Computer Applications
Fall 2009

Dr. Marenglen Biba

Computer Applications
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- **Course : Computer Applications (3 credit hours)**
- **Instructor : Dr. Marenglen Biba**
- **Office : Faculty building 1st floor**
- **Office Hours : Wednesday 15-17 or by appointment**
- **Phone : 42273056 or ext. 112**
- **E-mail : marenglenbiba@unyt.edu.al**
- **Course page : http://www.marenglenbiba.net/compapp/**

Location, time and description

- **Course Location and Time**
  - Laboratory Room 2B, Friday 13-16.
- **Catalogue Description**
  - This course provides a basic understanding of the technical and management aspects of the basic Computer’s hardware and software with an emphasis on Microsoft Office 2003.

Computer Applications

- **Course Objectives**
  - The objective of this course is to provide a basic understanding and usage of common computer applications.
  - You will learn basic concepts about computer's hardware and software. Course material on document processing will be presented using Microsoft Office 2003.
  - You will also be introduced to more advanced document processing techniques such as Latex.
  - The course will offer basic understanding and use of computer-based communication means.
- **At the end of the course students will be able to:**
  - Understand basic concepts of computer's hardware and software
  - Understand and use Microsoft Office (Word, Excel, Access, Powerpoint)
  - Understand and use basic features of Latex
  - Understand and use electronic mail applications
  - Understand and use internet-based applications

Computer Applications

- **Course Prerequisites**
  - None.
- **Required Readings**
  - Microsoft Office 2003: Introductory Concepts and Techniques by Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat.

Contents

- Introduction to Computers
  - Basic parts of computer hardware
  - Types of input/output devices
- Operating Systems
  - Windows Operating Systems
  - Linux Operating Systems
  - Introduction to Microsoft Office
  - Introduction to Open Office
- Document processing
  - Introduction to Microsoft Word
  - Basic word processing
  - Basic editing and formatting
  - Advanced editing and formatting
  - Advanced word processing
  - Advanced tools

Contents

- Data processing
  - Introduction to Microsoft Excel
  - Spreadsheet basics
  - Formatting spreadsheets
  - Advanced spreadsheet commands
  - Charts
- Data organization and processing
  - Introduction to Microsoft Access
  - Database basics
  - Creating a report using a wizard
  - Creating a form using a wizard
  - Creating queries
- Presentation development
  - Introduction to Microsoft PowerPoint
  - Creating a presentation
  - View buttons
  - Format
  - Slide Show

Contents

- Complex document processing
  - Introduction to Latex
  - Creating a simple document in Latex
  - Writing mathematical formulas in Latex
  - Writing complex documents in Latex
- Computer and Communication
  - Electronic mail
  - Internet
  - World Wide Web
  - Web Applications
  - Searching over Internet.

Requirements and participation

- **Course Requirements**
  - Students are required to attend lectures and labs. Lecture handouts and lab notes will be available before commencement of the class.
  - Students are expected to participate in class discussions**.** In the event of illness or emergency, contact your instructor IN ADVANCE to determine whether special arrangements are possible.

- **Participation:**
  - Participation extends beyond mere attendance. You may miss up to two classes without penalty. Each absence beyond the first two will cost you points off of your participation grade.
  - The only exceptions to this rule are severe illness (doctor's note required) and UNYT approved trips/activities.
  - Appropriate documentation for absences beyond the first two is necessary and is to be provided on the class day directly before or after the one you miss.
  - Students are expected to collect materials from the online course page, their classmates or see the instructor during consultation hours.

