NETWORK & SYSTEM ADMINISTARTION

LAB RECORD

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MCA-B

SEM-II

ROLL NO: 35

ASSIGNMENT-1

COMPONENTS OF MOTHERBOARD

What is a Motherboard?

The motherboard is a thin **printed circuit board** (PCB) which links all different components inside your computer.So, we can say the motherboard acts as a hub in a network. People call motherboard with a different name like mainboard, logic board, baseboard, system board, mobo, etc.

Location of Motherboard:

In Desktop PC: In a desktop PC, you will find a big rectangular computer case. Once you open the case to expose inside the machine, you will find green/blue/brown/red large square printed circuit plate. This plate is the motherboard of the PC.

In laptop: If you open the bottom cover of your laptop, you will get exposed to the large PCB board which is the motherboard.

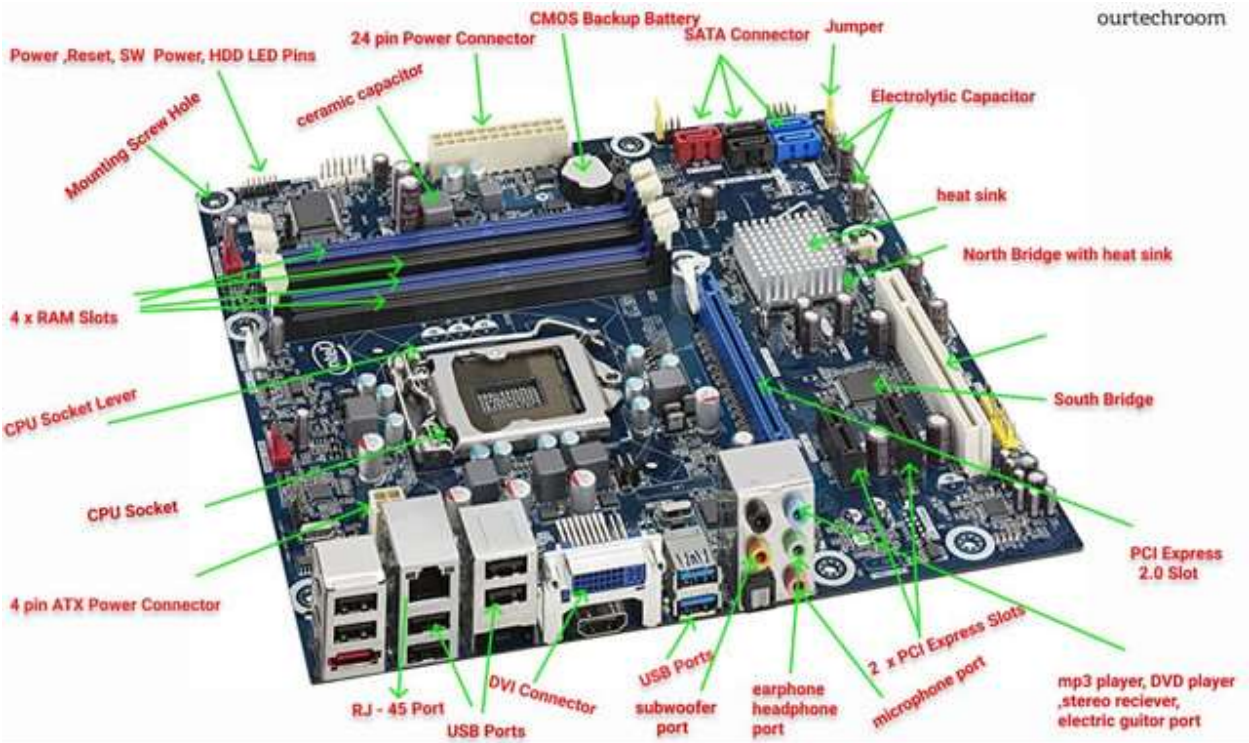
In smartphone: When you open the back cover of the smartphone, and screws up some pins then you will find your motherboard.

Types of Motherboard

In all the programmable electronics devices motherboard is a large PCBs board. The component attached to the board may vary from system to system. The desktop has different kinds of sockets and hardware which may vary from a smartphone. General components like CPU, memory, storage, capacitor, transistor, slots, connectors are
common in all electronic devices.

If you know all of these components on the desktop, then you can easily get an idea about components in other electronic devices. So in this article, we focus on desktop components.

Parts of Motherboard



Parts of MotherBoard

Parts of the Motherboard are as follow.

- RAM Chip and RAM Slot
- CPU Chip and Socket
- PCI Slots
- Accelerated Graphics Port
- North Bridge
- SouthBridge
- CMOS Battery
- Power Supply Plug
- Parallel Port
- Serial Port
- SATA and PATA Connector
- USB Port
- DVI Port
- RJ-45 Port
- HDMI Port
- FDD Connector

- Optical Drive Audio Connector
- 1394 Headers
- F Audio Connectors
- Heat Sink
- Switches and Jumper
- Microphone port, headphone port, subwoofer port, guitar port, DVD player port, stereo receiver port
- Capacitor
- Transistor
- Mounting Screw Hole
- Power, Reset, SW, LED Pins

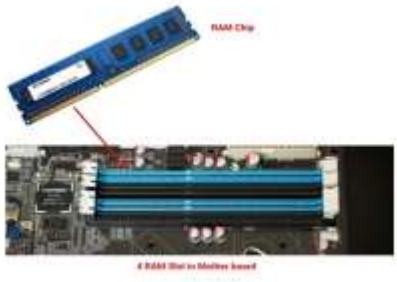
1) RAM chip and RAM Slot

RAM stands for Random Access Memory. It is also called the **main memory**.RAM is a **temporary data storage** device in computers and other devices. Data stored in RAM will get erased as soon as power is turned off.

RAM has **bidirectional data transfer** capacity from CPU to memory during a write operation and from RAM to CPU during the reading operation. It acts as a mediator for data transfer from CPU to other devices like HDD, cdrom, PEN drives.

It is called **Random-access memory** because any memory address of RAM can be accessed directly from any location. If row number and column number are known then data in any memory location can be accessed.

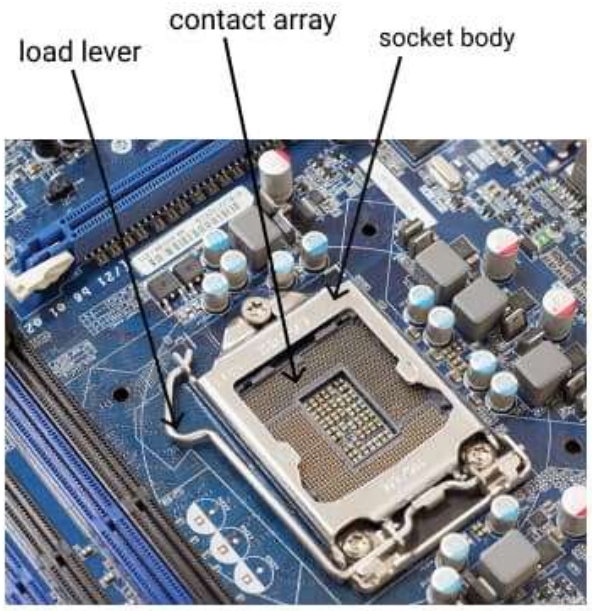
Various types of RAM are available in the market some of them are DRAM, SDRAM, DDR, SRAM, CMOS RAM,VRAM etc. Generally available RAM in the PC market is from 2 GB to 16 GB.



2) CPU Chip and Socket

CPU stands for Central Processing Unit. Considered as the **brain of the computer** and other electronic devices because all the decision making tasks of the computer is performed by the CPU. It is a large printed circuit board where all the components and peripherals are directly or indirectly connected. The main function of the CPU is to execute basics arithmetical, logical, and input/output operations.

CPU Chip



CPU Socket

CPU consists of 3 main typical components. ALU, CU

ALU: Arithmetical Logical Unit (ALU) is a digital circuit(gates) of CPU which is used for performing all arithmetical and logical operations. Some normal arithmetical operations performed by ALU are addition, subtraction, multiplication, and division. Some logical operations performed by ALU is comparisons between numbers and letters. A single CPU may also contain more than one ALU.

CU: Control Unit (CU) is a digital circuit of CPU which controls all the operations within the CPU.It allows and teaches various logical units, I/O devices, the memory of computer how to respond to a program's instructions of the various components as well as the user.

Memory or Storage Unit:

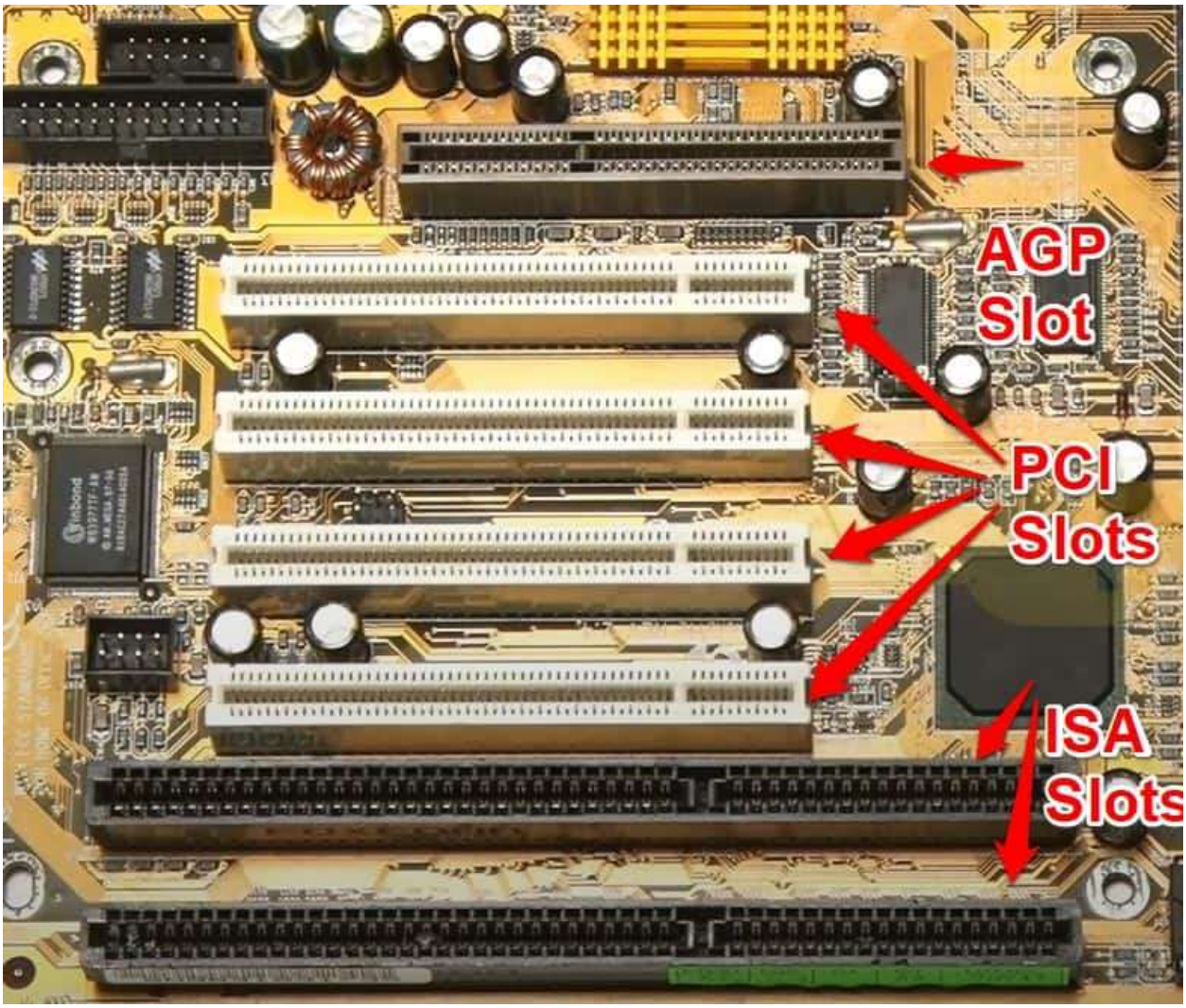
3) PCI Slots and PCI Chip

PCI Chip

PCI Slots

Peripheral Component Interconnected(PCI) is an attached hardware component of motherboard for connecting various hardware components like modems, disk controller, NIC cards, Sound Card, graphics cards, SSD add-on cards, RAID cards, extra USB and serial port required so PCI slots help increasing motherboard capabilities without adding or replacing the motherboard.

If you have limited ports and slots on the motherboard to connects various types of hardware devices like saying graphics card port(AGP port) then you can use PCI slots to connects Graphics cards and enjoy the same features. Same way if you have limited USB port in your computer system and want more than you can use a USB expansion card and get more USB port in your system.



4) AGP Slot and Chip

Accelerated Graphics Port Slot(AGP Slot) is a kind of expansion slot like a PCI slot but mainly designed for graphics cards. It was first introduced by Intel in 1996. We can easily locate this expansion slot because it is usually presented in **brown color**.

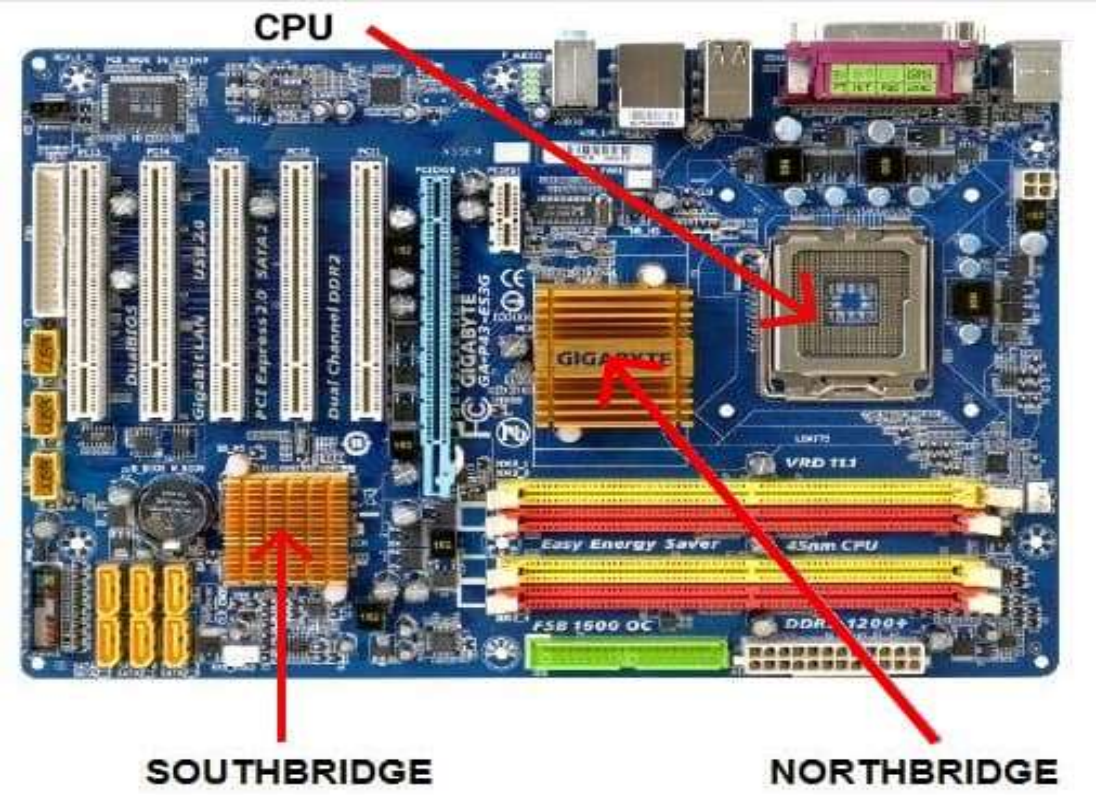
5) North Bridge

North Bridge is also called Host bridge or Memory Controller Hub. It acts as the primary controller in the motherboard which directs traffics to and from the CPU.So, the performance of the computer also depends on the northbridge chip. It does lots of processing so it generally comes with a heatsink.

Characteristics of North Bridge:

- It connects southbridge to the CPU.
- It handles and communicates faster components on the motherboard like Main Memory, AGP, PCIe, ROM, and CPU.
- It acts as a controller in bus speed on the motherboard.
- Generally, it does lots of work with the CPU, so it is located near to the CPU generally with the heatsink.
- It is a core component and is directly connected to the CPU.

In some processors of Intel, all the functioning of northbridge is performed by CPU.



6) South Bridge

Southbridge is an IC chip that generally handles and controls IO functioning in the motherboard. Unlike Northbridge, it does not have direct with CPU. It generally handles low-speed devices because its communication speed is lower. Instruction from CPU reaches northbridge then from northbridge to southbridge. It is

connected to the PCI bus, ISA buses, IDE buses, audio, serial devices like mouse, keyboard, USB ports, etc, and SATA hard disk connector.

7)CMOS Backup Battery

CMOS stands for "**Complementary Metal Oxide Semiconductor**" and found in both laptop and desktop PC as a small circular coin shape.CMOS stores a wide range of system information like current system clock, date, time, pulses, mostly used hardware settings, BIOS configuration settings, BOOT sequences, BIOS master/admin password, GPU and virtualization settings,power management, etc. They can save those set for a longer time around 2 to 10 years.CMOS works continuously even if you shut down your system because it is continually holding all those setting mention above.

8)Power Supply Plug

The main work of the Power Supply port in the Motherboard is to provide power to Motherboard and its attached components and peripherals.

i)24(20+4)ATXpowersupply
In modern PCs, ATX power supply is provided which is 24 Pin(20 + 4) Main Power Supply Connector (Older Pcs only have 20 Pin)

ii)4Pinor8PinConnector
This port in the motherboard is to provide dedicated power to the CPU. Older PCs may not have this Plugin motherboard but modern computers can do lots of works like overclocking so, a dedicated cable is provided to the CPU.

8Pin connector can be split into two and each split part can be used as 4 pin connector.

iii)PCI-Express6-Pinor8-PinConnector
This is required to power the PCI-E port.PCI-E slot required 75W power to operates.

THE older PC does not have this.

iv)Molex
Molex pin is 4 power pin which is required to supply power to older CDROM and hard drives. Molex is nowadays used for Case Fan. (some have some do not have)

Molex connector comes with Mini Molex connectors, which is used for floppy disk drives in much older PCs.

v)SATApowersupply

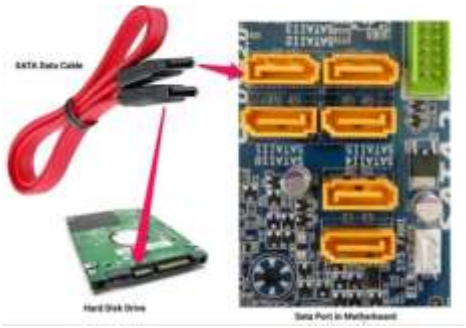
Modern hard drives and CDROM uses SATA cable for power. In motherboard, it is L-shape port and so its cable is connected to SATA port in one way only. In motherboard, it has 15 pins. It provides features of hot-swappable hard drives ie. plug and play hard drive features.

9) SATA and PATA Port and Connector

PATA stands for Parallel Advanced Technology Attachment. It is 40 pins long and wide ribbon cable used for connecting mass storage devices like hard disks(HDD or SSD), optical drives to the computer. It was launched in 1986 by Western Digital and Compaq. Every cable of PATA has two or three connectors, of which one is attached to the adapter interfacing and the remaining are plugged into secondary storage devices.

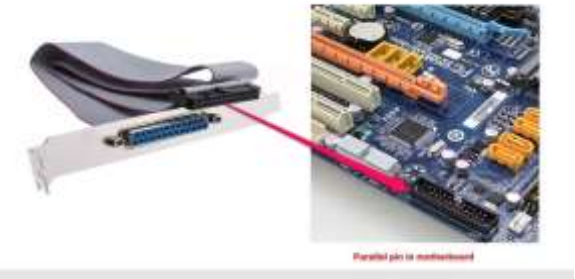
In modern computers, it is not used. It is outdated technology and is replaced by SATA Technology

SATA stands for Serial Advanced Technology Attachment. It is 7 pin cable which is shorter and powerful than the PATA connector and its function is the same as the PATA connector. The first version of SATA was launched in 2000.



10) Parallel Port

A parallel port is used to transfer in a parallel manner through multiple communication channels. Used for printers, scanner, Zip Drive, external HDD, tape backup devices, external CD ROM, etc.



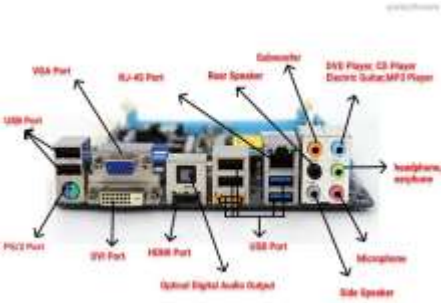
10) Serial Port

With a serial port, only one bit of data gets transfer at a time. It is found in an older PC to connect older keyboards, PDAs, external modems.

11) PS/2 Port

PS/2 port was popular in older desktop PCs.But now it is obsolete.

- PS/2 (green color) is for the mouse.
- PS/2 (purple) is for the keyboard.



11) USB Port

USB stands for Universal Serial Bus.Its transfer rates is faster than PS/2 connector so modern PC we donot find PS/2 port.There are various types of USB port some of them are :

- Type A
- Type B
- Type C
- Type A Mini
- Type B Mini
- Type A Micro
- Type B Micro
- Type B Micro USB3

12) RJ-45 Port

RJ stands for **Register Jack.** It looks like a telephone jack but slightly bigger.RJ45 is also called Ethernet Port because it is used to provide the internet to the computer.RJ 45 port is used to connect to Local Area Network using twisted pair ethernet cable . Ethernet Cable has a connector this connector is connected to RJ45 port.

13) HDMI port

HDMI stands for **High Definition Multimedia Interface**. It was developed in 2002 AD. It looks like a USB port but it is quite larger in size.HDMI is a digital interface for transmission of audio and video data in a single cable to digital devices like digital TV, projector, gaming console, computer, mobile devices, digital camera, cable box, blu ray, etc.

14) Audio Port

Most of the desktop computer nowadays comes with 3 to 6 port.

- Green Color Port is a Line Out which is for headphones and stereo speakers.
- Pink /Light Pink Port for Microphones input.
- Light Blue Port is line In which is for mp3 players, DVD player, CD player, stereo receiver, turntable, electric guitar, VCR audio outputs.
- Dolby Audio Black Port for rear speaker.
- Orange/yellow port is Center/Bass Channel which is for subwoofer

15) Heatsink

Heatsinks use a thermal conductor to reduce heat generated and prevent overheating from hardware components like CPU, GPU, northbridge, southbridge, RAM modules, etc. In general, that component that generates heats required a heatsink.

CPU has to perform a large number of tasks every second. While performing large tasks, it beings to generate heat and if heat is not maintained then the processor will destroy itself. Also at the top of the heatsink will have a FAN and this FAN helps to cool down the heat sink. This is Air coolant Heatsink

But in the market, we will have liquid coolant heatsink as well generally used in a high-end gaming environment, servers, and datacenter.

CPU Fan and Heatsink

NorthBridge with Heatsink

CPU with Heatsink above it

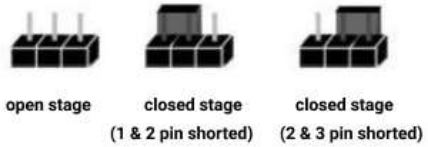
16) Switches and Jumper

Switches and jumpers are used to reconfigure the circuit onto an existing circuit board in a reversible way.

Jumper also called Jumper Shunt is a small circuit board used to close, open or bypass part of an electronic circuit.

Closed Stage Jumper: If the plug is pushed down over two pins, the jumper is referred to as jumpered.

Opened Stage Jumper: If there is no plug into the pin then it is an open stage.



