CSC 170 - Introduction to Computers and Their Applications

Lecture 9 – Software

Essentials

- When searching for new software, it helps to have a framework of categories
- System Software
  - Operating Systems
    - For controlling a digital device's internal operations
    - Windows, macOS, iOS, Linux, Android, UNIX, and Chrome OS.

Essentials

- When searching for new software, it helps to have a framework of categories
- System Software
  - Device Drivers
    - For digital devices to communicate with each other .
    - Printer Drivers and Video Drivers
  - Utilities
    - For file management, security, communications, backup, network management, and system monitoring

Essentials

- Development Software
  - Programming Languages
    - For writing programs C Basic, Java, Fortran, C++, C#, Scheme, and Objective-C
  - Scripting Languages
    - For writing scripts, creating Web pages, and querying databases
    - HTML, JavaScript, PHP, Python, Ruby, and SQL
  - Quality Assurance Tools
    - For testing software Debuggers, Load Testing, Security Testing

Essentials

- Application Software
  - Professional Tools
    - For automating professional activities at work and in the home office
    - Desktop Publishing, Graphic Design, and Special Effects
  - Educational Software
    - For students and teachers engaged in the process of learning in classrooms and at a distance
    - Tutorials, Courseware, and Learning Management Systems

Essentials

- Application Software
  - Personal Finance Software
    - For managing bank accounts, preparing taxes, retirement planning, and other financial matters
    - Tax Preparation, Banking Apps, and Loan Calculators

Essentials

- Entertainment Software
  - For accessing media and playing games
  - Ebook Readers, Games, Media Players, and Media Editors
- Reference Software
  - For accessing information in specific topic areas
  - Travel, Sports, Medical, Hobbies, Lifestyle, Maps, News, Weather, and Shopping
- Social Media Software
  - For accessing and working with social media services, such as Facebook and WordPress
  - Social Analytics, Dashboards, and Marketing

Essentials

- Business Software
  - For automating core business functions
  - Accounting, Inventory Management, Billing Databases, Point of Sale, Sales force Management and Estimating
- Productivity Software
  - For automating tasks formerly carried out with legacy technologies, such as pen and paper, typewriters, calculators, and slide Projectors
  - Word Processors, Spreadsheets, Presentations, Calendars, and Contact Managers

Essentials

- Mobile devices are used differently from desktop and laptop computers, so the configuration of their software is slightly different
- Files tend to be stored and retrieved by each app, so users have little need for a utility that allows access to the file management system.

Distribution

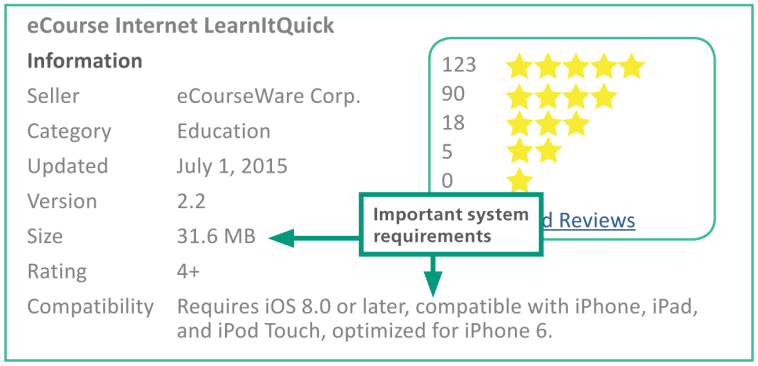
- Most consumers obtain software online, where it can be downloaded directly from the developer or from a software aggregator
- An **executable file** contains a computer program that is carried out step-by-step within the microprocessor.
- Software can contain viruses and other malware, so consumers should download new applications only from trusted sources.

Distribution

- Software developers usually have a Web site for distributing software. Well-established developers tend to offer trustworthy products.

Distribution

- **System requirements** specify the operating system and minimum hardware capacities necessary for a software product to work correctly.



Distribution

- When a new version or edition of a software product is released, it is referred to as a ***software upgrade*.**
- A ***software update*** (sometimes called a software patch) is a small section of program code that replaces part of the software currently installed.

Distribution

- The term **service pack**, which usually applies to operating system updates, refers to a set of updates.
- Updates and service packs are designed to correct problems and address security vulnerabilities.