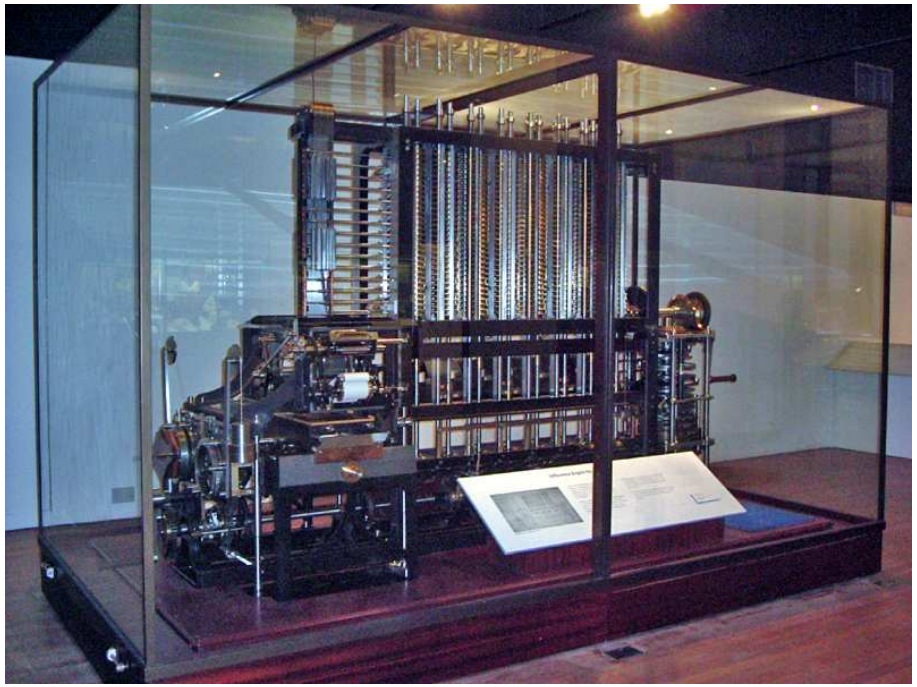
Lesson 1

Introduction to Computers

History of Computers - 1822

The **Difference Engine** was an automatic, mechanical calculator designed to tabulate polynomial functions.
Both logarithmic and trigonometric functions can be approximated by polynomials, so a difference engine can compute many useful sets of numbers.

In 1822, Charles Babbage proposed the use of such a machine in a paper to the Royal Astronomical Society on 14 June entitled "Note on the application of machinery to the computation of astronomical and mathematical tables".



Science Museum London, 1992.

The **analytical engine**, an important step in the history of computers, was the design of a mechanical general-purpose computer by the British mathematician Charles Babbage. It was first described in 1837, but Babbage continued to work on the design until his death in 1871. Because of financial, political, and legal issues, the engine was never built. In its logical design the machine was essentially modern, anticipating the first completed general-purpose computers by about 100 years.

Ada Lovelace
(the first programmer ever)