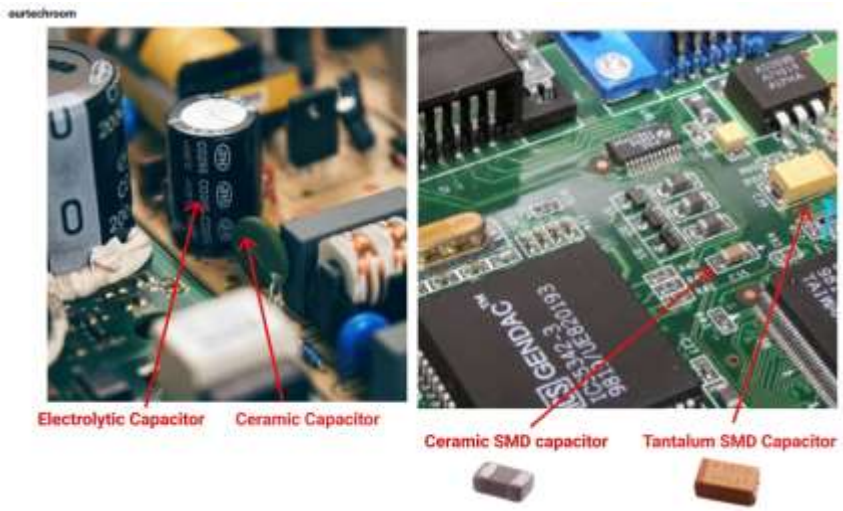
open stage | closed stage (1 & 2 pin shorted) | closed stage (2 & 3 pin shorted)

Jumper

17) Capacitor

A capacitor is an electronic device used for filtering, decoupling, and timing the circuit in the motherboard. There are more capacitors in the motherboard which mostly does decoupling functionality, so those capacitors are called a decoupling capacitor. A decoupling capacitor is used for stabilizing power in each IC used in the system.

It comes with various voltage levels like 3.3 V, 5 V, 12 V.



Suppose a circuit needs 5 V input than before that circuit there will be capacitors in parallel which allow up to 5 V to pass to that circuit.

18) Transistor and MOSFET

Transistor is used in most of the component of motherboard for various purpose like

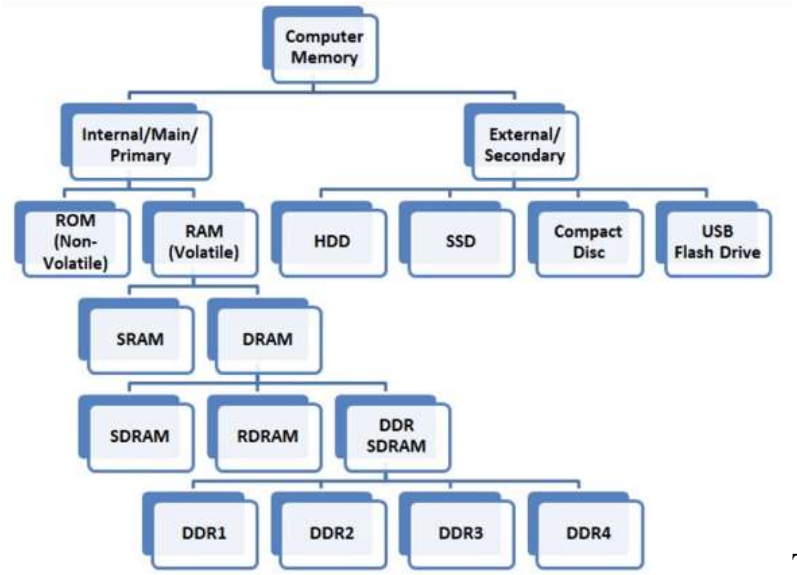
- controlling the amount of current or voltage in the component
- amplification/modulation electronic signal
- switching of an electronic signal and electrical power.

RAM MODULES

What is RAM?

The full form of RAM is Random Access Memory. The information stored in this type of memory is lost when the power supply to the PC or laptop is switched off. The information stored in RAM can be checked with the help of BIOS. It is generally known as the main memory or temporary memory or cache memory or volatile memory of the computer system.

Types of RAM



Types of RAM

Two main types of RAM are:

- Static RAM
- Dynamic RAM

Static RAM

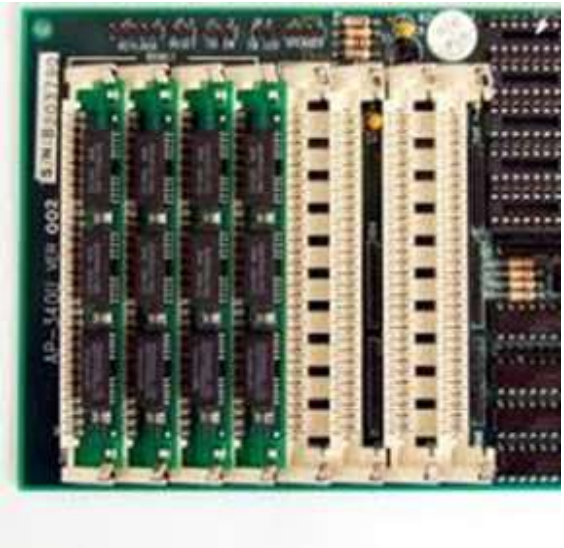
Static RAM is the full form of SRAM. In this type of RAM, data is stored using the state of a six transistor memory cell. Static RAM is mostly used as a cache memory for the processor (CPU).

Dynamic RAM

DRAM stands for Dynamic Random Access Memory. It is a type of RAM which allows you to stores each bit of data in a separate capacitor within a specific integrated circuit. Dynamic RAM is a standard computer memory of the many modern desktop computers.

This type of RAM is a volatile memory that needs to be refreshed with voltage regularly. Else it loses the information stored on it.

Other Important Types of RAM



FPM DRAM

Fast Page Mode Dynamic Random Access Memory is a type of RAM that waits through the entire process of locating a bit of data by column and row and then reading the bit before it begins on the next bit. Max transfer rate is around 176 Mbps.

SDR RAM

SDR RAM

SDR RAM is a full form of synchronous dynamic access memory. It has access times between 25 and 10 ns(nanosecond), and they are in DIMM (dual in-line memory module) modules of 168 contacts.

They store data using capacitors using IC's (Integrated Circuits). On one of its sides, they have terminations, which can be inserted inside of the individual slots for the Motherboard's memory.RD RAM

RD RAM

Rambus Dynamic Random Access Memory is a full form of RDRAM. This type of RAM chips works in parallel, which allows you to achieve a data rate of 800 MHz or 1,600 Mbps. It generates much more heat as they operate at such high speeds.

VRAM (Video):

VRAM

RAM optimized for video adapters is called VRAM. These chips have two ports so that video data can be written to chips at the same time the video adapter regularly reads the memory to refresh the monitor's current display.EDO RAM

EDO RAM

EDO DRAM is an abbreviation of Extended Data Output Random Access Memory. It doesn't wait for the completion of the processing of the first bit before continuing to the next one. As soon as the address of the first bit is located, EDO DRAM begins looking for the next bit.

Flash Memory :

Flash Memory

Flash memory is an electrically erasable and programmable permanent type of memory. It uses a one-transistor memory to store a bit. It offers low power consumption and helps to reduce the cost. It is mainly used in digital cameras, MP3 players, etc.

DDR SDRAM

DDR RAM

The full form of DDR SDRAM is Double Data Rate Synchronous Dynamic Random-Access Memory. It is just like SDRAM. The only difference between the

two is that it has a higher bandwidth, which offers greater speed. It's maximum transfer rate to L2 cache which is approximately 1,064 Mbps.

Uses of RAM

Here, are important uses of RAM:

- RAM is utilized in the computer as a scratchpad, buffer, and main memory.
- It offers a fast operating speed.
- It is also popular for its compatibility
- It offers low power dissipation

DAUGHTER CARDS

A **daughterboard (or *daughter board* , *daughter card* , or *daughtercard*)** is a circuit board that plugs into and extends the circuitry of another circuit board. The other circuit board may be the computer's main board (its motherboard) or it may be another board or card that is already in the computer, often a sound card. The term is commonly used by manufacturers of wavetable daughterboards that attach to existing sound cards.

Alternatively known as a **bus slot** or **expansion port**, an **expansion slot** is a connection or port inside a computer on the motherboard or riser card. It provides an installation point for a hardware expansion card to be connected. For example, if you wanted to install a new video card in the computer, you'd purchase a video expansion card and install that card into the compatible expansion slot.

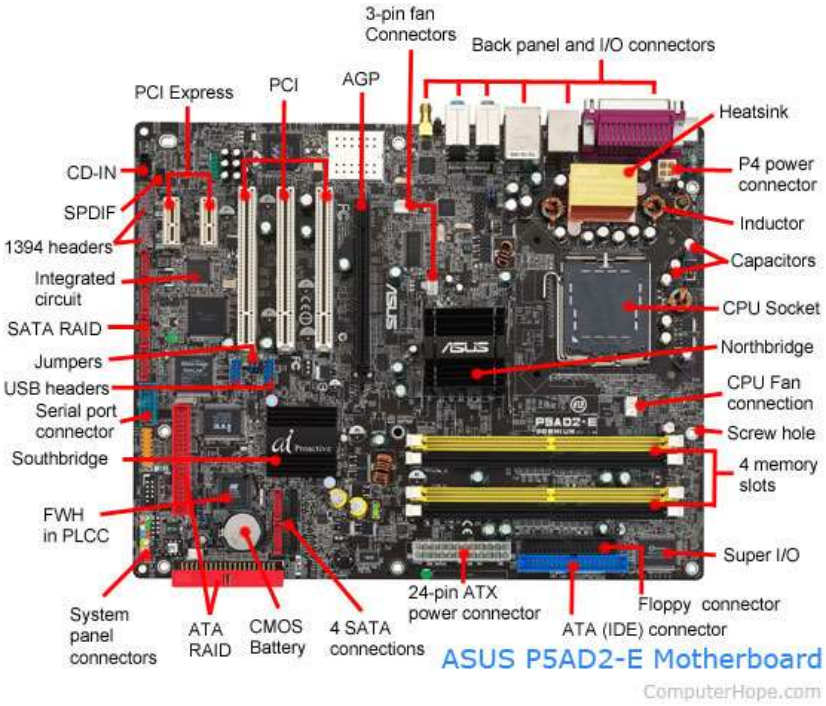
Computer expansion slots

Below is a listing of expansion slots commonly found in a computer and the devices associated with those slots. Clicking any of the links below provide you with additional details.

- **AGP** - Video card.

- **AMR** - Modem, sound card.
- **CNR** - Modem, network card, sound card.
- **EISA** - SCSI, network card, video card.
- **ISA** - Network card, sound card, video card.
- **PCI** - Network card, SCSI, sound card, video card.
- **PCI Express** - Video card, modem, sound card, network card.
- **VESA** - Video card.

Many of the expansion card slots above are obsolete. You're most likely only going to encounter AGP, PCI, and PCI Express when working with computers today. The picture below is an example of what expansion slots may look like on a motherboard. In this picture, there are three different types of expansion slots: PCI Express, PCI, and AGP.



How many expansion slots does my computer have?

Every computer motherboard is different, to determine how many expansion slots are on your computer motherboard identify the manufacturer and model of the motherboard. Once you've identified the model of motherboard, you can find complete information about the motherboard in its manual.

Adding additional expansion slots for older motherboards could be accomplished using a riser board, which would add several ISA or PCI slots. Today, riser boards are rarely used with motherboards, as there is limited need for additional expansion slots with modern motherboards.

What type of expansion slots are on my motherboard?

As mentioned above, every motherboard model is unique, so to determine the type of expansion slots on the motherboard, consult the board's specifications and owner's manual. You can also open the computer case and visually examine the motherboard.

Why do computers have expansion slots?

Computers have expansion slots to give the user the ability to add new devices to their computer. For example, a computer gamer may upgrade their video card to get better performance in their games. An expansion slot allows them to remove the old video card and add a new video card without replacing the motherboard.

What is the most common expansion slot today?

Today, the most commonly used expansion slot used and found on computer motherboards is the PCI Express expansion slot.

Does a laptop have an expansion slot?

Laptops do not have expansion slots like a desktop computer. However, some laptops do have PC Cards that can be inserted into the side of the laptop. They may also have a Cardbus slot for an ExpressCard to be added.

SMPS

SMPS is the Switched Mode Power Supply circuit which is designed for obtaining the regulated DC output voltage from an unregulated DC or AC voltage. There are four main types of **SMPS** such as. DC to DC Converter. AC to DC Converter.

The SMPS is mostly used where switching of voltages is not at all a problem and where efficiency of the system really matters. There are few points which are to be noted regarding SMPS. They are

- SMPS circuit is operated by switching and hence the voltages vary continuously.
- The switching device is operated in saturation or cut off mode.
- The output voltage is controlled by the switching time of the feedback circuitry.
- Switching time is adjusted by adjusting the duty cycle.
- The efficiency of SMPS is high because, instead of dissipating excess power as heat, it continuously switches its input to control the output.

Disadvantages

There are few disadvantages in SMPS, such as

- The noise is present due to high frequency switching.
- The circuit is complex.
- It produces electromagnetic interference.

Advantages

The advantages of SMPS include,

- The efficiency is as high as 80 to 90%
- Less heat generation; less power wastage.
- Reduced harmonic feedback into the supply mains.
- The device is compact and small in size.
- The manufacturing cost is reduced.
- Provision for providing the required number of voltages.

Applications

There are many applications of SMPS. They are used in the motherboard of computers, mobile phone chargers, HVDC measurements, battery chargers, central power distribution, motor vehicles, consumer electronics, laptops, security systems, space stations, etc.

Types of SMPS

SMPS is the Switched Mode Power Supply circuit which is designed for obtaining the regulated DC output voltage from an unregulated DC or AC voltage. There are four main types of SMPS such as

- DC to DC Converter
- AC to DC Converter
- Fly back Converter
- Forward Converter

Internal Storage Devices

Internal storage can mean several different things, but most often refers to a computer's **internal** hard drive. This is the primary **storage device** used to store a user's files and applications. If a computer has multiple **internal** hard **drives**, they are all considered part of the computer's **internal storage**

Optical Storage

Optical Storage is a device for storage method in which data is written and readable with a laser and purpose is to store backup. Data written methods such as CDs and DVDs. From some of the years Optical storage is replacement for drives in personal computers and tape backup in mass storage. This is durable and protected to environmental conditions. Now the optical speeds approaching hard drives as said by OSTA(Optical Storage Technology Association). There are some of the new formats introduced Blu-ray and UDO i.e. ultra density optical and also use blue laser to increase capacity.

Magnetic Storage

Magnetic Storage is the most common and enduring form of removable storage device which is used in mostly systems. It is used as a drive which is mechanical device connects to computer in that you can insert the media that actually used as a storage device. The media used in removable storage device is made up of iron oxide and that oxide is ferromagnetic material, here the meaning of the term ferromagnetic is if you expose it into magnetic field it is permanently magnetised that is known as a disk or cartridge. The drive use motor to rotate the device at a

very high speed and access information stored by the heads. There are many types of magnetic storage devices hard drives, Tapes, Floppy disk, Iomega.

Semiconductor Storage

This storage device is used to store digital information that is fabricated by using integrated circuit technology also known as semiconductor technology which is an essential parts of today world. As there is rapid improvement in the requirement of such kind of technologies there are some of the related technologies emerged are ROM, RAM, EPROM, EEPROM, Flash Memory, DRAM and so on. Now we are going to discuss Flash memory its function and features. In this data can written and erased on the individual cell basis. To re-programme different areas of chip at different levels electronic equipment are used. It is non-volatile which make it useful to use. Used in many different fields like mobile phone, memory cards for digital cameras and many other applications.

Ports and Interfaces

The Motherboard of a computer has many I/O sockets that are connected to the ports and interfaces found on the rear side of a computer (Figure 3.13). The external devices can be connected to the ports and interfaces. The various types of ports are given below:

Serial Port: To connect the external devices, found in old computers.

Parallel Port: To connect the printers, found in old computers.

USB Ports: To connect external devices like cameras, scanners, mobile phones, external hard disks and printers to the computer.

USB 3.0 is the third major version of the Universal Serial Bus (USB) standard to connect computers with other electronic gadgets as shown in Figure 3.13. USB 3.0 can transfer data up to 5 Giga byte/second. USB3.1 and USB 3.2 are also released.

Figure 3.13 USB 3.0 Ports

VGA Connector: To connect a monitor or any display device like LCD projector.

Audio Plugs: To connect sound speakers, microphone and headphones.

PS/2 Port: To connect mouse and keyboard to PC.

SCSI Port: To connect the hard disk drives and network connectors.

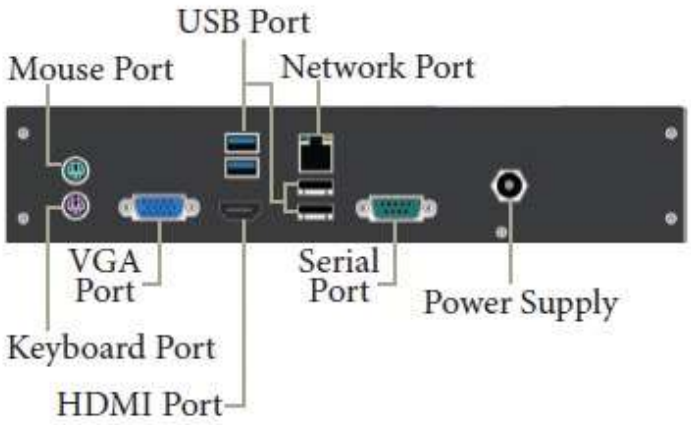


Fig 3.14 Ports and Interfaces

High Definition Multimedia Interface (HDMI)

High-Definition Multimedia Interface is an audio/video interface which transfers the uncompressed video and audio data from a video controller, to a compatible computer monitor, LCD projector, digital television etc.

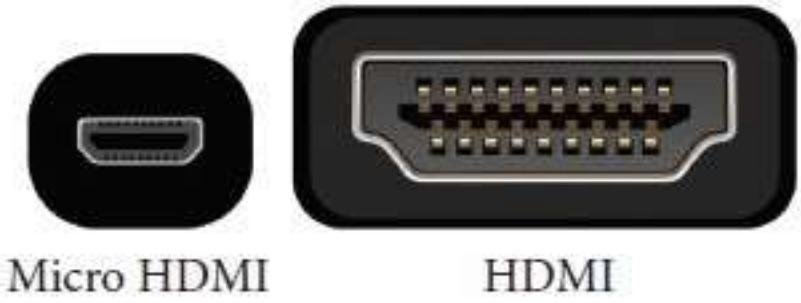


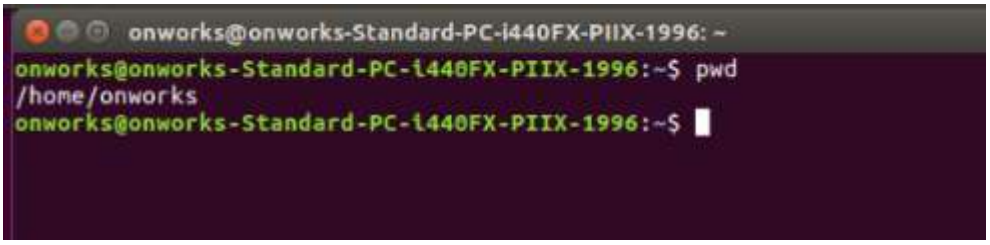
Figure 3.15 HDMI Ports

ASSIGNMENT-2

BASIC LINUX COMMANDS

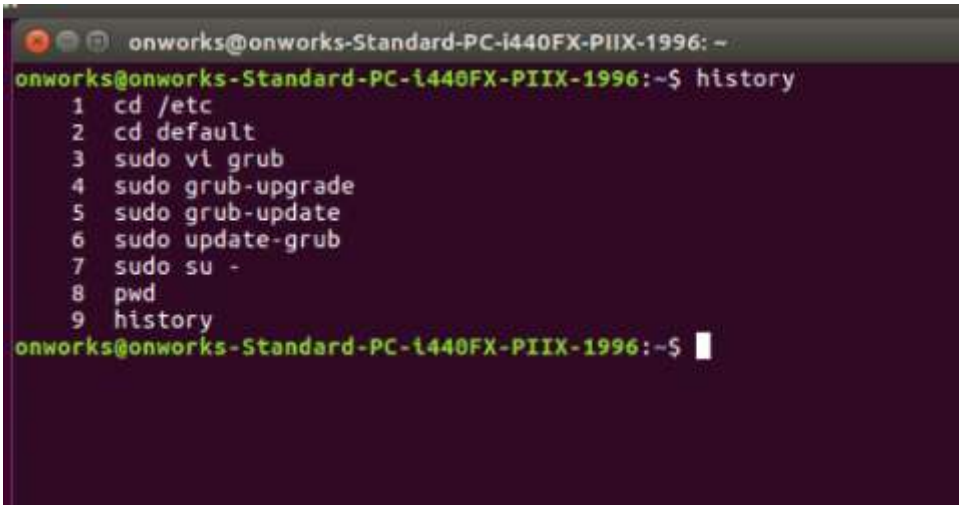
1. pwd (Print Working Directory)

Use the pwd command to find out the path of the current working directory (folder) you're in.



2. history

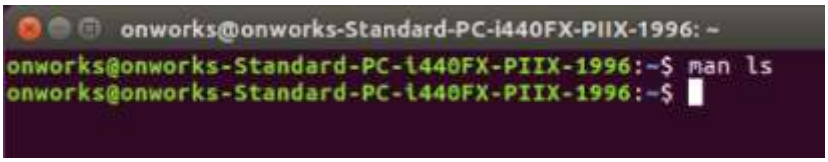
- When you have been using Linux for a certain period of time, you will quickly notice that you can run hundreds of commands everyday. As such, running history command is particularly useful if you want to review the commands you have entered before.
- history
- !command number to run a command from history

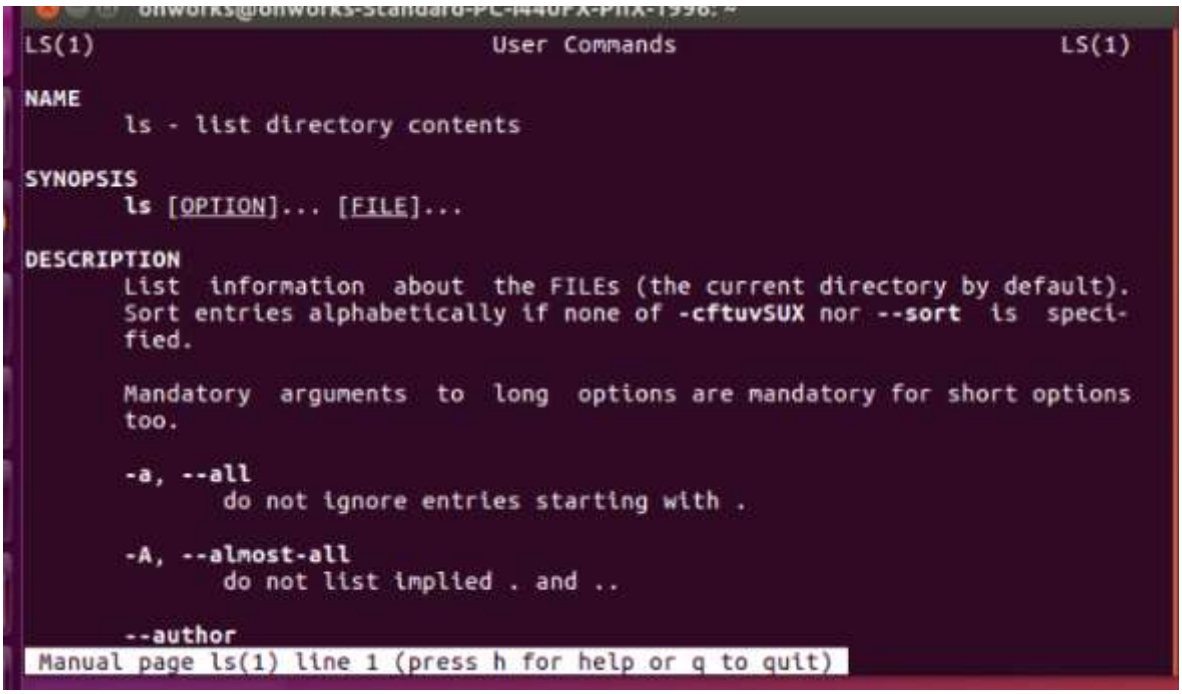


3. man

If we are confused about the function of certain Linux commands we can easily learn how to use them right from Linux's shell by using the man command. For instance, entering **man tail** will show the manual instruction of the **tail** command.

man ls





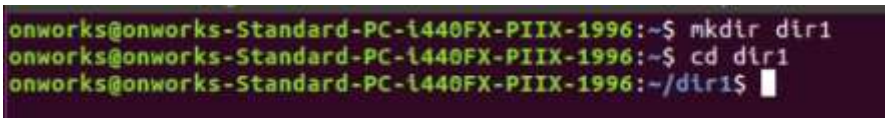
4. cd

To navigate through the Linux files and directories, use the cd .

