بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِيْمِ

Introduction to Information & Communication Technologies

Lecture 01 – Introduction to Computer World

Dr. Jawad Shafi

Dua – Take Help from Allah Before Starting Any Task

اللَّهُمَّ خِرْ لِيْ وَاخْتَرْ لِي

سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا ﷺ
إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

رَبِّ اشْرَحْ لِي صَدْرِي
وَيَسِّرْ لِي اَمْرِي
وَاحْلُلْ عُقْدَةً مِنْ لِسَانِي
يَفْقَهُوا قَوْلِي

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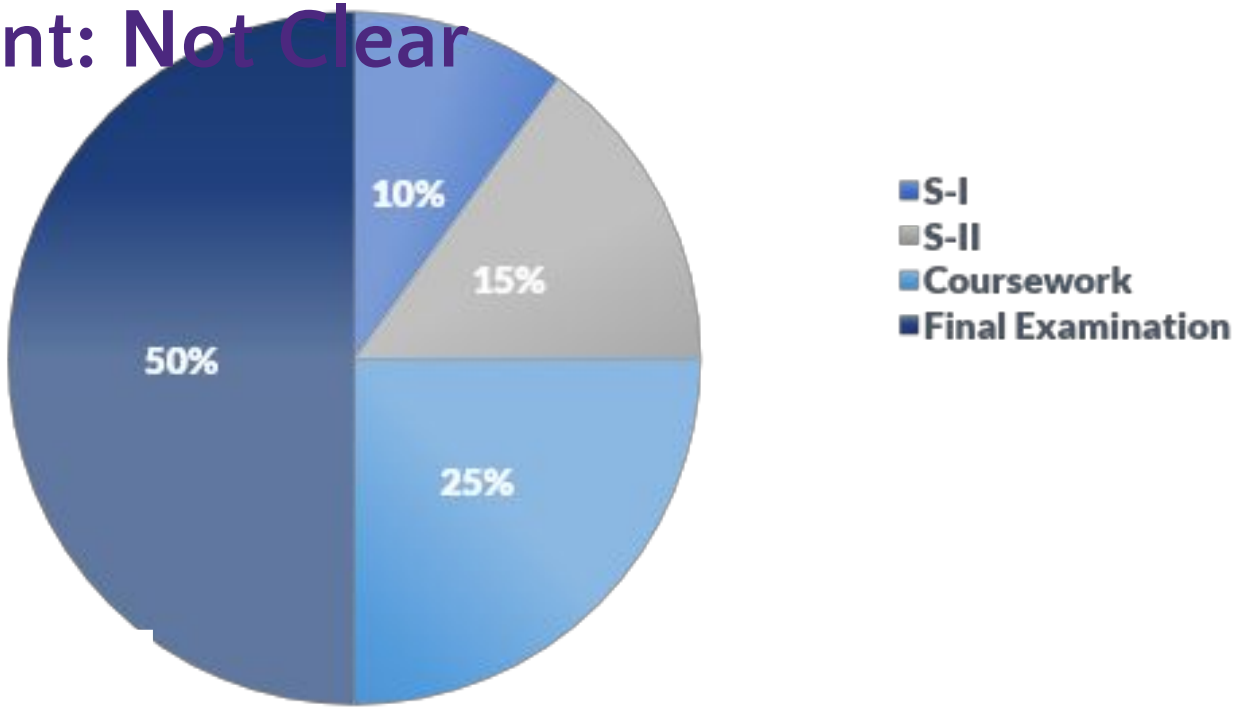
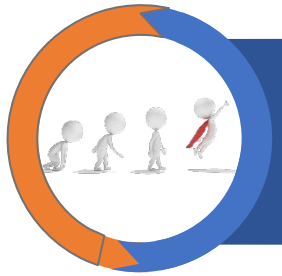
Assessment: Not Clear

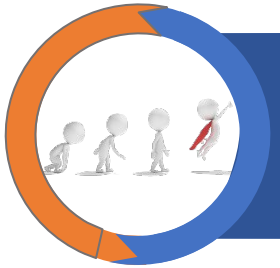


Course Focus

Mainly get Excellence in two things



Become a great Human Being



Become a great Computer Scientist

Outline

- This lecture covers:
  - What computers are, how they work, and how they are used
  - Computer terminology
  - The basic types of computers in use today