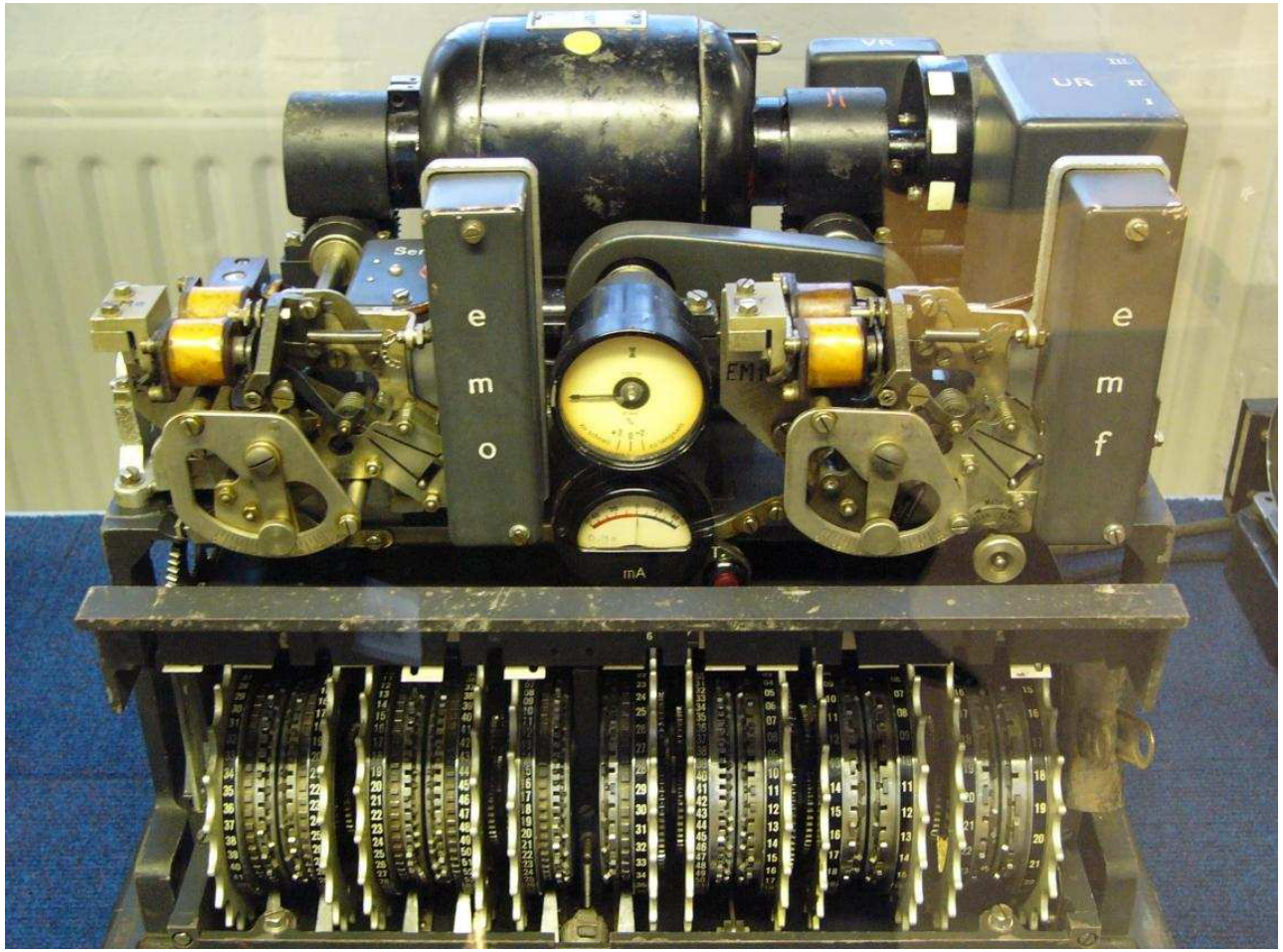
Lord Byron’s daughter

She is mainly known for having written a description of Charles Babbage's early mechanical general-purpose computer, the analytical engine. She is today appreciated as the "first programmer" since she was writing programs—that is, encoding an algorithm in a form to be processed by a machine—for a machine that Babbage had not yet built. She also foresaw the capability