It requires either the full path or the name of the directory, depending on the current working directory that you're in.

Shortcuts to help you navigate quickly:

- cd .. (with two dots) to move one directory up
- cd to go straight to the home folder
- cd- (with a hyphen) to move to your previous directory



5. ls

The ls command is used to view the contents of a directory. By default, this command will display the contents of your current working directory.

There are variations you can use with the ls command:

• **ls -R** will list all the files in the sub-directories as well

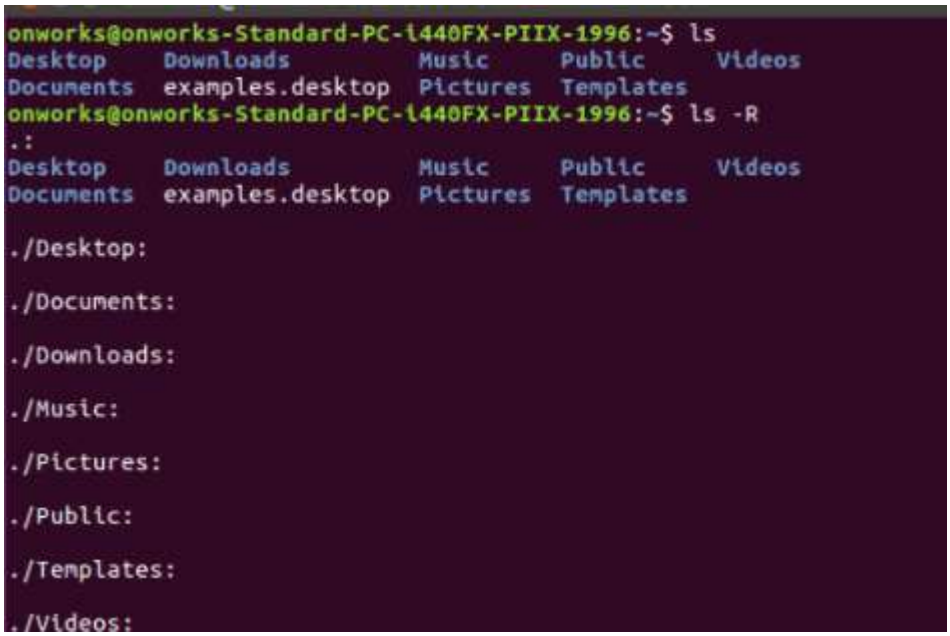
• **ls –l –** long listing

• **ls -a** will show the hidden files

• **ls -al** will list the files and directories with detailed information like the permissions, size, owner, etc.

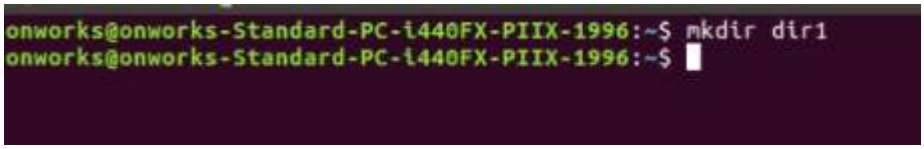
• **ls -t** lists files sorted in the order of "last modified".

• **ls -r** option will reverse the natural sorting order. Usually used in combination with other switches such as ls -tr. This will reverse the time-wise listing.



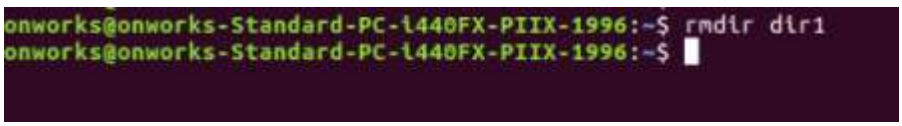
6. mkdir

Use mkdir command to make a new directory .
To generate a new directory inside another directory, use this Linux basic command.



7. rmdir

If you need to delete a directory, use the rmdir command. However, rmdir only allows you to delete empty directories.



8. touch

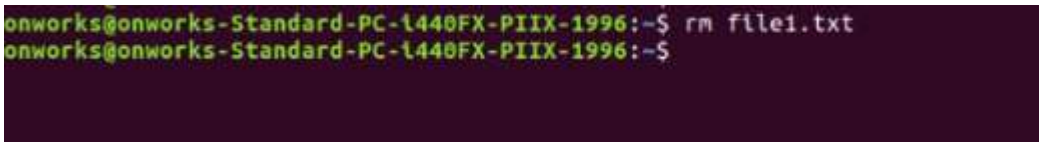
The touch command allows you to create a blank new file through the Linux command line.

9. rm

The rm command is used to delete directories and the contents within them.

If you only want to delete the directory — as an alternative to rmdir — use rm -r.

To remove a file use **rm filename**



10. cat

cat (short for concatenate) is one of the most frequently used commands in Linux. It is used to list the contents of a file on the standard output stdout .

To run this command, type cat followed by the file's name and its extension. For instance: cat file.txt.

Here are other ways to use the cat command:

- **cat > filename** creates a new file

- **cat filename1 filename2>filename3** joins two files (1 and 2) and stores the output of them in a new file (3)

- to convert a file to upper or lower case use, **cat filename | tr a-z A-Z >output.txt**

- **cat >>myfile** insert data to a file

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat > file1.txt
hello
world
^C
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat file1.txt
hello
world
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat file1.txt >> file2.txt
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat file2.txt
hello
world
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

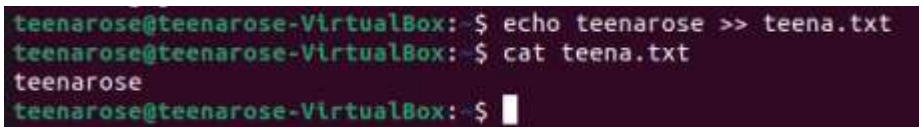
```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat file2.txt | tr a-z A-z
HELLO
WORLD
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

ASSIGNMENT-3

BASIC LINUX COMMANDS

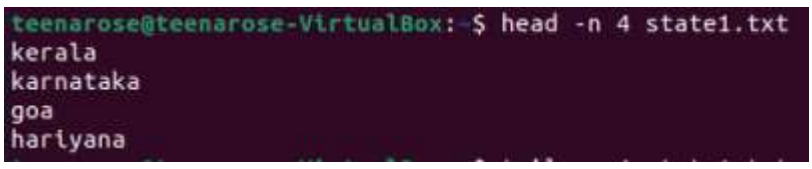
1. echo

• echo command is used to move some data into a file.
• If you want to add the text, “Hello, my name is John” into a file called name.txt, you would type echo Hello, my name is John >> name.txt



2. head

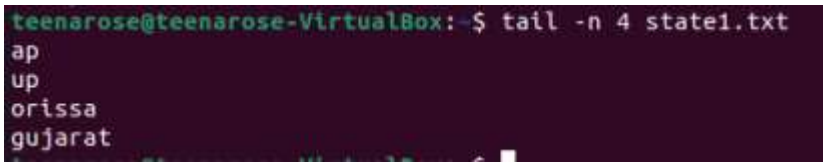
- The head command is used to view the first lines of any text file.
- By default, it will show the first ten lines, but you can change this number to your liking.
  - If you only want to show the first five lines, type head -n 5 filename.txt



3. tail

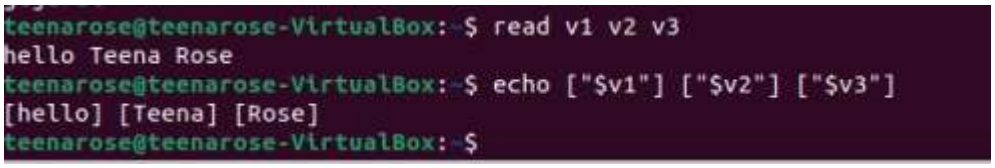
• This one has a similar function to the head command, but instead of showing the first lines, the tail command will display the last ten lines of a text file.

• tail -n filename.txt



4. read

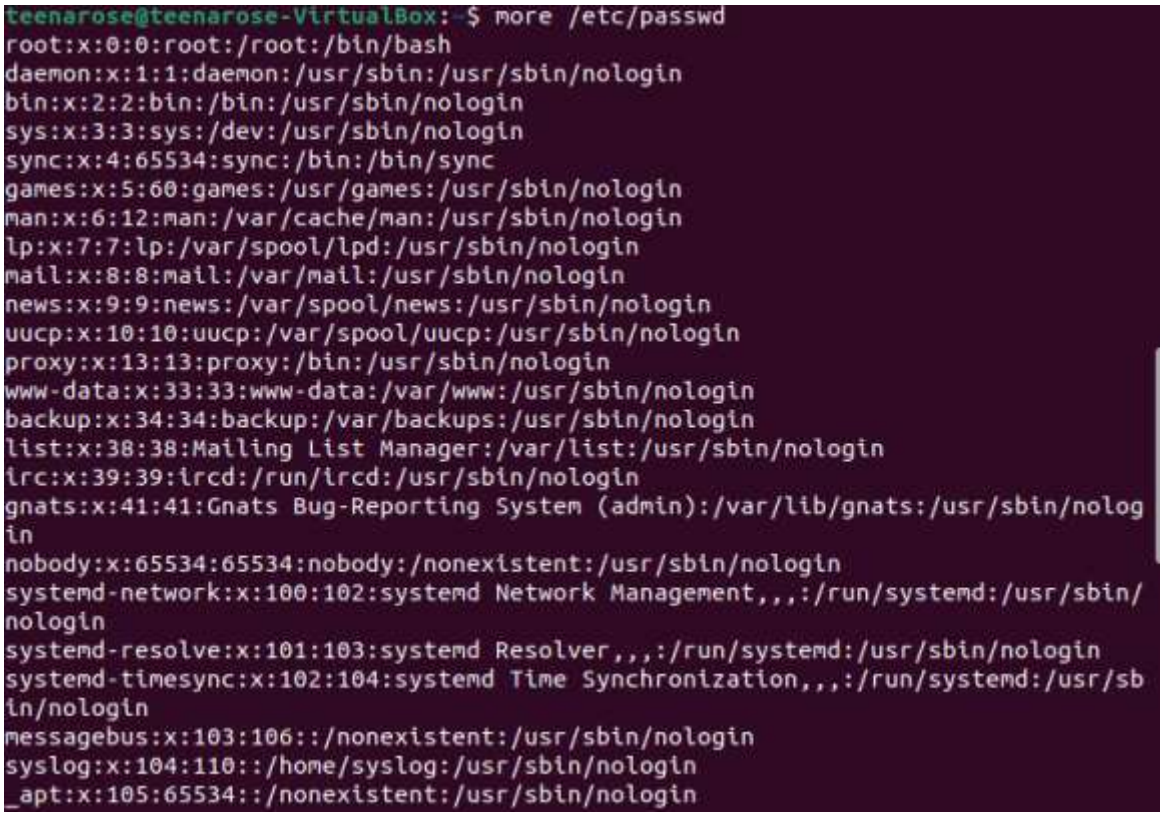
a. read the contents of a line into a variable.
b. The read command can be used with and without arguments
c. read command is used to read [options] [name...]
d. $read • $read var1 var2 var3
e. $echo "[$var1] [$var2] [$var3]“



5. more

- Like cat command, more command displays the content of a file. Only difference is that, in case of larger files, 'cat' command output will scroll off your screen while 'more' command displays output one screenful at a time.
- Enter key: To scroll down page line by line.
- Space bar: To go to next page.
- b key: To go to the backward page.
- / key: Lets you search the string
- . • Syntax: more <file name>
- **more /etc/passwd**

- **more -num** Limits the line displayed per page.
- **more -d** Displays user message at right corner.
- **more -s** Squeeze blank lines.
- **more +/string name** It helps to find the string.
- **more +num** Used to display the content from a specific line.



6. Less

- The 'less' command is same as 'more' command but include some more features.
- It automatically adjust with the width and height of the teminal window, while 'more' command cuts the content as the width of the terminal window get shorter.
- less <file name>
- **$less /etc/passwd**

```
teenarose@teenarose-VirtualBox:~$ less /etc/passwd
teenarose@teenarose-VirtualBox:~$
```

```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:103:106::/nonexistent:/usr/sbin/nologin
syslog:x:104:110::/home/syslog:/usr/sbin/nologin
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
:
```

7. cut

- The cut command is used for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by byte position, character and field
- **cut OPTION... [FILE]...**
- **$cut -b 1,2,3 state.txt**

```
teenarose@teenarose-VirtualBox:~$ cut -b 1,2,3 state1.txt
ker
kar
goa
har
bih
ass
ap
up
ori
guj
```

8. paste

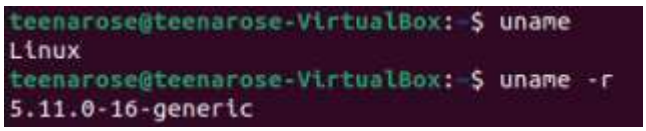
- It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by tab as delimiter, to the standard output.
- **paste [OPTION]... [FILES]...**
- **$ paste state.txt capital.txt**

```
teenarose@teenarose-VirtualBox: $ cat >> state1.txt
kerala
karnataka
goa
hariyana
bihar
assam
ap
up
orissa
gujarat
^C
teenarose@teenarose-VirtualBox: $ cat >> num1.txt
1
2
3
4
5
6
7
8
9
10
^C
```

```
teenarose@teenarose-VirtualBox: $ paste num1.txt state1.txt
1       kerala
2       karnataka
3       goa
4       hariyana
5       bihar
6       assam
7       ap
8       up
9       orissa
10      gujarat
teenarose@teenarose-VirtualBox: $
```

9. uname

- The uname command, short for Unix Name, will print detailed information about your Linux system like the machine name, operating system, kernel, and so on.
- **$uname**
- **$uname –r**



10.cp

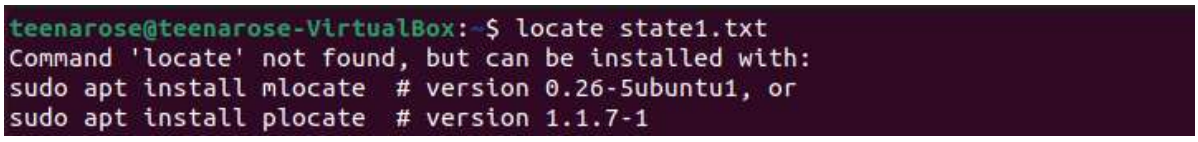
- cp command is used to copy files from the current directory to a different directory. For instance, the command cp scenery.jpg /home/username/Pictures would create a copy of scenery.jpg (from your current directory) into the Pictures directory.
- **cp -i** will ask for user's consent in case of a potential file overwrite.
- **cp -p** will preserve source files' mode, ownership and timestamp.
- **cp -r** will copy directories recursively.
- **cp -u** copies files only if the destination file is not existing or the source file is newer than the destination file.

11.mv

- The primary use of the mv command is to move files, it can also be used to rename files. The arguments in mv are similar to the cp command. You need to type mv, the file's name, and the destination's directory.
- **mv file.txt /home/username/Documents**
- To rename files, the Linux is mv oldname.txt newname.txt

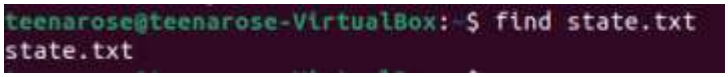
12. locate

- To locate a file, just like the search command in Windows.
- What's more, using the -i argument along with this command will make it case-insensitive, so you can search for a file even if you don't remember its exact name.
- To search for a file that contains two or more words, use an asterisk (*).
- For example, **locate -i school*note** command will search for any file that contains the word "school" and "note", whether it is uppercase or lowercase.



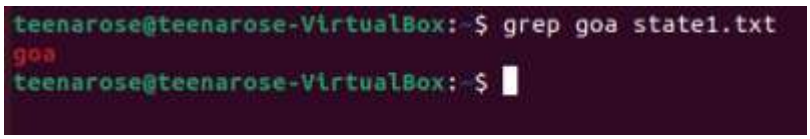
13. find

- Similar to the locate command, using find also searches for files and directories.
- The difference is, you use the find command to locate files within a given directory.
- As an example, **find /home/ -name notes.txt** command will search for a file called notes.txt within the home directory and its subdirectories.
- Other variations when using the find are:
- To find files in the current directory use, **find . -name notes.txt**
- To look for directories use, **/ -type d -name notes. txt**



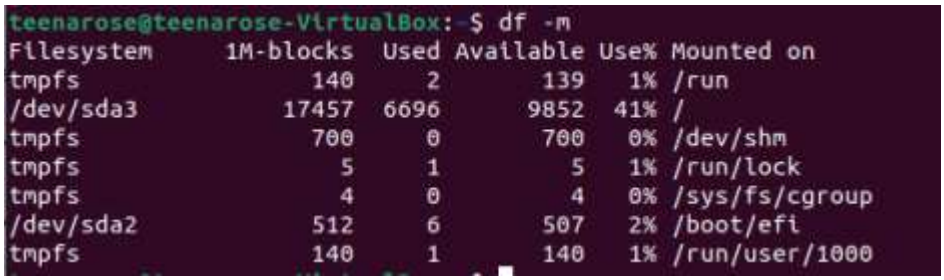
14. grep

- Another basic Linux command that is undoubtedly helpful for everyday use is grep. It lets you search through all the text in a given file.
- To illustrate, grep blue notepad.txt will search for the word blue in the notepad file. Lines that contain the searched word will be displayed fully. Usually output of a previous command is piped into the grep command. For example ls -l | grep “kernel”



15. df

• Use df command to get a report on the system's disk space usage, shown in percentage and KBs. If you want to see the report in megabytes, type **df -m.**

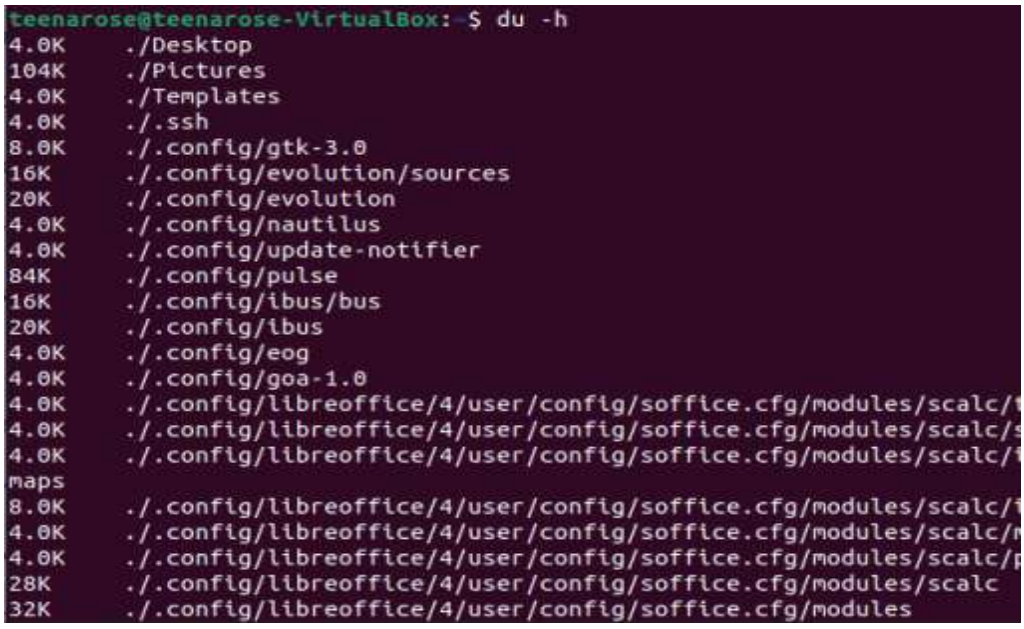


16. du

• If you want to check how much space a file or a directory takes, the du (Disk Usage) command is the answer. However, the disk usage summary will show disk block numbers instead of the usual size format.

• If you want to see it in bytes, kilobytes, and megabytes, add the -h argument to the command line.

• **$du -h**

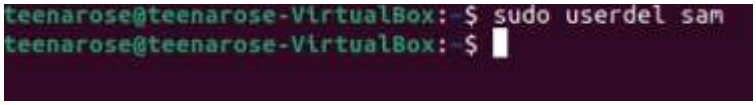


17.useradd

- This is available only to system admins
- Since Linux is a multi-user system, this means more than one person can interact with the same system at the same time.
- useradd is used to create a new user, while passwd is adding a password to that user's account. To add a new person named John type, useradd John and then to add his password type, passwd 123456789

18.userdel

- Remove a user is very similar to adding a new user. To delete the users account type, userdel UserName



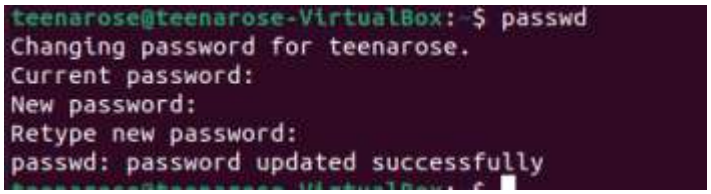
19.sudo

- Short for "SuperUser Do", this command enables you to perform tasks that require administrative or root permissions. You must have sufficient permissions to use this command.

- **sudo useradd maria**

20. passwd

- Changes passwords for user accounts.
- A normal user may only change the password for their own account, while the superuser may change the password for any account.
- passwd[option] [username]
- **passwd**
- passwd user1



ASSIGNMENT-4

BASIC LINUX COMMANDS

1. **usermod**

usermod command is used to change the properties of a user in Linux through the command line.

```
teenarose@teenarose-VirtualBox:~$ sudo useradd irene
teenarose@teenarose-VirtualBox:~$ sudo passwd
New password:
Retype new password:
passwd: password updated successfully
```

```
teenarose@teenarose-VirtualBox:~$ sudo usermod -u 2000 irene
teenarose@teenarose-VirtualBox:~$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nolog
in
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/
nologin
```

2. **groupadd**

groupadd command creates a new group account using the values specified on the command line and the default values from the system.

```
teenarose@teenarose-VirtualBox:~$ sudo groupadd SJ
teenarose@teenarose-VirtualBox:~$ groups
teenarose adm cdrom sudo dip plugdev lpadmin lxd sambashare
teenarose@teenarose-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,teenarose
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:teenarose
floppy:x:25:
tape:x:26:
sudo:x:27:teenarose
audio:x:29:pulse
dip:x:30:teenarose
www-data:x:33:
backup:x:34:
```

3. **groups**
   print the groups a user is in.

4. **groupdel**
   groupdel command modifies the system account files, deleting all entries that refer to group. The named group must exist.

```
teenarose@teenarose-VirtualBox:~$ sudo groupdel SJ
teenarose@teenarose-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,teenarose
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:teenarose
floppy:x:25:
tape:x:26:
sudo:x:27:teenarose
audio:x:29:pulse
dip:x:30:teenarose
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
```

5. **groupmod**

   The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.

