CSC101 – Introduction to ICT Lecture 02 Input/Output

PETER NORTON'S®

Introduction to Computers

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- Web integrated activities
- Self-assessments to reinforce main concepts
- Online Resource: www.mhhe.com/peternorton

McGraw-Hill Technology Education

Chapter 3A

Input Devices

The Keyboard

- The most common input device
  - Must be proficient with keyboard
  - Skill is called keyboarding

The Keyboard

- How keyboard works
  - Keyboard controller detects a key press
  - Controller sends a code to the CPU
    - Code represents the key pressed
  - Controller notifies the operating system
  - Operating system responds
  - Controller repeats the letter if held

The Mouse

- All modern computers have a variant
  - Allows users to select objects
    - Pointer moved by the mouse

- Mechanical mouse
  - Rubber ball determines direction and speed
  - The ball often requires cleaning

- Optical mouse
  - Light shown onto mouse pad
  - Reflection determines speed and direction
  - Requires little maintenance

The Mouse

- Interacting with a mouse
  - Actions involve pointing to an object
  - Clicking selects the object
  - Clicking and holding drags the object
  - Releasing an object is a drop
  - Right clicking activates the shortcut menu
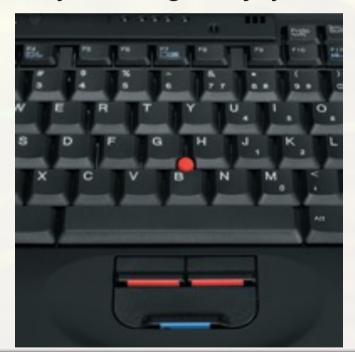 - Modern mice include a scroll wheel

Variants of the Mouse

- Track pads
  - Stationary pointing device
  - Small plastic rectangle
  - Finger moves across the pad
  - Pointer moves with the pointer
  - Popular on laptops

Variants of the Mouse

- Track point
  - Little joystick on the keyboard
  - Move pointer by moving the joystick

Devices for the Hand

- Pen based input
  - Tablet PCs, PDA
  - Pen used to write data
  - Pen used as a pointer
  - Handwriting recognition
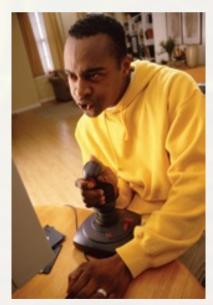 - On screen keyboard

Devices for the hand

- Touch screens
  - Sensors determine where finger points
  - Sensors create an X,Y coordinate
  - Usually presents a menu to users

Devices for the hand

- Game controllers
  - Enhances gaming experience
  - Provide custom input to the game
  - Modern controllers offer feedback
  - Joystick
  - Game pad

Optical Input Devices

- Allows the computer to see input
- Bar code readers
  - Converts bar codes to numbers
    - Universal Product Code (UPC) code
  - Computer find number in a database
  - Works by reflecting light
    - Amount of reflected light indicates number

Optical Input Devices

- Image scanners
  - Converts printed media into electronic
  - Reflects light of the image
  - Sensors read the intensity
  - Filters determine color depths

Optical input devices

- Optical character recognition (OCR)
  - Converts scanned text into editable text
  - Each letter is scanned
  - Letters are compared to known letters
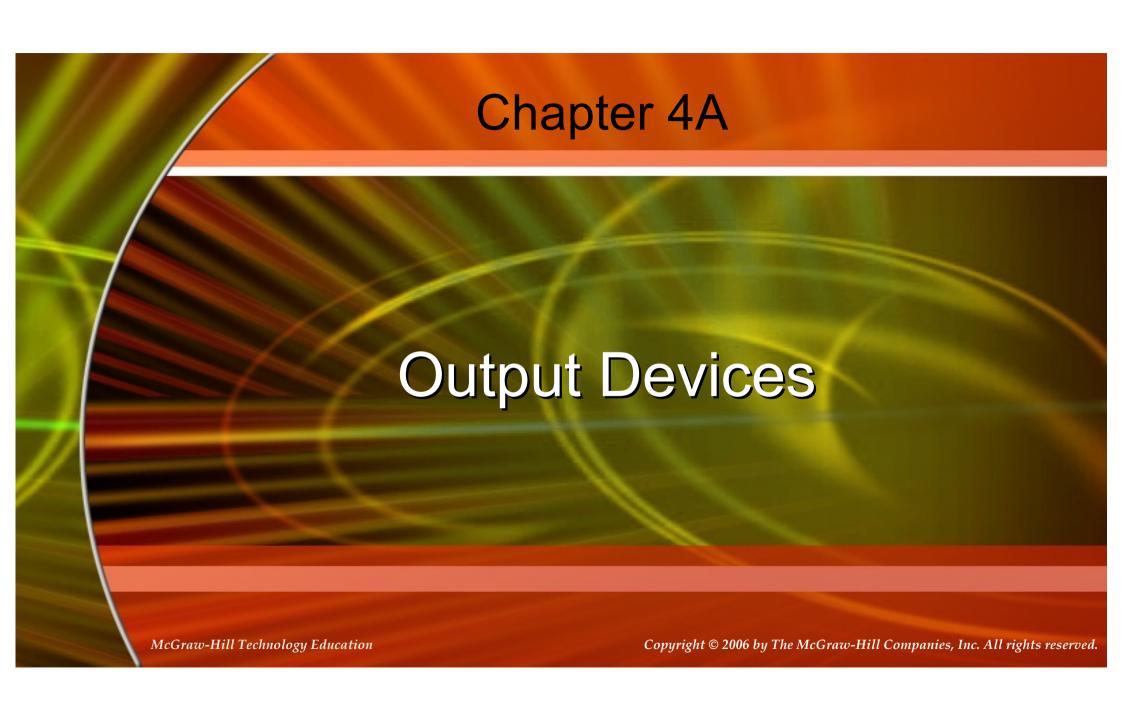 - Best match is entered into document
  - Rarely 100% accurate