of computers to go beyond mere calculating or number-crunching while others, including Babbage himself, focused only on these capabilities.

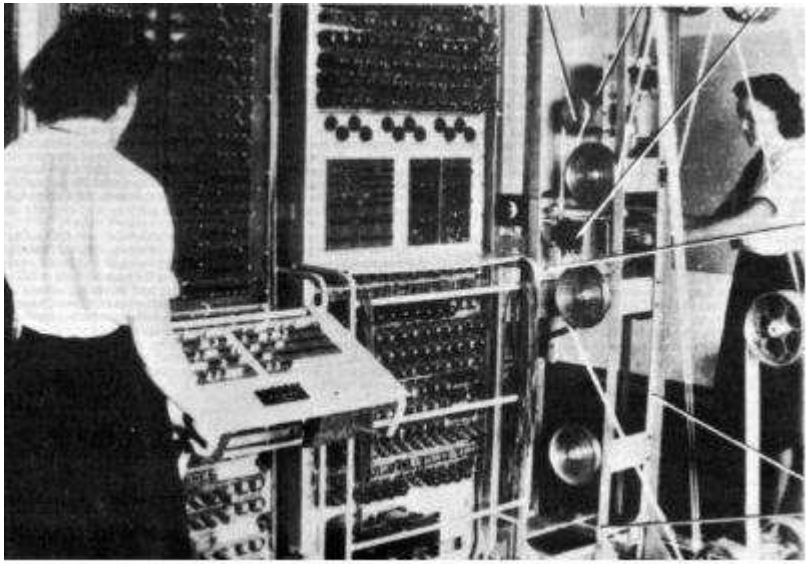
Enigma

An **Enigma machine** is any of a family of related electro-mechanical rotor machines used for the encryption and decryption of secret messages. The first Enigma was invented by German engineer Arthur Scherbius at the end of World War I.