```
teenarose@teenarose-VirtualBox:~$ sudo groupadd lavender
teenarose@teenarose-VirtualBox:~$ groups
teenarose adm cdrom sudo dip plugdev lpadmin lxd sambashare
teenarose@teenarose-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,teenarose
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
```

```
teenarose@teenarose-VirtualBox:~$ tail /etc/group
alloshy:x:1006:
irene:x:2003:
SJ:x:2004:
Ss:x:2005:
ss:x:2006:
SG:x:2007:
flowers:x:2008:
mn:x:2009:
trees:x:2010:
lavender:x:2011:
```

```
teenarose@teenarose-VirtualBox:~$ sudo groupmod -n HH lavender
teenarose@teenarose-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,teenarose
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
```

6. **chmod**

   To change directory permissions of file/ Directory in Linux.
   chmod +rwx filename to add permissions.
   chmod -rwx directoryname to remove permissions.
   chmod +x filename to allow executable permissions.
   chmod -wx filename to take out write and executable permissions.

```
teenarose@teenarose-VirtualBox:~$ chmod u+x state.txt
teenarose@teenarose-VirtualBox:~$
```

7. **chown**

   The chown command allows you to change the user and/or group ownership of a given file, directory.

```
teenarose@teenarose-VirtualBox:~$ chown teenarose  hi.txt
teenarose@teenarose-VirtualBox:~$ ls -l hi.txt
-rw-rw-r-- 1 teenarose teenarose 11 Aug  9 20:36 hi.txt
teenarose@teenarose-VirtualBox:~$
```

8. **id**

id command in Linux is used to find out user and group names and numeric ID's (UID or group ID) of the current user.

```
teenarose@teenarose-VirtualBox:~$ id
uid=1000(teenarose) gid=1000(teenarose) groups=1000(teenarose),4(adm),24(cdrom)
,27(sudo),30(dip),46(plugdev),121(lpadmin),132(lxd),133(sambashare)
teenarose@teenarose-VirtualBox:~$
```

9. **ps**

The ps command, short for Process Status, is a command line utility that is used to display or view information related to the processes running in a Linux system.

PID – This is the unique process ID.

TTY – This is the type of terminal that the user is logged in to.

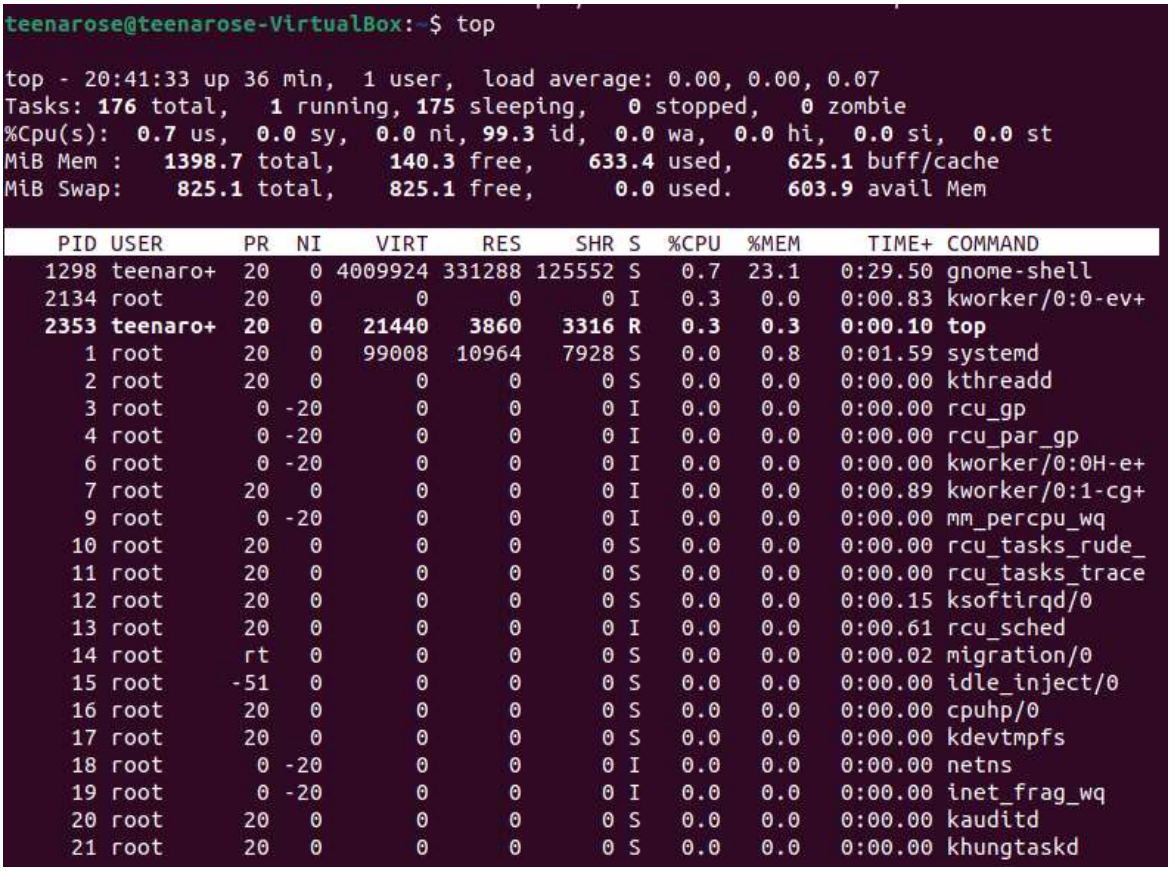
TIME – This is the time in minutes and seconds that the process has been running.

CMD – The command that launched the process.

```
teenarose@teenarose-VirtualBox:~$ ps -u
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
teenaro+    1198  0.0  0.4 171604  6088 tty2     Ssl+ 20:06   0:00 /usr/libexec
teenaro+    1201  0.0  1.0 229916 15568 tty2     Sl+  20:06   0:00 /usr/libexec
teenaro+    2081  0.0  0.3  19612  5168 pts/0    Ss   20:13   0:00 bash
teenaro+    2352  0.0  0.2  21092  3408 pts/0    R+   20:39   0:00 ps -u
```

10. **top**

top command is used to show the Linux processes. It provides a dynamic real-time view of the running system.


teenarose@teenarose-VirtualBox:~$ top
top - 20:41:33 up 36 min, 1 user, load average: 0.00, 0.00, 0.07
Tasks: 176 total, 1 running, 175 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.7 us, 0.0 sy, 0.0 ni, 99.3 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 1398.7 total, 140.3 free, 633.4 used, 625.1 buff/cache
MiB Swap: 825.1 total, 825.1 free, 0.0 used. 603.9 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1298 teenaro+ 20 0 4009924 331288 125552 S 0.7 23.1 0:29.50 gnome-shell
2134 root 20 0 0 0 0 I 0.3 0.0 0:00.83 kworker/0:0-ev+
2353 teenaro+ 20 0 21440 3860 3316 R 0.3 0.3 0:00.10 top
1 root 20 0 99008 10964 7928 S 0.0 0.8 0:01.59 systemd
2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthreadd
3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_gp
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_par_gp
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H-e+
7 root 20 0 0 0 0 I 0.0 0.0 0:00.89 kworker/0:1-cg+
9 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
10 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_tasks_rude_
11 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_tasks_trace
12 root 20 0 0 0 0 S 0.0 0.0 0:00.15 ksoftirqd/0
13 root 20 0 0 0 0 I 0.0 0.0 0:00.61 rcu_sched
14 root rt 0 0 0 0 S 0.0 0.0 0:00.02 migration/0
15 root -51 0 0 0 0 S 0.0 0.0 0:00.00 idle_inject/0
16 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
17 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kdevtmpfs
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
19 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 inet_frag_wq
20 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kauditd
21 root 20 0 0 0 0 S 0.0 0.0 0:00.00 khungtaskd

ASSIGNMENT-5

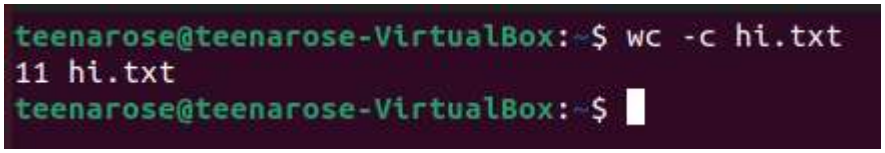
BASIC LINUX COMMANDS

1. **wc**

   wc stands for word count.

   Used for counting purpose.

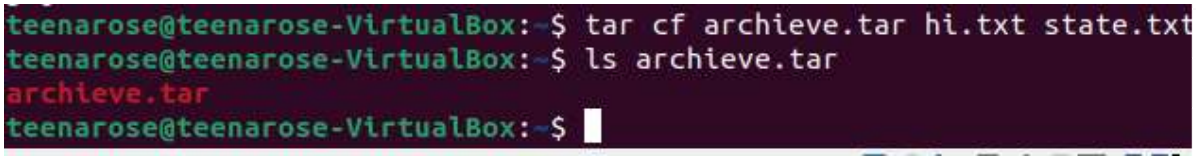
   It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.



2. **tar**

   The Linux ‘tar’ stands for tape archive, is used to create Archive and extract the Archive files.

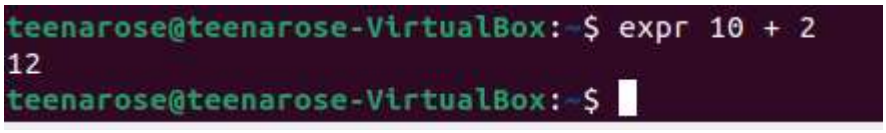
   Linux tar command to create compressed or uncompressed Archive files.



3. **expr**

   The expr command evaluates a given expression and displays its corresponding output. It is used for:

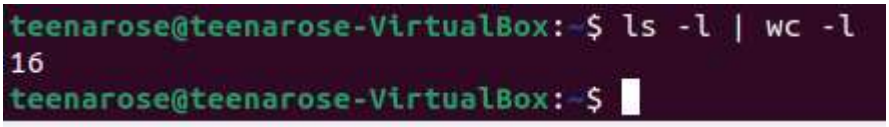
   Basic operations like addition, subtraction, multiplication, division, and modulus on integers.



4. **Redirections & Piping**

   A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.

Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.



5. **ssh**

- ssh stands for "Secure Shell".
- It is a protocol used to securely connect to a remote server/system.
- ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.
- It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

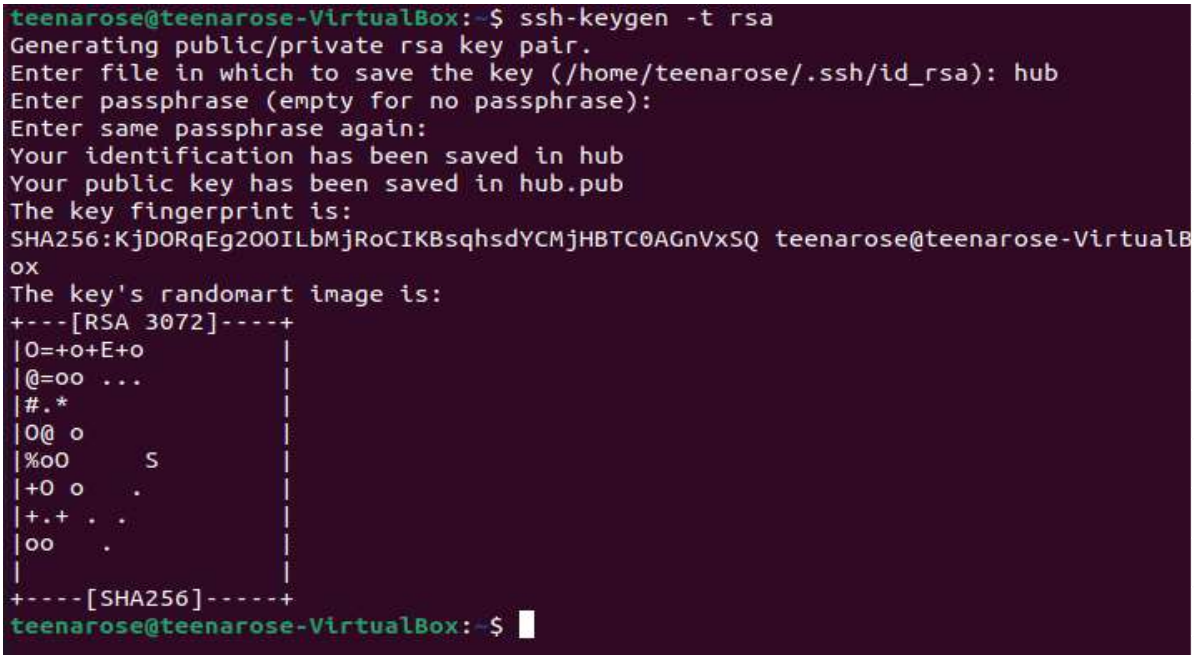
6. **Scp**

SCP (secure copy) is a command-line utility that allows you to securely copy files and directories between two locations.
With scp, you can copy a file or directory:

- From your local system to a remote system.
- From a remote system to your local system.
- Between two remote systems from your local system.

7. **ssh-keygen**

ssh-keygen command to generate a public/private authentication key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.



8. ssh-copy-id

The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.

This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.

$ssh-copy-id username@remote_host

ASSIGNMENT-6

Managing Files, Creating Users and Groups Using Command-line tools

1. a. Create six files with name of the form songX.mp3

```
teenarose@teenarose-VirtualBox:~$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3
 song5.mp3 song6.mp3
teenarose@teenarose-VirtualBox:~$ ls -l
total 88
-rw-rw-r-- 1 teenarose teenarose 10240 Aug  9 20:50 archieve.tar
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Desktop
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 20:20 Documents
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Downloads
-rw-rw-r-- 1 teenarose teenarose    28 Aug  9 21:11 flowers.txt
-rw------- 1 teenarose teenarose  2675 Aug  9 20:55 ha
-rw-r--r-- 1 teenarose teenarose   584 Aug  9 20:55 ha.pub
-rw-rw-r-- 1 teenarose teenarose    11 Aug  9 20:36 hi.txt
-rw------- 1 teenarose teenarose  2675 Aug  9 21:08 hub
-rw-r--r-- 1 teenarose teenarose   584 Aug  9 21:08 hub.pub
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Music
-rw-rw-r-- 1 teenarose teenarose    21 Jun 21 20:38 num1.txt
-rw-rw-r-- 1 teenarose teenarose    18 Jun 21 20:01 num.txt
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:44 Pictures
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Public
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song1.mp3
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song2.mp3
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song3.mp3
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song4.mp3
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song5.mp3
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 14:50 song6.mp3
-rw-rw-r-- 1 teenarose teenarose    63 Jun 21 20:38 state1.txt
-rwxrw-r-- 1 teenarose teenarose   175 Jun 21 20:01 state.txt
-rw-rw-r-- 1 teenarose teenarose    10 Jun 21 20:42 teena.txt
```

b. Create six files with name of the form snapX.mp3

```
teenarose@teenarose-VirtualBox:~$ touch snap1.jpg snap2.jpg snap3.jpg snap4.jpg
 snap5.jpg snap6.jpg
teenarose@teenarose-VirtualBox:~$ ls -l
total 88
```

```
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap1.jpg
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap2.jpg
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap3.jpg
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap4.jpg
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap5.jpg
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:13 snap6.jpg
```

c. Create six files with name of the form filmX.mp3 (In each set, replace X with the numbers 1 through 6)

```
teenarose@teenarose-VirtualBox:~$ touch film1.mp4 film2.mp4 film3.mp4 film4.mp4
 film5.mp4 film6.mp4
teenarose@teenarose-VirtualBox:~$ ls -l
total 88
-rw-rw-r-- 1 teenarose teenarose 10240 Aug  9 20:50 archieve.tar
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Desktop
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 20:20 Documents
drwxr-xr-x 2 teenarose teenarose  4096 Jun 21 19:09 Downloads
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film1.mp4
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film2.mp4
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film3.mp4
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film4.mp4
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film5.mp4
-rw-rw-r-- 1 teenarose teenarose     0 Aug 17 15:11 film6.mp4
```

2. From your home directory, move the song files into your music subdirectory, the snapshot files into your pictures subdirectory, and the movie files into videos subdirectory.

```
teenarose@teenarose-VirtualBox:~$ mv *.mp3 ./Music/
teenarose@teenarose-VirtualBox:~$ mv *.jpg ./Pictures/
teenarose@teenarose-VirtualBox:~$ mv *.mp4 ./Videos/
teenarose@teenarose-VirtualBox:~$
```

3. In your home directory, create three subdirectories for organizing your files. Call these directories friends, family, and work. Create all three with one command.

```
teenarose@teenarose-VirtualBox:~$ mkdir -p {friends,family,work}
teenarose@teenarose-VirtualBox:~$
```

4. Copy song files to the friends folder and snap files to family folder.

```
teenarose@teenarose-VirtualBox:~$ cp /home/teenarose/Music song1.mp3 song2.mp3
song3.mp3 song4.mp3 song5.mp3 song6.mp3 /home/teenarose/friends/
```

```
teenarose@teenarose-VirtualBox:~$ cp /home/teenarose/Pictures snap.jpg snap2.jp
g snap3.jpg snap4.jpg snap5.jpg snap6.jpg /home/teenarose/family/
```

5. Attempt to delete both family and friends projects with a single rmdir command.

```
teenarose@teenarose-VirtualBox:~$ rmdir {friends,family}
```

6. Use another command that will succeed in deleting both the family and friends folder.

```
teenarose@teenarose-VirtualBox:~$ rm -r friends family
teenarose@teenarose-VirtualBox:~$
```

7. Redirect a long listing of all home directory files, including hidden, into a file named allfiles.txt. Confirm that the file contains the listing.

```
teenarose@teenarose-VirtualBox:~$ ls -a > allfiles.txt
teenarose@teenarose-VirtualBox:~$
```

8. In the command window, display today's date with day of the week, month, date and year.

```
teenarose@teenarose-VirtualBox:~$ date
Tuesday 17 August 2021 06:52:42 PM IST
teenarose@teenarose-VirtualBox:~$
```

9. Add the user Juliet

```
teenarose@teenarose-VirtualBox:~$ sudo useradd Juliet
[sudo] password for teenarose:
teenarose@teenarose-VirtualBox:~$
```

10. Confirm that Juliet has been added by examining the /etc/passwd file

```
teenarose@teenarose-VirtualBox:~$ cat /etc/passwd | grep Juliet
Juliet:x:2003:2012::/home/Juliet:/bin/sh
teenarose@teenarose-VirtualBox:~$
```

11. Use the passwd command to initialize Juliet's password

```
teenarose@teenarose-VirtualBox:~$ sudo passwd Juliet
New password:
Retype new password:
passwd: password updated successfully
```

12. Create a supplementary group called Shakespeare with a group id of 30000

```
teenarose@teenarose-VirtualBox:~$ sudo groupadd -g 30000 Shakespheare
teenarose@teenarose-VirtualBox:~$
```

13. Create a supplementary group called artists.

```
teenarose@teenarose-VirtualBox:~$ sudo groupadd artist
```

14. Confirm that Shakespeare and artists have been added by examining the /etc/group file.

```
teenarose@teenarose-VirtualBox:~$ less /etc/group
```

```
Shakespheare:x:30000:
artist:x:30001:
```

15. Add the Juliet user to the Shakespeare group as a supplementary group.

```
teenarose@teenarose-VirtualBox:~$ sudo usermod -G Shakespheare Juliet
```

16. Confirm that Juliet has been added using the id command.

```
teenarose@teenarose-VirtualBox:~$ id Juliet
uid=2003(Juliet) gid=2012(Juliet) groups=2012(Juliet)
```

17. Add Romeo and Hamlet to the Shakespeare group.

```
teenarose@teenarose-VirtualBox:~$ sudo usermod -G Shakespheare Juliet
teenarose@teenarose-VirtualBox:~$ sudo useradd Romeo
teenarose@teenarose-VirtualBox:~$ sudo useradd Hamlet
teenarose@teenarose-VirtualBox:~$ sudo usermod -G Shakespheare Romeo
teenarose@teenarose-VirtualBox:~$ sudo usermod -G Shakespheare Hamlet
```

18. Add Reba, Dolly and Elvis to the artists group.

```
teenarose@teenarose-VirtualBox:~$ sudo useradd Reba
teenarose@teenarose-VirtualBox:~$ sudo useradd Dolly
teenarose@teenarose-VirtualBox:~$ sudo useradd Elvis
teenarose@teenarose-VirtualBox:~$ sudo usermod -G artist Reba
teenarose@teenarose-VirtualBox:~$ sudo usermod -G artist Dolly
teenarose@teenarose-VirtualBox:~$ sudo usermod -G artist Elvis
```

19. Verify the supplemental group memberships by examining the /etc/group file

```
teenarose@teenarose-VirtualBox:~$ less /etc/group
Juliet:x:2012:
Shakespheare:x:30000:Juliet,Romeo,Hamlet
artist:x:30001:Reba,Dolly,Elvis
Romeo:x:30002:
Hamlet:x:30003:
Reba:x:30004:
Dolly:x:30005:
Elvis:x:30006:
```

20. Attempt to remove user Dolly.

```
teenarose@teenarose-VirtualBox:~$ sudo userdel Dolly
[sudo] password for teenarose:
```

ASSIGNMENT-7

NETWORK COMMANDS

1. **Try out these network commands in Window as well as in Linux and perform at least 4 options with each command: ping route traceroute, nslookup,Ip Config, NetStat .**

Windows

Ping

```
C:\Users\Teena>ping google.com

Pinging google.com [142.250.67.46] with 32 bytes of data:
Reply from 142.250.67.46: bytes=32 time=18ms TTL=119
Reply from 142.250.67.46: bytes=32 time=17ms TTL=119
Reply from 142.250.67.46: bytes=32 time=18ms TTL=119
Reply from 142.250.67.46: bytes=32 time=35ms TTL=119

Ping statistics for 142.250.67.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 17ms, Maximum = 35ms, Average = 22ms
```

```
C:\Users\Teena>ping -a google.com

Pinging google.com [142.250.71.14] with 32 bytes of data:
Reply from 142.250.71.14: bytes=32 time=16ms TTL=119
Reply from 142.250.71.14: bytes=32 time=16ms TTL=119
Reply from 142.250.71.14: bytes=32 time=16ms TTL=119
Reply from 142.250.71.14: bytes=32 time=16ms TTL=119

Ping statistics for 142.250.71.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 16ms, Maximum = 16ms, Average = 16ms
```

```
C:\Users\Teena>ping -t google.com

Pinging google.com [142.250.67.46] with 32 bytes of data:
Reply from 142.250.67.46: bytes=32 time=90ms TTL=119
Reply from 142.250.67.46: bytes=32 time=18ms TTL=119
Reply from 142.250.67.46: bytes=32 time=18ms TTL=119
Reply from 142.250.67.46: bytes=32 time=32ms TTL=119
Reply from 142.250.67.46: bytes=32 time=657ms TTL=119
Reply from 142.250.67.46: bytes=32 time=23ms TTL=119
Reply from 142.250.67.46: bytes=32 time=21ms TTL=119
Reply from 142.250.67.46: bytes=32 time=19ms TTL=119
Reply from 142.250.67.46: bytes=32 time=18ms TTL=119

Ping statistics for 142.250.67.46:
    Packets: Sent = 9, Received = 9, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 18ms, Maximum = 657ms, Average = 99ms
Control-C
^C
```

```
C:\Users\Teena>ping -j google.com

Pinging google.com [142.250.67.46] with 32 bytes of data:
General failure.
General failure.
General failure.
General failure.

