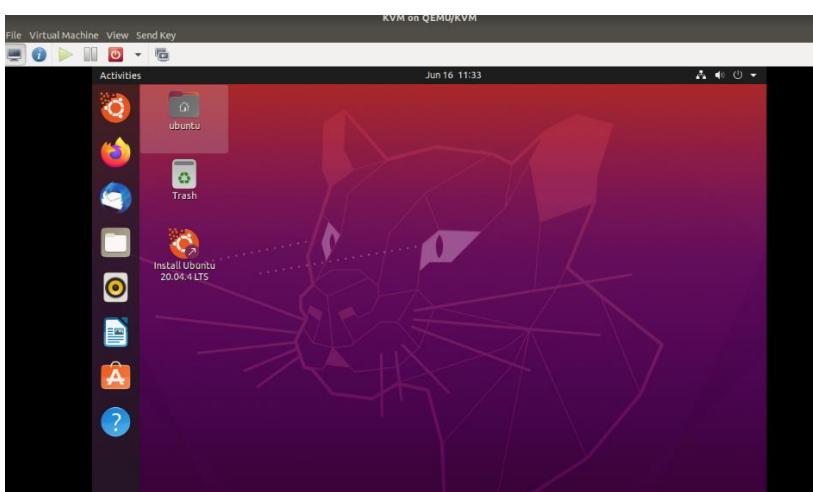
**Step 8:** Specify the name for your VM and click **Finish** to complete the setup.



## Step 9: Select language

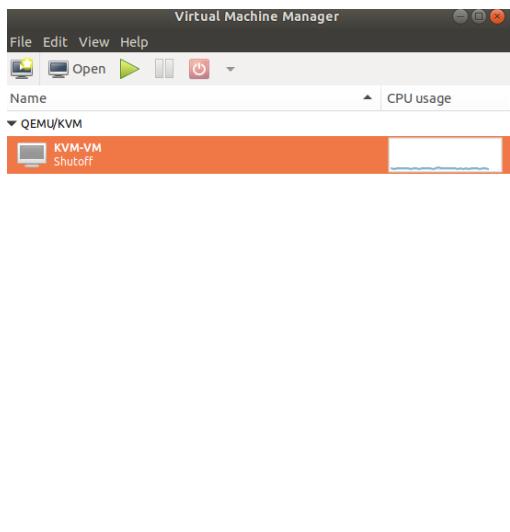


**Step 10:** The VM starts automatically, prompting you to start installing the OS that's on the ISO file.



**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
mca@U40:~$
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 30

#### Aim

Docker Installation.

**Name: Justin v kalappura**

**Roll No:10**

**Batch: B**

**Date: 23/05/2022**

#### 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@s40:~$ 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 distro-info gimp-data i965-va-driver libaaacs0 libamdgpu2 libarchive-cpio-perl libavcodec57
  libavformat57 libavutil55 libbabl-0.1-0 libbdplus0 libblas3 libbluray2 libcamd2 libcolamd2 libchromaprint1 libcrystalhd3
  libfile-stripnondeterminism-perl libgegl-0.3-0 libgfortran4 libglmp2.0 libgme0 libgsmliblapack3 libmail-sendmail-perl libmetis5 libmng2
  libopenjp2-7 libopenmp7 libpcre16-3 libpcre3-dev libpcre32-3 libprecpp0v5 libshine3 libsnappy1v5 libsoxr0 libssh-gcrypt-4 libssl-dev
  libssl-doc libswresample2 libwscale4 libsys-hostname-long-perl libumfpack5 libva-drm2 libva-x11-2 libvdpau1 libx264-152
  libx265-146 libxvidcore4 libzvbi-common libzvbi0 linux-headers-4.15.0-22 linux-headers-4.15.0-22-generic linux-image-4.15.0-22-generic
  linux-modules-4.15.0-22-generic linux-modules-extra-4.15.0-22-generic mesa-va-drivers mesa-vdpau-drivers php-common php-pear php-xm
  l php7.2-cli php7.2-common php7.2-json php7.2-opcache php7.2-readline php7.2-xml pkg-php-tools po-debconf shtool va-driver-all
  vdpau-driver-all x11proto-dri2-dev x11proto-gl-dev
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

