BA(prog)III yr 18/04/2020

Flash Memory or Thumb Drives

- These flash memory data storage devices are about the size of a thin cigarette lighter and can be integrated with USB or FireWire interfaces to store from eight megabytes to several GB of data.
- They are available in every color of the rainbow, are extremely portable, and, because they have fewer moving parts, are more reliable than disk drives.
- Consisting of a small printed circuit board encased in a sturdy metal or plastic casing with a USB connector covered with a cap, the flash drive is trendy as a status symbol, and convenient to use.
- This same solid-state storage is used in digital cameras, cell phones, and audio recording devices, and for solid state hard drives (no spinning platters or moving parts) that are found in some netbooks and other handheld devices.

CD-ROM Discs Compact disc read-only memory (CD-ROM)

- They have become an integral part of the multimedia development workstation and are an important delivery vehicle for mass-produced projects.
- A wide variety of developer utilities, graphic backgrounds, stock photography and sounds, applications, games, reference texts, and educational software are available on this medium.
- CD-ROM players have typically been very slow to access and transmit data (150 KBps, which is the speed required of consumer Audio CDs), but developments have led to double-, triple-, quadruplespeed, 24x, 48x, and 56x drives designed specifically for computer (not Red Book Audio) use.
- These faster drives spool and can be somewhat noisy, especially if the inserted compact disc is not evenly balanced.
- With a compact disc recorder, you can make your own CDs, using CD-recordable (CD-R) blank discs to create a CD in most formats of CD-ROM and CD-Audio .
- Software, such as Roxio's Toast and Easy CD Creator, lets you organize files on your hard disk(s) into a "virtual" structure, and then writes them to the CD in that order.

- CD-R discs are manufactured differently than normal CDs but can play in any CD-Audio or CD-ROM player. These write once, enhanced CDs make excellent high-capacity file archives and are used extensively by multimedia developers for pre-mastering and testing CD-ROM projects and titles.
- Because they have become very inexpensive, they are also used for short-run distribution of finished multimedia projects and data backup. A CD-RW (read and write) recorder can rewrite 700MB of data to a CD-RW disc about 1,000 times.

Digital Versatile Discs (DVD)

- In December 1995, nine major electronics companies (Toshiba, Matsushita, Sony, Philips, Time Warner, Pioneer, JVC, Hitachi, and Mitsubishi Electric) agreed to promote a new optical disc technology for distribution of multimedia and feature-length movies called **Digital Versatile Disc (DVD)**

DVD Feature	DVD Specification	Blu-ray Specification
Disc diameter	120 mm (5 inches)	120 mm (5 inches)
Disc thickness	1.2 mm (0.6 mm thick disc × 2)	1.2 mm (0.6 mm thick disc × 2)
Memory capacity	4.7 gigabytes/single side	25 gigabytes/single layer
Wave length of laser diode	650 nanometer/635 nanometer (red)	405 nanometer (blue-violet)
Data transfer rate 1x	Variable speed data transfer at an average rate of 4.69 Mbps for image and sound	Variable speed data transfer at an average rate of 36 Mbps for image and sound
Image compression	MPEG2 digital image compression	MPEG-2 Part 2, H.264/MPEG-4 AVC, and SMPTE VC-1
Audio	Dolby AC-3 (5.1 ch), LPCM for NTSC and MPEG Audio, LPCM for PAL/SECAM (a maximum of 8 audio channels and 32 subtitle channels can be stored)	Dolby Digital (AC-3), DTS, and linear PCM
Running time (movies)	Single Layer (4.7GB): 133 minutes a side (at an average data rate of 4.69 Mbps for image and sound, including three audio channels and four subtitle channels)	Single Layer (25GB): Encoded using MPEG-2 video, about two hours of HD content; using VC-1 or MPEG-4 AVC codecs, about 4 hours of HD quality video and audio

Table 7-3 DVD and Blu-ray Specifications

- With a DVD capable not only of gigabyte storage capacity but also full-motion video (MPEG2) and high-quality audio in surround sound, this is an excellent medium for delivery of multimedia projects.
- Commercial multimedia projects will become more expensive to produce as consumers' performance expectations rise.
- There are three types of DVD, including DVD-**Read Write**, **DVD-Video**, and **DVD-ROM**. These types reflect marketing channels, not the technology.

