

Lecture #3

Software. Operating system

1. Types and characteristics of software
2. Operating system basic concepts
3. Classification of OS
4. Types of OS

- **SOFTWARE**

Software is the general term for the set of programs and data, which direct the hardware on what to do, it is the various kinds of [programs](#) used to operate [computers](#) and related devices. Softwares are subdivided into ***Application and System software***.



- System software focuses on handling technical details.
- Application software focuses on completing specific tasks or application.



System Software

This software is designed to control and work with computer [hardware](#).

These are programs expressly designed to make the computer more efficient and flexible

SOFTWARE

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graph TD; S[SOFTWARE] --> SS[System Software]; S --> AS[Application Software]; SS --- OS[Operating Systems]; SS --- A[Assemblers]; SS --- D[Debuggers]; SS --- FMT[File Mgmt. Tools]; SS --- C[Compilers]; SS --- U[Utilities]; AS --- IP[Image Processors]; AS --- DB[Databases]; AS --- G[Games]; AS --- WP[Word Processors]; AS --- SS2[Spread sheets]; AS --- CS[Communication Software]; OS <--> FMT; A <--> C; D <--> U; IP <--> WP; DB <--> SS2; G <--> CS;
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System Software

Operating
Systems

File
Mgmt.
Tools

Assemblers

Compilers

Debuggers

Utilities

Application Software

Image
Processors

Word
Processors

Databases

Spread
sheets

Games

Communication
Software

- System files include libraries of functions, system services, drivers for printers and other hardware, system preferences, and other configuration files. The programs that are part of the system software include assemblers, compilers, file management tools, system utilities, and [debuggers](#).
- The system software is installed on your computer when you install your operating system. You can update the software by running programs such as "Windows Update" for Windows or "Software Update" for Mac OS X. Unlike [application programs](#), however, system software is not meant to be run by the end user. For example, while you might use your Web browser every day, you probably don't have much use for an assembler program (unless, of course, you are a computer programmer).

SYSTEM SOFTWARE

OPERATING SYSTEM

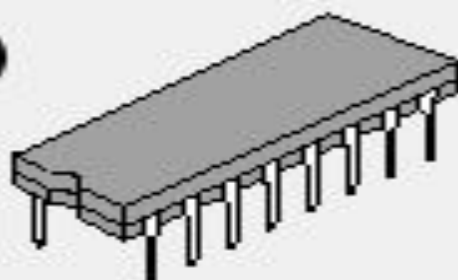
Manages the computer system. Provides file, task and job management. All application programs "talk to" the operating system. Examples are Windows, Mac OS X, Unix and Linux.

DRIVER

Software that supports a peripheral device, such as a display adapter or DVD drive. The driver contains the detailed machine language necessary to activate all functions in the device. The operating system commands the driver, which in turn commands the hardware device.

BIOS (Basic Input/Output System)

In a PC, a set of software routines built into a chip that boots the machine and serves as an interface between the drivers and the peripheral devices.



