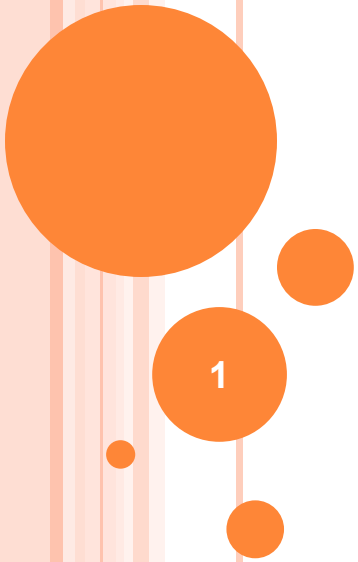


UNIT 5

Operating Systems

Nguyen Thi Thu Huong - SoICT - HUST

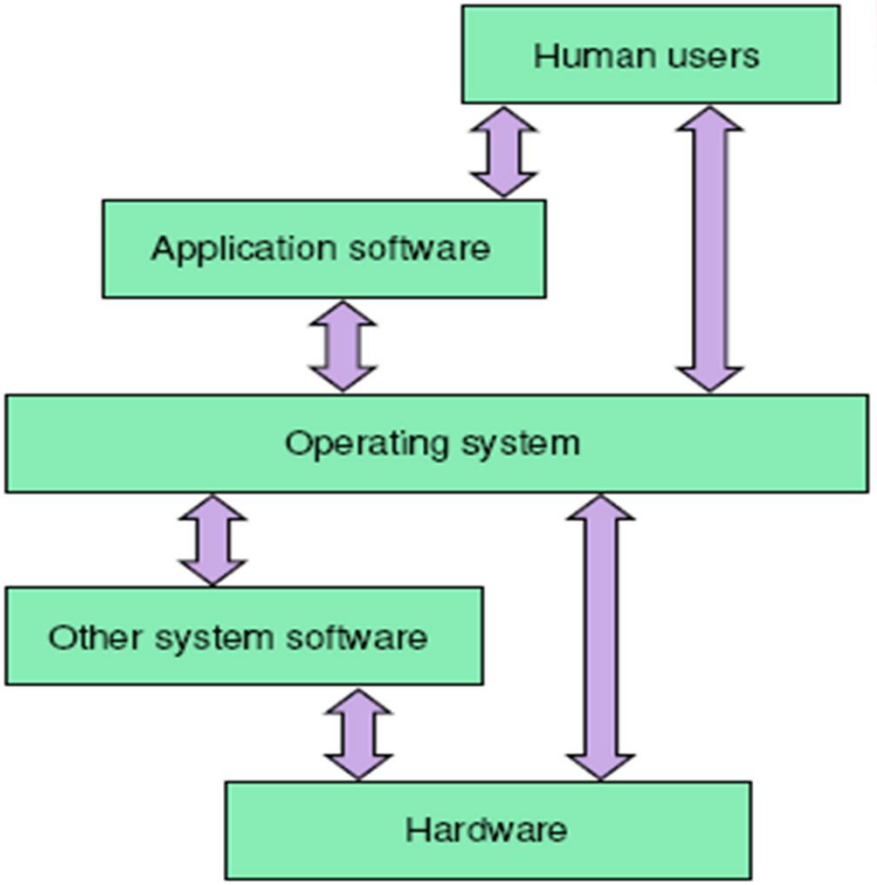
What is Operating System?

System software that manages computer resources and provides an interface for system interaction

Examples

Windows, UNIX (Linux), Mac OS

Interaction of OS with the computer system



SERVICES OF AN OS

- The operating system (OS) is the first thing loaded onto the computer -- without the operating system, a computer is useless.
- Create Interface between you and your computer
- Memory management
- Ability to perform input and output on a variety of devices
- Resource allocation
- Management of the running systems

CATEGORIZATION OF OS

- All desktop and laptop computers have operating systems.
- Operating systems are categorized based on the types of computers they control and the sort of applications they support.
  - Single-user, single task
  - Single-user, multi-tasking
  - Multi-user
  - Real-time operating system
- An OS includes a set of files,
  - For instant MS-DOS includes MSDOS.SYS, IO.SYS, COMMAND.COM . . .