Lorenz cipher

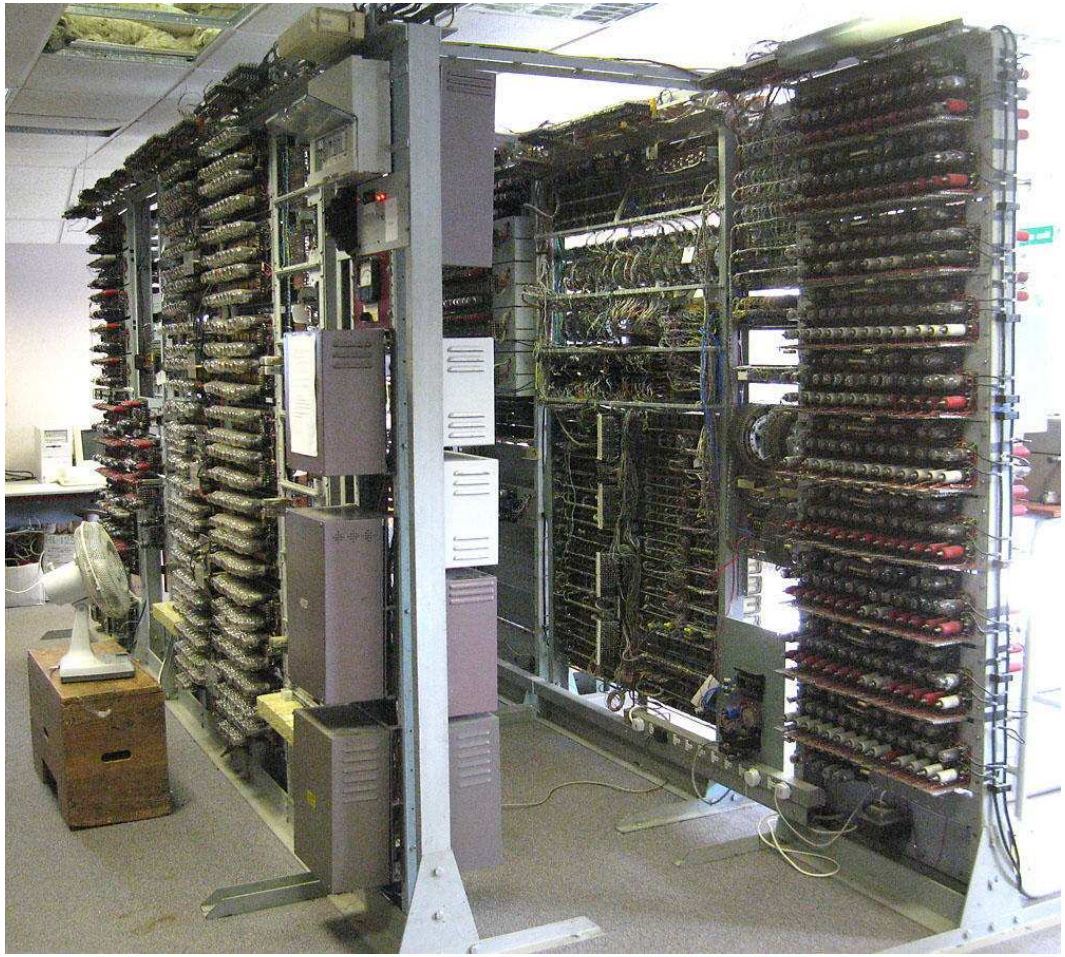


Colossus

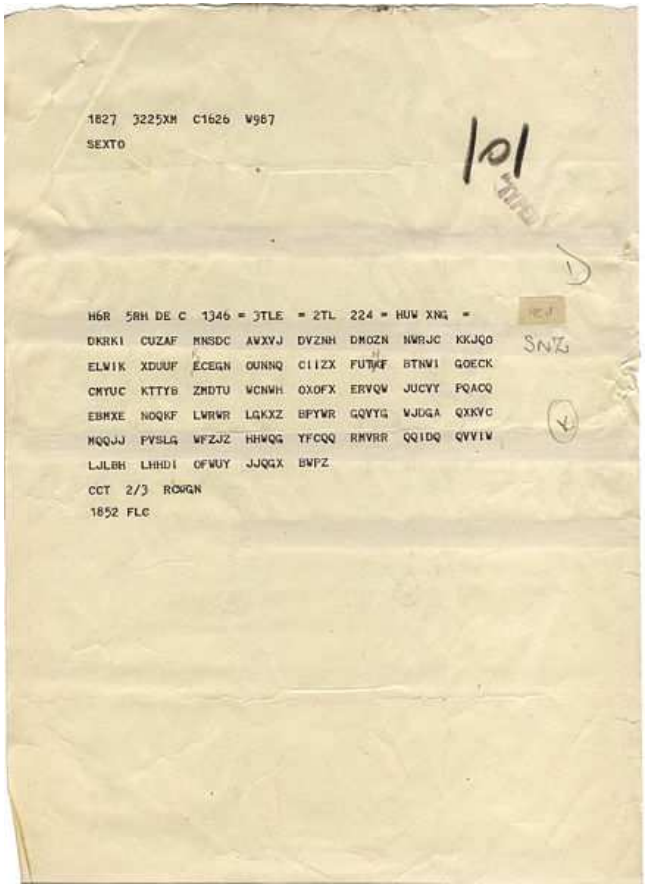


COLOSSUS - Top-secret vacuum tube computer designed to break the Lorenz SZ40 (a relative of the Enigma) intercepted cyphers. This was a single purpose computer programmed cables and plugboards. Bletchley Park, Britain (1943)

