Lecture 2 Introduction to Linux Notes

1. What is an Operating System?

- An operating system (OS) is essential system software that manages a computer's hardware and software resources, serving as a bridge between the user and the machine's physical components.

2. What is a kernel?

- A kernel is a computer program at the core of a computer's operating system that always has complete control over everything in the system. The kernel is also responsible for preventing and mitigating conflicts between different processes. It is the portion of the operating system code that is always resident in memory and facilitates interactions between hardware and software components.

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

- The kernel is at the core of any OS, but it's a component that most users don't directly manipulate. Instead, most users interact with a number of other software components. Such programs include:
    - Command-Line Shells
    - Graphical User Interfaces
    - Utility and Productivity Programs
    - Libraries

4. What is linux and linux distribution?

- Linux is an open-source operating system kernel, and a Linux distribution (or "distro") is a complete operating system built by combining the Linux kernel with other software like system libraries, utilities, and applications, along with a package manager to install new software
- a Complete Linux system package is called a Linux Distribution. These elements make up a linux distribution:
    - A linux Kernel
    - Core unix Tools
    - Supplemental Software
    - Startup Scripts
    - An installer .

5. List at least 4 linux characteristics:

- Open source

The source code for Linux is freely available to the public for anyone to see, modify, and distribute. This has fostered a large, global community of developers who continuously work to improve its functionality and fix bugs

- Security

Linux systems are highly secure due to a robust permissions system and rapid, community-driven security updates. Its architecture makes it inherently less susceptible to malware and viruses than other operating systems, and it includes features like user authentication, access controls, and data encryption

- Stability

Known for its reliability, Linux can run for extended periods without needing a reboot. This stability makes it a popular choice for mission-critical systems like servers and supercomputers, where downtime can be costly.

- Flexibility and customization

Linux is extremely flexible and can be customized to fit specific user needs. Users can choose from a wide variety of distributions (or "distros") that are tailored for different purposes, hardware types, and user experience levels. This includes using a graphical user interface (GUI) or a powerful command-line interface (CLI)

6. What is Debian?

- Debian is a stable, free and open-source Linux-based operating system developed by a global community of volunteers, known for its stability, security, and extensive package repository.

7. List and define the different types of licensing agreements

- Patent License: Grants the licensee the right to use, manufacture, sell, or import a patented invention.
- Trademark License: Allows the licensee to use the licensor's brand name, logo, slogan, or other brand identity on specific products or services
- Copyright License: Permits the licensee to use copyrighted materials, such as music, software, literature, photographs, or other creative works.
- Trade Secret License: Authorizes the use of confidential business information or proprietary knowledge not registered with the government, often requiring a non-disclosure agreement (NDA).

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

- The free Software Foundation is a critical force in the open source world. The SFS has a certain philosophy which manifests itself in the GPL, which is FSF's favored software license.
    - Freedom 0: Use a software for any purpose.
    - Freedom 1: Examine the source code and modify it as you see fit.
    - Freedom 2: Redistribute the softwore
    - Freedom 3: Redistribute your modified software

9. What is virtualization?

- Virtualization is defined as creating a virtual versions of something. Virtualization is often used to let multiple OSs run on one physical machine at the same time. Virtualization allows administrators to divide the hardware and create multiple computers inside a single physical computer.