Memory Management

- When multiple programs and their data are stored in the memory at the same time, OS must :
  - Track where and how a program resides in memory
  - Convert logical program addresses into actual memory addresses

CONVERTING LOGICAL ADDRESSES TO PHYSICAL ADDRESSES

- Logical address: a reference to a stored value relative to the program making the reference
- Physical address: an actual address in the main memory device
- When a program is compiled, a reference to an identifier (such as a variable name) is changed to a logical address
- When the program is loaded into memory, each logical address corresponds to a specific physical address.
- The mapping of a logical address to a physical address is called address binding

Process Management

- Process state: new, waiting, ready, running, terminated
- The Process Control Block (PCB) : manage information about process

CPU SCHEDULING

- Decide which process should be given over to the CPU so that it can make computational progress (move to running state)
- Approaches:
  - First-Come, First-Served
  - Shortest Job Next
  - Round Robin

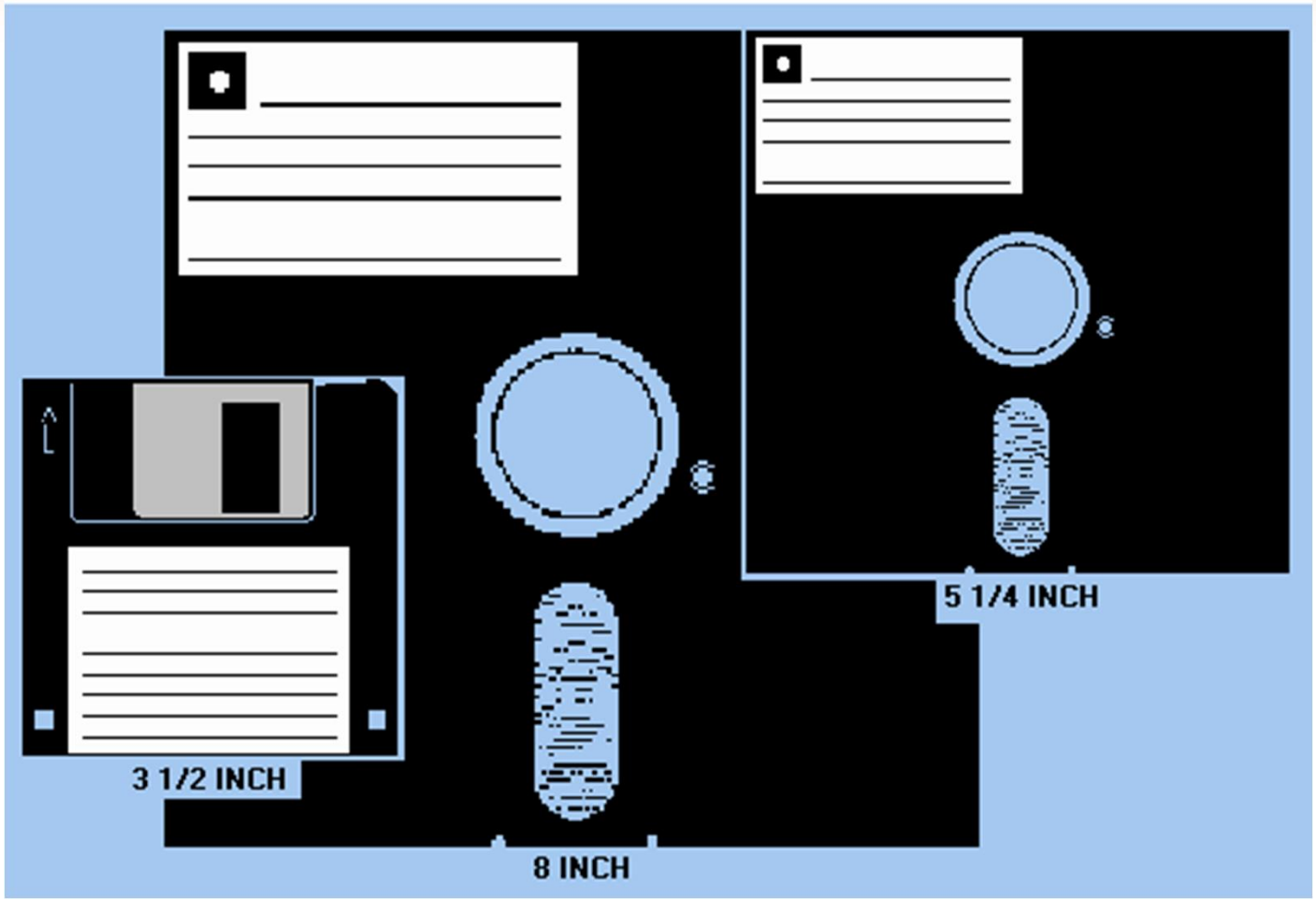
File Management

- Structure of Disks
- Organizing Information on Disks