Colossus rebuilt



Deciphering documents: WWII

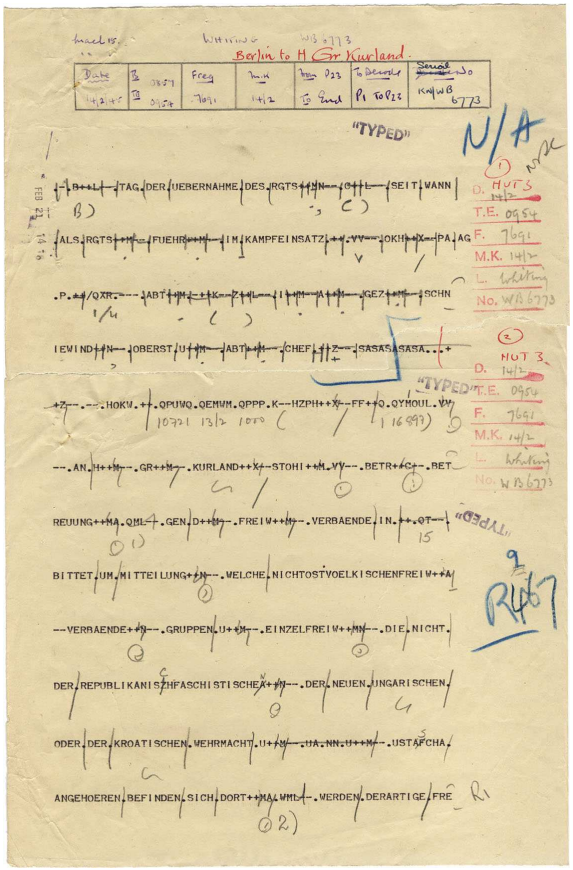


1827 3225XM C1626 W967
SEXTO

101

H6R 5RH DE C 1346 = 3TLE = 2TL 224 = HUW XNG =
DKRKI CUZAF MNSDC AWXVJ DVZNH DMOZN NWRJC KKJQO
ELWIK XDUUF ECEGN OUNNQ CIIZX FUTKF BTNWI GOECK
CMYUC KTTYB ZMDTU WCNWH OXOFX ERVQW JUCVY FQACQ
EBMXE NOQKF LWRWR LQKXZ BPYWR GQVYG WJDGA QXXVC
MQQJJ PVSLG WFZJZ HHWQG YFCQQ RMVRR QQIDQ QVVIW
LJLBH LHHDI OFWUY JJQGX BWPZ
CCT 2/3 ROWGN
1852 FLC

Coded document



Berlin to H Gr Kurland

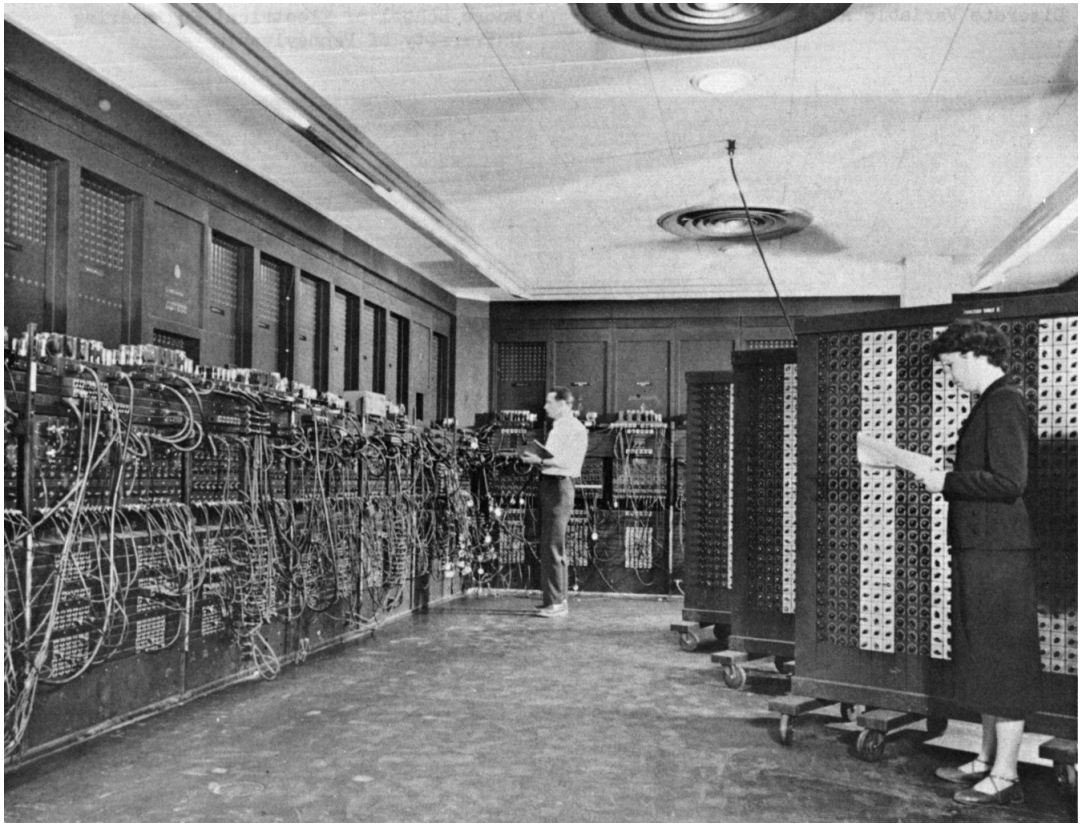
"TYPED"