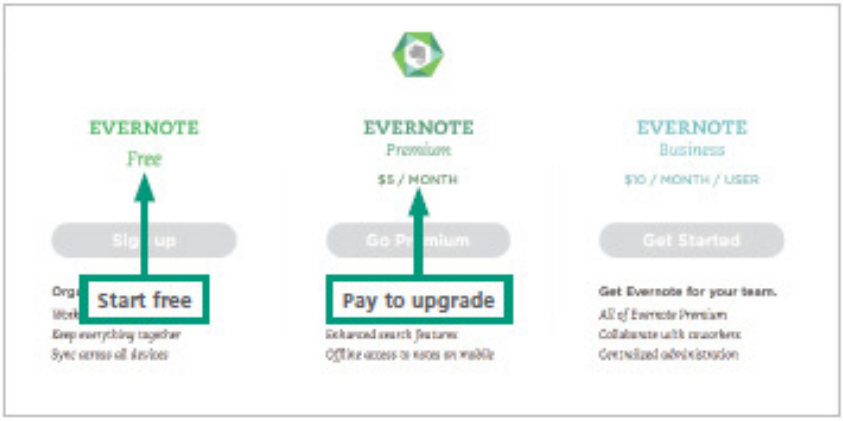
Distribution

- Software can be obtained under a variety of pricing models:
  - **One-time purchase** – the software remains basically the same as when it was purchased.
  - **Subscription** – consumers pay a monthly or an annual fee to use software; updates and upgrades are usually included in the pricing.

Distribution

- Software can be obtained under a variety of pricing models:
  - **Trial** – consumers use a software product during a free trial period.
  - **Freemium** – provides free use of a stripped-down or basic version of the product but requires payment for upgraded features.

Distribution (5 of 5)



Software Licenses

- A ***software license***, or license agreement, is a legal contract that defines the ways in which a computer program may be used
- These licenses are sometimes referred to as ***EULA*s** (***E***nd ***U***ser ***L***icense ***A***greements).

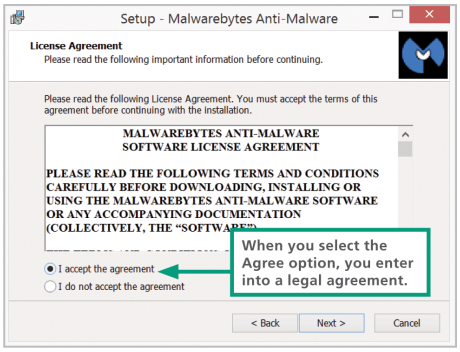
The purchaser has the right to copy software from distribution media or a Web site to a device's internal storage medium in order to install it.

The purchaser can make an extra, or backup, copy of the software in case the original copy becomes erased or damaged—unless the process of making the backup requires the purchaser to defeat a copy protection mechanism designed to prohibit copying.

The purchaser is allowed to copy and distribute sections of a software program for use in critical reviews and teaching.

Software Licenses

- License agreements are displayed during the installation process. By clicking the ***I Agree*** button, you consent to the terms of the license agreement.



Software Licenses

- ***Public domain software*** is not protected by copyright because the copyright has expired or the author has placed the program in the public domain, making it available without restriction.
- ***Proprietary software*** has restrictions on its use that are delineated by copyright, patents, or license agreements.

Software Licenses

- ***Commercial software*** is usually sold in retail stores or on Web sites. Most commercial software is distributed under a ***single-user license*** that limits use to one person at a time.

Software Licenses

- A ***site license*** is generally priced at a flat rate and allows software to be used on all computers at a specific location.
- A ***multiple-user license*** is priced per copy and allows the allocated number of copies to be used simultaneously.

Software Licenses

- ***Freeware*** is copyrighted software that—as you might expect—is available for free. It is fully functional and requires no payment for its use.
- ***Demoware*** is proprietary software made available as a trial version. It is distributed for free and often comes preinstalled on new devices.

Software Licenses

- ***Product activation*** is a means of protecting software from illegal copying by requiring users to enter a product key or an activation code.

Software Licenses

- ***Open source software*** makes uncompiled program instructions—the source code—available to programmers who want to modify and improve the software. Linux is an example of open source software
- Two of the most common open source and free software licenses are BSD and GPL

Pirated Software

- Software that is illegally copied and sold is referred to as ***pirated software*.**
- Some unsuspecting consumers have inadvertently obtained pirated software, even when paying full price from a reputable source.
- Pirated software may not update properly and is not eligible for authenticated upgrades.

