Identify Components of the Motherboard

• Chipset
  – Collection of chips that work together to provide the switching circuitry needed to move data throughout the computer
Identify Components of the Motherboard

• Peripheral component interconnect bus
  – PCI
  – A slower bus connecting devices to the faster microprocessor system bus
Identify Components of the Motherboard

- **Memory**
  - Refers to the chips located on the motherboard or within the CPU

- **Memory modules**
  - Memory cards
    - Small circuit boards holding several RAM chips
      - Dual inline memory modules (DIMM)
      - Single inline memory modules (SIMM)
Identify Components of the Motherboard

• Virtual memory
  – Used when RAM is full (On the Hard Disk)

• Cache memory
  – Small unit of ultrafast memory built into or near the processor storing frequently or recently accessed program instructions and data
Identify Components of the Motherboard

• Level 1 cache
  – Primary cache
  – Runs at approximately 10 nanoseconds

• Level 2 cache
  – Secondary cache
  – Up to 512 KB of ultrafast memory

• Level 3 cache
  – Found on newer microprocessors, located outside the processor on a separate chip
Identify Components of the Motherboard

**PROXIMITY OF CACHE TO CPU**

- CPU
- Level 1 cache
- Level 2 cache
- Level 3 cache
- Registers
- Motherboard
- RAM
Identify Components of the Motherboard

• **ROM**
  – Read-only memory
  – Nonvolatile memory in which essential startup instructions are prerecorded

• **Basic input/output system (BIOS)**
  – First code to run when system is powered on

• **Bootstrap Loader**
  – Program that locates the operating system on hard drive and loads it into RAM
Identify Components of the Motherboard

- **Complementary metal-oxide semiconductor**
  - CMOS (BIOS configuration and clock)
  - Volatile (Works on the battery)
  - Controls a variety of actions, including starting the power-on self-test

- **Power-on self-test (POST)**
  - A program activated by CMOS that checks the circuitry and RAM, marking defective locations
Identify Connectors Located Outside the System Unit

- **Connector**
  - Physical receptacle either on the system unit or extending from an expansion card

- **Port**
  - Electronic pathway or interface for getting information into and out of the computer
Identify Connectors Located Outside the System Unit

• USB
  – Universal serial bus
  – Provides a way to connect a variety of devices
  – Advantages
    • Hot swapping
      – Ability to connect devices without shutting off system
    • Plug-and-Play
      – Allows computer to automatically detect a device
Identify Connectors Located Outside the System Unit

- **ExpressCard**
  - Credit-card-sized device that fits into a designated slot to provide expanded capabilities, including wireless communication
- **Is a *Legacy technology***
  - Refers to technology, devices, or applications that are being phased out
Recognize Input Devices

- Advanced Keyboards include a number pad and special keys to facilitate Internet access and control media.
Recognize Input Devices

- Special keys on a PC keyboard

<table>
<thead>
<tr>
<th>Key Name</th>
<th>Typical Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alt</td>
<td>In combination with another key, enters a command.</td>
</tr>
<tr>
<td>Caps Lock</td>
<td>Toggles Caps Lock mode on or off.</td>
</tr>
<tr>
<td>Ctrl</td>
<td>In combination with another key, enters a command.</td>
</tr>
<tr>
<td>End</td>
<td>Moves the insertion point to the end of the current line.</td>
</tr>
<tr>
<td>F1</td>
<td>Displays the Help system for the application.</td>
</tr>
<tr>
<td>Home</td>
<td>Moves the insertion point to the beginning of the current line.</td>
</tr>
<tr>
<td>Insert</td>
<td>Toggles between Insert mode and Overwrite mode if these modes are available in the program you are using.</td>
</tr>
<tr>
<td>Print Screen</td>
<td>Captures the image on the screen and places it in memory. Also labeled as PrtScn, Prt Scr, or PrintScrn.</td>
</tr>
<tr>
<td>Windows key</td>
<td>Displays the Start menu in Microsoft Windows.</td>
</tr>
</tbody>
</table>
Recognize Input Devices