N/A

Deciphered document

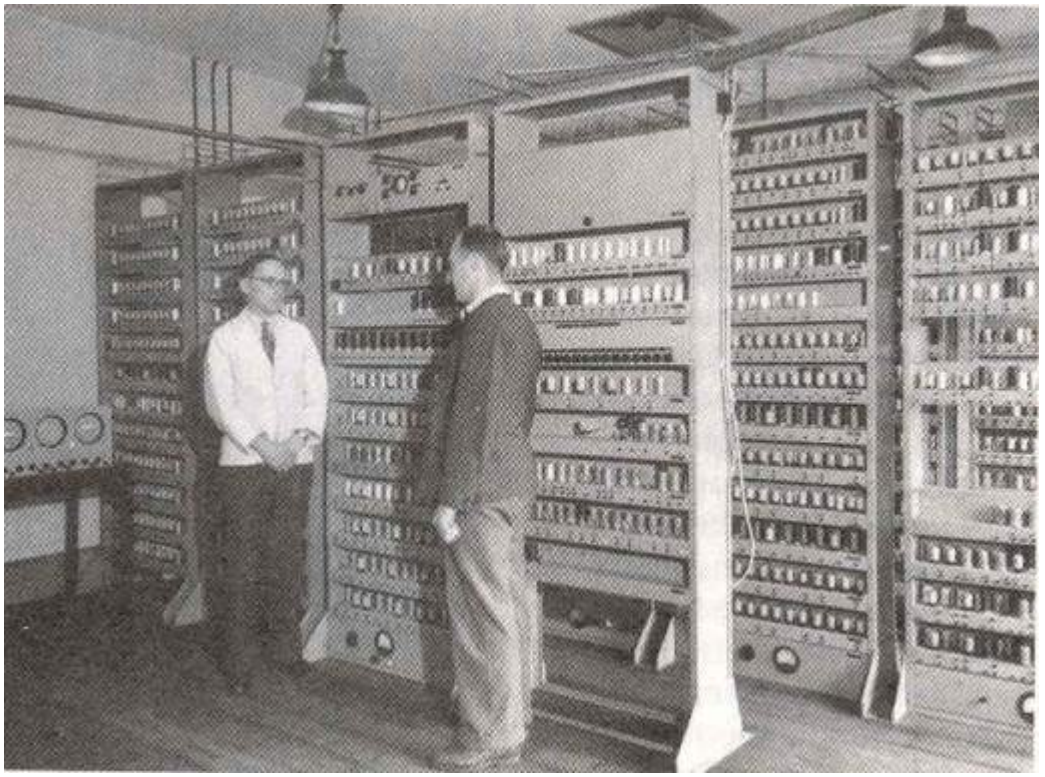
F.W. Winterbotham, in *The Ultra Secret* (1974), quotes the western Supreme Allied Commander, Dwight D. Eisenhower, as at war's end describing Ultra as having been "decisive" to Allied victory in World War II.