Computers in Your Life

- Why learn about computers?
  - Pervasive computing
    - Also known as 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

Computers in Your Life

- 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 80% of US households include a computer, and most use computers at work
  - Electronic devices are converging into single units with multiple capabilities

Computers in the Home

- Computers used for a variety of tasks:
  - Looking up information and news
  - Exchanging e-mail
  - Shopping and paying bills
  - Watching TV and videos
  - Downloading music and movies
  - Organizing digital photographs
  - Playing games
  - Telecommuting
- 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

REFERENCE AND COMMUNICATIONS
Many individuals today have access to the Internet at home; retrieving information, obtaining news, viewing recipes, shopping online, and exchanging e-mail are popular home computer activities.

ENTERTAINMENT
Home computers and gaming consoles are becoming a central hub for entertainment, such a the delivery of photos, videos, music, games, and recorded TV.

Computers in Education

- Many students today have access to computers either in a classroom or a computer lab
- Colleges and universities are even more integrated
  - Wireless hotspots allow usage of personal laptops to connect to the college network
  - Some colleges require a computer for enrollment
- Distance learning
  - Students participate from locations other than the traditional classroom setting using computers and Internet access

Computers on the Job

- Computers have become a universal on-the-job tool for decision-making, productivity, and communic
  - 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

DECISION MAKING
Many individuals today use a computer to help them make on-the-job decisions.

PRODUCTIVITY
Many individuals today use a computer to perform on-the-job tasks efficiently and accurately.

Computers on the Go

- Computers are encountered in nearly every aspect of daily life
  - Consumer kiosks
  - ATM transactions
  - POS systems at retail stores
  - Self-checkout systems
  - Portable computers or mobile devices
  - M-commerce systems
  - GPS systems

PORTABLE COMPUTERS
Many people today carry a portable computer or mobile device with them at all times or when they travel in order to remain in touch with others and Internet resources.

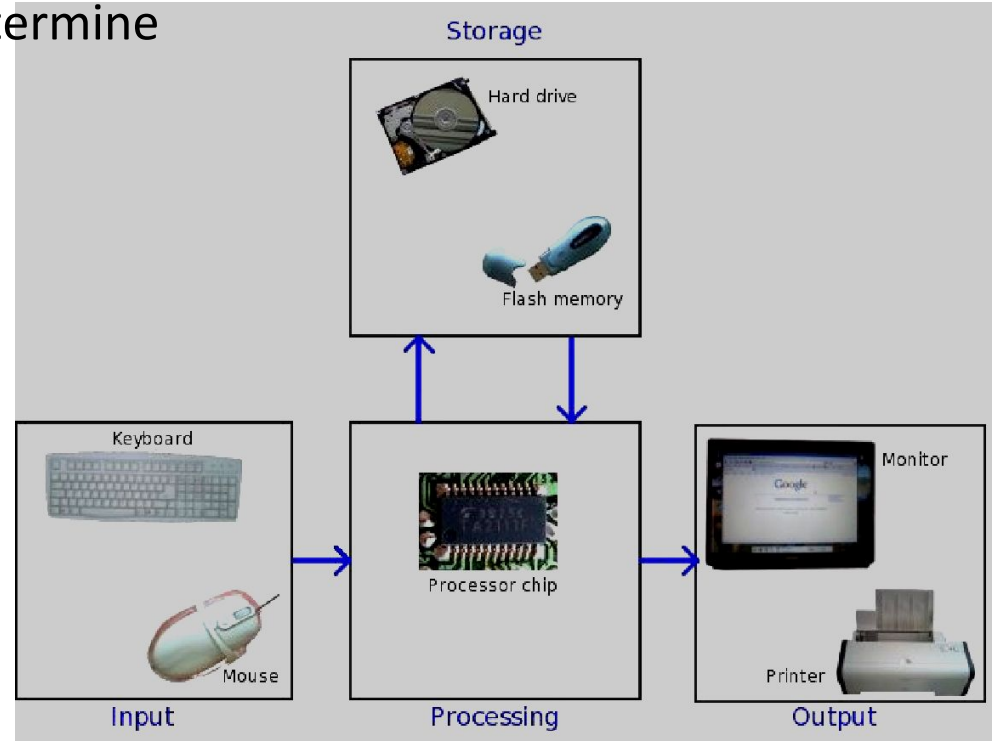
CONSUMER KIOSKS
Electronic kiosks are widely available to view conference or gift registry information, print photographs, order products or services, and more.