Operating Systems Basics

- An operating system gives your digital device a personality. It controls key elements of the **user interface**, which includes the visual experience as well as the keyboard, mouse, microphone, or touchscreen that collects user commands.
- Behind the scenes, the OS is busy supervising critical operations that take place within a device.

Operating Systems Basics

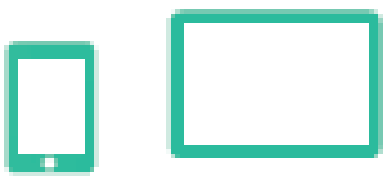
- A **desktop operating system** is designed for a desktop or laptop computer.
- The computer you use at home, at school, or at work is most likely configured with a desktop operating system, such as Microsoft Windows, macOS, or Chrome OS.

Operating Systems Basics

- Key characteristics of desktop operating systems include the following:
  - Accommodate one user at a time, but allow multiple accounts.
  - Provide local area networking capability
  - Include file management tools.
  - Run more than one application at a time.
  - Offer a graphical user interface designed for keyboard and mouse input.

Operating Systems Basics

- Operating systems such as iOS and Android are classified as **mobile operating systems** because they are designed for use on smartphones, tablet computers, and ebook readers.



Operating Systems Basics

- Computers that are deployed as Web servers, or as servers for files, applications, databases, or email, generally use a ***server operating system*** designed for distributed networks accessed by many simultaneous users.
- Linux, UNIX, Windows Server, and macOS Server are examples of popular server operating systems.

Operating Systems Basics

- During the boot process, the OS kernel is loaded into RAM. A ***kernel*** provides essential operating system services, such as memory management and file access
- In the context of digital devices, the term ***resource*** refers to any component that is required to perform work

Operating Systems Basics

- Depending on the capabilities of the operating system and computer hardware, processes can be managed by multitasking, multithreading, and multiprocessing
  - **Multitasking** – provides process and memory management services that allow two or more tasks, jobs, or programs to run simultaneously
  - **Multithreading** – allows multiple commands, or threads to run simultaneously
  - **Multiprocessing** – a capability that supports a division of labor among all the processing units

Microsoft Windows

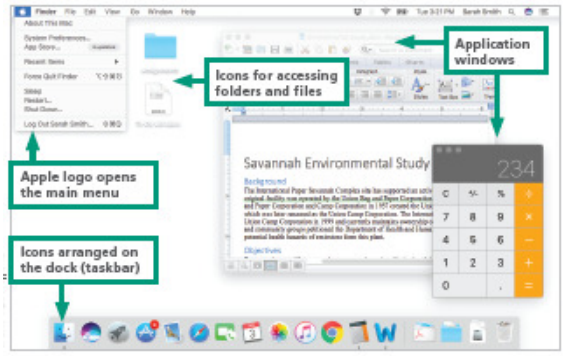
- **Microsoft Windows** is installed on more than 80% of the world's personal computers.
- The Windows OS got its name from the rectangular work areas displayed on its screen-based desktop.

Microsoft Windows

- Windows evolved from a Microsoft OS called **DOS** (Disk Operating System) that was designed to run on early PCs with Intel or Intel-compatible microprocessors.
- The most recent versions of Windows are Windows 7, Windows 8, and Windows 10.

macOS

- As a desktop operating system, **macOS** features beautifully designed icons and multiple rectangular work areas to reflect multitasking capabilities.



macOS

- MacOS has a reputation for being an easy-to-use, reliable, and secure operating system
- MacOS uses a kernel based on UNIX, a server operating system that includes industrial-strength memory protection features that contribute to a low incidence of errors and glitches
- As a desktop operating system, **macOS** features beautifully designed icons and multiple rectangular work areas to reflect multitasking capabilities.

iOS

- **iOS** is a mobile operating system derived from the same UNIX code that is the basis for macOS.
- iOS displays a home screen containing application icons.
- iOS was the first operating system to offer routines to manage touchscreen gesture inputs, such as using your fingers to "squeeze" an on-screen graphic into a smaller size.

iOS

Limitations to iOS:

- iOS limits your selection of apps to those provided by the online Apple App Store, unless you make unauthorized modifications to "jailbreak" the phone.
- Background processes, such as music, voice calls, and notifications, provide very limited multitasking capabilities.

Android

- Developed in 2007, ***Android*** is a mobile operating system that is a popular platform for tablet computers, smartphones, and ebook readers.
- Android devices have a screen-based home button rather than a physical button.
- In addition to touchscreen input, the Android OS supports voice input for Google searching, voice dialing, navigation, and other applications.