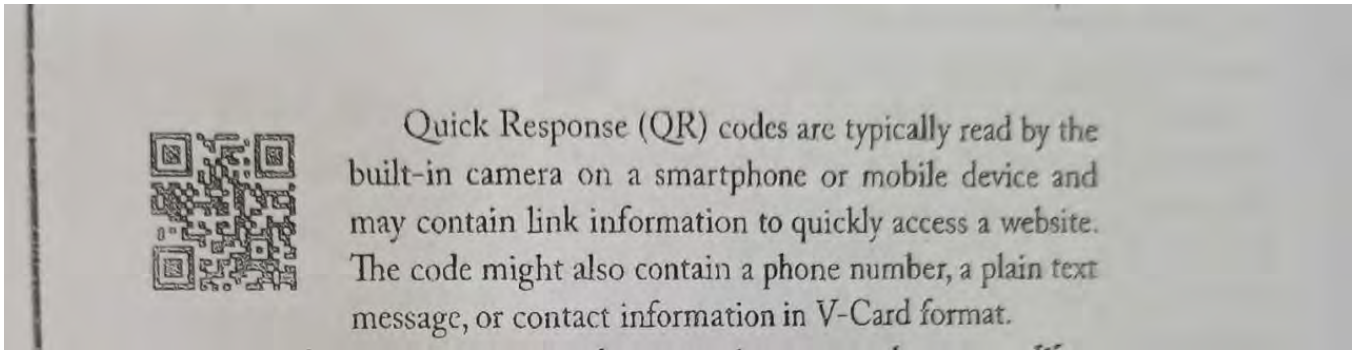
Blu-ray Discs

- Driven by the implementation of **High Definition TV (HDTV)** and by the motion picture industry, a new technology was needed to increase storage capacity and throughput beyond DVD. Two competing and incompatible solutions were promoted and a war was fought in the marketplace between HD-DVD, backed by Toshiba, and **Blu-ray**, backed by Sony.
- By 2008, Toshiba had sold about one million HD-DVD players, but Sony had sold close to ten million Blu-ray players, which were also included in popular PlayStation game machines.
- Toshiba announced it was quitting. Blu-ray is promoted not only for high definition television recording and high definition video distribution, but also for high definition camcorder archiving, mass data storage, and digital asset management and professional storage when used as a recording medium in BD-R format.

Input Devices

- A great variety of input devices—from the familiar keyboard and handy mouse to touchscreens and voice recognition setups—can be used for the development and delivery of a multimedia project.
- If you are designing your project for a public kiosk, use a touchscreen.
- If your project is for a lecturing professor who likes to wander about the classroom, use a remote handheld mouse.
- If you create a great deal of original computer-rendered art, consider a pressure-sensitive stylus and a drawing tablet.
- Scanners enable you to use **optical character recognition (OCR)** software, such as OmniPage from ScanSoft, a division of Nuance Communications , or Recore from Maxsoft-Ocron.
- With OCR software and a scanner, you can convert paper documents into a word processing document on your computer without retyping or rekeying.
- Barcode readers are probably the most familiar optical character recognition devices in use today—mostly at markets, shops, and other pointof- purchase locations.
- Using photo cells and laser beams, barcode readers recognize the numeric characters of the **Universal Product Code** (UPC) that are printed in a pattern of parallel black bars on merchandise labels.

- With OCR, or **barcoding**, retailers can efficiently process goods in and out of their stores and maintain better inventory control.
- An OCR terminal can be of use to a multimedia developer because it recognizes not only printed characters but also handwriting. This facility may be beneficial at a kiosk or in a general education environment where user friendliness is a goal, because there is growing demand for a more personal and less technical interface to data and information.