M-COMMERCE SYSTEMS
Allow individuals to pay for purchases using a mobile phone or other device.

CONSUMER AUTHENTICATION SYSTEMS
Allow access to facilities for authorized members only, such as for theme park annual pass holders, as shown here.

What Is a 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
  - Computers 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
    - Connect to the computer via a wired or wireless connection
  - There is hardware associated with all five computer operations

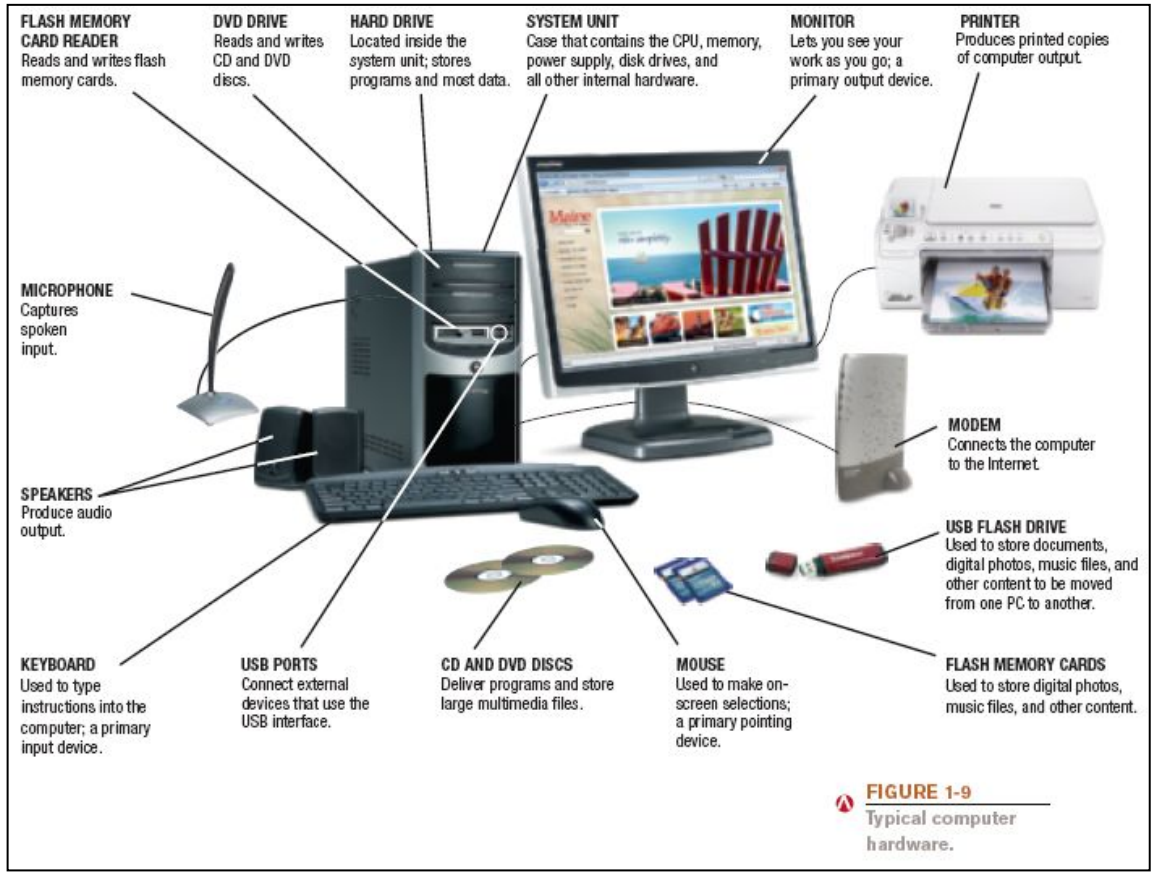


FIGURE 1-9
Typical computer hardware.

