Lecture 2 Introduction to Linux Notes

1. What is an Operating System?

An Operating System is the main software that manages a computer's hardware and allows users and programs to run.

- It controls CPU, memory, storage, and devices
- Runs applications
- Provides a user interface

2. What is a kernel?

The kernel is the core of the operating system:

- It communicates with hardware
- Manages memory and CPU
- Controls processes
- Handles input/output

3. Which other parts aside from the kernel identify an OS?

Besides the kernel, an OS includes:

- **System libraries**- help programs talk to the kernel
- **Shell/Command Line**- lets users run commands

4. What is linux and linux distribution?

Linux is an open-source kernel created by Linus Torvalds. It is NOT a full OS by itself.

A Linux distribution is the software, tools, package manager, and interface of Linux. Examples:

- Ubuntu
- Debian
- Fedora
- Arch

5. List at least 4 linux characteristics:

- **Open Source**- Anyone can view/modify the code
- **Multi-user**- Many users can use the system
- **Multitasking**- Runs many programs at once
- **Secure**- Runs many programs at once
- **Stable**- Rarely crashes
- **Portable**- Runs on many devices

6. What is Debian?

Debian is a popular Linux distribution known for:

- Stability
- Security
- Free software philosophy
- Large software repository

7. List and define the different types of licensing agreements

1. Proprietary License

- Closed source
- You can not modify it
- Owned by a company Examples: Windows

2. Open Source License

- Source code is public
- Can modify it and share Example: Linux

3. Free Software License (GPL)

- Gives users full freedoms
- Must keep software free when shared Example: GNU GPL

4. Shareware/Freeware

- Free to use (sometimes limited)
- No access to source code Example: trial software

8. What is Free Software? Define the 4 freedoms.

Free software means users control the software, not companies. It gives 4 freedoms:

Freedom 0 Run the program for any purpose **Freedom 1** Study and change the source code **Freedom 2** Share copies with others **Freedom 3** Share modified versions

9. What is virtualization?

Virtualization is using software to create virtual computers (VMs) inside a real computer.

It allows you to:

- Run multiple OSs at once
- Test systems safely
- Save hardware costs