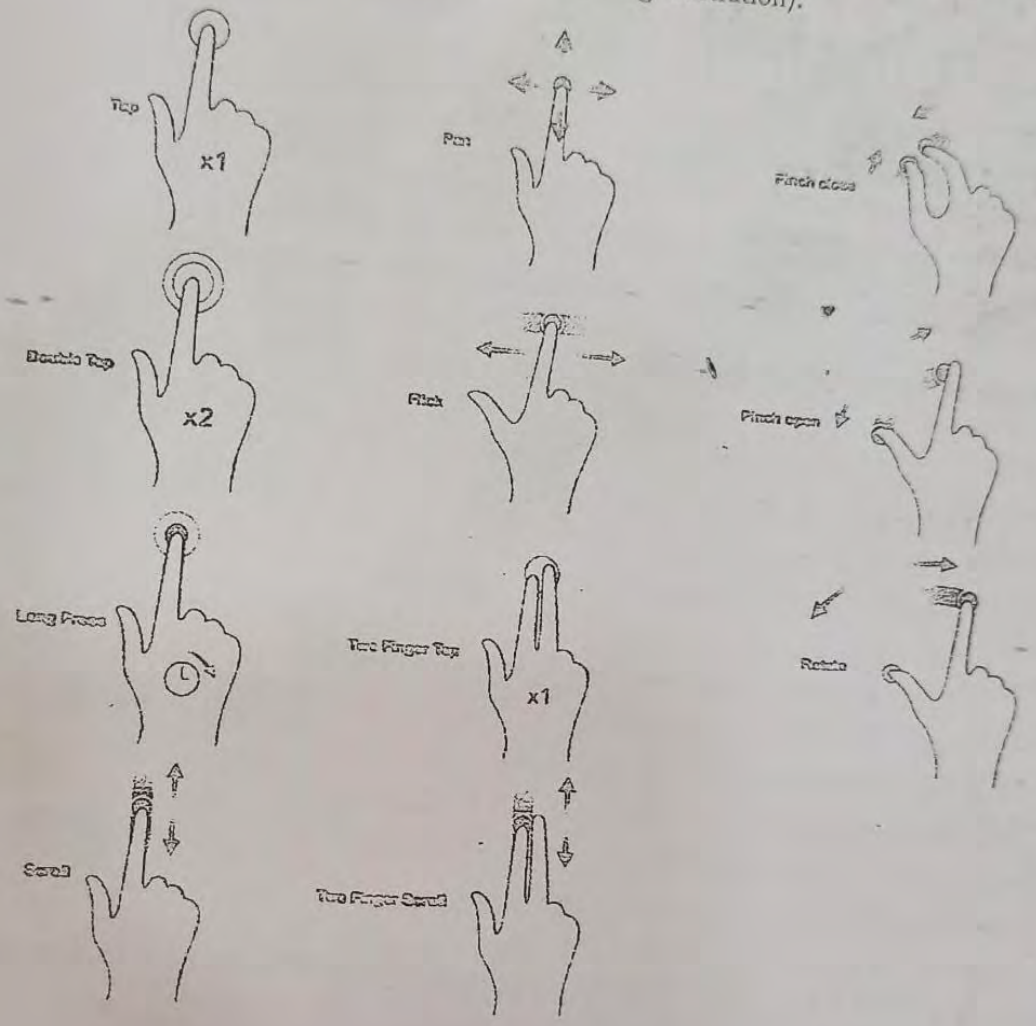


- For hands-free interaction with your project, try **voice recognition systems**. These behavioral biometric systems usually provide a unidirectional cardioid, noise-canceling microphone that automatically filters out background noise and learns to recognize voiceprints.
- Most voice recognition systems currently available can trigger common menu events such as Save, Open, Quit, and Print, and you can teach the system to recognize other commands that are more specific to your application.
- Systems available for the Macintosh and Windows environments typically must be taught to recognize individual voices and then be programmed with the appropriate responses to the recognized word or phrase.
- Dragon's Naturally Speaking takes dictation, translates text to speech, and does command-toclick, a serious aid for people unable to use their hands.
- The quality of your audio recordings is greatly affected by the caliber of your microphone and cables.