Software

- Software: The programs or instructions used to tell the computer hardware what to do
  - System software: Operating system starts up the computer and controls its operation
    - Without OS computer cannot function
    - Boots the computer and launches programs at the user's direction
  - Application software: Performs specific tasks or applications

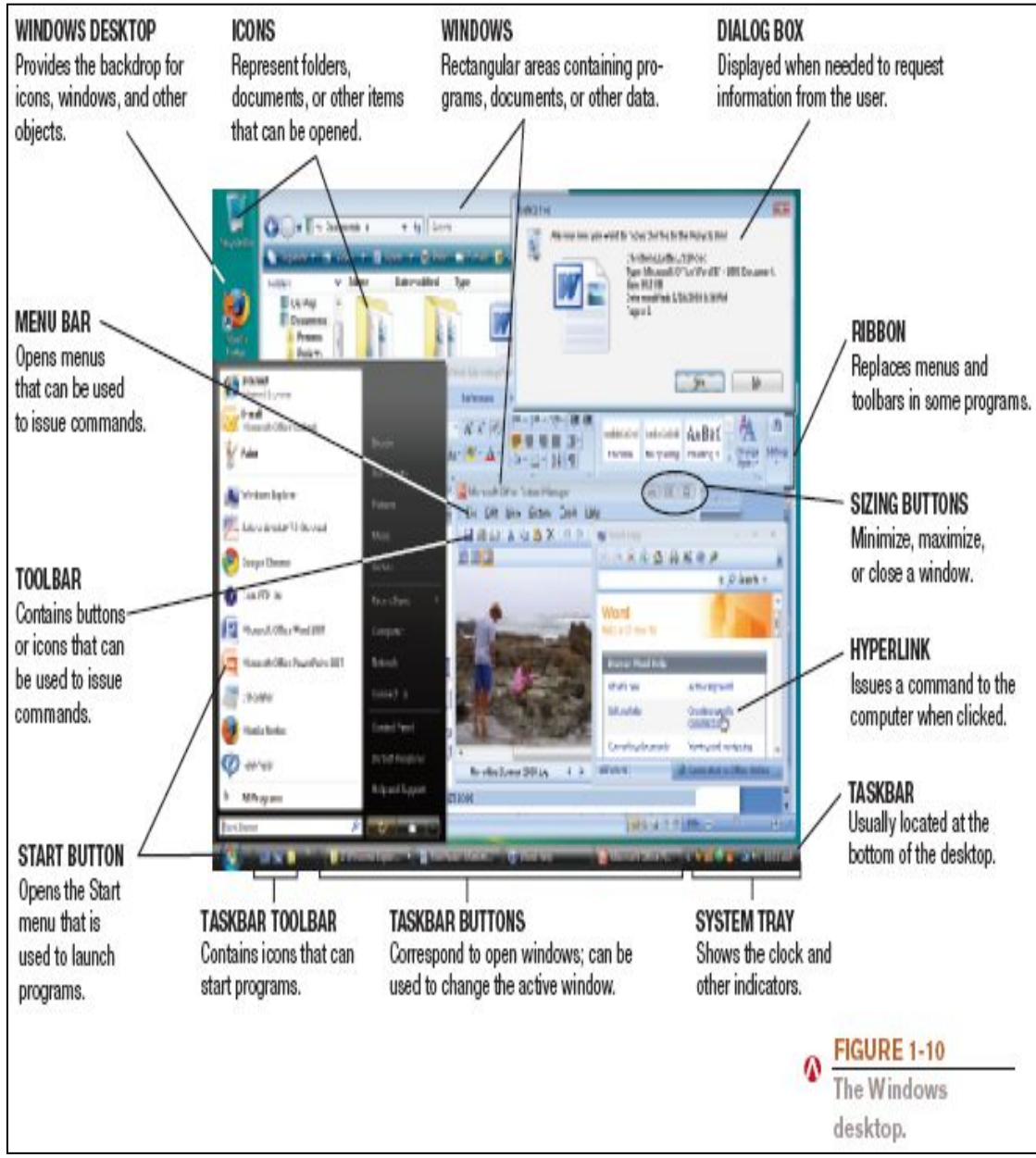


FIGURE 1-10
The Windows desktop.

