Lesson 6
Software and Hardware Interaction

Computer Literacy BASICS: A Comprehensive Guide to IC^3, 3rd Edition

Objectives

- Identify how hardware and software interact.
- Explain how a software program works.
- Describe the difference between application software and system software.
- Describe the software distribution process.

Vocabulary

- algorithm
- application software
- beta testing
- bundleware
- flowchart
- inputting
- network license
- operating systems
- patch
- service pack
- single-user license
- software

Vocabulary (continued)

- Software as a Service (SaaS)
- software development
- software license
- software piracy
- system software
- update
- upgrades
- Web applications

Introduction

- Over the last 50 years or so, computer technology has changed the world.
- Because computers developed the capacity to do many tasks very quickly, they now have a major influence on the culture and economy.
- Computers have had such an impact due to the vision and desire of software developers, who created thousands of ideas and ways in which to use computers.

How Hardware and Software Interact

- Inputting is the process of using an input device to enter data.
- You use input devices to interact with software.

How Hardware and Software Interact (continued)

The Role of Software:

- Software is programming code written to provide instructions to the hardware so it can perform tasks.
- The way hardware and software interact as a computer processes data allows us to use the computer to complete many tasks.

How a Software Program Works

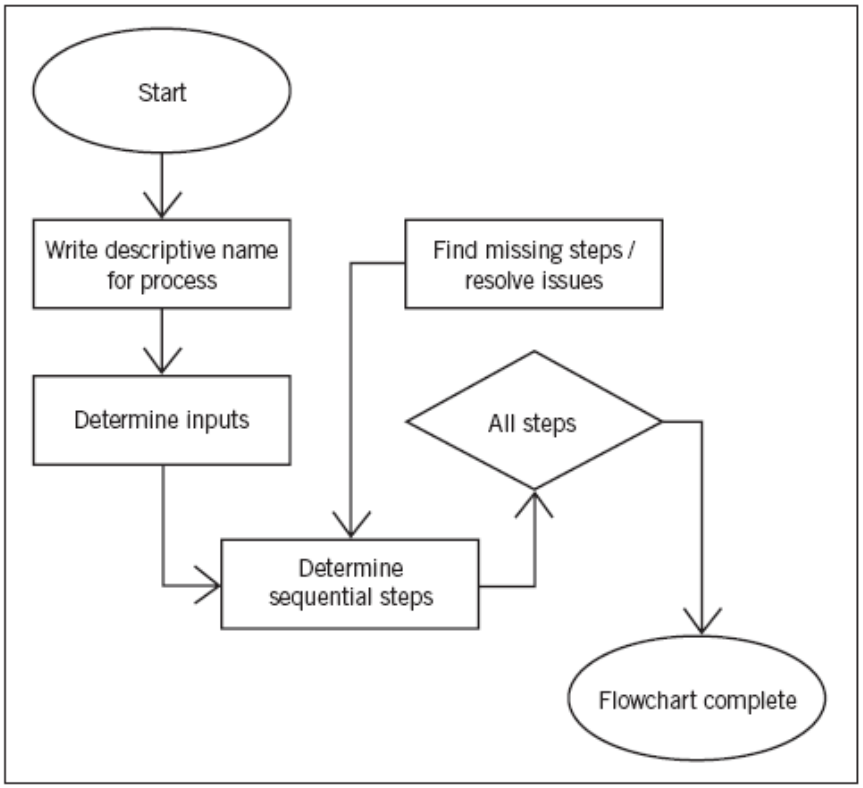
- A computer processes data by applying rules called algorithms. An algorithm is a set of clearly defined, logical steps that solve a problem.
- A programmer writes an algorithm, rewrites the steps in formal programming language, and a specialized computer program translates it to machine language that the computer can understand.

Software Development

- Software development is a multistep process that usually begins when someone recognizes a need to perform a task more effectively and/or efficiently using a computer.
- Often the programmer works out the logic for the steps in the algorithm by using a flowchart that shows different paths the program will take depending on what data is inputted.

Software Development (continued)

- Flowchart



Software Development (continued)

- Next, the programmer writes code that uses a formal set of terms and syntax. The computer translates the code and executes the commands.
- The quality control process involves running systematic tests, debugging (finding and correcting errors in the code), and beta testing.

Application Software and System Software

- Application software helps you perform a specific task. System software refers to the operating system and all utility programs that manage computer resources at a low level.

Application Software:

- Composed of programs designed for an end user, also referred to as productivity software.

Using Application Software:

- You can modify and apply rules to data.

Application Software and System Software (continued)

System Software:

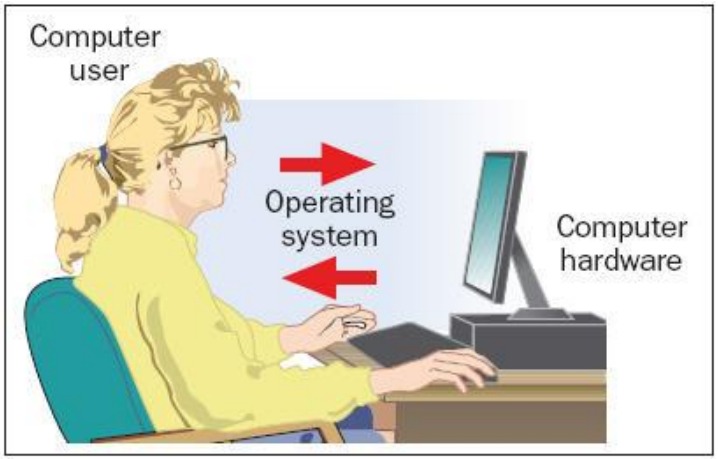
- A group of programs that coordinate and control the resources and operations of a computer system.

