Notes 2

1. What is an Operating System?

An **operating system** provides all fundamental software features of a computer. It enables us to use the computer's hardware providing us the basic tools that make the computer useful. All those features rely on the OS's kernel and other OS features are owed to additional programs that run atop the kernel.

2. What is a kernel?

An **OS kernel** is a software component that's responsible for managing low-level features of the computer, including the following managing system hardware, memory allocation, CPU time, and program to program interaction.

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

- **Command-Line Shells**
  - This was the de facto way of using computers before the Graphical Interface was invented. CMDs work by typing commands in a shell. In Linux, the entire system can be control via the CLI.
- **Graphical User Interfaces**
  - GUIs rely on icons, menus, and a mouse pointer for the user interaction. Linux relies on a GUI known as the X Window System in combination with desktop environments program suites.
- **Utility and Productivity Programs**
  - Tools like web browsers, document processors and text editors.
- **Libraries**
  - Libraries are collections of programming functions that can be used by a variety of programs.

4. What is linux and linux distribution?

Linux is a **Unix-like Operating System** popular in academic and business environments which consists of a kernel, libraries, and utilities that make up the entire operating system.

Linux distribution is any operating system that runs the Linux kernel or a complete Linux system package. Some popular linux distributions include **Arch, CentOS, Debian, Fedora, openSUSE, Red Hat, Slackware, Ubuntu** and many more.

5. List at least 4 linux characteristics:

- Linux is an **open source software** available **free of charge**.
- Linux is **highly scalable** and customizable.
- Linux includes many of the **Unix tools** including many important Internet server programs and programming languages out of the box.
- Linux can be **installed on almost any system** as it supports almost every processor architecture.

6. What is Debian?

Debian is an all-volunteer organization dedicated to developing **free software** and promoting the ideals of the Free Software community.

7. List and define the different types of licensing agreements

- **Open Source**: The source code is distributed with the software and the software maybe distributed for a fee or free.
- **Closed Source**: The source code is not distributed with the software and the user is restricted from modifying the code.
    - **Freeware**: The software that is free but the source code is not available.
    - **Shareware**: The software that is free on a trial basis.

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

The software is distributed with the source code and the software can be free of charge or obtained by a fee.

The **Free Software Foundation** (FSF) defines four software freedoms:

- **Freedom 0**: use the software for any purpose
- **Freedom 1**: examine the source code and modify it as you see fit
- **Freedom 2**: redistribute the software
- **Freedom 3**: redistribute your modified software

9. What is virtualization?

Virtualization is defined as **Cloud computing** or creating virtual versions of something. It lets **multiple OSs run on one physical machine** at the same time. It also allows administrators to **divide the hardware** and create multiple computers **inside a single physical computer**.