NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

INFORMATION SECURITY LAB

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Lab	01
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IN LAB TASKS

1. File System Comparison: Write a brief comparison (200 words) between the file system structures of Windows and Ubuntu.

Windows and Ubuntu handle files in pretty different ways. In Windows, everything is organized by drive letters like C: or D:, and then you have folders and subfolders. It uses NTFS (New Technology File System), which lets you do things like encrypt files, compress them, or control who can access them. You also have file attributes like read-only or hidden, which can make managing files simple for everyday users.

Ubuntu, which runs on Linux, takes a different approach. It has a single big tree starting from / and everything, even devices and drives, is part of this hierarchy. Important folders include /home for your personal stuff, /etc for system settings, and /var for logs. Permissions are really important here, with separate rights for owners, groups, and everyone else.

In short, Windows makes it easy to navigate with drives and folders, while Ubuntu is more structured, focusing on security and control. Both work well in their own world, but they think about files very differently.

2. VM Benefits: Summarize (150 words) why a VM is ideal for information security experiments, especially for tasks like malware testing.

Virtual Machines (VMs) are basically perfect for playing around with security experiments safely. Since a VM is isolated from your main computer, you can test malware or risky software without worrying

about breaking your system. If something goes wrong, you can just roll back to a snapshot and start fresh.

You can also run different operating systems at the same time on one computer, which is great if you want to see how something behaves on Windows vs Linux. VMs let you tweak network settings, simulate attacks, and analyze traffic without putting your main network at risk. Plus, you can control how much CPU or memory each VM gets, so experiments are flexible. Basically, they give you a safe playground for testing, learning, and experimenting without consequences.

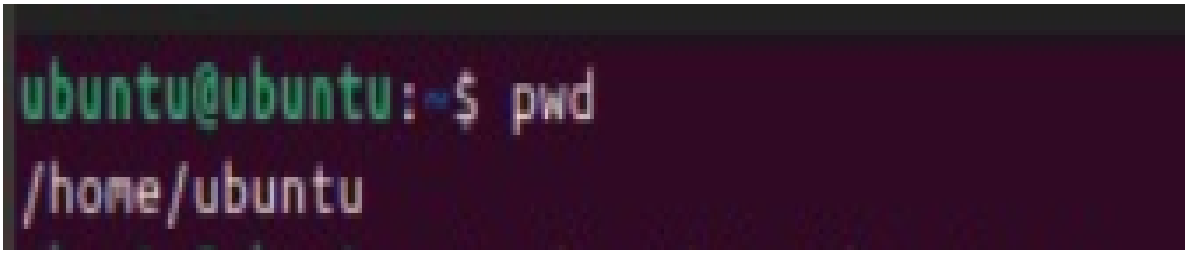
3. Command Practice: Run the commands listed in Step 3 and document the output for each command.

Step 3: Basic Ubuntu Commands

1. Navigating the File System:

- **Display current directory:**

Pwd : Prints the current working directory, showing you where you are in the file system.



- **Change directory:**

cd /path/to/directory: Changes the current working directory to the specified path.

```
ubuntu@ubuntu:~/Desktop$ cd ayesha
ubuntu@ubuntu:~/Desktop/ayesha$
```

- **List directory contents:**

ls: Lists all files and folders in the current directory.

```
ubuntu@ubuntu:~/Desktop/ayesha$ ls
aye.txt
```

2. Managing Files and Directories:

- **Create a new directory:**

mkdir new_directory : Creates a new folder with the given name.

```
ubuntu@ubuntu:~/Desktop$ mkdir ayesha
```

- **Create a new file:**

touch new file.txt: Creates an empty file or updates the timestamp of an existing file.

```
ubuntu@ubuntu:~/Desktop/ayesha$ touch aye.txt
ubuntu@ubuntu:~/Desktop/ayesha$ ls
aye.txt
```

- **Copy a file:**

cp file.txt /path/to/new_directory: Copies a file to the specified directory.

```
ubuntu@ubuntu:~/Desktop$ cp new.txt ayesha/
```

- **Move a file:**

mv file.txt /path/to/new_directory : Moves a file to a new location or renames it.

- **Delete a file:**

- **rm file.txt:** Deletes the specified file permanently.

4. Installing and Removing Software:

- **Update package lists:** Updates the package list so the system knows about the latest versions.

```
ubuntu@ubuntu:~/Desktop$ sudo apt update
Ign:1 cdrom://Ubuntu 24.04.1 LTS _Noble Numbat_ - Release amd64 (20240827.1) no
le InRelease
Hit:2 cdrom://Ubuntu 24.04.1 LTS _Noble Numbat_ - Release amd64 (20240827.1) no
le Release
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:5 http://archive.ubuntu.com/ubuntu noble InRelease
```

- **Install a package:**
  sudo apt install package_name – Installs the specified software package.

```
ubuntu@ubuntu:~/Desktop$ sudo apt install nmap
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libblas3 liblinear4 libssh2-1t64 nmap-common
```

- **Remove a package:**
  sudo apt remove package_name – Removes the specified software package from the system.

```
ubuntu@ubuntu:~/Desktop$ sudo apt remove nmap
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libblas3 liblinear4 libssh2-1t64 nmap-common
```

5. Navigating the File System

- **Change the current working directory to the specified path.**
  cd /path/to/directory:

```
ubuntu@ubuntu:~/Desktop$ cd ~/Desktop/ayesha
ubuntu@ubuntu:~/Desktop/ayesha$
```

- **To go back to the previous directory:**
  cd.. : Moves one level back (to the parent directory).

```
ubuntu@ubuntu:~/Desktop/ayesha$ cd ..
ubuntu@ubuntu:~/Desktop$
```

- **To go to Home directory:**
  cd : Takes you back to your home directory.

```
yesha-imran@ayesha-imran-VMware-Virtual-Platform:~/Desktop$ cd
yesha-imran@ayesha-imran-VMware-Virtual-Platform:~$
```

6. Viewing Command History

- **Clear Terminal screen**

clear: Clears all text from the terminal screen for a fresh view.

```
ubuntu@ubuntu:~$ clear
```

- **Display a list of previously executed commands with line numbers, making it easier to recall and reuse past commands.**

history : Shows a numbered list of all previously executed commands.

```
ubuntu@ubuntu:~$ history
    1  pwd
    2  cd/path/to/directory
    3  ls
    4  mkdir new_directory
    5  touch newfile.txt
    6  cp file.txt/path/to/new_directory
    7  mv file.txt/path/to/new_directory
    8  rm file.txt
    9  clear
   10  ped
   11  clear
   12  pwd
   13  cd/path/to/directory
   14  ls
   15  mkdir new_directory
   16  touch new_file.txt
   17  cp new_file.txt/path/to/new_directory
   18  mv file.txt/path/to/new_directory
   19  rm file.txt
   20  sudo apt update
   21  cd ..
   22  cd
   23  cd~
   24  clear
   25  history
ubuntu@ubuntu:~$ sudo ufw status
Status: inactive
ubuntu@ubuntu:~$
```