Ping statistics for 142.250.67.46:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```
C:\Users\Teena>ping -4 google.com

Pinging google.com [142.250.67.46] with 32 bytes of data:
Reply from 142.250.67.46: bytes=32 time=112ms TTL=119
Reply from 142.250.67.46: bytes=32 time=21ms TTL=119
Reply from 142.250.67.46: bytes=32 time=41ms TTL=119
Reply from 142.250.67.46: bytes=32 time=54ms TTL=119

Ping statistics for 142.250.67.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 21ms, Maximum = 112ms, Average = 57ms
```

Route

```
C:\Users\Teena>route print
===========================================================================
Interface List
 11...10 e7 c6 7d 6d a2 ......Realtek PCIe GbE Family Controller
 18...0a 00 27 00 00 12 ......VirtualBox Host-Only Ethernet Adapter
 19...9e 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter
 13...9c 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter #2
  7...9c 30 5b e1 a1 e5 ......Realtek RTL8723DE 802.11b/g/n PCIe Adapter
  3...9c 30 5b e1 a1 e6 ......Bluetooth Device (Personal Area Network)
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0     192.168.18.1     192.168.18.5     60
        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
     192.168.18.0    255.255.255.0         On-link      192.168.18.5    316
     192.168.18.5  255.255.255.255         On-link      192.168.18.5    316
   192.168.18.255  255.255.255.255         On-link      192.168.18.5    316
     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      192.168.18.5    316
  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      192.168.18.5    316
===========================================================================
Persistent Routes:
  None
```

```
IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
 18    281 fe80::/64                On-link
  7    316 fe80::/64                On-link
 18    281 fe80::5571:aa89:9833:7e21/128
                                   On-link
  7    316 fe80::e0a1:1e81:5e9e:68f1/128
                                   On-link
  1    331 ff00::/8                 On-link
 18    281 ff00::/8                 On-link
  7    316 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

```
C:\Users\Teena>route print -4
===========================================================================
Interface List
 11...10 e7 c6 7d 6d a2 ......Realtek PCIe GbE Family Controller
 18...0a 00 27 00 00 12 ......VirtualBox Host-Only Ethernet Adapter
 19...9e 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter
 13...9c 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter #2
  7...9c 30 5b e1 a1 e5 ......Realtek RTL8723DE 802.11b/g/n PCIe Adapter
  3...9c 30 5b e1 a1 e6 ......Bluetooth Device (Personal Area Network)
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0     192.168.18.1     192.168.18.5     60
        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
     192.168.18.0    255.255.255.0         On-link      192.168.18.5    316
     192.168.18.5  255.255.255.255         On-link      192.168.18.5    316
   192.168.18.255  255.255.255.255         On-link      192.168.18.5    316
     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      192.168.18.5    316
  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      192.168.18.5    316
===========================================================================
Persistent Routes:
  None
```

```
C:\Users\Teena>route print -6
===========================================================================
Interface List
 11...10 e7 c6 7d 6d a2 ......Realtek PCIe GbE Family Controller
 18...0a 00 27 00 00 12 ......VirtualBox Host-Only Ethernet Adapter
 19...9e 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter
 13...9c 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter #2
  7...9c 30 5b e1 a1 e5 ......Realtek RTL8723DE 802.11b/g/n PCIe Adapter
  3...9c 30 5b e1 a1 e6 ......Bluetooth Device (Personal Area Network)
  1...........................Software Loopback Interface 1
===========================================================================

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
 18    281 fe80::/64                On-link
  7    316 fe80::/64                On-link
 18    281 fe80::5571:aa89:9833:7e21/128
                                    On-link
  7    316 fe80::e0a1:1e81:5e9e:68f1/128
                                    On-link
  1    331 ff00::/8                 On-link
 18    281 ff00::/8                 On-link
  7    316 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

```
C:\Users\Teena>route print *157
===========================================================================
Interface List
 11...10 e7 c6 7d 6d a2 ......Realtek PCIe GbE Family Controller
 18...0a 00 27 00 00 12 ......VirtualBox Host-Only Ethernet Adapter
 19...9e 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter
 13...9c 30 5b e1 a1 e5 ......Microsoft Wi-Fi Direct Virtual Adapter #2
  7...9c 30 5b e1 a1 e5 ......Realtek RTL8723DE 802.11b/g/n PCIe Adapter
  3...9c 30 5b e1 a1 e6 ......Bluetooth Device (Personal Area Network)
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
  None
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:
  None
Persistent Routes:
  None
```

Tracert

```
C:\Users\Teena>tracert 192.168.1.1

Tracing route to 192.168.1.1 over a maximum of 30 hops

  1   247 ms     2 ms     2 ms  192.168.18.1
  2    59 ms    98 ms   100 ms  100.98.0.1
  3     *        *        *     Request timed out.
  4     *        *        *     Request timed out.
  5     *        *        *     Request timed out.
  6     *        *        *     Request timed out.
  7     *        *        *     Request timed out.
  8     *        *        *     Request timed out.
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15     *        *        *     Request timed out.
 16     *        *        *     Request timed out.
 17     *        *        *     Request timed out.
 18     *        *        *     Request timed out.
 19     *        *        *     Request timed out.
 20     *        *        *     Request timed out.
 21     *        *        *     Request timed out.
 22     *        *        *     Request timed out.
 23     *        *        *     Request timed out.
 24     *        *        *     Request timed out.
 25     *        *        *     Request timed out.
 26     *        *        *     Request timed out.
 27     *        *        *     Request timed out.
 28     *        *        *     Request timed out.
 29     *        *        *     Request timed out.
 30     *        *        *     Request timed out.

Trace complete.
```

```
C:\Users\Teena>tracert www.google.com

Tracing route to www.google.com [142.250.71.4]
over a maximum of 30 hops:

  1    79 ms     2 ms     2 ms  192.168.18.1
  2    10 ms   101 ms   100 ms  100.98.0.1
  3   854 ms    18 ms    22 ms  10.1.5.13
  4    48 ms    17 ms    17 ms  72.14.205.178
  5    57 ms    99 ms   131 ms  74.125.252.219
  6    65 ms    84 ms    99 ms  172.253.73.29
  7   123 ms    97 ms    17 ms  maa03s34-in-f4.1e100.net [142.250.71.4]

Trace complete.
```

```
C:\Users\Teena>tracert -d  www.yahoo.com

Tracing route to new-fp-shed.wg1.b.yahoo.com [202.165.107.50]
over a maximum of 30 hops:

  1    43 ms     2 ms     2 ms  192.168.18.1
  2    19 ms     8 ms     6 ms  100.98.0.1
  3     8 ms     8 ms     8 ms  122.15.23.162
  4    23 ms    23 ms    24 ms  182.19.108.215
  5    62 ms    60 ms    62 ms  210.176.138.157
  6    64 ms    59 ms    73 ms  202.126.129.127
  7    58 ms    63 ms    59 ms  203.84.209.89
  8    56 ms    56 ms    56 ms  106.10.128.9
  9    59 ms    66 ms    56 ms  106.10.131.216
 10    65 ms    58 ms    59 ms  106.10.128.246
 11    58 ms    59 ms    58 ms  202.165.107.50

Trace complete.
```

```
C:\Users\Teena>tracert 22.110.0.1

Tracing route to 22.110.0.1 over a maximum of 30 hops

  1    83 ms   132 ms    67 ms  192.168.18.1
  2    81 ms    99 ms    99 ms  100.98.0.1
  3   300 ms    11 ms     7 ms  122.15.23.162
  4   130 ms   134 ms    65 ms  182.19.106.200
  5   152 ms   126 ms   128 ms  ae11-100-xcr1.mar.cw.net [213.185.219.53]
  6   209 ms   202 ms   187 ms  ae10-xcr1.ptl.cw.net [195.2.30.213]
  7   208 ms   202 ms   202 ms  10gigabitethernet-2-2.par2.he.net [195.42.144.104]
  8   309 ms   304 ms   306 ms  100ge12-2.core2.ash1.he.net [184.104.196.241]
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15     *        *        *     Request timed out.
 16     *        *        *     Request timed out.
 17     *        *        *     Request timed out.
 18     *        *        *     Request timed out.
 19     *        *        *     Request timed out.
 20     *        *        *     Request timed out.
 21     *        *        *     Request timed out.
 22     *        *        *     Request timed out.
 23     *        *        *     Request timed out.
 24     *        *        *     Request timed out.
 25     *        *        *     Request timed out.
 26     *        *        *     Request timed out.
 27     *        *        *     Request timed out.
 28     *        *        *     Request timed out.
 29     *        *        *     Request timed out.
 30     *        *        *     Request timed out.

Trace complete.
```

Nslookup

```
C:\Users\Teena>nslookup
Default Server:  UnKnown
Address:  192.168.18.1
```

```
C:\Users\Teena>nslookup google.com
Server:  UnKnown
Address:  192.168.18.1

Non-authoritative answer:
Name:    google.com
Address:  216.58.196.174
```

```
C:\Users\Teena>nslookup -q=MX google.com
Server:  UnKnown
Address:  192.168.18.1

Non-authoritative answer:
google.com      MX preference = 50, mail exchanger = alt4.aspmx.l.google.com
google.com      MX preference = 40, mail exchanger = alt3.aspmx.l.google.com
google.com      MX preference = 20, mail exchanger = alt1.aspmx.l.google.com
google.com      MX preference = 30, mail exchanger = alt2.aspmx.l.google.com
google.com      MX preference = 10, mail exchanger = aspmx.l.google.com
```

```
C:\Users\Teena>nslookup -type=ns google.com
Server:  UnKnown
Address:  192.168.18.1

Non-authoritative answer:
google.com      nameserver = ns1.google.com
google.com      nameserver = ns2.google.com
google.com      nameserver = ns4.google.com
google.com      nameserver = ns3.google.com
```

Ipconfig

```
C:\Users\Teena>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::5571:aa89:9833:7e21%18
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 9:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 10:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e0a1:1e81:5e9e:68f1%7
   IPv4 Address. . . . . . . . . . . : 192.168.18.5
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.18.1

Ethernet adapter Bluetooth Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```

```
C:\Users\Teena>ipconfig /allcompartments

Windows IP Configuration


================================================================================
Network Information for Compartment 1 (ACTIVE)
================================================================================

Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::5571:aa89:9833:7e21%18
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :
```

```
Wireless LAN adapter Local Area Connection* 9:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 10:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e0a1:1e81:5e9e:68f1%7
   IPv4 Address. . . . . . . . . . . : 192.168.18.5
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.18.1

Ethernet adapter Bluetooth Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```

```
C:\Users\Teena>ipconfig /displaydns

Windows IP Configuration

    www.gstatic.com
    ----------------------------------------
    Record Name . . . . . : www.gstatic.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 0
    Data Length . . . . . : 4
    Section . . . . . . . : Answer
    A (Host) Record . . . : 139.162.197.244


    www.gstatic.com
    ----------------------------------------
    No records of type AAAA


    241.196.104.184.in-addr.arpa
    ----------------------------------------
    Record Name . . . . . : 241.196.104.184.in-addr.arpa
    Record Type . . . . . : 12
    Time To Live  . . . . : 17781
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    PTR Record  . . . . . : 100ge12-2.core2.ash1.he.net


    www.aesajce.in
    ----------------------------------------
    Record Name . . . . . : www.aesajce.in
    Record Type . . . . . : 5
    Time To Live  . . . . : 6398
    Data Length . . . . . : 8
    Section . . . . . . . : Answer
    CNAME Record  . . . . : aesajce.in
```

```
C:\Users\Teena>ipconfig /release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 9 while it has its media disconnected.
No operation can be performed on Local Area Connection* 10 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::5571:aa89:9833:7e21%18
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 9:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 10:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e0a1:1e81:5e9e:68f1%7
   Default Gateway . . . . . . . . . :

Ethernet adapter Bluetooth Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```

Netstat

```
C:\Users\Teena>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49289        DESKTOP-84J780G:49290  ESTABLISHED
  TCP    127.0.0.1:49290        DESKTOP-84J780G:49289  ESTABLISHED
  TCP    127.0.0.1:49291        DESKTOP-84J780G:49292  ESTABLISHED
  TCP    127.0.0.1:49292        DESKTOP-84J780G:49291  ESTABLISHED
  TCP    127.0.0.1:49293        DESKTOP-84J780G:49294  ESTABLISHED
  TCP    127.0.0.1:49294        DESKTOP-84J780G:49293  ESTABLISHED
  TCP    127.0.0.1:49295        DESKTOP-84J780G:49296  ESTABLISHED
  TCP    127.0.0.1:49296        DESKTOP-84J780G:49295  ESTABLISHED
  TCP    127.0.0.1:49299        DESKTOP-84J780G:49300  ESTABLISHED
  TCP    127.0.0.1:49300        DESKTOP-84J780G:49299  ESTABLISHED
  TCP    127.0.0.1:49301        DESKTOP-84J780G:49302  ESTABLISHED
  TCP    127.0.0.1:49302        DESKTOP-84J780G:49301  ESTABLISHED
  TCP    127.0.0.1:49303        DESKTOP-84J780G:49304  ESTABLISHED
  TCP    127.0.0.1:49304        DESKTOP-84J780G:49303  ESTABLISHED
  TCP    127.0.0.1:49305        DESKTOP-84J780G:49306  ESTABLISHED
  TCP    127.0.0.1:49306        DESKTOP-84J780G:49305  ESTABLISHED
  TCP    127.0.0.1:49675        DESKTOP-84J780G:49676  ESTABLISHED
  TCP    127.0.0.1:49676        DESKTOP-84J780G:49675  ESTABLISHED
  TCP    127.0.0.1:49677        DESKTOP-84J780G:49678  ESTABLISHED
  TCP    127.0.0.1:49678        DESKTOP-84J780G:49677  ESTABLISHED
  TCP    127.0.0.1:59563        DESKTOP-84J780G:wsd    TIME_WAIT
  TCP    192.168.18.5:51893     si-in-f188:https       ESTABLISHED
  TCP    192.168.18.5:51899     20.190.146.37:https    ESTABLISHED
  TCP    192.168.18.5:51900     40.119.205.193:https   TIME_WAIT
  TCP    192.168.18.5:59565     20.198.162.78:https    ESTABLISHED
  TCP    192.168.18.5:64851     maa05s25-in-f3:https   ESTABLISHED
  TCP    192.168.18.5:64854     52.156.147.113:https   TIME_WAIT
  TCP    192.168.18.5:64857     20.50.201.200:https    ESTABLISHED
  TCP    192.168.18.5:64858     52.138.119.101:https   ESTABLISHED
```

```
C:\Users\Teena>netstat -n

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49289        127.0.0.1:49290        ESTABLISHED
  TCP    127.0.0.1:49290        127.0.0.1:49289        ESTABLISHED
  TCP    127.0.0.1:49291        127.0.0.1:49292        ESTABLISHED
  TCP    127.0.0.1:49292        127.0.0.1:49291        ESTABLISHED
  TCP    127.0.0.1:49293        127.0.0.1:49294        ESTABLISHED
  TCP    127.0.0.1:49294        127.0.0.1:49293        ESTABLISHED
  TCP    127.0.0.1:49295        127.0.0.1:49296        ESTABLISHED
  TCP    127.0.0.1:49296        127.0.0.1:49295        ESTABLISHED
  TCP    127.0.0.1:49299        127.0.0.1:49300        ESTABLISHED
  TCP    127.0.0.1:49300        127.0.0.1:49299        ESTABLISHED
  TCP    127.0.0.1:49301        127.0.0.1:49302        ESTABLISHED
  TCP    127.0.0.1:49302        127.0.0.1:49301        ESTABLISHED
  TCP    127.0.0.1:49303        127.0.0.1:49304        ESTABLISHED
  TCP    127.0.0.1:49304        127.0.0.1:49303        ESTABLISHED
  TCP    127.0.0.1:49305        127.0.0.1:49306        ESTABLISHED
  TCP    127.0.0.1:49306        127.0.0.1:49305        ESTABLISHED
  TCP    127.0.0.1:49675        127.0.0.1:49676        ESTABLISHED
  TCP    127.0.0.1:49676        127.0.0.1:49675        ESTABLISHED
  TCP    127.0.0.1:49677        127.0.0.1:49678        ESTABLISHED
  TCP    127.0.0.1:49678        127.0.0.1:49677        ESTABLISHED
  TCP    192.168.18.5:51893     172.217.194.188:443    ESTABLISHED
  TCP    192.168.18.5:58230     142.250.196.42:443     ESTABLISHED
  TCP    192.168.18.5:58231     35.186.224.25:443      ESTABLISHED
  TCP    192.168.18.5:59565     20.198.162.78:443      ESTABLISHED
  TCP    192.168.18.5:64851     142.250.193.131:443    ESTABLISHED
  TCP    192.168.18.5:64857     20.50.201.200:443      TIME_WAIT
  TCP    192.168.18.5:64858     52.138.119.101:443     TIME_WAIT
```

```
C:\Users\Teena>netstat -n 5

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:49289        127.0.0.1:49290        ESTABLISHED
  TCP    127.0.0.1:49290        127.0.0.1:49289        ESTABLISHED
  TCP    127.0.0.1:49291        127.0.0.1:49292        ESTABLISHED
  TCP    127.0.0.1:49292        127.0.0.1:49291        ESTABLISHED
  TCP    127.0.0.1:49293        127.0.0.1:49294        ESTABLISHED
  TCP    127.0.0.1:49294        127.0.0.1:49293        ESTABLISHED
  TCP    127.0.0.1:49295        127.0.0.1:49296        ESTABLISHED
  TCP    127.0.0.1:49296        127.0.0.1:49295        ESTABLISHED
  TCP    127.0.0.1:49299        127.0.0.1:49300        ESTABLISHED
  TCP    127.0.0.1:49300        127.0.0.1:49299        ESTABLISHED
  TCP    127.0.0.1:49301        127.0.0.1:49302        ESTABLISHED
  TCP    127.0.0.1:49302        127.0.0.1:49301        ESTABLISHED
  TCP    127.0.0.1:49303        127.0.0.1:49304        ESTABLISHED
  TCP    127.0.0.1:49304        127.0.0.1:49303        ESTABLISHED
  TCP    127.0.0.1:49305        127.0.0.1:49306        ESTABLISHED
  TCP    127.0.0.1:49306        127.0.0.1:49305        ESTABLISHED
  TCP    127.0.0.1:49675        127.0.0.1:49676        ESTABLISHED
  TCP    127.0.0.1:49676        127.0.0.1:49675        ESTABLISHED
  TCP    127.0.0.1:49677        127.0.0.1:49678        ESTABLISHED
  TCP    127.0.0.1:49678        127.0.0.1:49677        ESTABLISHED
  TCP    192.168.18.5:51893     172.217.194.188:443    ESTABLISHED
  TCP    192.168.18.5:58230     142.250.196.42:443     ESTABLISHED
  TCP    192.168.18.5:58231     35.186.224.25:443      ESTABLISHED
  TCP    192.168.18.5:59565     20.198.162.78:443      ESTABLISHED
  TCP    192.168.18.5:64851     142.250.193.131:443    ESTABLISHED
  TCP    192.168.18.5:64857     20.50.201.200:443      TIME_WAIT
  TCP    192.168.18.5:64858     52.138.119.101:443     TIME_WAIT

Active Connections
```

```
C:\Users\Teena>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:80             DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:135            DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:443            DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:445            DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:808            DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:3306           DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:3325           DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:5040           DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:5357           DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:33060          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49664          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49665          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49666          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49667          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49668          DESKTOP-84J780G:0      LISTENING
  TCP    0.0.0.0:49669          DESKTOP-84J780G:0      LISTENING
  TCP    127.0.0.1:5939         DESKTOP-84J780G:0      LISTENING
  TCP    127.0.0.1:27017        DESKTOP-84J780G:0      LISTENING
  TCP    127.0.0.1:37014        DESKTOP-84J780G:0      LISTENING
  TCP    127.0.0.1:37114        DESKTOP-84J780G:0      LISTENING
  TCP    127.0.0.1:49289        DESKTOP-84J780G:49290  ESTABLISHED
  TCP    127.0.0.1:49290        DESKTOP-84J780G:49289  ESTABLISHED
  TCP    127.0.0.1:49291        DESKTOP-84J780G:49292  ESTABLISHED
  TCP    127.0.0.1:49292        DESKTOP-84J780G:49291  ESTABLISHED
  TCP    127.0.0.1:49293        DESKTOP-84J780G:49294  ESTABLISHED
```

Linux

Ping

```
teenarose@teenarose-VirtualBox:~$ ping google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=1 ttl=118 ti
me=102 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=2 ttl=118 ti
me=21.5 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=3 ttl=118 ti
me=27.8 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=4 ttl=118 ti
me=20.5 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=5 ttl=118 ti
me=29.1 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=6 ttl=118 ti
me=20.7 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=7 ttl=118 ti
me=34.4 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=8 ttl=118 ti
me=20.6 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=9 ttl=118 ti
me=33.5 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=10 ttl=118 t
ime=20.4 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=11 ttl=118 t
ime=27.6 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=12 ttl=118 t
ime=21.4 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=13 ttl=118 t
ime=55.2 ms
```

```
teenarose@teenarose-VirtualBox:~$ ping -a google.com
PING google.com (216.58.200.142) 56(84) bytes of data.
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=1 ttl=118 ti
me=96.8 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=2 ttl=118 ti
me=36.7 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=3 ttl=118 ti
me=26.9 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=4 ttl=118 ti
me=20.7 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=5 ttl=118 ti
me=96.4 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=6 ttl=118 ti
me=21.4 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=7 ttl=118 ti
me=21.0 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=8 ttl=118 ti
me=20.8 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=9 ttl=118 ti
me=20.2 ms
```

```
teenarose@teenarose-VirtualBox:~$ ping -V
ping from iputils 20210202
```

```
teenarose@teenarose-VirtualBox:~$ ping -b google.com
PING google.com (216.58.200.142) 56(84) bytes of data.
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=1 ttl=118 ti
me=69.6 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=2 ttl=118 ti
me=102 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=3 ttl=118 ti
me=115 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=4 ttl=118 ti
me=135 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=5 ttl=118 ti
me=160 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=6 ttl=118 ti
me=81.6 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=7 ttl=118 ti
me=623 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=8 ttl=118 ti
me=229 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=9 ttl=118 ti
me=353 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=10 ttl=118 t
ime=273 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=11 ttl=118 t
ime=91.9 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=12 ttl=118 t
ime=115 ms
64 bytes from maa05s10-in-f14.1e100.net (216.58.200.142): icmp_seq=13 ttl=118 t
ime=37.9 ms
```

Route

```
teenarose@teenarose-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         _gateway        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
link-local      0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
```

```
teenarose@teenarose-VirtualBox:~$ route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.0.2.2        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 enp0s3
169.254.0.0     0.0.0.0         255.255.0.0     U     1000   0        0 enp0s3
```

```
teenarose@teenarose-VirtualBox:~$ route -Cn
Kernel IP routing cache
Source          Destination     Gateway         Flags Metric Ref    Use Iface
```

```
teenarose@teenarose-VirtualBox:~$ ip route
default via 10.0.2.2 dev enp0s3 proto dhcp metric 100
10.0.2.0/24 dev enp0s3 proto kernel scope link src 10.0.2.15 metric 100
169.254.0.0/16 dev enp0s3 scope link metric 1000
```

Traceroute

```
teenarose@teenarose-VirtualBox:~$ traceroute google.com
traceroute to google.com (216.58.196.174), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  1.377 ms  1.331 ms  1.269 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
```

```
teenarose@teenarose-VirtualBox:~$ traceroute  -4 google.com
traceroute to google.com (142.250.67.46), 30 hops max, 60 byte packets
 1  _gateway (10.0.2.2)  1.281 ms  1.251 ms  1.189 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
```

```
teenarose@teenarose-VirtualBox:~$ traceroute -d google.com
traceroute to google.com (142.250.67.46), 30 hops max, 60 byte packets
setsockopt SO_DEBUG: Permission denied
```

Nslookup

```
teenarose@teenarose-VirtualBox:~$ nslookup google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.67.46
```

```
teenarose@teenarose-VirtualBox:~$ nslookup -q=MX google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com      mail exchanger = 50 alt4.aspmx.l.google.com.
google.com      mail exchanger = 10 aspmx.l.google.com.
google.com      mail exchanger = 40 alt3.aspmx.l.google.com.
google.com      mail exchanger = 30 alt2.aspmx.l.google.com.
google.com      mail exchanger = 20 alt1.aspmx.l.google.com.

Authoritative answers can be found from:
```

```
teenarose@teenarose-VirtualBox:~$ nslookup -type=soa google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
google.com
        origin = ns1.google.com
        mail addr = dns-admin.google.com
        serial = 396194125
        refresh = 900
        retry = 900
        expire = 1800
        minimum = 60
```

```
teenarose@teenarose-VirtualBox:~$ nslookup -type=a google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.67.46
```