Computers to Fit Every Need

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

Computers to Fit Every Need

- Embedded computer
  - Embedded into a product and designed to perform specific tasks or functions for that product
  - Cannot be used as general-purpose computers
- Mobile device
  - A very small device with some type of built-in computing or Internet capability
  - Typically based on mobile phones
- Personal computer
  - A small computer designed to be used by one person at a time
  - Also called a microcomputer

Computers to Fit Every Need

- Notebook (laptop) computers
  - Typically use clamshell design
  - Tablet computers
    - Can be slate tablets or convertible tablets
  - Netbooks
    - Small notebooks; rapidly growing type of PC
  - Ultra-mobile PCs (UMPCs)
    - Handheld computers
- 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, or dumb terminal

Computers to Fit Every Need

- 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
  - Also called high-end servers or enterprise-class servers
- 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

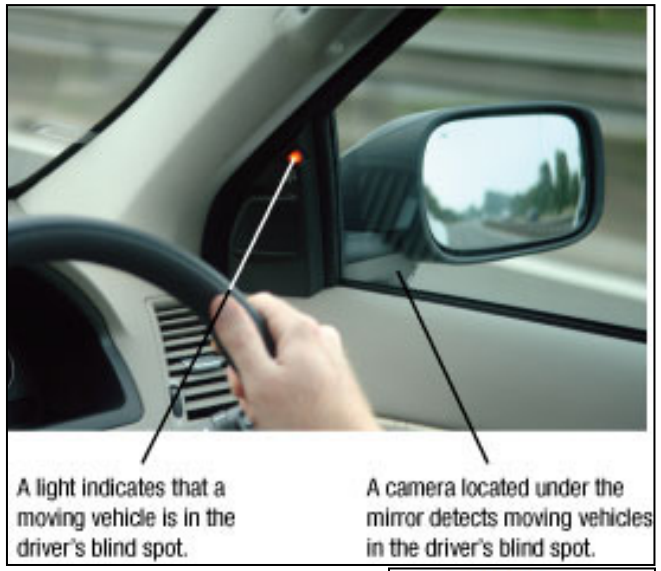


FIGURE 1-17
Midrange servers. Midrange servers are used to host data and programs on a small network, such as a school computer lab or medical office network.

FIGURE 1-12
Embedded computers. This car's embedded computers control numerous features, such as notifying the driver when a car enters his or her blind spot.

FIGURE 1-14
Desktop computers.

FIGURE 1-13
Smartphones. Most mobile devices today are based on the mobile phone.

FIGURE 1-18
Mainframe computers.

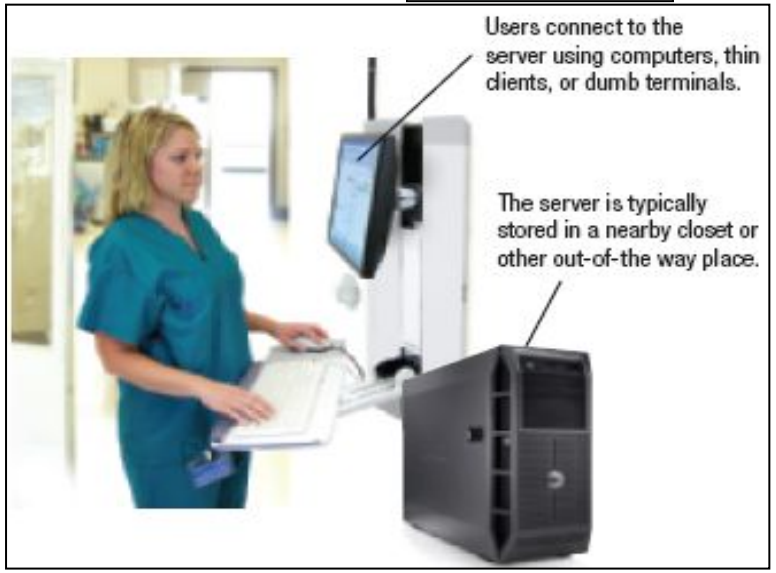


FIGURE 1-19
The Roadrunner supercomputer. Supercomputers are used for specialized situations in which immense processing speed is required.