Operating Systems:

- Provide an interface between the user or application program and the computer hardware.

Application Software and System Software (continued)

Operating Systems (cont):



Utilities and Language Translators:

- Programs that help to maintain computer hardware or other software.

Software Distribution

- Software and software licensing options are available through a variety of alternatives and distribution methods.

Software Licensing:

- When you purchase a software program, you are purchasing a software license that gives you permission to use the program.
- This single-user license gives you the right to install the software on a single computer.

Software Distribution (continued)

Software Licensing (cont):

- A network license gives an organization the right to install a program on a server which can be accessed by a specific number of computers.
- Software as a Service (SaaS) is a recently developed software delivery method where an application is licensed for use as a service.

Software Distribution (continued)

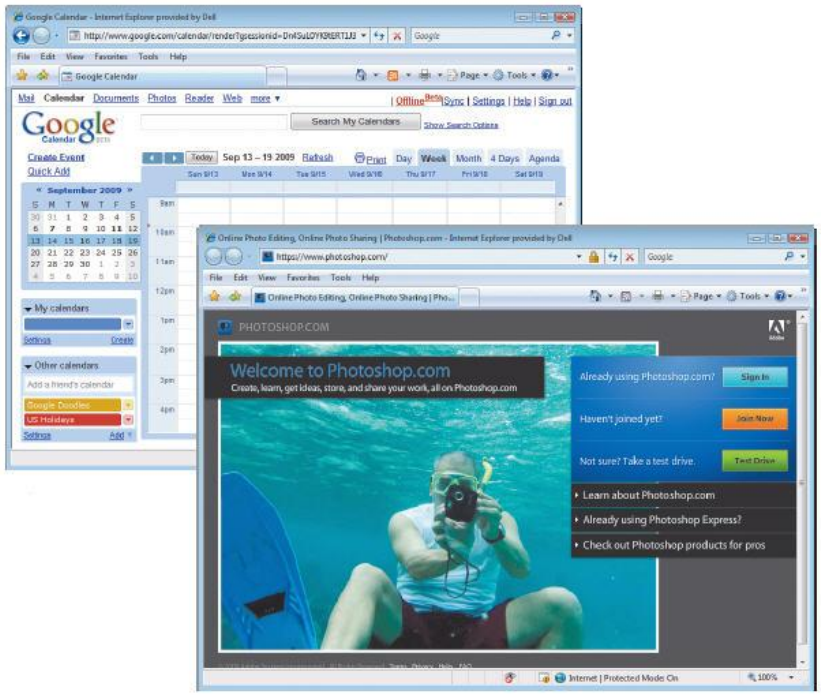
Updating and Upgrading Software:

- Fixes are called a patch, an update, or a service pack and are applied over software that you already have installed.
- Upgrades are revised versions of a software program and require the purchase of a newer version of the software.

Software Distribution (continued)

Updating and Upgrading Software (cont):

- Web applications are without platform constraints or installation requirements and are accessed through a Web browser.



Software Distribution (continued)

Alternative Methods of Software Distribution:

- *Open source:* Available to public without cost and can be modified and redistributed.
- *Freeware:* Given away by author, who retains copyright.
- *Shareware:* Downloadable, pay after trial basis.
- *Bundleware:* Software included with new computer.

Software Distribution (continued)

Alternative Methods of Software Distribution (cont):

- It is the responsibility of the user to verify and use only legitimately licensed software.
- A network manager must verify that the product is used and distributed within the terms of the license.
- Software piracy is the unauthorized copying of software.

Summary

In this lesson, you learned:

- Hardware refers to anything you can touch, including objects such as the keyboard, mouse, monitor, printer, chips, disk drives, and CD/DVD recorders. Inputting refers to using an input device to enter data.
- Software is programming code written to provide instructions to the hardware so that you can perform specific tasks. Using input devices, you interact with the software by typing commands, selecting an option from a menu, or clicking a button for example.
- Hardware and software interact as a computer processes data.

Summary (continued)

- A computer processes data by applying rules called algorithms, which are sets of clearly defined, logical steps that solve a problem.
- Software development usually begins when someone recognizes a need to perform a task more effectively using a computer. The programmer breaks down the task into an algorithm that covers all the actions needed to perform the task. The programmer often works out the logic for the steps in the algorithm by using a flowchart that shows different paths the program will take depending on what data is inputted.

Summary (continued)

- The programmer writes the steps in a computer programming language or code that uses a formal set of terms and syntax, or rules for how the words are used together. The computer translates the code into language it can understand, and uses the translated commands to execute the program.
- Software development also requires quality control, which involves running systematic tests, debugging (finding and correcting errors in the code), and beta testing.

Summary (continued)

- The two types of software are application software and system software. Application software helps you perform a specific task. System software refers to the operating system and all utility programs that manage computer resources at a low level.
- Operating systems provide an interface between the user or application program and the computer hardware.
- When you purchase a software program, you are purchasing a software license that gives you permission to use the program. A single-user license gives you the right to install the software on a single computer. Organizations using networks can purchase network licenses.

Summary (continued)

- Software as a Service (SaaS), is a recent software delivery method where an application is licensed for use as a service. The software is provided to customers on demand through the Internet, an intranet, or local network.
- A software update is a fix called a patch, an update, or a service pack. A software patch is applied over software that you already have installed.
- Software upgrades are revised versions of a software program and require the purchase of a newer version of the software.

Summary (continued)

- Web applications do not have platform constraints or installation requirements and are accessed through a Web browser over a network such as an intranet or the Internet. Common Web applications include Web mail and online calendars.
- Alternative methods of software distribution include open source, freeware, shareware, and bundleware.