- A unidirectional microphone helps filter out external noise, and good cables help reduce noise emitted from surrounding electronic equipment.
- Digital cameras use the same CCD technology as video cameras.
- They capture still images of a given number of pixels (resolution), and the images are stored in the camera's memory to be uploaded later to a computer.
- The resolution of a digital camera is determined by the number of pixels on the CCD chip, and the higher the megapixel rating, the higher the resolution of the camera.
- Images are uploaded from the camera's memory using a serial, parallel, or USB cable, or, alternatively, the camera's memory card is inserted into a PCMCIA reader connected to the computer.
- Digital cameras are small enough to fit in a cell phone, and in a more complicated manner they can be used in a television studio or spy camera on an orbiting spacecraft.

phone and, in a more complicated manner, they can be used in a television studio or spy camera on an orbiting spacecraft.

With the advent of mobile devices, smartphones, and tablets came operating systems that use a trackpad or touch screen for input using multi-touch gestures (see the following illustration).



Output Devices

- Presentation of the audio and visual components of your multimedia project requires hardware that may or may not be included with the computer itself, such as speakers, amplifiers, projectors, and motion video devices.
- The better the equipment is, of course, the better the presentation.
- There is no greater test of the benefits of good output hardware than to feed the audio output of your computer into an external amplifier system: suddenly the bass sounds become deeper and richer, and even music sampled at low quality may sound acceptable.
- Design your project to use many shorter-duration audio files rather
- than one long file. This simplifies the redaction of your project within your authoring system, and it may also improve performance because you will load shorter segments of sound into RAM at any one time.
- Often the speakers you use during a project's development will not be adequate for its presentation.
- Speakers with built-in amplifiers or attached to an external amplifier are important when your project will be presented to a large audience or in a noisy setting. warning
- Always use magnetically shielded speakers to prevent color distortion or damage to nearby CRT monitors.
- The monitor you need for development of multimedia projects depends on the type of multimedia application you are creating, as well as what computer you're using.
- A wide variety of monitors is available for both Macintoshes and PCs. High-end, large-screen graphics monitors and LCD panels are available for both, and they are expensive.
- Serious multimedia developers will often attach more than one monitor to their computers because they can work with several open windows at a time.
  For example, you can dedicate one monitor to viewing the work you are creating or designing, and you can perform various editing tasks in windows on other monitors that do not block the view of your work.

- When you need to show your material to more viewers than can huddle around a computer monitor, you will need to project it onto a large screen or even a white-painted wall. **Cathode-ray tube (CRT)** projectors, liquid crystal display (LCD) panels, Digital Light Processing (DLP) projectors, and liquid crystal on silicon (LCOS) projectors, as well as (for larger projects) Grating-Light-Valve (GLV) technologies, are available.
- CRT projectors have been around for quite a while—they are the original "big-screen" televisions and use three separate projection tubes and lenses (red, green, and blue).
- The three color channels of light must "converge" accurately on the screen. Setup, focusing, and alignment are important for getting a clear and crisp picture.
- CRT projectors are compatible with the output of most computers as well as televisions. Graphic print designers often use special color-correction hardware to ensure that what they see on screen matches precisely what will be printed.
- Multimedia does not usually require the same level of precision—mostly because the multimedia will likely be presented on any number of monitors with widely varying color settings.
- Hard-copy printed output has also entered the multimedia scene.
- From storyboards to presentations to production of collateral marketing material, printouts are an important part of the multimedia development environment.
- Color helps clarify concepts, improve understanding and retention of information, and organize complex data.
- As multimedia designers already know, intelligent use of color is critical to the success of a project.

For any doubt contact 9873961590