Ifconfig

```
teenarose@teenarose-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::78e7:3ddf:272e:32fc  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:61:04:55  txqueuelen 1000  (Ethernet)
        RX packets 238  bytes 137347 (137.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 560  bytes 52523 (52.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 231  bytes 18701 (18.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 231  bytes 18701 (18.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
teenarose@teenarose-VirtualBox:~$ ifconfig -a
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::78e7:3ddf:272e:32fc  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:61:04:55  txqueuelen 1000  (Ethernet)
        RX packets 238  bytes 137347 (137.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 560  bytes 52523 (52.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 231  bytes 18701 (18.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 231  bytes 18701 (18.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
teenarose@teenarose-VirtualBox:~$ ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3    1500      241      0      0 0           563      0      0      0 BMRU
lo       65536      233      0      0 0           233      0      0      0 LRU
```

```
teenarose@teenarose-VirtualBox:~$ ifconfig -v
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::78e7:3ddf:272e:32fc  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:61:04:55  txqueuelen 1000  (Ethernet)
        RX packets 241  bytes 137607 (137.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 563  bytes 52783 (52.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 233  bytes 18873 (18.8 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 233  bytes 18873 (18.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

Netstat

```
teenarose@teenarose-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 teenarose-Virtual:37832 17.111.232.35.bc.g:http TIME_WAIT
udp        0      0 teenarose-Virtua:bootpc _gateway:bootps         ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    21671    /run/user/1000/syste
md/notify
unix  3      [ ]         DGRAM                    15452    /run/systemd/notify
unix  2      [ ]         DGRAM                    15466    /run/systemd/journal
/syslog
unix  17     [ ]         DGRAM                    15475    /run/systemd/journal
/dev-log
unix  8      [ ]         DGRAM                    15477    /run/systemd/journal
/socket
unix  3      [ ]         STREAM     CONNECTED     35781    /tmp/dbus-e1ZWgFrCBQ
unix  3      [ ]         STREAM     CONNECTED     17204    /run/systemd/journal
/stdout
unix  3      [ ]         STREAM     CONNECTED     24400
unix  3      [ ]         STREAM     CONNECTED     24184    /run/user/1000/bus
```

```
teenarose@teenarose-VirtualBox:~$ netstat -n
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 10.0.2.15:68            10.0.2.2:67             ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    21671    /run/user/1000/syste
md/notify
unix  3      [ ]         DGRAM                    15452    /run/systemd/notify
unix  2      [ ]         DGRAM                    15466    /run/systemd/journal
/syslog
unix  17     [ ]         DGRAM                    15475    /run/systemd/journal
/dev-log
unix  8      [ ]         DGRAM                    15477    /run/systemd/journal
/socket
unix  3      [ ]         STREAM     CONNECTED     35781    /tmp/dbus-e1ZWgFrCBQ
unix  3      [ ]         STREAM     CONNECTED     17204    /run/systemd/journal
/stdout
unix  3      [ ]         STREAM     CONNECTED     24400
```

```
teenarose@teenarose-VirtualBox:~$ netstat -n 5
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 10.0.2.15:68            10.0.2.2:67             ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    21671    /run/user/1000/syste
md/notify
unix  3      [ ]         DGRAM                    15452    /run/systemd/notify
unix  2      [ ]         DGRAM                    15466    /run/systemd/journal
/syslog
unix  17     [ ]         DGRAM                    15475    /run/systemd/journal
/dev-log
unix  8      [ ]         DGRAM                    15477    /run/systemd/journal
/socket
unix  3      [ ]         STREAM     CONNECTED     35781    /tmp/dbus-e1ZWgFrCBQ
unix  3      [ ]         STREAM     CONNECTED     17204    /run/systemd/journal
/stdout
unix  3      [ ]         STREAM     CONNECTED     24400
```

```
teenarose@teenarose-VirtualBox:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:mysql         0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 teenarose-Virtua:bootpc _gateway:bootps         ESTABLISHED
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:44576           0.0.0.0:*
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:40290              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ACC ]     STREAM     LISTENING     22425    @/tmp/.ICE-unix/1404
unix  2      [ ACC ]     STREAM     LISTENING     22939    @/tmp/.X11-unix/X0
unix  2      [ ACC ]     STREAM     LISTENING     22941    @/tmp/.X11-unix/X1
unix  2      [ ]         DGRAM                    21671    /run/user/1000/syste
md/notify
```

2. Identify and perform 5 more network commands and it's working.

a). ARP

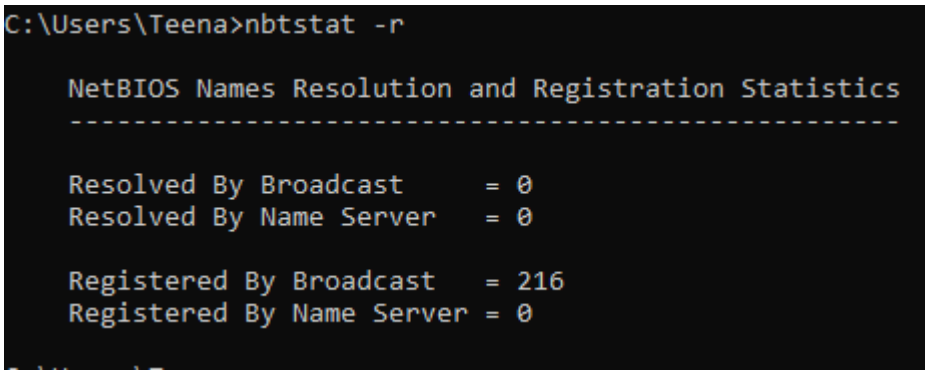
The ARP command corresponds to the Address Resolution Protocol. Although it is easy to think of network communications in terms of IP addressing, packet delivery is ultimately dependent on the Media Access Control (MAC) address of the device's network adapter. This is where the Address Resolution Protocol comes into play. Its job is to map IP addresses to MAC addresses. Windows devices maintain an ARP cache, which contains the results of recent ARP queries. You can see the contents of this cache by using the ARP -A command. If you are having problems communicating with one specific host, you can append the remote host's IP address to the ARP -A command.

```
C:\Users\Teena>arp -a

Interface: 192.168.18.5 --- 0x7
  Internet Address      Physical Address      Type
  192.168.18.1          38-eb-47-e4-a5-a0     dynamic
  192.168.18.255        ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
  255.255.255.255       ff-ff-ff-ff-ff-ff     static

Interface: 192.168.56.1 --- 0x12
  Internet Address      Physical Address      Type
  192.168.56.255        ff-ff-ff-ff-ff-ff     static
  224.0.0.22            01-00-5e-00-00-16     static
  224.0.0.251           01-00-5e-00-00-fb     static
  224.0.0.252           01-00-5e-00-00-fc     static
  239.255.255.250       01-00-5e-7f-ff-fa     static
```

b)NbtStat

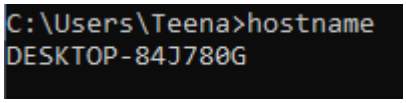
As I am sure you probably know, computers that are running a Windows operating system are assigned a computer name. Oftentimes, there is a domain name or a workgroup name that is also assigned to the computer. The computer name is sometimes referred to as the NetBIOS name. Windows uses several different methods to map NetBIOS names to IP addresses, such as broadcast, LMHost lookup, or even using the nearly extinct method of querying a WINS server. Of course, NetBIOS over TCP/IP can occasionally break down. The NbtStat command can help you to diagnose and correct such problems. The

NbtStat -n command for example, shows the NetBIOS names that are in use by a device. The NbtStat -r command shows how many NetBIOS names the device has been able to resolve recently



c)Hostname

The previously discussed NbtStat command can provide you with the host name that has been assigned to a Windows device, if you know which switch to use with the command. However, if you're just looking for a fast and easy way of verifying a computer's name, then try using the Hostname command. Typing Hostname at the command prompt returns the local computer name.



d) PathPing

Earlier, I talked about the Ping utility and the Tracert utility, and the similarities between them. As you might have guessed, the PathPing tool is a utility that combines the best aspects of Tracert and Ping. Entering the PathPing command followed by a host name initiates what looks like a somewhat standard Tracert process. Once this process completes however, the tool takes 300 seconds (five minutes) to gather statistics, and then reports latency and packet loss statistics that are more detailed than those provided by Ping or Tracert.

```
C:\Users\Teena>pathping www.google.com

Tracing route to www.google.com [142.250.77.164]
over a maximum of 30 hops:
  0  DESKTOP-84J780G [192.168.18.5]
  1  192.168.18.1
  2  100.98.0.1
  3  10.1.5.5
  4  45.120.251.127
  5  74.125.242.129
  6  209.85.247.229
  7  maa05s17-in-f4.1e100.net [142.250.77.164]

Computing statistics for 175 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                           DESKTOP-84J780G [192.168.18.5]
                                    0/ 100 =  0%   |
  1   15ms     1/ 100 =  1%     1/ 100 =  1%  192.168.18.1
                                    0/ 100 =  0%   |
  2   30ms     0/ 100 =  0%     0/ 100 =  0%  100.98.0.1
                                    0/ 100 =  0%   |
  3   33ms     0/ 100 =  0%     0/ 100 =  0%  10.1.5.5
                                    0/ 100 =  0%   |
  4   ---    100/ 100 =100%   100/ 100 =100%  45.120.251.127
                                    0/ 100 =  0%   |
  5   37ms     0/ 100 =  0%     0/ 100 =  0%  74.125.242.129
                                    0/ 100 =  0%   |
  6   29ms     0/ 100 =  0%     0/ 100 =  0%  209.85.247.229
                                    0/ 100 =  0%   |
  7   33ms     0/ 100 =  0%     0/ 100 =  0%  maa05s17-in-f4.1e100.net [142.250.77.164]

Trace complete.
```

e) getmac

Command Another very simple command that shows the MAC address of your network interfaces

```
C:\Users\Teena>getmac

Physical Address    Transport Name
=================== ==========================================================
9C-30-5B-E1-A1-E6   Media disconnected
10-E7-C6-7D-6D-A2   Media disconnected
9C-30-5B-E1-A1-E5   \Device\Tcpip_{5575F6F4-D56D-4FC2-868C-AA967CA11F00}
0A-00-27-00-00-12   \Device\Tcpip_{EAAFCFCA-EA23-4515-87A0-7BDE96F58BBE}
```

ASSIGNMENT-8

LAMP INSTALLATION

INSTALL APACHE

- **Update your system**
    - sudo apt update

```
teenarose@teenarose-VirtualBox:~$ sudo apt update
Hit:1 http://in.archive.ubuntu.com/ubuntu hirsute InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu hirsute-updates InRelease [115 kB]
Get:3 http://security.ubuntu.com/ubuntu hirsute-security InRelease [110 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu hirsute-backports InRelease [101 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 Packages [
373 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main i386 Packages [1
92 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 DEP-11 Met
adata [93.7 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu hirsute-updates/universe i386 Package
s [233 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu hirsute-updates/universe amd64 Packag
es [320 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu hirsute-updates/universe amd64 DEP-1
1 Metadata [55.3 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu hirsute-updates/multiverse amd64 DEP
-11 Metadata [944 B]
Get:12 http://in.archive.ubuntu.com/ubuntu hirsute-backports/universe amd64 DEP
-11 Metadata [9,348 B]
Fetched 1,603 kB in 10s (167 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
194 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- **Install Apache using apt:**
    - sudo apt install apache2

```
teenarose@teenarose-VirtualBox:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1
  libaprutil1-dbd-sqlite3 libaprutil1-ldap
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
0 upgraded, 8 newly installed, 0 to remove and 194 not upgraded.
Need to get 96.9 kB/1,739 kB of archives.
After this operation, 7,550 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 libapr1 am
d64 1.7.0-6ubuntu0.1 [96.9 kB]
Fetched 96.9 kB in 1s (73.8 kB/s)
Selecting previously unselected package libapr1:amd64.
(Reading database ... 191305 files and directories currently installed.)
Preparing to unpack .../0-libapr1_1.7.0-6ubuntu0.1_amd64.deb ...
Unpacking libapr1:amd64 (1.7.0-6ubuntu0.1) ...
Selecting previously unselected package libaprutil1:amd64.
Preparing to unpack .../1-libaprutil1_1.6.1-5ubuntu1_amd64.deb ...
Unpacking libaprutil1:amd64 (1.6.1-5ubuntu1) ...
```

- **Confirm that Apache is now running with the following command:**
    - **sudo systemctl status apache2**

```
teenarose@teenarose-VirtualBox:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
     Active: active (running) since Fri 2021-09-24 16:44:23 IST; 2min 19s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 24196 (apache2)
      Tasks: 55 (limit: 1599)
     Memory: 5.1M
     CGroup: /system.slice/apache2.service
             ├─24196 /usr/sbin/apache2 -k start
             ├─24198 /usr/sbin/apache2 -k start
             └─24199 /usr/sbin/apache2 -k start
```

- **if it is not working**
    - **sudo systemctl start apache2**
- Next, make sure that the UFW firewall has an application profile for Apache by typing in the following command:
    - **sudo ufw app list**

```
teenarose@teenarose-VirtualBox:~$ sudo ufw app list
Available applications:
  Apache
  Apache Full
  Apache Secure
  CUPS
```

- In the Apache Full profile, make sure it allows the traffic on ports 80 and 443. Check this by typing the command:
    - **sudo ufw app info “Apache Full”**

```
teenarose@teenarose-VirtualBox:~$ 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
```

- **Once installed, test by accessing your server’s IP in your browser:**
- http://youripaddress
    - *(find out your ip address using iffconfig)*

Install MariaDB

- **Install mariaDB**

    sudo apt install mariadb-server mariadb-client

```
teenarose@teenarose-VirtualBox:~$ sudo apt install mariadb-server mariadb-clien
t
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  galera-4 libaio1 libcgi-fast-perl libcgi-pm-perl libconfig-inifiles-perl
  libdbd-mariadb-perl libdbi-perl libfcgi-bin libfcgi-perl libfcgi0ldbl
  libhtml-template-perl libmariadb3 libmysqlclient21 libsnappy1v5
  libterm-readkey-perl mariadb-client-10.5 mariadb-client-core-10.5
  mariadb-common mariadb-server-10.5 mariadb-server-core-10.5 mysql-common
  socat
Suggested packages:
  libmldbm-perl libnet-daemon-perl libsql-statement-perl
  libipc-sharedcache-perl mailx mariadb-test
The following NEW packages will be installed:
  galera-4 libaio1 libcgi-fast-perl libcgi-pm-perl libconfig-inifiles-perl
  libdbd-mariadb-perl libdbi-perl libfcgi-bin libfcgi-perl libfcgi0ldbl
  libhtml-template-perl libmariadb3 libmysqlclient21 libsnappy1v5
  libterm-readkey-perl mariadb-client mariadb-client-10.5
  mariadb-client-core-10.5 mariadb-common mariadb-server mariadb-server-10.5
  mariadb-server-core-10.5 mysql-common socat
```

- **Check mariadb Installation**

  sudo systemctl status mysql

  (if it is not working sudo systemctl start mysql)

- **Secure your newly installed MariaDB service:**

  sudo mysql_secure_installation

(This will set password for mariadb, and strengthen the security by asking some questions like disallow root login remotely? Remove test database? Etc)

```
teenarose@teenarose-VirtualBox:~$ sudo mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
      SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
haven't set the root password yet, you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password or using the unix_socket ensures that nobody
can log into the MariaDB root user without the proper authorisation.

You already have your root account protected, so you can safely answer 'n'.

Switch to unix_socket authentication [Y/n] y
Enabled successfully!
Reloading privilege tables..
 ... Success!
```

Install PHP

sudo apt install php libapache2-mod-php php-opcache php-cli php-gd php-curl php-mysql

```
teenarose@teenarose-VirtualBox:~$ sudo apt install php libapache2-mod-php php-o
pcache php-cli php-gd php-curl php-mysql
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'php7.4-opcache' instead of 'php-opcache'
The following additional packages will be installed:
  libapache2-mod-php7.4 php-common php7.4 php7.4-cli php7.4-common
  php7.4-curl php7.4-gd php7.4-json php7.4-mysql php7.4-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  libapache2-mod-php libapache2-mod-php7.4 php php-cli php-common php-curl
  php-gd php-mysql php7.4 php7.4-cli php7.4-common php7.4-curl php7.4-gd
  php7.4-json php7.4-mysql php7.4-opcache php7.4-readline
0 upgraded, 17 newly installed, 0 to remove and 194 not upgraded.
Need to get 4,231 kB of archives.
After this operation, 18.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu hirsute/main amd64 php-common all 2:7
6ubuntu1 [12.2 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 php7.4-com
mon amd64 7.4.16-1ubuntu2.1 [985 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 php7.4-jso
n amd64 7.4.16-1ubuntu2.1 [19.4 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu hirsute-updates/main amd64 php7.4-opc
```

- **Restart apache2**

  sudo systemctl restart apache2

- Now you can check php installation

sudo echo “<?php phpinfo(); ?>” | sudo tee -a /var/www/html/phpinfo.php >

/dev/null

```
teenarose@teenarose-VirtualBox:~$ sudo echo"<?php phpinfo();?>"|sudo tee -a/var
/www/html/phpimfo.php>/dev/null
sudo: echo<?php phpinfo();?>: command not found
tee: invalid option -- '/'
Try 'tee --help' for more information.
```

- **Open a browser**

http://127.0.0.1/phpinfo.php

- **sudo mysql_secure_installation**

(This will set password for mariadb, and strengthen the security by asking some questions like disallow root login remotely? Remove test database? Etc)

Install phpmyadmin

sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl

```
teenarose@teenarose-VirtualBox:~$ sudo apt install phpmyadmin php-mbstring php-
zip php-gd php-json php-curl
[sudo] password for teenarose:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
php-curl is already the newest version (2:7.4+76ubuntu1).
php-gd is already the newest version (2:7.4+76ubuntu1).
The following additional packages will be installed:
  dbconfig-common dbconfig-mysql icc-profiles-free javascript-common
  libjs-jquery libjs-openlayers libjs-sphinxdoc libjs-underscore libonig5
  libzip4 php-bacon-qr-code php-bz2 php-dasprid-enum php-google-recaptcha
  php-phpmyadmin-motranslator php-phpmyadmin-shapefile
  php-phpmyadmin-sql-parser php-phpseclib php-psr-cache php-psr-container
  php-psr-log php-symfony-cache php-symfony-cache-contracts
  php-symfony-expression-language php-symfony-service-contracts
  php-symfony-var-exporter php-tcpdf php-twig php-twig-extensions php-xml
  php7.4-bz2 php7.4-mbstring php7.4-xml php7.4-zip
Suggested packages:
  php-imagick php-dbase php-libsodium php-mcrypt php-gmp
  php-symfony-service-implementation php-twig-doc php-symfony-translation
  php-recode php-gd2 php-pragmarx-google2fa php-samyoul-u2f-php-server
Recommended packages:
  php-mcrypt
The following NEW packages will be installed:
  dbconfig-common dbconfig-mysql icc-profiles-free javascript-common
  libjs-jquery libjs-openlayers libjs-sphinxdoc libjs-underscore libonig5
  libzip4 php-bacon-qr-code php-bz2 php-dasprid-enum php-google-recaptcha
  php-json php-mbstring php-phpmyadmin-motranslator php-phpmyadmin-shapefile
```

(It asks for webserver select apache2, select db-configuration and set password)

- **Restart apache2**

  sudo systemctl restart apache2

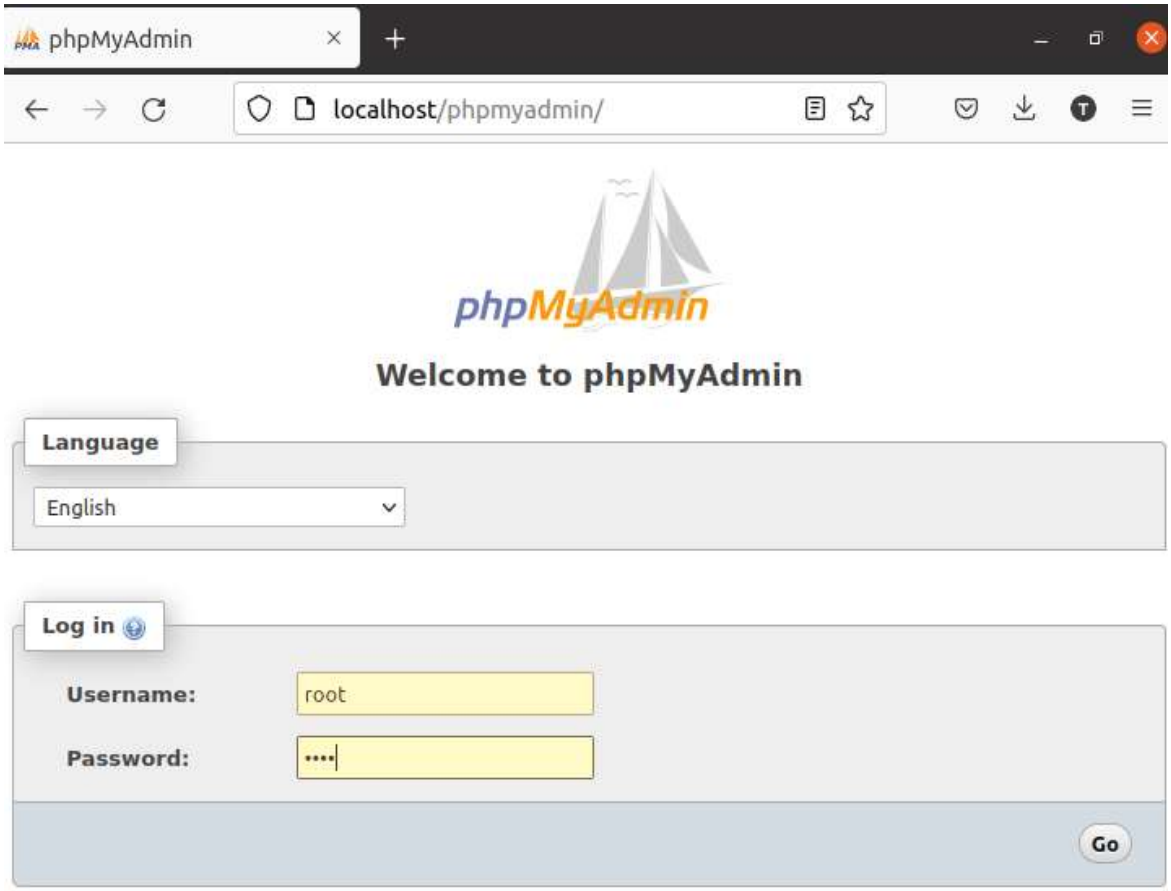
- **Check phpmyadmin**

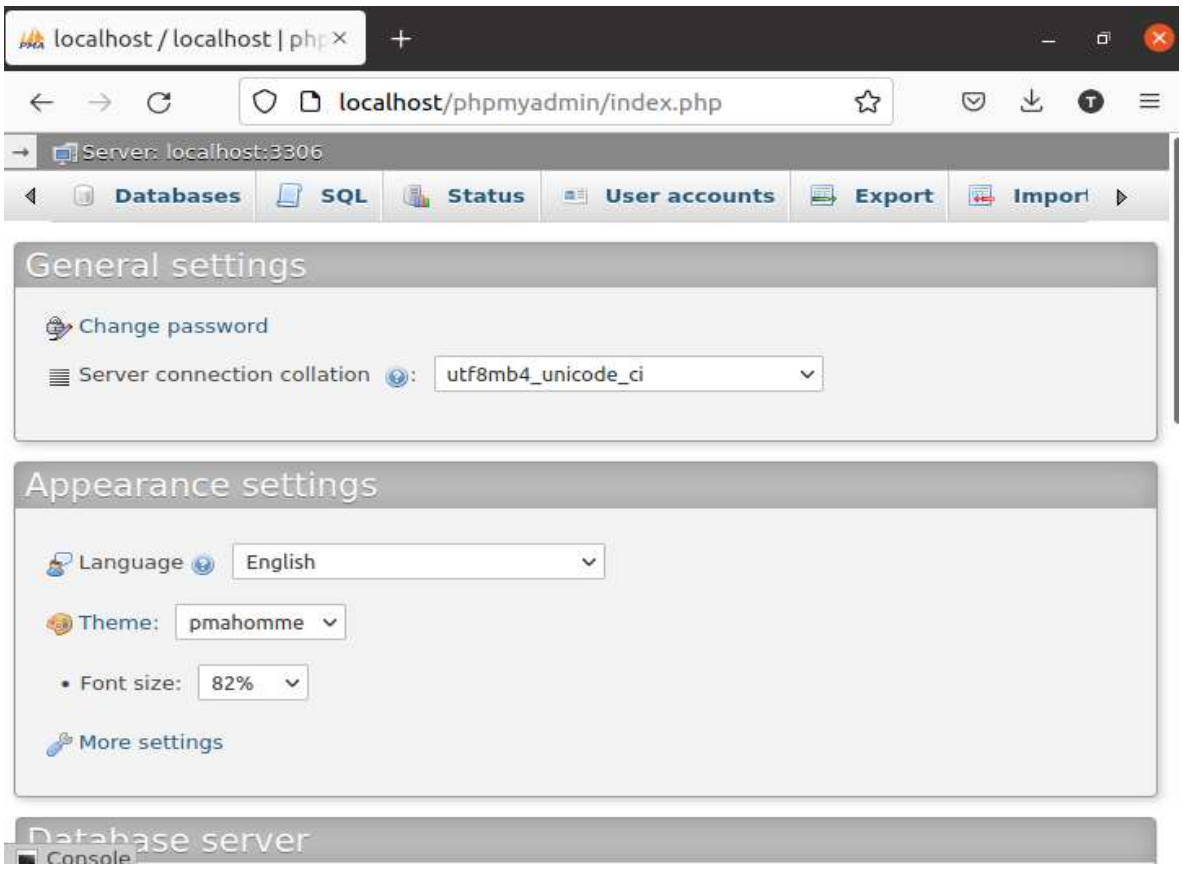
  Open a browser

  http://localhost/phpmyadmin

  username : root

  password : yourpassword


phpMyAdmin
localhost/phpmyadmin/
phpMyAdmin
Welcome to phpMyAdmin
Language
English
Log in
Username:
root
Password:
Go


localhost / localhost | php
localhost/phpmyadmin/index.php
Server: localhost:3306
Databases
SQL
Status
User accounts
Export
Impor
General settings
Change password
Server connection collation:
utf8mb4_unicode_ci
Appearance settings
Language
English
Theme:
pmahomme
Font size:
82%
More settings
Database server
Console