Operating system

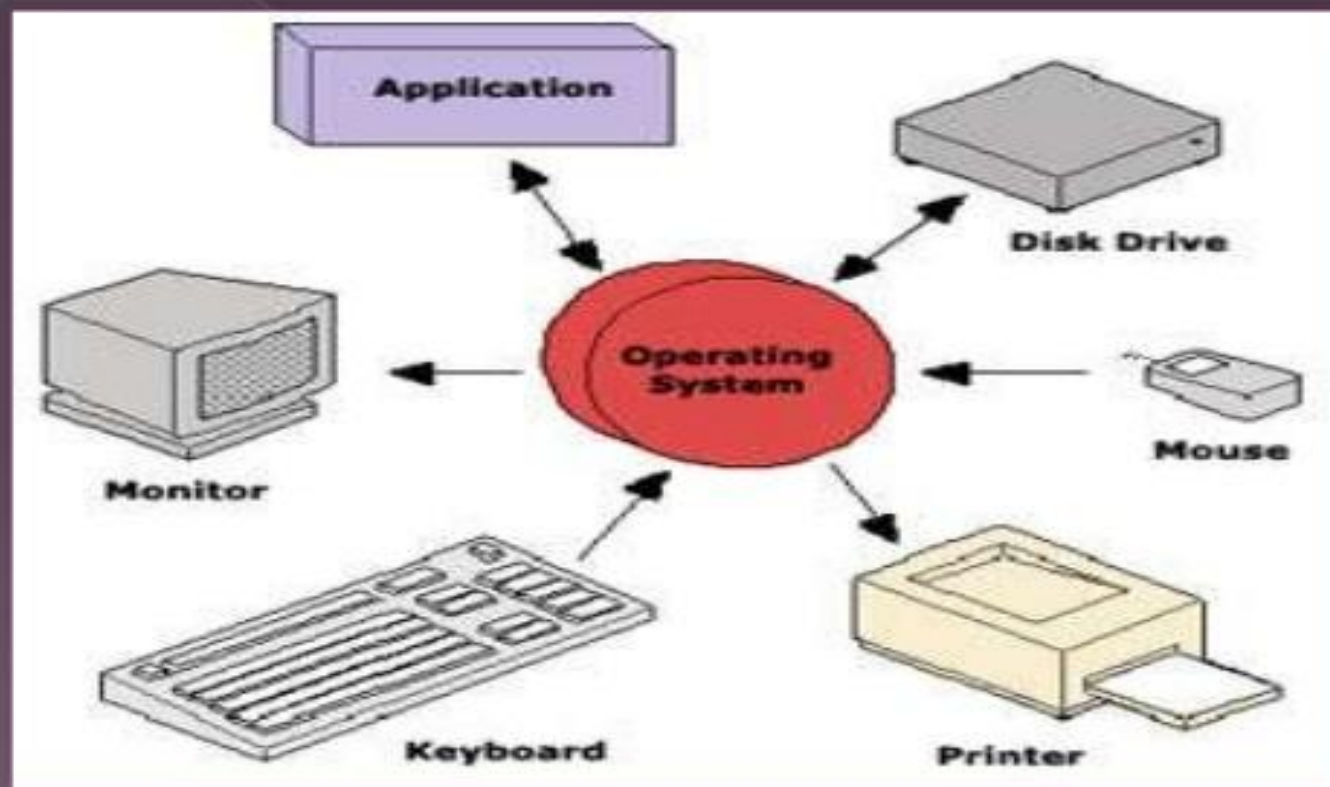
- **What is an operating system?** An operating system is the most important collection of programs that runs on a computer.

OS manages the memory and processes, hardware, i.e. controls all computer's resources.

OS allows you to communicate with the computer without knowing computer's language

OS provides a pleasant and effective interface between the user and the hardware.

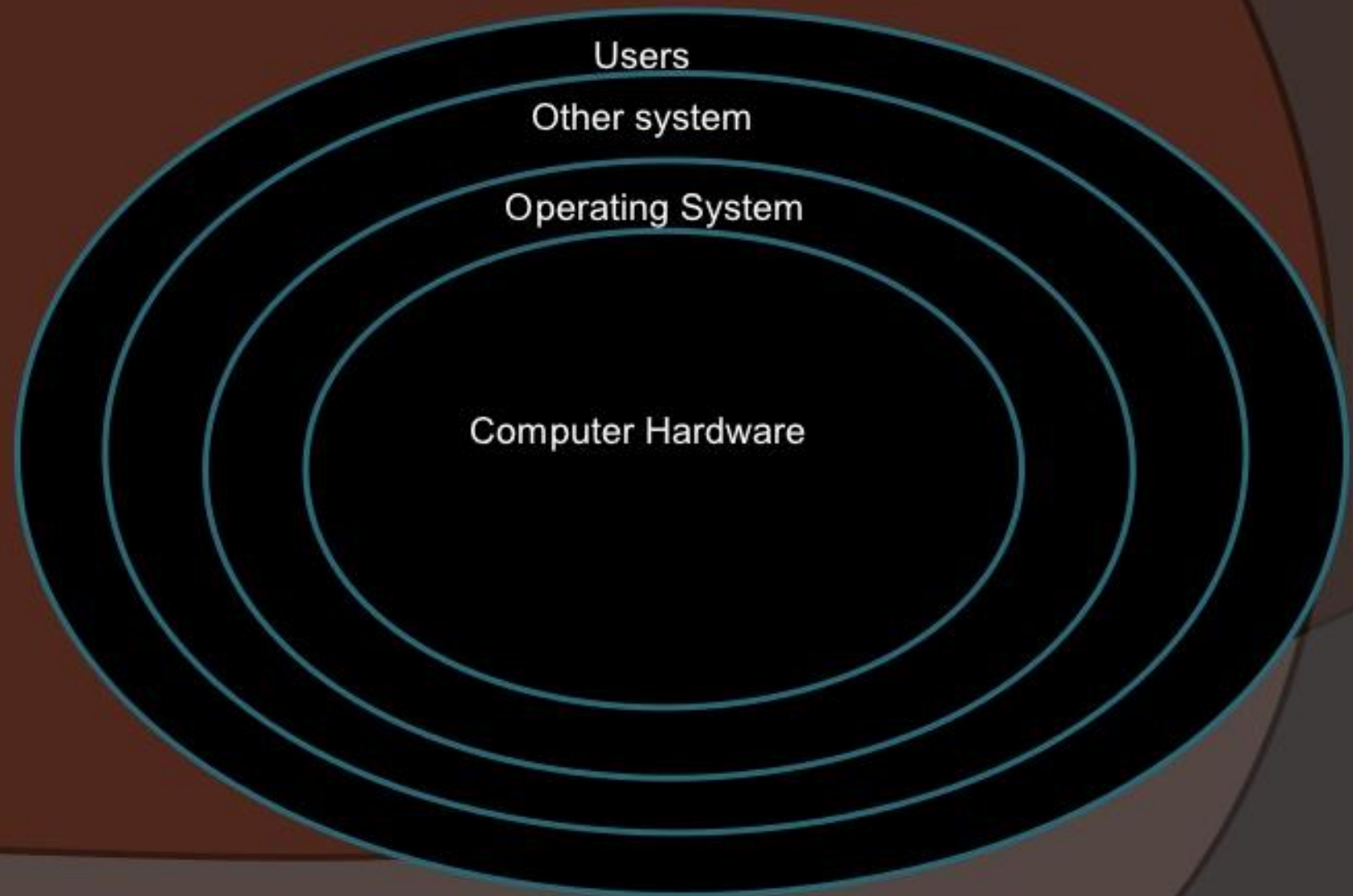
Without OS, a computer is useless.



