UNIVERSITY OF ENGINEERING AND TECHNOLOGY, TAXILA

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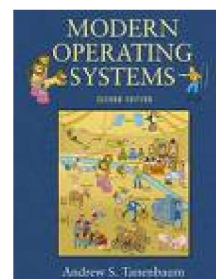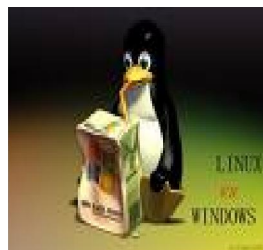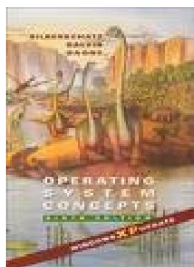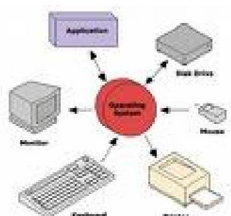
Operating systems

INTRODUCTION TO OPERATING SYSTEMS

LAB MANUAL 1

Date:	
Name:	
Reg#:	**Group:**
Marks:	**Signature:**

Lab Objective: Objective of this lab is to give some background of Linux and elaborate the procedure of installing Linux.

1. Operating Systems:

An **operating system** (**OS**) is a set of programs that manage computer hardware resources and provide common services for application software. The operating system is the most important type of system software in a computer system. A user cannot run an application program on the computer without an operating system, unless the application program is self booting.

Examples of popular modern operating systems include Android, iOS, Linux, Mac OS X, BSD, all of which have their roots in Unix, and Microsoft Windows.

Components:

The components of an operating system all exist in order to make the different parts of a computer work together.

2. Background

2.1 Kernel

The **kernel** is the main component of most computer operating systems; it is a bridge between applications and the actual data processing done at the hardware level. The kernel's responsibilities include managing the system's resources (the communication between hardware and software components)
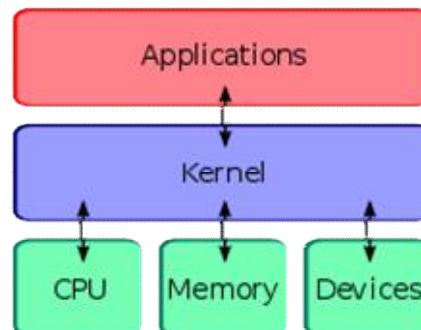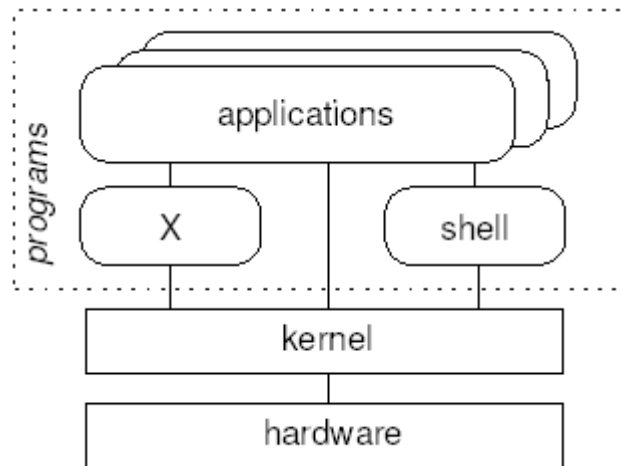
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2.2 UNIX and Linux

- Linux is based on Unix
    - o Unix philosophy
    - o Unix commands
    - o Unix standards and conventions
- There is some variation between Unix operating systems
    - o Especially regarding system administration
    - o Often Linux-specific things in these areas

2.3 UNIX System Architecture

- The shell and the window environment are programs
- Programs' only access to hardware is via the kernel

2.4 UNIX Philosophy

- Multi-user
    - o A **user** needs an **account** to use a computer
    - o Each user must **log in**
    - o Complete separation of different users' files and configuration settings
- Small components

- o Each component should perform a single task
- o Multiple components can be combined and chained together for more complex tasks
- o An individual component can be substituted for another, without affecting other components

2.5 What is Linux?

🞂 Linux kernel

The **Linux kernel** is an operating system kernel used by the Linux family of Unix-like systems. It is one of the most prominent examples of free and open source software.

- o Developed by Linus Torvalds
- o Strictly speaking, 'Linux' is just the kernel

🞂 Associated utilities

- o Standard tools found on (nearly) all Linux systems
- o Many important parts come from the **GNU** project
  - ▪ Free Software Foundation's project to make a free Unix
  - ▪ Some claim the OS as a whole should be 'GNU/Linux'

🞂 Linux distributions

- o Kernel plus utilities plus other tools, packaged up for end users
- o Generally with installation program
- o Distributors include: Red Hat, Debian, SuSE, Mandrake

Run diskmgmt.msc command

Booting:

In computing, **booting** (also known as **booting up**) is a process that begins when a user turns on a computer system and prepares the computer to perform its normal operations. On modern computers, this typically involves loading and starting an operating system.

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The boot sequence is the initial set of operations that the computer performs when power is switched on. A boot loader is a computer program that typically loads the main operating system or runtime environment for the computer after completion of a power-on self-test.

3- Installation

Dual Boot

- Partitions
- Root boot swap
- File formats

➕ Free some space on your hard disk for installing Linux and delete it. Now when Linux installation will run you will have to select this unpartitioned area for your Linux installation.

➕ Perform media check on Linux installation CDs to confirm the integrity of the installing media.

➕ There are two modes of installation

- o Texture Interface for professionals
- o Graphical User Interface for novice people
  It is recommended to select the latter option.

➕ At the time of partitioning, you will be prompted to select 'manual partitioning' or 'automatic partitioning'. Automatic partitioning is recommended for new users.

➕ For running NS-2 or some other development tools later in Linux, it is recommended to install all development packages at the time of installation. Otherwise you can install them later just like 'add/remove window components' in windows.

➕ Select the 'Boot from CD option' and start installation..

➕ To help you during the installation procedure, some tips are normally provided on the left top corner of the screen.

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Virtual Machine

- Minidisks
  - Copy image of fedora in any drive of your computer.
  - Install virtual box software and just follow the next instruction
  - Give path of image of fedora in the desired tab and click next
  - It will start installation

4- Lab Exercises

(Note: All Lab exercises must be submitted in hand written form)

a. What is the file system used by the Linux?
b. Name two types of boot loaders available.
c. What are the names of partitions created for Linux?
d. Why we use Linux?
e. What are the benefits of Linux Operating Systems?