ASSIGNMENT-9

ANSIBLE INSTALLATION

- **$ sudo apt-get install ansible**

```
teenarose@teenarose-VirtualBox:~$ sudo apt-get install ansible
[sudo] password for teenarose:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ansible-base ieee-data python3-argcomplete python3-distutils
  python3-dnspython python3-ecdsa python3-jinja2 python3-jmespath
  python3-kerberos python3-libcloud python3-netaddr python3-ntlm-auth
  python3-packaging python3-pycryptodome python3-pyparsing
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmltodict
Suggested packages:
  cowsay sshpass python-jinja2-doc ipython3 python-netaddr-docs
  python-pyparsing-doc
The following NEW packages will be installed:
  ansible ansible-base ieee-data python3-argcomplete python3-distutils
  python3-dnspython python3-ecdsa python3-jinja2 python3-jmespath
  python3-kerberos python3-libcloud python3-netaddr python3-ntlm-auth
  python3-packaging python3-pycryptodome python3-pyparsing
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmltodict
0 upgraded, 21 newly installed, 0 to remove and 191 not upgraded.
Need to get 31.8 MB of archives.
After this operation, 275 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu hirsute/main amd64 python3-jinja2 all
 2.11.2-1 [99.8 kB]
Ign:2 http://in.archive.ubuntu.com/ubuntu hirsute/main amd64 python3-pyparsing
```

- **$ ansible --version**

```
teenarose@teenarose-VirtualBox:~$ ansible --version
ansible 2.10.5
  config file = None
  configured module search path = ['/home/teenarose/.ansible/plugins/modules',
'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.9.5 (default, May 11 2021, 08:20:37) [GCC 10.3.0]
teenarose@teenarose-VirtualBox:~$
```

ASSIGNMENT-10

ANALYZING NETWORK PACKETS STREAM USING tcpdump

Tcpdump Installation

◎ On Debian based distributions tcpdump can be installed with the APT command :

#sudo apt update && sudo apt install tcpdump

```
teenarose@teenarose-VirtualBox:~$ sudo apt update && sudo apt install tcpdump
Hit:1 http://in.archive.ubuntu.com/ubuntu hirsute InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu hirsute-updates InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu hirsute-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu hirsute-security InRelease [110 kB]
Get:5 http://security.ubuntu.com/ubuntu hirsute-security/main i386 Packages [10
9 kB]
Get:6 http://security.ubuntu.com/ubuntu hirsute-security/main amd64 Packages [2
56 kB]
Get:7 http://security.ubuntu.com/ubuntu hirsute-security/main Translation-en [6
5.8 kB]
Get:8 http://security.ubuntu.com/ubuntu hirsute-security/main amd64 DEP-11 Meta
data [9,716 B]
Get:9 http://security.ubuntu.com/ubuntu hirsute-security/main DEP-11 48x48 Icon
s [7,781 B]
Get:10 http://security.ubuntu.com/ubuntu hirsute-security/main DEP-11 64x64 Ico
ns [19.5 kB]
Get:11 http://security.ubuntu.com/ubuntu hirsute-security/main amd64 c-n-f Meta
data [4,364 B]
Get:12 http://security.ubuntu.com/ubuntu hirsute-security/restricted amd64 Pack
ages [193 kB]
Get:13 http://security.ubuntu.com/ubuntu hirsute-security/restricted Translatio
n-en [27.1 kB]
Get:14 http://security.ubuntu.com/ubuntu hirsute-security/universe i386 Package
s [190 kB]
Get:15 http://security.ubuntu.com/ubuntu hirsute-security/universe amd64 Packag
es [216 kB]
Get:16 http://security.ubuntu.com/ubuntu hirsute-security/universe Translation-
```

To invoke tcpdump without any o ptions and filters:

- **sudo tcpdump**

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump
[sudo] password for teenarose:
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:53:19.425736 IP6 teenarose-VirtualBox.mdns > ff02::fb.mdns: 0 [2q] PTR (QM)?
 _ipp._tcp.local. PTR (QM)? _ipps._tcp.local. (45)
13:53:19.425910 IP teenarose-VirtualBox.mdns > 224.0.0.251.mdns: 0 [2q] PTR (QM
)? _ipp._tcp.local. PTR (QM)? _ipps._tcp.local. (45)
13:53:26.825363 IP6 teenarose-VirtualBox.mdns > ff02::fb.mdns: 0 PTR (QM)? _pgp
key-hkp._tcp.local. (40)
13:53:26.825505 IP teenarose-VirtualBox.mdns > 224.0.0.251.mdns: 0 PTR (QM)? _p
gpkey-hkp._tcp.local. (40)
13:53:42.789351 IP6 teenarose-VirtualBox > ip6-allrouters: ICMP6, router solici
tation, length 8
13:54:30.869373 IP6 teenarose-VirtualBox.mdns > ff02::fb.mdns: 0 PTR (QM)? _pgp
key-hkp._tcp.local. (40)
13:54:30.869549 IP teenarose-VirtualBox.mdns > 224.0.0.251.mdns: 0 PTR (QM)? _p
gpkey-hkp._tcp.local. (40)
^C
7 packets captured
7 packets received by filter
0 packets dropped by kernel
```

$ sudo tcpdump –i any

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -i any
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on any, link-type LINUX_SLL (Linux cooked v1), capture size 262144 by
tes
13:56:27.583015 IP localhost.59657 > localhost.domain: 7232+ [1au] A? ntp.ubunt
u.com. (43)
13:56:27.583079 IP localhost.59657 > localhost.domain: 17219+ [1au] AAAA? ntp.u
buntu.com. (43)
13:56:27.583346 IP localhost.domain > localhost.59657: 7232 ServFail 0/0/1 (43)
13:56:27.583406 IP localhost.domain > localhost.59657: 17219 ServFail 0/0/1 (43
)
13:56:27.585550 IP localhost.38367 > localhost.domain: 49440+ [1au] A? ntp.ubun
tu.com. (43)
13:56:27.585558 IP localhost.38367 > localhost.domain: 56354+ [1au] AAAA? ntp.u
buntu.com. (43)
13:56:27.585612 IP localhost.domain > localhost.38367: 49440 ServFail 0/0/1 (43
)
13:56:27.585653 IP localhost.domain > localhost.38367: 56354 ServFail 0/0/1 (43
)
13:56:27.585800 IP localhost.54132 > localhost.domain: 17943+ [1au] A? ntp.ubun
tu.com. (43)
13:56:27.585807 IP localhost.54132 > localhost.domain: 7193+ [1au] AAAA? ntp.ub
untu.com. (43)
13:56:27.585860 IP localhost.domain > localhost.54132: 17943 ServFail 0/0/1 (43
)
13:56:27.585900 IP localhost.domain > localhost.54132: 7193 ServFail 0/0/1 (43)
13:56:27.586072 IP localhost.54132 > localhost.domain: 17943+ [1au] A? ntp.ubun
tu.com. (43)
```

```
144 packets captured
324 packets received by filter
35 packets dropped by kernel
```

 # tcpdump –D

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -D
1.enp0s3 [Up, Running]
2.any (Pseudo-device that captures on all interfaces) [Up, Running]
3.lo [Up, Running, Loopback]
4.bluetooth-monitor (Bluetooth Linux Monitor) [none]
5.nflog (Linux netfilter log (NFLOG) interface) [none]
6.nfqueue (Linux netfilter queue (NFQUEUE) interface) [none]
7.dbus-system (D-Bus system bus) [none]
8.dbus-session (D-Bus session bus) [none]
```

To capture packets flowing through a specific interface, use the -i flag with the interface name. Without the -i interface tcpdump will pick up the first network interface it comes across.

 # tcpdump -i enp2s0

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -i enp0s3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
14:06:07.505747 IP6 teenarose-VirtualBox.mdns > ff02::fb.mdns: 0 [2q] PTR (QM)?
 _ipp._tcp.local. PTR (QM)? _ipps._tcp.local. (45)
14:06:07.505863 IP teenarose-VirtualBox.mdns > 224.0.0.251.mdns: 0 [2q] PTR (QM
)? _ipp._tcp.local. PTR (QM)? _ipps._tcp.local. (45)
^C
2 packets captured
2 packets received by filter
0 packets dropped by kernel
```

To capture only a set of lines, say 5, use the -c flag:

◎ #tcpdump -c 5

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
14:09:27.037544 IP6 teenarose-VirtualBox.mdns > ff02::fb.mdns: 0 PTR (QM)? _pgp
key-hkp._tcp.local. (40)
14:09:27.037619 IP teenarose-VirtualBox.mdns > 224.0.0.251.mdns: 0 PTR (QM)? _p
gpkey-hkp._tcp.local. (40)
^C
2 packets captured
2 packets received by filter
0 packets dropped by kernel
```

port filter

◎ Use port filter to view packets arriving at a specific port:

#sudo tcpdump -i enp2s0 -c 5 port 80

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -i enp0s3 -c 5 port 80
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
```

host filter

◎ To capture all packets arriving at or leaving from the host with IP address of 10.0.2.15:

◎ # tcpdump host 10.0.2.15

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump host 10.0.2.15
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
```

To capture packets of a specific protocol type, for example, icmp, on eth1 interface:

◎ # tcpdump -i eth1 icmp

◎ sudo tcpdump -n net 10.1

```
teenarose@teenarose-VirtualBox:~$ sudo tcpdump -n net 10.10
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
```

Saving packet headers to a file

◎ Since the output of tcpdump can scroll past the screen quite fast, you can store packet headers to a file with the -w flag. The files to save the output use pcap format and have an extension of .pcap. ◎ PCAP stands for packet capture. The following command saves 10 lines of output on the eth1 interface to icmp.pcap.

◎ # tcpdump -i eth1 -c 10 -w icmp.pcap

◎ You can read this file with -r flag:

◎ tcpdump -r icmp.pcap

Viewing packet details

◎ So far we have only seen the packet headers, to view packet contents use -A option. This prints the packet contents in ASCII, which can be of help in network troubleshooting. Also -X flag can be used to display output in hex format. This may not be of much help if the connection is encrypted.

 # tcpdump -c10 -i eth1 -n -A port 80

ASSIGNMENT-11

Shell Scripting Lab Assignments

1. Write a shell script to ask your name, and college name and print it on the screen.

```
teenarose@teenarose-VirtualBox:~$ gedit college.sh
```

Open | college.sh | Save

```
1 #!/bin/bash
2 echo "Enter Details and view"
3 echo "======================"
4 echo Enter your Name
5 read name
6 echo Enter your College name
7 read college
8 clear
9 echo Details you entered
10 echo Name:$name
11 echo College:$college
```

sh | Tab Width: 8 | Ln 11, Col 22 | INS

```
teenarose@teenarose-VirtualBox:~$ bash college.sh
Enter Details and view
======================
Enter your Name
Teena Rose Mathew
Enter your College name
Amal Jyothi College of Engineering
```

```
Details you entered
Name:Teena Rose Mathew
College:Amal Jyothi College of Engineering
```

2. Write a shell script to set a value for a variable and display it on command line interface

```
teenarose@teenarose-VirtualBox:~$ gedit 2.sh
```

Open 2.sh Save

```
1 #!/bin/bash
2 echo "Display value of a variable"
3 echo "============================"
4 a=10
5 echo "$a"
```

```
teenarose@teenarose-VirtualBox:~$ bash 2.sh
Display value of a variable
============================
10
```

3. Write a shell script to perform addition, substation, multiplication, division with two numbers that is accepted from user.

```
teenarose@teenarose-VirtualBox:~$ gedit 3.sh
```

Open 3.sh Save

```
 1 #!/bin/bash
 2 echo "ARITHMETIC OPERATIONS"
 3 echo "====================="
 4 echo "Enter a number"
 5 read a
 6 echo "Enter another number"
 7 read b
 8 echo "Enter operation needed"
 9 echo "\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division"
10 read op
11 case "$op" in
12 "1")echo "a+b="$(($a+$b));;
13 "2")echo "a-b="$(($a-$b));;
14 "3")echo "a*b="$(($a*$b));;
15 "4")echo "a/b="$(($a/$b));;
16 esac
```

```
teenarose@teenarose-VirtualBox:~$ bash 3.sh
ARITHMETIC OPERATIONS
=====================
Enter a number
10
Enter another number
30
Enter operation needed
\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division
1
a+b=40
```

```
teenarose@teenarose-VirtualBox:~$ bash 3.sh
ARITHMETIC OPERATIONS
=====================
Enter a number
40
Enter another number
10
Enter operation needed
\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division
2
a-b=30
```

```
teenarose@teenarose-VirtualBox:~$ bash 3.sh
ARITHMETIC OPERATIONS
=====================
Enter a number
50
Enter another number
10
Enter operation needed
\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division
3
a*b=500
```

```
teenarose@teenarose-VirtualBox:~$ bash 3.sh
ARITHMETIC OPERATIONS
=====================
Enter a number
10
Enter another number
2
Enter operation needed
\n1.Addition\n2.Substraction\n3.Multiplication\n4.Division
4
a/b=5
```

4. Write a shell script to check the value of a given number and display whether the number is found or not

```
teenarose@teenarose-VirtualBox:~$ gedit 4.sh
```

Open | 4.sh | Save

```
1 #!/bin/bash
2 echo "Finding a number"
3 echo "=============="
4 echo "Enter a number"
5 read a
6 if [ $a == 10 ];
7 then echo "Number Found;)"
8 else
9 echo "Number not found!"
10 fi
```

```
teenarose@teenarose-VirtualBox:~$ bash 4.sh
Finding a number
==============
Enter a number
10
Number Found;)
```

5. Write a shell script to display current date, calendar.

```
echo "Today is $(date)"
echo "calender:"
cal
```

```
user@user-VirtualBox: $ bash 5.sh
Today is Saturday 02 October 2021 05:53:45 PM IST
calender:
    October 2021
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
```

6. Write a shell script to check a number is even or odd.

```
teenarose@teenarose-VirtualBox:~$ gedit 6.sh
```

Open 6.sh Save

```
1 #!/bin/bash
2 echo "EVEN OR ODD"
3 echo "==========="
4 echo "Enter a number"
5 read n
6 x=$(($n%2))
7 if [ $x -eq 0 ]; then
8 echo "Number is Even"
9 else
10 echo "Number is odd"
11 fi
```

```
teenarose@teenarose-VirtualBox:~$ bash 6.sh
EVEN OR ODD
===========
Enter a number
2
Number is Even
teenarose@teenarose-VirtualBox:~$ bash 6.sh
EVEN OR ODD
===========
Enter a number
5
Number is odd
```

7. Write a shell script to check a number is greater than, less than or equal to another number.

```
teenarose@teenarose-VirtualBox:~$ gedit 7.sh
```

Open 7.sh Save

```
#!/bin/bash
echo "Comparing numbers"
echo "================="
echo "Enter first number"
read a
echo "Enter second number"
read b
if [ $a -gt $b ]; then
echo "$a is greater"
elif [ $b -gt $a ]; then
echo "$b is greater"
else echo "Both are equal"
fi
```

```
teenarose@teenarose-VirtualBox:~$ bash 7.sh
Comparing numbers
=================
Enter first number
3
Enter second number
4
4 is greater
teenarose@teenarose-VirtualBox:~$ bash 7.sh
Comparing numbers
=================
Enter first number
5
Enter second number
4
5 is greater
```

8. Write a shell script to find the sum of first 10 numbers.

```
teenarose@teenarose-VirtualBox:~$ gedit 8.sh
```

Open 8.sh Save

```
#!/bin/bash
echo "Sum of Numbers"
echo "==============="
s=0
for (( i=1;i<=10;i++ )) do
 s='expr $s + $i'
 done
echo "Sum of first 10 numbers = "$s
```

```
user@user-VirtualBox:~$ bash 8.sh
sum of first 10 numbers=55
```

9. Write a shell script to find the sum, the average and the product of the four integers entered.

Open 9.sh Save

```
#!/bin/bash
echo "AVG, SUM & PRODUCT OF 4 No."
echo "============================"
echo "Please enter your first number :"
read a
echo "Second number:"
read b
echo "Third number:"
read c
echo "Fourth number:"
read d
sum=$(($a + $b + $c + $d))
avg=$(echo $sum /4 | bc -1)
prod=$(($a * $b * $c * $d))
echo "The sum of these numbers is: " $sum
echo "The average of these numbers is: " $avg
echo "The product of these numbers is: " $prod
```

```
user@user-VirtualBox:~$ bash 9.sh
please enter your first number
1
please enter your second number
2
please enter your third number
3
please enter your fourth number
4
the sum is:10
the average is:2.500000000000000000
the product is:24
```

10.Write a shell script to find the smallest of three numbers.

```
echo enter first number
read a
echo enter second number
read b
echo enter third number
read c
if [ $a -lt $b ];
then
if [ $a -lt $c ];
then
echo "$a is smallest"
fi
elif [ $b -lt $c ];
then
echo "$b is smallest"
else
echo "$c is smallest";
fi
```

```
user@user-VirtualBox:~$ bash 10.sh
enter first number
5
enter second number
2
enter third number
6
2 is smallest
```

11.Write a shell program to find factorial of given number.

```
echo enter a number
read n
f=1
for ((i=2;i<=n;i++))
do
f=$(($f*$i))
done
echo "factorial is $f"
```

```
user@user-VirtualBox:~$ bash 11.sh
enter a number
5
factorial is 120
```

12.Write a shell program to check a number is palindrome or not.

```
echo enter a number
read n
rev=$(echo $n | rev)
if [ $n -eq $rev ];
then
echo "number is palindrome"
else
echo "number is not palindrome"
fi
```

```
user@user-VirtualBox:~$ bash 12.sh
enter a number
1221
number is palindrome
```

13.Write a shell script to find the average of the numbers entered in command line.

```
echo enter size
read n
i=1
s=0
echo "enter numbers"
while [ $i -le $n ]
do
read num
s=$((s+num))
i=$((i+1))
done
avg=$(echo $s/$n | bc -l)
echo "average is $avg"
```

```
user@user-VirtualBox:~$ bash 13.sh
enter size
5
enter numbers
6
7
8
9
4
average is 6.800000000000000000
```

14.Write a shell program to find the sum of all the digits in a number.

```
teenarose@teenarose-VirtualBox:~$ gedit 14.sh
```

Open 14.sh Save

```
#!bin/bash
echo "Sum of all digits"
echo "================="
echo "Enter a number:"
read num
sum=0

while [$num-gt 0]
do
    mod=$((num%10))
    sum=$((sum+mod))
    num=$((num/10))
done
echo "Sum of digits is $sum"
```

```
teenarose@teenarose-VirtualBox:~$ bash 14.sh
Sum of all digits
=================
Enter a number:
457734
14.sh: line 8: [457734-gt: command not found
Sum of digits is 0
```

15.Write a shell Script to check whether given year is leap year or not.