Quick Quiz

1. A tablet PC is an example of a(n) _____.
   a. Desktop computer
   b. Portable PC
   c. Internet appliance
2. True or False: The terms mainframe computer and supercomputer are interchangeable; both refer to the largest, most powerful computers.
3. A smartphone is an example of a(n) _____.

Answers: 1) b; 2) False; 3) mobile device

Summary

- Computers in Your Life
- What Is a Computer and What Does It Do
- Computers to Fit Every Need

Introduction to Computer World
Fall 2021

Introduction to Information and Communication Technologies

CSD-102

Outline

- This lecture covers:
  - An overview Internet
  - Online Communication
  - Societal impacts of computers
  - An overview of the history of computers

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, Chrome, Safari, Firefox, Opera, etc.)
- A wide variety of information is available through the Web

What Are the Internet and the World Wide Web?

FIGURE 1-21
Some common Web activities.

Surfing the Web

- Web browser: Used to display Web pages
- Browser starting or home page: The first page displayed when the browser is opened
- To navigate to 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

Surfing the Web

- Uniform Resource Locators (URLs)
  - URL: Uniquely identifies a Web page
  - Consists of:
    - Protocol or standard being used
    - Identification of the Web server
    - Names of folders in which the Web page file is stored
    - Web page's filename
- Protocols:
  - Hypertext Transfer Protocol (http://) is typically used to display Web pages (https:// is used for secure Web pages)

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.