Audiovisual Input Devices

- Microphones
  - Used to record speech
  - Speech recognition
    - "Understands" human speech
    - Allows dictation or control of computer
    - Matches spoken sound to known phonemes
    - Enters best match into document

Audiovisual Input Devices

- Digital cameras
  - Captures images electronically
  - No film is needed
  - Image is stored as a JPG file
  - Memory cards store the images
  - Used in a variety of professions

Chapter 4A

Output Devices

Monitors

- Most common output device
- Connects to the video card
- Categorized by color output
  - Monochrome
    - One color with black background
  - Grayscale
    - Varying degrees of gray
  - Color
    - Display 4 to 16 million colors

Monitors and Video Cards

- Monitors impacts user effectiveness
- Monitors should have
  - Crisp text
  - Clear graphics
  - Adjustable controls
  - Clear edges

Monitors and Video Cards

- Resolution
  - Number of pixels on the screen
  - Higher number creates sharper images
- Refresh rate
  - Number of time the screen is redrawn
  - Modern equipment sets this automatically
- Dot pitch
  - Distance between the same color dots
  - Smaller creates a finer picture

Video Cards

- Device between the CPU and monitor
- Better cards result in better output
- Removes burden of drawing from CPU
- Have their own processor and RAM
- Modern cards have up to 512 MB RAM
- Capable of rendering 3D images

Data Projectors

- Replaced overhead and slide projectors
- Project image onto wall or screen
- LCD projectors
  - Most common type of projector
  - Small LCD screen
  - Require a darkened room
- Digital Light Projectors
  - A series of mirrors control the display
  - May be used in a lighted room

Sound Systems

- Integral part of the computer experience
- Capable of recording and playback
- Sound card
  - Device between the CPU and speakers
  - Converts digital sounds to analog
  - Can be connected to several devices
  - Modern cards support Dolby Surround Sound

Sound Systems

- Headphones and headsets
  - Replacement for speakers and microphones
  - Offer privacy
  - Does not annoy other people
  - Outside noise is not a factor
  - Headsets have speakers and a microphone

Commonly Used Printers

- Impact printers
  - Generate output by striking the paper
  - Uses an inked ribbon
- Non-impact printers
  - Use methods other than force
  - Tend to be quiet and fast

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Commonly Used Printers

- Dot matrix printers
  - Impact printer
  - Used to print to multi-sheet pages
  - Print head strikes inked ribbon
  - Line printers
  - Band printers
  - Speed measured in characters per second

Commonly Used Printers

- Ink-jet printers
  - Non-impact printer
  - Inexpensive home printer
  - Color output common using CMYK
    - Cyan, magenta, yellow, black
  - Sprays ink onto paper
  - Speed measured in pages per minute
  - Quality expressed as dots per inch

Commonly Used Printers

- Laser printer
  - Non-impact printer
  - Produces high quality documents
  - Color or black and white
  - Print process
    - Laser draws text on page
    - Toner sticks to text
    - Toner melted to page
  - Speed measured in pages per minute
  - Quality expressed as dots per inch

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Commonly Used Printers

- All-in-one peripherals
    - Scanner, copier, printer and fax
    - Popular in home offices
    - Prices are very reasonable

High-Quality Printers

- Special purpose printers
  - Used by a print shop
  - Output is professional grade
  - Prints to a variety of surfaces

High-Quality Printers

- Photo printers
  - Produces film quality pictures
  - Prints very slow
  - Prints a variety of sizes

High-Quality Printers

- Thermal wax printers
    - Produces bold color output
    - Color generated by melting wax
    - Colors do not bleed
    - Operation costs are low
    - Output is slow

High-Quality Printers

- Dye sublimation printers
  - Produces realistic output
  - Very high quality
  - Color is produced by evaporating ink
  - Operation costs are high
  - Output is very slow

High-Quality Printers

- Plotters
  - Large high quality blueprints
  - Older models draw with pens
  - Operational costs are low
  - Output is very slow