Computers in your life

- Why learn about computers?
- Pervasive computing (ubiquitous computing): Computers have become an integral part of our lives.
- Basic computer literacy: Knowing about and understanding computers and their uses is an essential skill today for everyone.
- Before 1980:
    - Computers were large, expensive
    - Very few people had access to them
    - Computers were mostly used for high-volume processing tasks
- Microcomputers in the early 80s:
    - Inexpensive personal computers
    - Computer use increased dramatically
- Today:
    - More than 60% of US households include a computer, and most use computers at work
    - Electronic devices are converging into single units with multiple capabilities

Computers in Home

- Computers used for a variety of tasks:
    - Looking up information and news
    - Exchange e-mail
    - Shopping and paying bills
    - Downloading music and movies
- Wireless networking
    - Computers can be used in nearly any location

- Smart appliances
    - Traditional appliances with built-in computer or communication technology
- Smart homes
    - Household tasks are monitored and controlled by a main computer in the house

Computers in Education

- Colleges and universities are even more integrated
    - Classrooms, computer labs, dorms, libraries
    - Internet assignments
- Teachers
    - Prepare handouts, exams, and class presentations
    - Maintain course Web pages
- Distance learning
    - Students participate from locations other than the traditional classroom setting using computers and Internet access

Computers in the Workplace

- Computers have become a universal on-the-job tool for decision-making, productivity, and communication
    - Used by all types of employees
    - Used for access control and other security measures
    - Use by service professionals is growing
    - Used extensively by the military
    - Employees in all lines of work need to continually refresh their computer skills

Computers on the Go

- Computers are encountered in nearly every aspect of daily life
    - Portable PCs and handheld computers
    - Wi-Fi hotspots and Internet cafes
    - ATM machines and retail stores
    - Self-checkout systems and consumer kiosks
    - M-commerce systems
    - GPS systems

What is Computer and What does it do?

- Computer: A programmable, electronic device that accepts data, performs operations on that data, and stores the data or results as needed, follow instructions, called programs, which determine the tasks the computer will perform.
- Basic operations:
    - Input: Entering data into the computer
    - Processing: Performing operations on the data
    - Output: Presenting the results
    - Storage: Saving data, programs, or output for future use
    - Communications: Sending or receiving data

Data vs Information

- Data:
    - Raw, unorganized facts. Can be in the form of text, graphics, audio, or video
- Information:
    - Data that has been processed into a meaningful form
- Information processing: Converting data into information.

Hardware

- Hardware: The physical parts of a computer
  - Internal hardware: Located inside the main box (system unit) of the computer
  - External hardware: Located outside the system unit and plug into ports located on the exterior of the system unit
  - Hardware associated with all five computer operations:
    - Input devices: Used to input data into the computer as Keyboards, mice, scanners, cameras, microphones, joysticks, etc.
    - Processing devices: Perform calculations and control computer's operation as Central processing unit (CPU) and memory
    - Output devices: Present results to the user as Monitors, printers, speakers, projectors, etc.
    - Storage devices: Used to store data on or access data from storage media as Hard drives, DVD disks and drives, USB flash drives, etc.
    - Communications devices: Allow users to communicate with others and to electronically access information as Modems, network adapters, etc.

Software

- Software: The programs or instructions used to tell the computer hardware what to do
- System software: Operating system allows a computer to operate
  - Boots the computer and launches programs at the user's direction
  - Most use a GUI to interact with the user via windows, icons, menus, buttons, etc.
  - Windows, Mac OS, Linux, etc.
- Application software: Performs specific tasks or applications as Creating letters, budgets, Viewing Web pages, Sending and receiving e-mail, Recording and playing CDs.

- Computer users (*end users*):
  - People who use a computer to obtain information
- Computer professionals include:
  - Programmers
  - Systems analysts
  - Computer operations personnel

Computers to Fit Every Need

- Six basic categories of computers
  - Embedded computers
  - Mobile devices
  - Personal computers
  - Midrange servers
  - Mainframe computers
  - Supercomputers

Embedded Computers

- Embedded computer: Embedded into a product and designed to perform specific tasks or functions for that product
  - Cannot be used as general-purpose computers
  - Often embedded into: Household appliances, Sewing machines and Cars

Mobile Devices

- Mobile device: A very small device with some type of built-in computing or Internet capability. Typically based on cellular phones as Smart phones, Smart watches, Handheld gaming devices, Portable digital media players

Personal Computers

- Personal Computer: a computer system designed to be used by one person at a time also it called a micro computer. Can be desktop or portable computers.