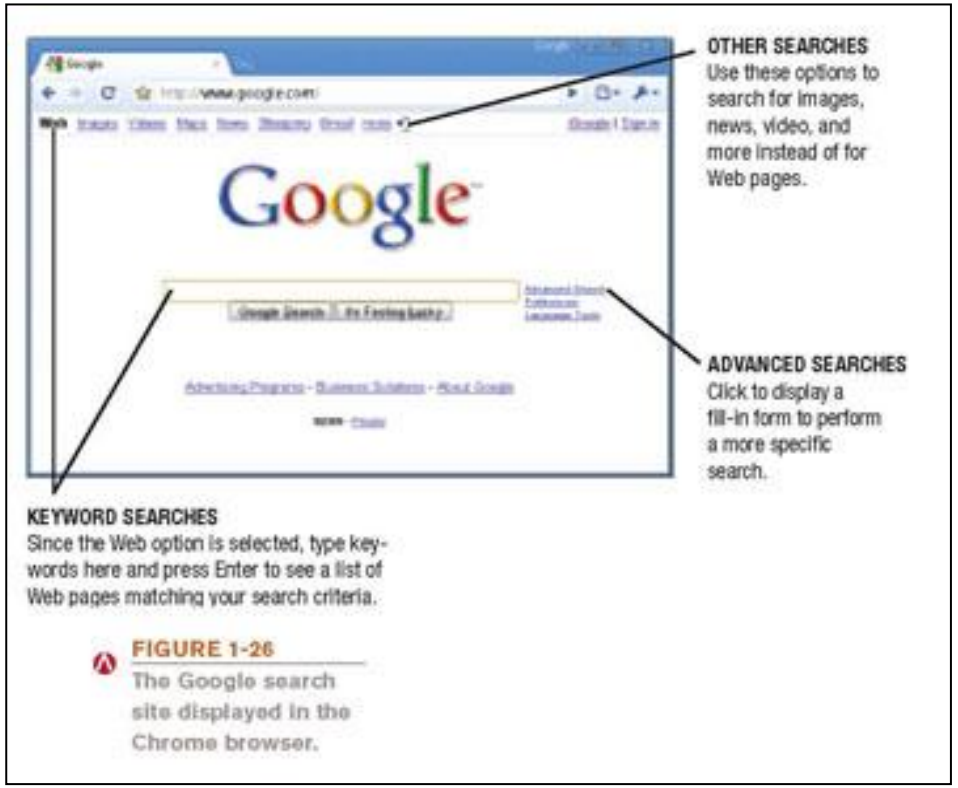
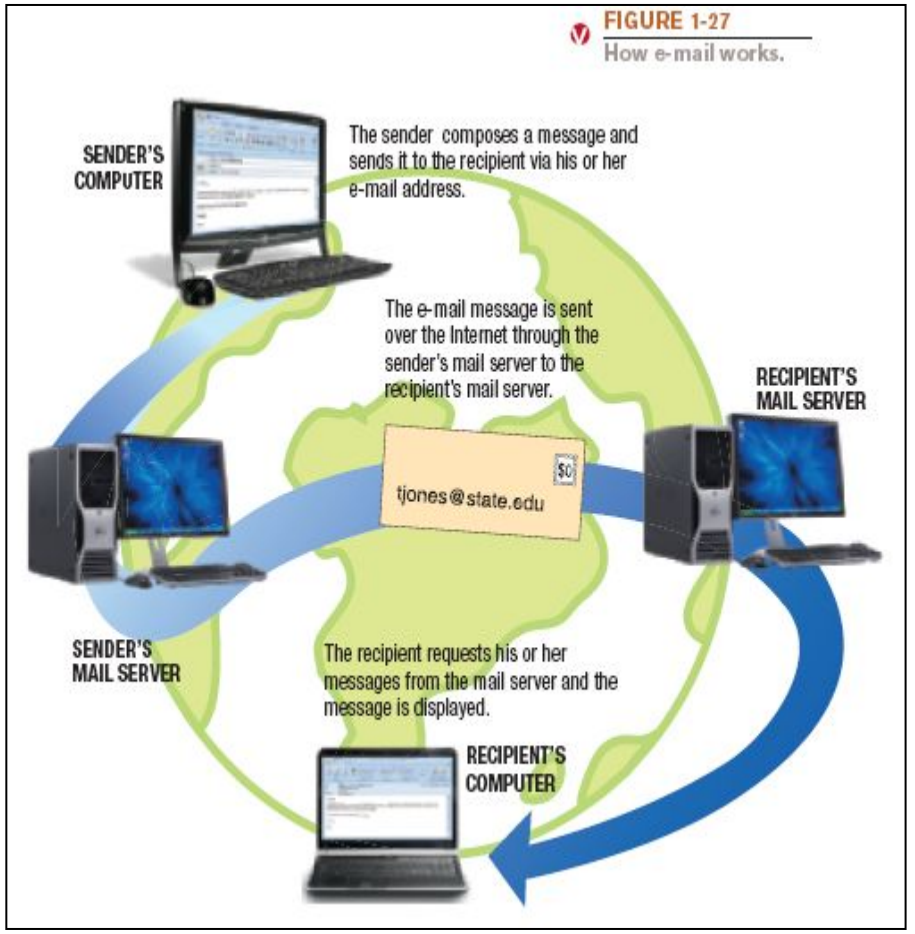


FIGURE 1-26
The Google search site displayed in the Chrome browser.

Email

- Electronic mail (e-mail): electronic messages exchanged between computers on a network
  - Can be conventional or Web-based
  - Can contain photos, attached files, etc.
- E-mail addresses consist of:
  - Username: A person's identifying name for a particular domain
  - The @ symbol
  - Domain name for the computer that will be handling the person's e-mail (mail server)
- Pronouncing Internet addresses



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
- Many benefits of a computer-oriented society:
  - Ability to design products before construction leads to safer products
  - Earlier medical diagnoses
  - Devices that allow challenged people to perform job tasks
  - Documents e-mailed or faxed in moments
  - Download information, music, programs, movies, and more on demand

Computer Oriented Society

- Benefits
  - Faster pace of daily chores and tasks
  - Online business and personal world
  - Communication throughout the world
  - Enhancing knowledge
  - Job influences
  - Entertainment
  - Research

Computer Oriented Society

- Risks and disadvantages
  - Security and privacy issues
    - Computer viruses and malware
    - Identity theft and phishing
    - Privacy issues
  - Excessive use
    - lack of human communication for face to face conversation and more communication through the computer. This affects our society's confidence for when they are in in-personal conversation.
  - Accessibility to abuse time

Computers and Society

- Differences in online communications
  - Less formal than traditional
  - Netiquette
  - Emoticons
- The anonymity factor
- Information Integrity
  - Check your source, not all information on the Internet is accurate.