Structures of Disks

- Floppy Disk and Hard Disk
- Tracks, Sectors, Clusters
- Formatting

Types of Floppy Disks

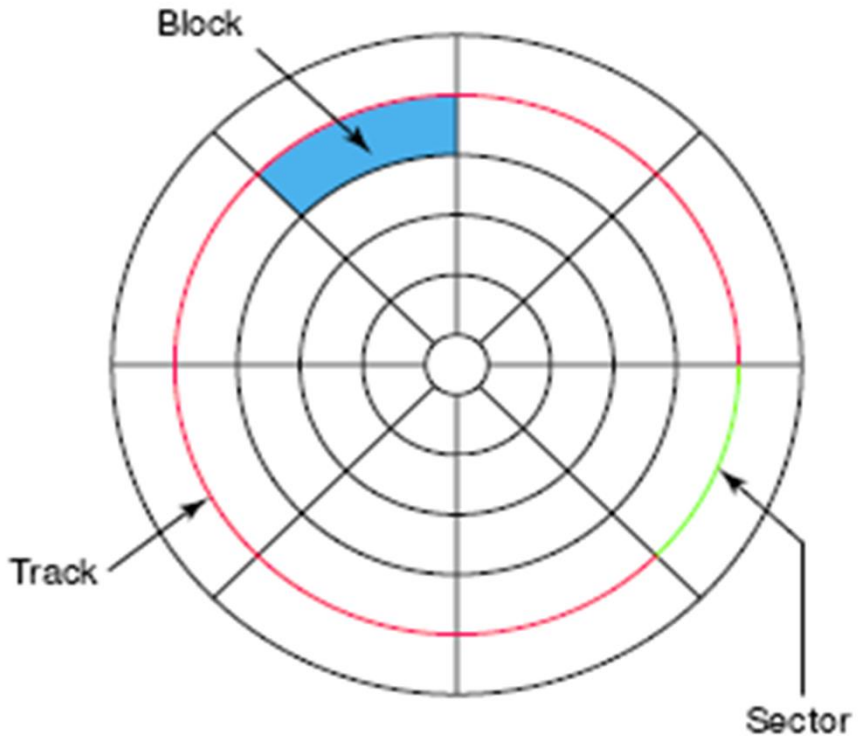


Inside a Hard Disk

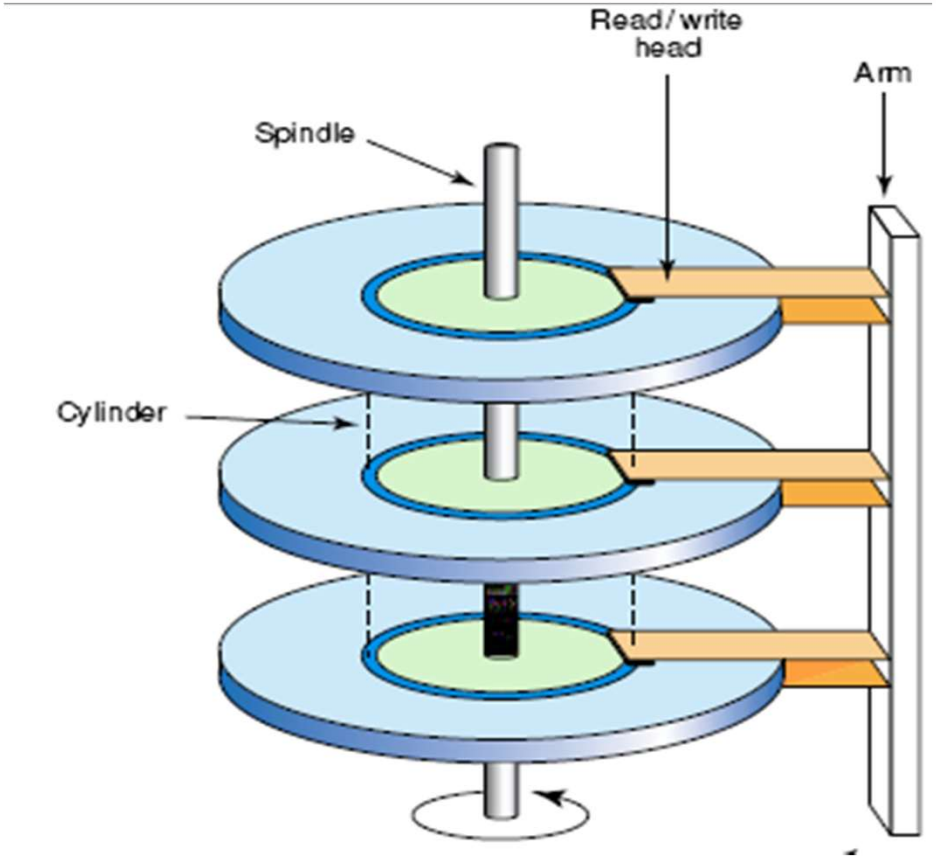
Tracks, Sectors and Clusters

- Floppy disk can be single-sided or double-sided
- Data is stored on a disk in circular tracks
- Tracks are numbered 0, 1. . .
- Each track is broken up into arcs called sectors
- Each sector stores a fixed amount of data. The typical formatting of these media provide space for 512 bytes (for magnetic disks) or 2048 bytes (for optical discs) of user-accessible data per sector.