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

**Command:**

**\$ sudo apt-get update**

```
mca@s40:~$ sudo apt-get update
Hit:1 http://in.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:3 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:5 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu bionic InRelease [15.9 kB]
Ign:6 https://repo.mongodb.org/apt/ubuntu trusty/mongodb-org/3.6 InRelease
Get:7 http://in.archive.ubuntu.com/ubuntu bionic-proposed InRelease [242 kB]
Hit:8 http://archive.ubuntu.com/ubuntu bionic InRelease
```

```
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' 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.
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 58712A2291FA4AD5 MongoDB 3.
6 Release Signing Key <packaging@mongodb.com>
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://storage.googleapis.com/download.dartlang.org/linux/debian stable Release: The following signatures couldn't be verified because the publ
ic key is not available: NO_PUBKEY 78BD65473CB3BD13
```

**Step 4:** Install Docker using the following command:

**Command:**

```
$ sudo apt install docker.io
```

```
mca@S40:~$ 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 distro-info gimp-data i965-va-driver libaaacs0 libamd2 libarchive-cpio-perl libavcodec57
  libavformat57 libavutil55 libbabl-0.1-0 libbdplus0 libbluras3 libbluray2 libcamd2 libccolamd2 libcholmod3 libchromaprint1 libcrystalhd3
  libfile-stripnondeterminism-perl libgegl-0.3-0 libgfortran4 libgimp2.0 libgme0 libgsml1 liblapack3 libmail-sendmail-perl libmetis5 libmng2
  libopenjp2-7 libopenjp2-7 libpcre3-dev libpcre32-3 libpcrecpp0v5 libshine3 libsnappy1v5 libsoxr0 libssh-gcrypt-4 libssl-dev
  libssl-doc libswresample2 libswscaled libsys-hostname-long-perl libumfpack5 libva-drm2 libva-x11-2 libv2a libvpau libx264-152
  libx265-146 libxvidcore4 libzvbi-common libzvbi0 linux-headers-4.15.0-22 linux-headers-4.15.0-22-generic linux-image-4.15.0-22-generic
  linux-modules-4.15.0-22-generic linux-modules-extra-4.15.0-22-generic mesa-va-drivers mesa-vdpau-drivers php-common php-pecl 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 va-driver-all
  vdpau-driver-all x11proto-dri2-dev x11proto-gl-dev

Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /lib/systemd/system/docker.service.
Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /lib/systemd/system/docker.socket.
Processing triggers for systemd (237-3ubuntu10.52) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for ureadahead (0.100.0-21) ...
ureadahead will be reprofiled on next reboot
```

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

**Command:**

```
$ sudo snap install docker
```

```
mca@S40:~$ sudo snap install docker
docker 20.10.14 from Canonical* installed
```

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

**Command:**

```
$ docker --version
```

```
mca@S40:~$ docker --version
Docker version 20.10.7, build 20.10.7-0ubuntu5~18.04.3
```

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

**Command:**

```
$ sudo docker run hello-world
```

```
mca@S40:~$ sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:80f31da1ac7b312ba29d65080fdddf797dd76acfb870e677f390d5acba9741b17
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:

**Command:**

```
$ sudo docker images
```

```
mca@S40:~$ 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:

**Command:**

```
$ sudo docker ps -a
```

```
mca@S40:~$ sudo docker ps -a
CONTAINER ID      IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
95a7d4356673    hello-world    "/hello"    2 minutes ago   Exited (0) 2 minutes ago          nervous_jang
```

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

**Command:**

```
$ sudo docker ps
```

```
mca@S40:~$ sudo docker ps
CONTAINER ID      IMAGE      COMMAND      CREATED      STATUS      PORTS      NAMES
```

## NETWORKING & SYSTEM ADMINISTRATION LAB

### Experiment No.: 31

#### Aim

Setting Up an Apache Container

**Name: Justin v kalappura**

**Roll No:10**

**Batch: B**

**Date: 23/05/2022**

#### Procedure

##### **Step 1: Pull Docker Apache Container**

###### **Command:**

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

```
mca@540:~$ sudo docker run -dit --name tecmint-web -p 8080:80 -v /home/user/website/:/usr/local/apache2/htdocs/ httpd:2.4
[sudo] password for mca:
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: sha256:2df8839d6127e400ac5f65481d8a0f17ac46a3b91de40b01e649c9a0324dea0
Status: Downloaded newer image for httpd:2.4
44915fded0afda746d8a5fe80ffa6c6652d1233d6fb26910ab142fc92e8e15b
```

At this point, our Apache container should be up and running.

