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Software Layers

- Software can generally be divided into several layers for organizational purposes
 - Layer 1 BIOS (Basic Input Output System)
 - o Layer 2a Operating System Kernel
 - o Layer 2b Operating System User Interface
 - o Layer 3 Applications

What is the BIOS?



Basic Input Output System

Including:

- Firmware (resides permanently on motherboard)
- Utilized during startup and initialization to test available hardware



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What is an operating system?



- Often called an O/S or OS
- 3 Main Functions
 - Manage files and resources (CPU, memory etc.)
 - o Provide a user interface
 - o Provide a platform for application software
- Consists of 2 parts
 - o **Kernel** Nucleus of software that communicates with hardware
 - **User Interface** Software that is designed for user interaction



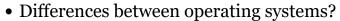
Popular Operating Systems?

- Microsoft Windows (3.1 / 95 / 98 / XP / 7 / 10 / ...)
- Apple Mac OS
- Linux
 - $\circ\,$ This is a generic term, there are MANY kinds of Linux

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Managing Files • File management is a central feature of almost all operating systems □ 🥯 (C:) Local Disk ■ ADOBEPATH □ 🗎 bin ► 🛅 Library ▶ 📵 Movies ▼ 🗊 Music Config.Msi ▼ 🛅 iTunes ▶ 🛅 Album Artwork ☐ iTunes Library Extras.itdb ☐ iTunes Library Extras.itdb ☐ iTunes Library Genius.itdb ☐ iTunes Music ☐ 🛅 Drivers Dual Pointing Device ■ ☐ Sound iTunes Music Library.xml Mobile Applications ■ MSOCache Previous iTunes Libraries Program Files Temp File.tmp ▼ @ Pictures RECYCLER iChat Icons iPhoto Library ok10-Install.exe System Volume Information ▶ ☐ iPhoto Slideshows▶ ☐ Photo Booth ► 🔯 Public

Managing Files



- o Allowed characters, length of names, case sensitivity
- o File security
- Many different file & disk formats
 - \circ FAT32, NTFS, HFS, EXT

https://www.youtube.com/watch?v=KN8YgJnShPM

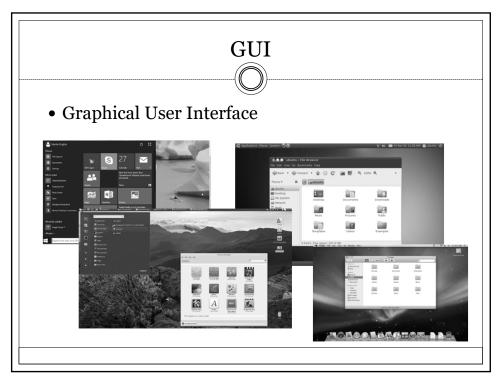
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User Interface

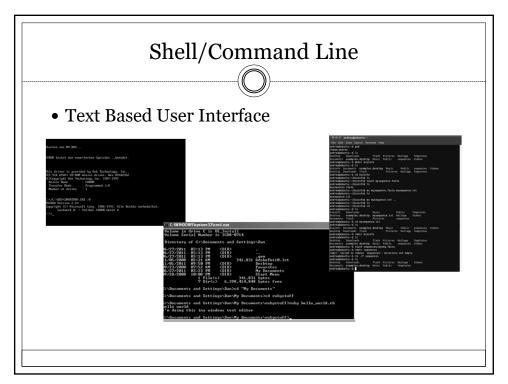


- Brings structure to the interaction between a user and the computer
- A program or set of programs that sits as a layer above the operating system itself.
- Two types
 - o Graphical User Interface (GUI)
 - o Text Based User Interface (Shell/Command Line)

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Types of Operating Systems



- Real-Time Operating System (RTOS)
 - o For control machinery, scientific / industrial equipment
 - o Little (if any) user interface
 - o Good at doing something specific
- Multi-Task Operating System
 - o The type most people have today
 - o Designed for one person to do a variety of tasks, possibly at the same time
 - o Ex: Windows, Mac OS, Linux