The structure of OS consists of 4 layers:

- Hardware
- Operating System
- System programs
- Application programs

Structure of OS



Functions of Operating system

- Process Management
- Memory Management
- File Management
- Security management
- Command Interpreter

Types of OS

- Multi-user
- Multiprocessing
- Multitasking
- Multithreading
- Embedded system

OPERATING SYSTEM TYPES

Multi-user - A multi-user operating system allows for multiple users to use the same computer at the same time and different times.

OPERATING SYSTEM TYPES

Multiprocessing - An operating system capable of supporting and utilizing more than one computer processor.

OPERATING SYSTEM TYPES

Multitasking - An operating system that is capable of allowing multiple software processes to run at the same time.

OPERATING SYSTEM TYPES

Multithreading -

Operating systems that allow different parts of a software program to run concurrently.

OPERATING SYSTEM TYPES

Embedded System: The operating systems designed to operate on small machines like PDAs with less autonomy. They are able to operate with a limited number of resources

Operating Systems

- The three most common operating systems for personal computers are
- **Microsoft Windows**
- **Mac OS X**
- **Linux.**

Some Examples of Operating System



Windows

Microsoft created the **Windows** operating system in the mid-1980s. Over the years, there have been many different versions of Windows, but the most recent ones are:

Windows Vista (2007)

Windows 7 (2009)

Windows 8 (2012)

Windows 10 (released in 2015)

Windows comes **pre-loaded** on most new PCs and nowadays it is the **most popular operating system** in the world.

Mac OS

Mac OS is a line of operating systems created by Apple. It comes preloaded on all new Macintosh computers, or Macs. All of the recent versions are known as **OS X** (pronounced O-S Ten), and the specific versions include **El Capitan** (released in 2015), **Yosemite** (2014), **Mavericks** (2013), **Mountain Lion** (2012), and **Lion** (2011).

According to Statistics, Mac OS X users account for less than **10%** of global operating systems—much lower than the percentage of Windows users (more than **80%**). One reason for this is that Apple computers tend to be more expensive. However, many people do prefer the look and feel of Mac OS X over Windows

Linux

Linux (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world. This is different from **proprietary software** like Windows, which can only be modified by the company that owns it. The advantages of Linux are that it is **free**, and there are many different **distributions**—or versions—you can choose from.

OS for mobile devices

- **Mobile devices** such as **phones, tablet computers, and MP3 players** are different from desktop and laptop computers, so they need OS specifically for mobile devices. Examples of mobile operating systems include
 - **Apple iOS**
 - **Google Android**
 - **Windows Mobile**
 - **Bada(Samsung mobile OS)**
 - **Nokia's Symbian**