MOBILE DEVICES EQUIPPED WITH KEYBOARD OPTIONS

On screen keyboard with visual confirmation

Mini-keyboard

Keypad
Recognize Input Devices

Input system allowing customization of location and function of input keys
Virtual Laser Keyboard
Recognize Input Devices

• Pointing device
  – Input device to control the movements of the pointer
  – Most widely used device is a *mouse*
  – Air mouse
    • Motion-sensing device that recognized the typical forward, back, left, and right, motions made by the mouse
Recognize Input Devices

- Pointing devices

- Mouse
- Trackball
- Joystick
- Touchpad
- Touchscreen
- Stylus
Recognize Input Devices

• Optical mouse

- The wheel provides quick scrolling
- Finger buttons activate commands
- An optical sensor reads mouse movement
- Reprogrammable thumb buttons allow you to perform specific actions
Recognize Input Devices

• Stylus
  – Looks like an ordinary pen

• Touch screen
  – Display screen that is sensitive to touch of a finger or stylus

• Speech or voice recognition
  – Conversion of spoken words into computer text
Recognize Input Devices

• Scanner
  – Automated form of input that copies anything entered on a sheet of paper

• Bitmapped image
  – Representation of an image as a matrix of dots, called pixels

• Optical character recognition (OCR)
  – Software to convert scanned text into a text file instead of a bitmapped image
Recognize Input Devices

- Other input devices
  - Bar code reader
  - Optical mark reader (OMR)
  - RFID reader
Recognize Input Devices

- Other input devices
  - Magnetic ink character recognition (MICR)
  - Biometric input device
Recognize Input Devices

• Other input devices
  – magnetic stripe card reader
  – Digital camera
  – Digital video camera
  – Webcam
Describe Output Devices and How They Engage Your Senses

• Output devices
  – Enable people to see, hear, and even feel the results of processing operations

• Soft copy
  – Screen display, not a permanent record

• Hard copy
  – Printed output
Describe Output Devices and How They Engage Your Senses

- CRT (Cathode Ray Tube) Monitors

- LCD (Liquid crystal displays)
  - Back light
  - Layered of crystal solutions
Describe Output Devices and How They Engage Your Senses

• OLED (organic light emitting diode) displays
  – Better resolution
  – Thinner

• Flexible OLED displays (FOLED)
  – Paper thin
Describe Output Devices and How They Engage Your Senses

• Printers
  – Produce a hard copy of the output on the display screen
  • Inkjet printer
  • Laser printer
  • Thermal-transfer printer
  • Photo printer
  • Plotter
Describe Output Devices and How They Engage Your Senses

• Speakers
  – Transmit computer-generated sound, such as music

• Data projectors
  – Display computer’s video output on a screen for an audience to view

• Interactive white boards
  – Connect to a computer and allow video display to become touch sensitive
Evaluate Methods for Storing Data

• Storage
  – Refers to the ways your computer system can keep software and data for future use

• Storage devices
  – Hardware components that store data
Evaluate Methods for Storing Data

• Many types of recording media
Hard Disk

- **Access time**: The amount of time it takes a device from a request for information to the delivery of that information.

- **Seek time**: The time it takes the read/write head to locate the data before reading begins.

- **Transfer performance**: refers to how quickly the read/write head transfers data from the disk to random access memory.
Solid-state Storage Devices

- Solid state storage devices store computer data on non-volatile "flash" memory chips
- rather than by changing the surface properties of a magnetic or optical spinning disk.
- the future for almost all forms of computer storage (SSD)
Covered Objectives

• Recognize the Difference Between Human and Computer Representation of Input
• List the Elements of the System Unit
• Identify Components of the Motherboard
• Identify Connectors Located Outside the System Unit
Covered Objectives

• Recognize Input Devices
• Describe Output Devices and How They Engage Your Senses
• Evaluate Methods for Storing Data