Sector, Track, Block



Organization of a Hard Disk



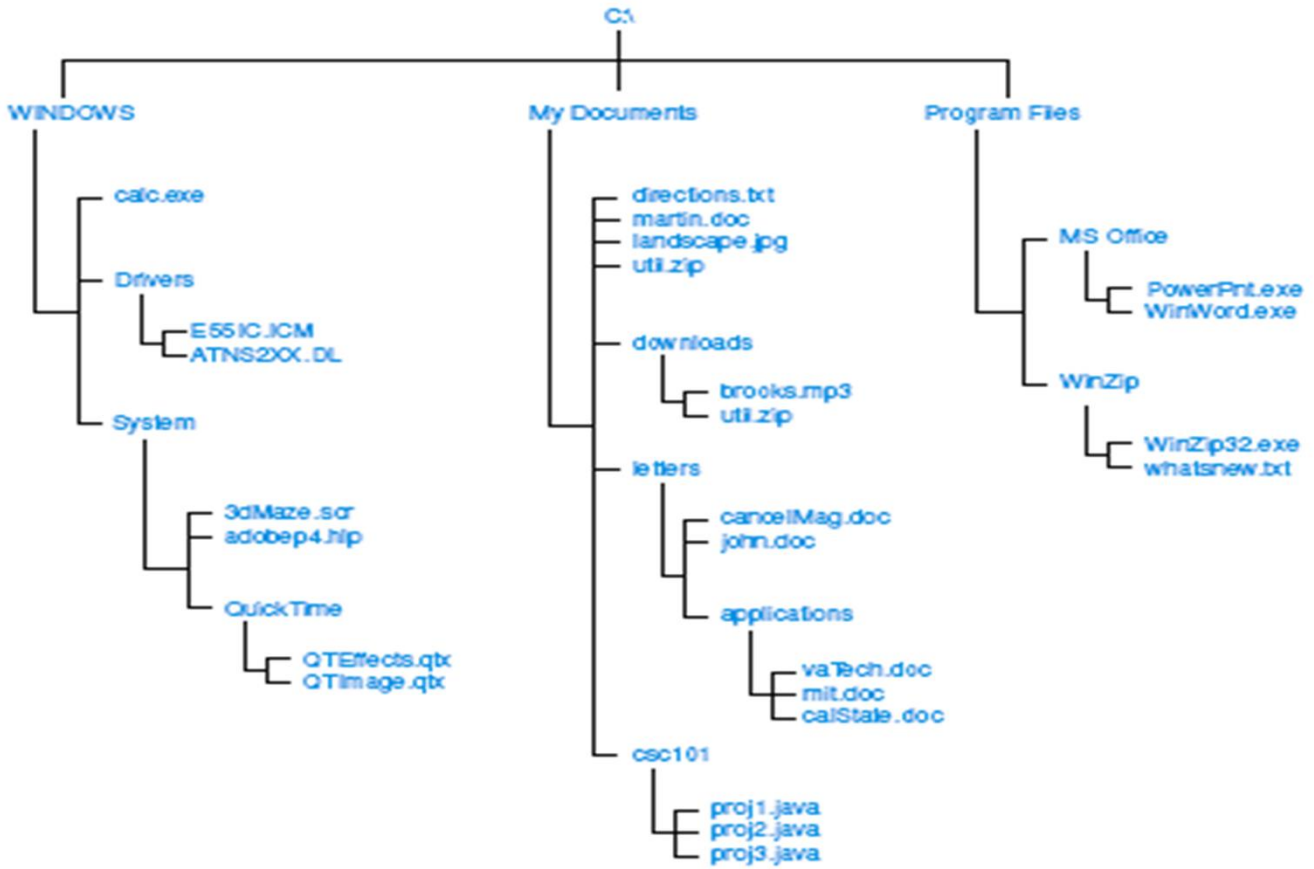
FORMATTING (INITIALIZING)

- Determines the sector size and placement.
- Slices the disk into sectors by writing codes on the disk.
- Locates bad spots on the disk, locks it out to prevent the bad spot from being used.
- Side number, track number, sector number ⇒ address : locates where on the disk the computer will store the data.

Organizing Information on Disks

- A collection of data grouped into one unit on a disk
- Files can be located in directories.
- File name : Depends on the operating system
- Common name (full name) of a file includes
  - Device (or node) (e.g., C:, /, etc.)
  - Directory (or path) — directory tree (e.g., /usr/bin, \TEMP, etc.)
  - file — base name of the file
  - type (format or extension) — indicates the content type of the file (e.g., .txt, .exe, .doc, etc.)

A Windows Directory Tree



MICROSOFT WINDOWS

- An operating environment created by Microsoft.
- Provides an interface known as Graphical User Interface (GUI) for IBM compatible computers.
- Eliminates the need for a user to have to type each command at a command line, like MS-DOS.
- Using a mouse to navigate through drop-down menus, dialog boxes, buttons, tabs, and icons.
- Win 1.0 was announced in 1983.

Microsoft Windows: What to learn?

- Getting Start with Windows
- Navigating in a Window
- Control Panel
- Managing Files, Folders and Disks
- Running Programs with Windows
- Command Prompt

Getting Start with Windows

- Starting Windows
  - Part of Screen
  - Start Button & Start Menu
  - Icons
  - Taskbars
- Using Help and Support
- Shutting down Windows

Navigating in a Window

- Parts of a Window
- Menus
- Dialog Boxes
- Toolbars

CONTROL PANEL

- Your system
- Setting date and time
- Changing mouse and keyboard properties
- Setting up a printer
- Managing fonts
- Changing the Taskbar
- Adjusting screen appearance

Managing Files, Folders and Disks

- Overview
- Navigating between folders
- Manipulating files and folders
- Searching for files and folders
- Working with the Recycle Bin
- Formatting Disks
- Copying a floppy disk
- Copying files to a writable CD
- Setting file management option

Running Programs with Windows

- Working with Word, Excel, Notepad
- Adding and removing windows components
- Installing, removing programs