Computers Then and Now

- First-generation computers (1946-1957)
  - Enormous and powered by vacuum tubes
  - Used a great deal of electricity, and generated a lot of heat
  - ENIAC and UNIVAC
- Second-generation computers (1958-1963)
  - Used transistors
  - Computers were smaller, more powerful, cheaper, more energy-efficient, and more reliable
  - Punch cards and magnetic tape were used to input and store data

Computers Then and Now

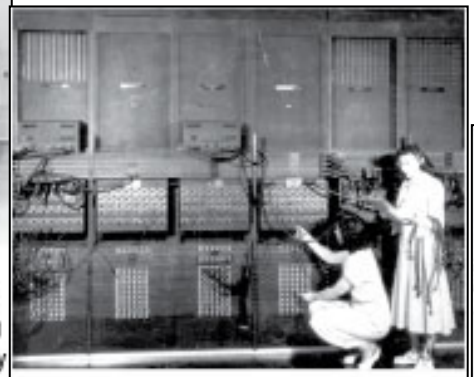
- Third-generation computers (1964-1970)
  - Used integrated circuits (ICs)
  - Keyboards and monitors introduced
- Fourth-generation computers (1971-present)
  - Use microprocessors
  - IBM PC, Apple Macintosh
  - Use keyboards, mice, monitors, and printers
  - Use magnetic disks, flash memory, and optical disks for storage
  - Computer networks, wireless technologies, Internet introduced

Computers Then and Now

- Fifth-generation (now and the future)
  - Infancy stage
  - No precise classification
  - May be based on artificial intelligence (AI)
  - Likely use voice and touch input
  - May be based on optical computers and utilize nanotechnology

Computers Then and Now

PRECOMPUTERS AND EARLY COMPUTERS
Dr. Herman Hollerith's Punch Card Tabulating Machine and Sorter is an example of an early computing device. It was used to process the 1890 U.S. Census data.



FIRST-GENERATION COMPUTERS
First-generation computers, such as ENIAC shown here, were large and bulky, used vacuum tubes, and had to be physically wired and reset to run programs.

SECOND-GENERATION COMPUTERS
Second-generation computers, such as the IBM 1401 mainframe shown here, used transistors instead of vacuum tubes so they were smaller, faster, and more reliable than first-generation computers.

THIRD-GENERATION COMPUTERS
Third-generation computers used integrated circuits which allowed the introduction of smaller computers, such as the IBM System/360 mainframe shown here.

FOURTH-GENERATION COMPUTERS
Fourth-generation computers, such as the original IBM PC shown here, are based on microprocessors. Most of today's computers fall into this category.

FIGURE 1-7
A brief look at computer generations.

HISTORY OF COMPUTING SOFTWARE

FIRST GENERATION (1951-1959)
- Machine language (1 &0)
- Assembly language

SECOND GENERATION (1959-1965)
- High level languages
- Fortran, COBOL, LISP

THIRD GENERATION (1965-1971)
- Operating systems
- System software
- Application package

FOURTH GENERATION (1971-1989)
- Structured programming (Pascal, C/C++)
- Application software
- Spreadsheets, word processors, DBMS

FIFTH GENERATION (1990-todate)
- Microsoft products
- AI applications
- Object oriented design
- World wide web
- HTML
- Cloud Computing

Quick Quiz

1. Index.html is an example of a(n) _____.
   a. URL
   b. IP address
   c. Web page filename
2. True or False: All information published to Web pages is accurate.
3. In the e-mail address jsmith@abc.com, abc.com is the _____.

Answers: 1) c; 2) False; 3) domain name

Summary

- Computer and the Internet
- Computers and Society
- Computer History