##### **Step 2: Check Apache Docker Container.**

###### **Command:**

```
$ sudo docker ps
```

```
mca@540:~$ sudo docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
44915fded0a httpd:2.4 "httpd-foreground" 8 minutes ago Up 8 minutes 0.0.0.0:8080->80/tcp, :::8080->80/tcp tecmint-web
```

Now let's create a simple web page named docker.html inside the /home/user/website directory.

##### **Step 3:**

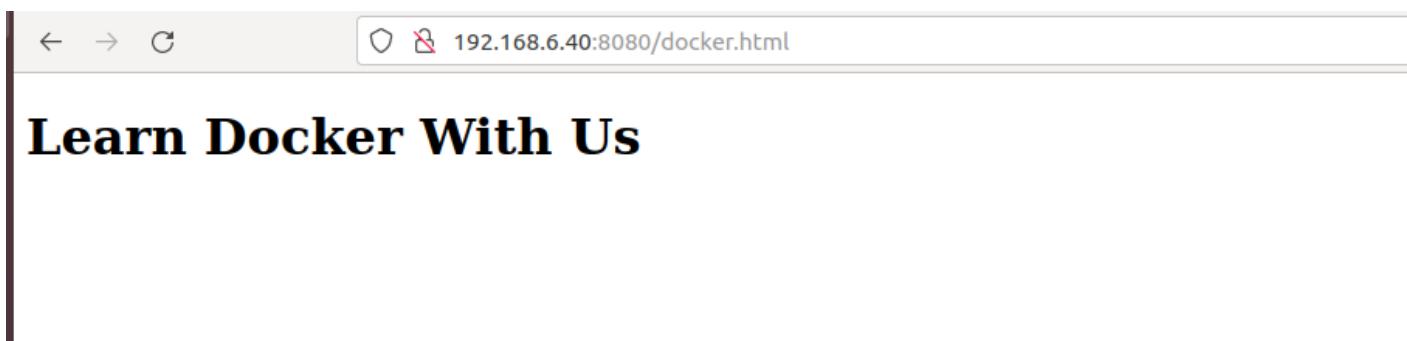
```
$ sudo gedit /home/user/website/docker.html
```

```
mca@S40:~$ sudo gedit /home/user/website/docker.html
** (gedit:12248): WARNING **: 15:47:02.094: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:12248): WARNING **: 15:47:02.094: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:12248): WARNING **: 15:47:08.218: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:12248): WARNING **: 15:47:08.219: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:12248): WARNING **: 15:47:09.596: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:12248): WARNING **: 15:47:09.596: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
** (gedit:12248): WARNING **: 15:47:13.079: Set document metadata failed: Setting attribute metadata::gedit-spell-language not supported
** (gedit:12248): WARNING **: 15:47:13.079: Set document metadata failed: Setting attribute metadata::gedit-encoding not supported
^Z
```

Add the following sample HTML content to the file.

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<title>Learn Docker at Tecmint.com</title>
</head>
<body>
<h1>Learn Docker With Us</h1>
</body>
</html>
```

Next, point your browser to Server-IP:8080/docker.html (where Server-IP is your host's public IP address). You should be presented with the page we created previously.



**Step 5:** If you wish, you can now stop the container.

```
$ sudo docker stop tecmint-web
```

```
mca@S40:~$ sudo docker stop tecmint-web
tecmint-web
```

**Step 6:** Remove it

**Command:**

```
$ sudo docker rm tecmint-web
```

```
mca@S40:~$ sudo docker rm tecmint-web
tecmint-web
```

**Step 7 :** To finish cleaning up, you may want to delete the image that was used in the container (omit this step if you're planning on creating other Apache 2.4 containers soon).

**Command:**

```
$ sudo docker image remove httpd:2.4
```

```
mca@S40:~$ 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
```