- Desktop PCs: fit on or next to a desk
  - Can use tower case, desktop case, or all-in-one
  - Can be PC-compatible or Macintosh
  - Not designed to be portable
- Portable PCs:
  - Most include wireless networking capabilities
  - Can synch (share information) with a desktop computer as needed
  - Can use a docking station or notebook stand as needed

  As:
  - Notebook (laptop) computers: Typically use clamshell design
  - Tablet PCs: Can be slate tablets or convertible
  - Handheld computers
    - Size of a paperback book or pocket calculator
    - Some include phone capabilities
    - Ultra Mobile Personal Computer (UMPC): Fully-functioning handheld

Midrange Servers

- Midrange server: A medium-sized computer used to host programs and data for a small network
  - Users connect via a network with a computer, thin client.

Mainframe Computers

- Mainframe computer: Powerful computer used by several large organizations to manage large amounts of centralized data
  - Standard choice for large organizations, hospitals, universities, large businesses, banks, government offices
  - Larger, more expensive, and more powerful than midrange servers
  - Usually operate 24 hours a day

Super Computers

- Supercomputer: Fastest, most expensive, most powerful type of computer
  - Generally, run one program at a time, as fast as possible
  - Commonly built by connecting hundreds of smaller computers, supercomputing cluster
  - Used for space exploration, satellites, weather forecast, oil exploration, scientific research, complex Web sites, decision support systems, 3D applications, etc.

Computer Networks and The Internet

- Computer network: A collection of hardware and other devices that are connected together.
  - Users can share hardware, software, and data
  - Users can communicate with each other
- Network servers: Manage resources on a network
- Clients: Access resources through the network server
- Computer networks exist in many sizes and types
  - Home networks
  - School and small business networks
  - Large corporate
  - Public wireless networks

What are The Internet and The World Wide Web?

- Internet: The largest and most well-known computer network in the world
  - Individuals connect to the Internet using an Internet service provider (ISP)
- World Wide Web: One resource (a vast collection of Web pages) available through the Internet
  - Web sites contain Web pages stored on Web servers
  - Web pages viewed using a Web browser (Internet Explorer, Safari, Firefox, Opera, etc.
  - A wide variety of information is available through the Web

Accessing a Network or The Internet

- Need a modem or network adapter
- Some networks require a username and password
- Internet connections can be:
    - Direct (always-on) connections
    - Dial-up connections
- Internet addresses are used to access resources on the Internet
    - IP address: Numeric address that identifies computers (207.46.138.20)
    - Domain name: Text-based address that identifies computers (microsoft.com)
    - Uniform resource locator (URL): Identifies Web pages (http://www.pbskids.org)
    - E-mail address: Identifies people for e-mail exchange (jsmith@cengage.com)

IP Addresses and Domain Names

- IP addresses are numeric and unique
- Domain Names: Correspond to IP addresses
    - Top-level domains (TLDs) identifies type of organization or its location

Uniform Resource Locators (URLs)

- URL: Uniquely identifies a Web page consists of:
    - Information identifying the Web server
    - Names of folders in which the Web page files are stored
    - Web page's filename
- Protocols:
    - Hypertext Transfer Protocol (http) is typically used to display Web pages (https is used for secure Web pages
    - File Transfer Protocol (ftp) is often used for file exchange

E-mail Addresses

- Consists of:
  - Username: A persons' identifying name for a particular domain
  - The @ symbol
  - Domain name for the computer that will be handling the person's e-mail (mail server)

Surfing the Web

- Web browser: Used to display Web pages
- Browser home page: The first page displayed when the browser is opened
- To load a Web page, you can:
  - Type a URL in the Address bar
  - Click a hyperlink on a displayed Web page
  - Select a Favorite/Bookmark or page from the History list

Searching the Web

- Search site: Web page that helps you find Web pages containing the information you are seeking
  - Typically search using keywords
- Reference sites: Look up addresses, telephone numbers, ZIP codes, maps, etc.

Computers and Society

- The vast improvements in technology over the past decade have had a distinct impact on daily life, both at home and at work
- A computer-oriented society has many benefits
- It has risks also as:
  - Computer viruses
  - Identity theft and phishing
  - Privacy issues
- Information integrity (not all information on the Internet is accurate)