```
teenarose@teenarose-VirtualBox:~$ gedit 15.sh
```

Open 15.sh Save

```
#!/bin/bash
echo "LEAP YEAR OR NOT"
echo "================"
echo "Enter the year"
read y
a=`expr $y%4`
b=`expr $y%100`
c=`expr $y%400`
if [$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
```

```
teenarose@teenarose-VirtualBox:~$ bash 15.sh
LEAP YEAR OR NOT
================
Enter the year
2001
```

```
2001 is not leap year
```

ASSIGNMENT-12

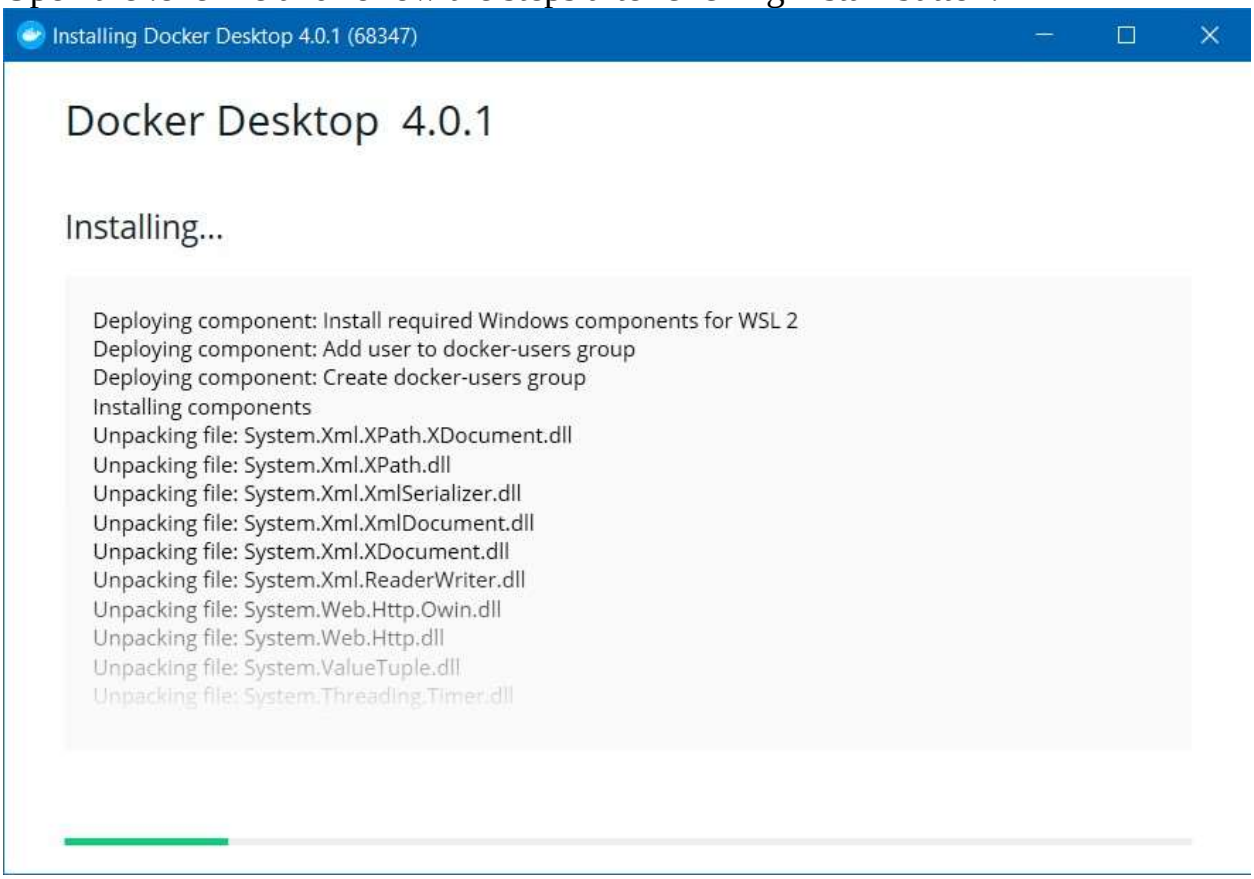
Installation and deployment of Docker

Step-I

Download Docker Desktop installer for Windows from
https://desktop.docker.com/win/main/amd64/Docker%20Desktop%20Installer.exe

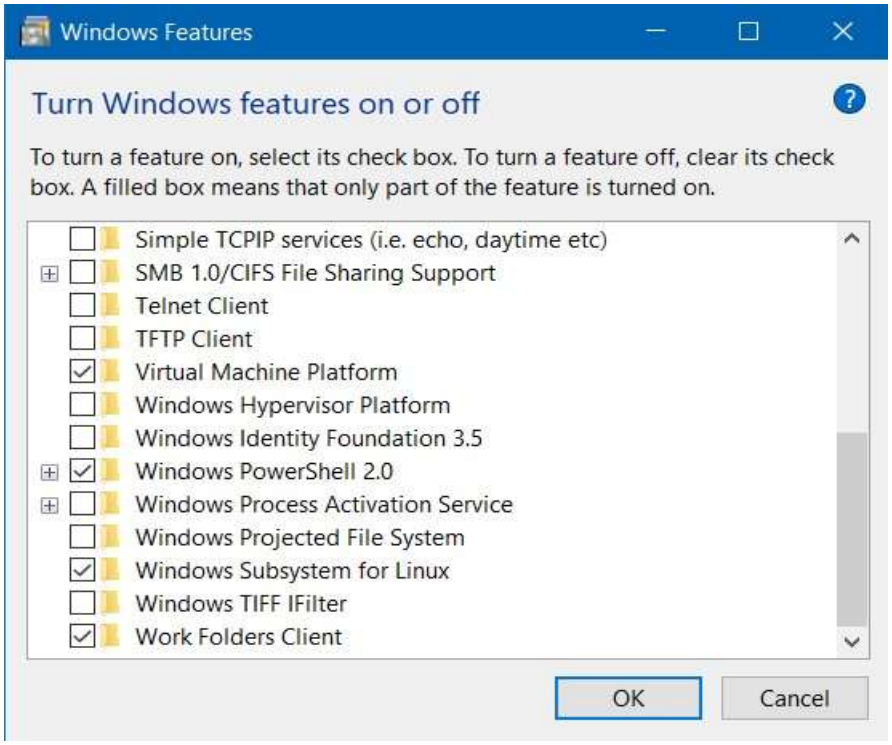
Step-II

Open the .exe file and follow the steps after clicking install button.



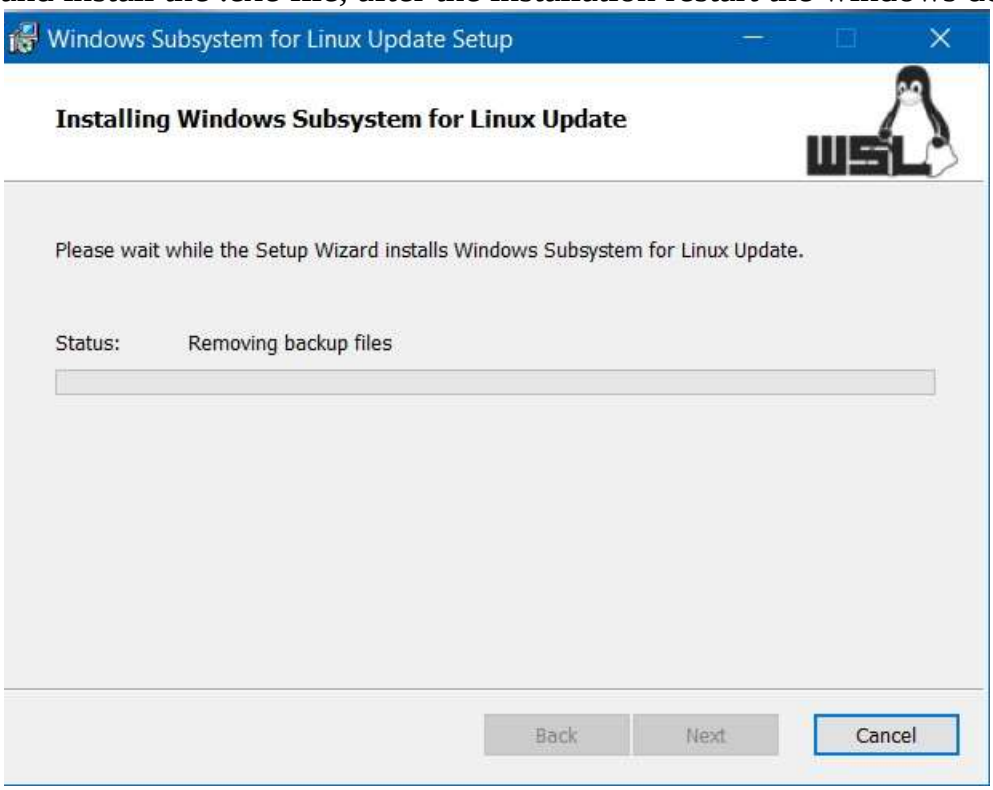
Step-III
Once installed go to programs and features and click turn on windows features on or off

Scroll to the bottom and select windows subsystem for Linux



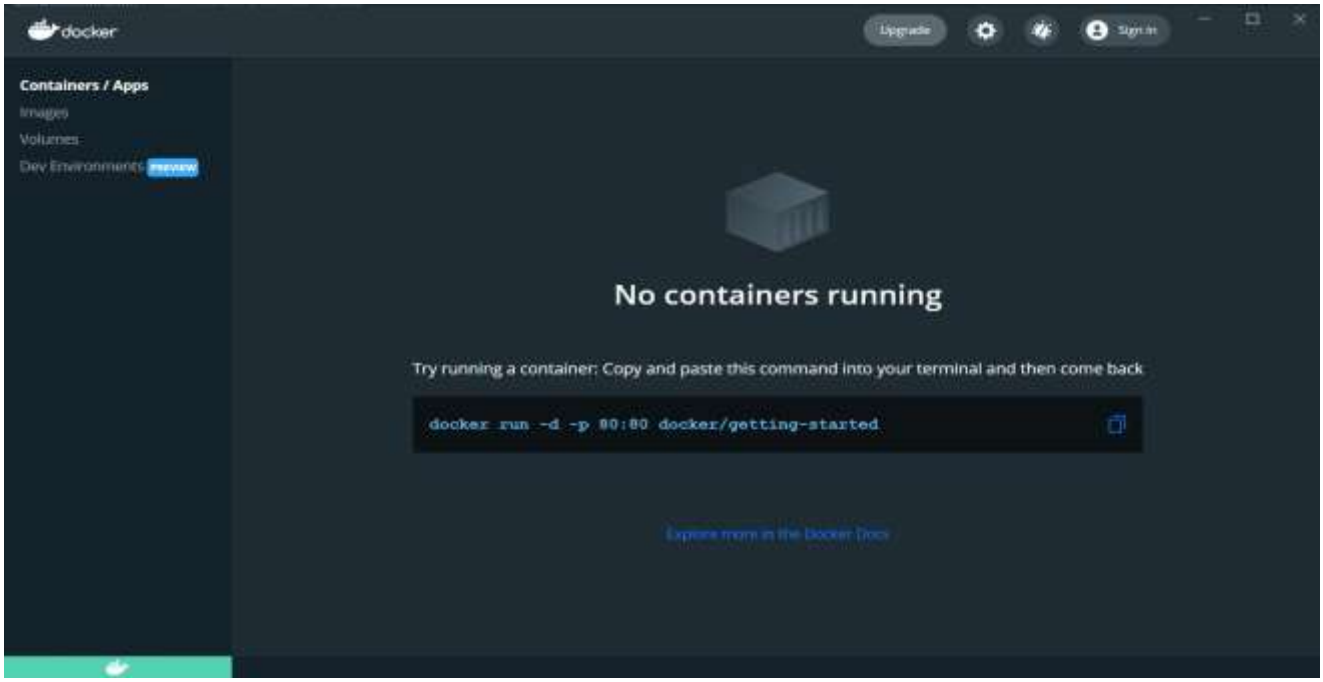
Step-IV

If any WSL 2 error occurs download windows subsystem for linux update package and install the .exe file, after the installation restart the windows device.

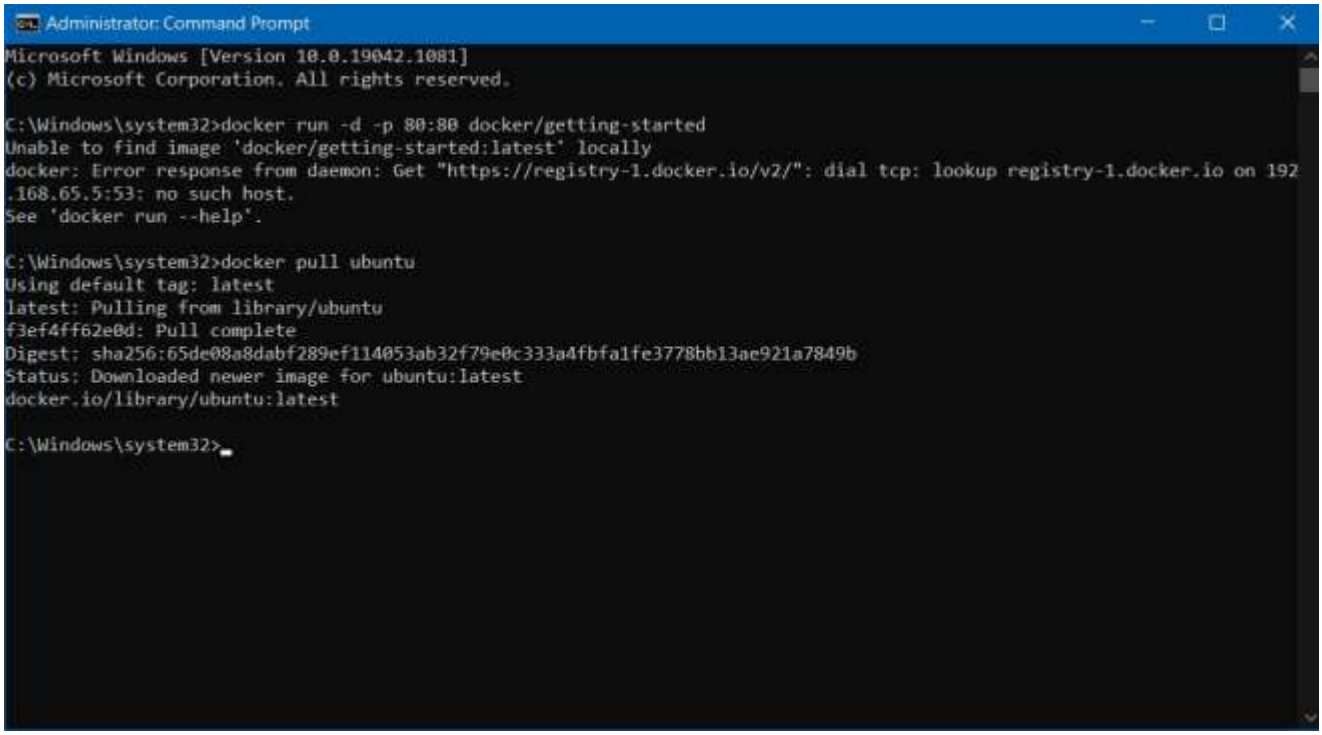


Step-V

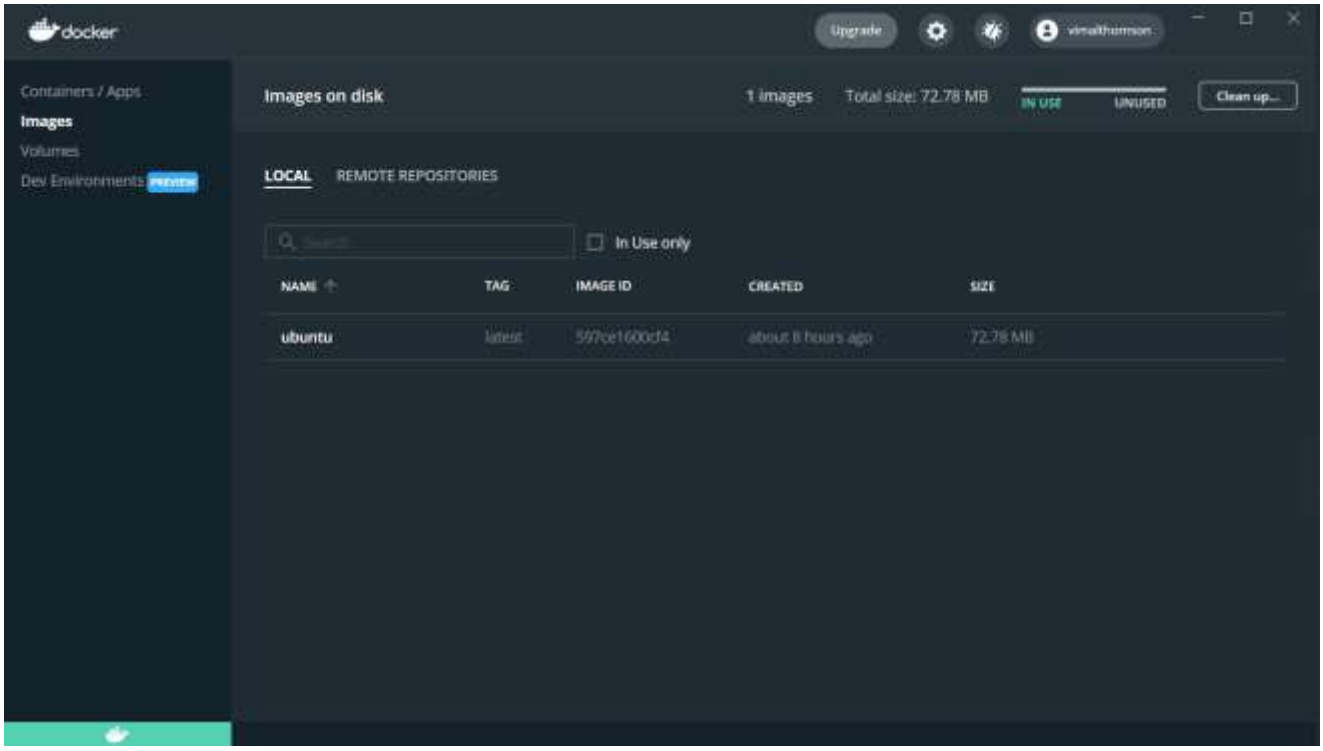
Once installed, open the docker desktop app, and signin using the dockerID



Step-VI
Now pull any image from docker hub using the docker pull command in the command prompt (eg: docker pull ubuntu)



Now in the images tab an image of ubuntu will be displayed, we can run the ubuntu instance using the cli.


docker
Upgrade
Containers / Apps
Images
Volumes
Dev Environments
PREVIEW
Images on disk
1 images
Total size: 72.78 MB
IN USE
UNUSED
Clean up...
LOCAL
REMOTE REPOSITORIES
In Use only
NAME
TAG
IMAGE ID
CREATED
SIZE
ubuntu
latest
597ce1600cf4
about 8 hours ago
72.78 MB

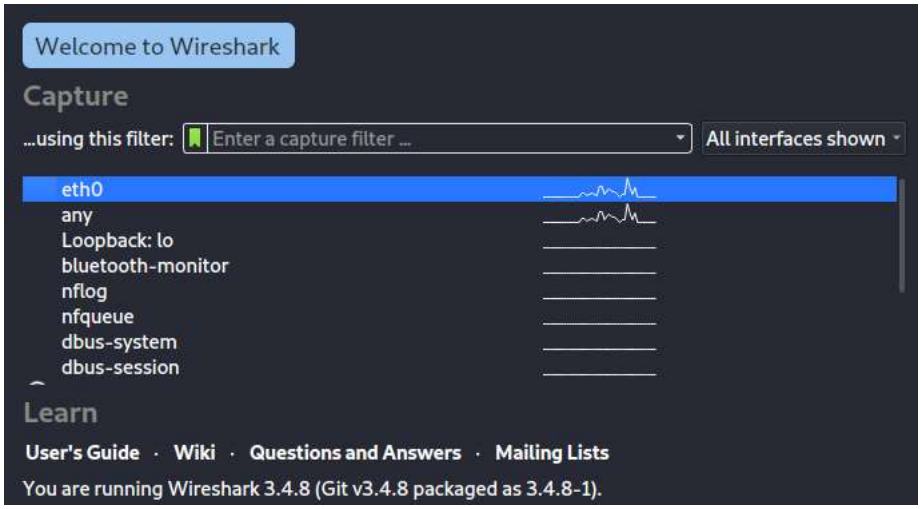
ASSIGNMENT-13

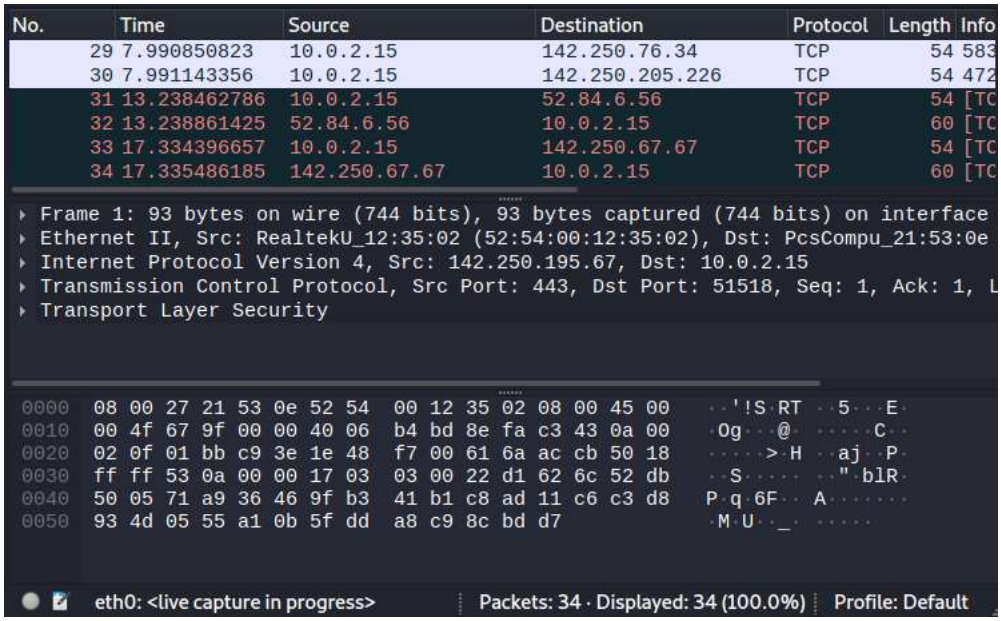
WIRESHARK & NETCAT

sudo apt-get install wireshark

```
┌──(reddevil㉿kali)-[~]
└─$ sudo apt-get install wireshark                                                    100 × 4
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
The following additional packages will be installed:
  libbcg729-0 libc-ares2 libgnutls30 liblua5.2-0 libminizip1 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimediagsttools5 libqt5multimediawidgets5 libqt5printsupport5 libsmi2ldbl libspandsp2 libwireshark-data
  libwireshark14 libwiretap11 libwsutil12 wireshark-common wireshark-qt
Suggested packages:
  gnutls-bin snmp-mibs-downloader geoipupdate geoip-database geoip-database-extra libjs-leaflet
  libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
  libbcg729-0 libc-ares2 liblua5.2-0 libminizip1 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimediagsttools5 libqt5multimediawidgets5 libqt5printsupport5 libsmi2ldbl libspandsp2 libwireshark-data
  libwireshark14 libwiretap11 libwsutil12 wireshark wireshark-common wireshark-qt
The following packages will be upgraded:
  libgnutls30
1 upgraded, 18 newly installed, 0 to remove and 512 not upgraded.
Need to get 25.1 MB of archives.
After this operation, 124 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ftp.harukasan.org/kali kali-rolling/main amd64 libgnutls30 amd64 3.7.2-2 [1,350 kB]
Get:2 http://ftp.harukasan.org/kali kali-rolling/main amd64 libbcg729-0 amd64 1.1.1-2 [33.1 kB]
Get:3 http://ftp.harukasan.org/kali kali-rolling/main amd64 libc-ares2 amd64 1.17.2-1 [104 kB]
Get:4 http://ftp.harukasan.org/kali kali-rolling/main amd64 liblua5.2-0 amd64 5.2.4-1.1+b3 [108 kB]
Get:5 http://ftp.harukasan.org/kali kali-rolling/main amd64 libminizip1 amd64 1.1-8+b1 [20.4 kB]
Get:6 http://ftp.harukasan.org/kali kali-rolling/main amd64 libqt5multimedia5 amd64 5.15.2-3 [287 kB]
Get:7 http://ftp.harukasan.org/kali kali-rolling/main amd64 libqt5multimediawidgets5 amd64 5.15.2-3 [44.1 kB]
Get:8 http://ftp.harukasan.org/kali kali-rolling/main amd64 libqt5multimediagsttools5 amd64 5.15.2-3 [101 kB]
Get:9 http://ftp.harukasan.org/kali kali-rolling/main amd64 libqt5multimedia5-plugins amd64 5.15.2-3 [156 kB]
Get:10 http://ftp.harukasan.org/kali kali-rolling/main amd64 libqt5printsupport5 amd64 5.15.2+dfsg-12 [231 kB]
Get:11 http://ftp.harukasan.org/kali kali-rolling/main amd64 libsmi2ldbl amd64 0.4.8+dfsg2-16 [123 kB]
Get:12 http://ftp.harukasan.org/kali kali-rolling/main amd64 libspandsp2 amd64 0.0.6+dfsg-2 [279 kB]
Get:13 http://ftp.harukasan.org/kali kali-rolling/main amd64 libwireshark-data all 3.4.8-1 [1,559 kB]
Get:14 http://ftp.harukasan.org/kali kali-rolling/main amd64 libwsutil12 amd64 3.4.8-1 [101 kB]
```

```
┌──(reddevil㉿kali)-[~]
└─$ sudo dpkg-reconfigure wireshark-common
```





Netcat

```
┌──(reddevil㉿kali)-[~]
└─$ nc -z -v 10.0.2.255 20-80
10.0.2.255: inverse host lookup failed: Unknown host
(UNKNOWN) [10.0.2.255] 80 (http) : Network is unreachable
(UNKNOWN) [10.0.2.255] 79 (finger) : Network is unreachable
(UNKNOWN) [10.0.2.255] 78 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 77 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 76 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 75 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 74 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 73 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 72 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 71 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 70 (gopher) : Network is unreachable
(UNKNOWN) [10.0.2.255] 69 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 68 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 67 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 66 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 65 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 64 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 63 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 62 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 61 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 60 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 59 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 58 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 57 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 56 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 55 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 54 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 53 (domain) : Network is unreachable
(UNKNOWN) [10.0.2.255] 52 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 51 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 50 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 49 (tacacs) : Network is unreachable
(UNKNOWN) [10.0.2.255] 48 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 47 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 46 (?) : Network is unreachable
(UNKNOWN) [10.0.2.255] 45 (?) : Network is unreachable
```