ENIAC



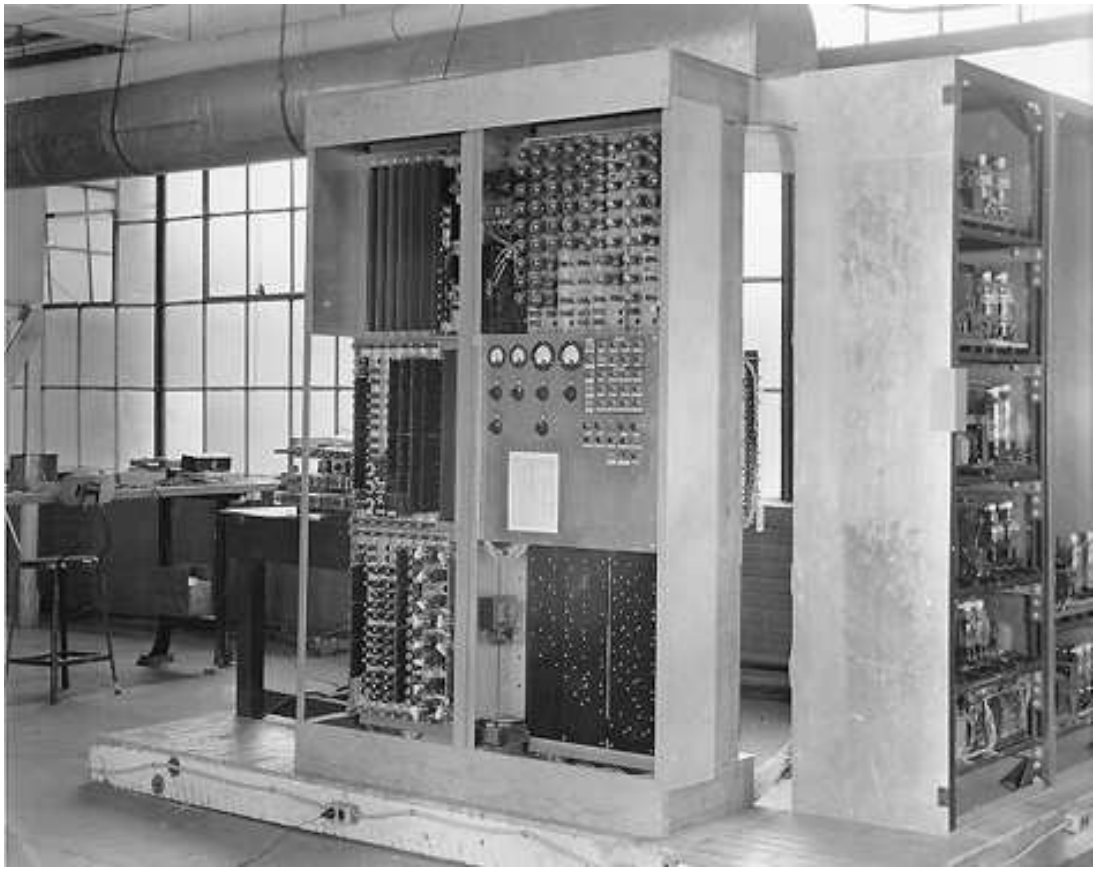
ENIAC - Electronic Numerical Integrator and Calculator –
John Mauchley and J Presper Eckert - Programmed
via switches and jumper cables and utilized 20 10-digit decimal registers –
University of Pennsylvania (1946)

EDSAC



EDSAC - Electronic Delay Storage Automatic Calculator –
Maurice Wilkes – The first general purpose stored program computer –
An example of the von Neuman Architecture in which data and instructions share a common data path. - University of Cambridge (1949)

EDVAC



EDVAC - Electronic Discrete Variable Automatic Computer - Eckert/Mauchley – similar in capability and intent to the EDSAC - University of Pennsylvania (1951)

ASCII

Binary	Oct	Dec	Hex	Abbr	PR[t 1]	CS[t 2]	CEC[t 3]	Description
000 0000	000	0	00	NUL	NUL	^@	\0	Null character
000 0001	001	1	01	SOH	SOH	^A		Start of Header
000 0010	002	2	02	STX	STX	^B		Start of Text
000 0011	003	3	03	ETX	ETX	^C		End of Text
000 0100	004	4	04	EOT	EOT	^D		End of Transmission
000 0101	005	5	05	ENQ	ENQ	^E		Enquiry
000 0110	006	6	06	ACK	ACK	^F		Acknowledgment
000 0111	007	7	07	BEL	BEL	^G	\a	Bell
000 1000	010	8	08	BS	BS	^H	\b	Backspace[t 4][t 5]
000 1001	011	9	09	HT	HT	^I	\t	Horizontal Tab
000 1010	012	10	0A	LF	LF	^J	\n	Line feed
000 1011	013	11	0B	VT	VT	^K	\v	Vertical Tab
000 1100	014	12	0C	FF	FF	^L	\f	Form feed
000 1101	015	13	0D	CR	CR	^M	\r	Carriage return[t 6]
000 1110	016	14	0E	SO	SO	^N		Shift Out
000 1111	017	15	0F	SI	SI	^O		Shift In
001 0000	020	16	10	DLE	DLE	^P		Data Link Escape
001 0001	021	17	11	DC1	DC1	^Q		Device Control 1 (oft. XON)

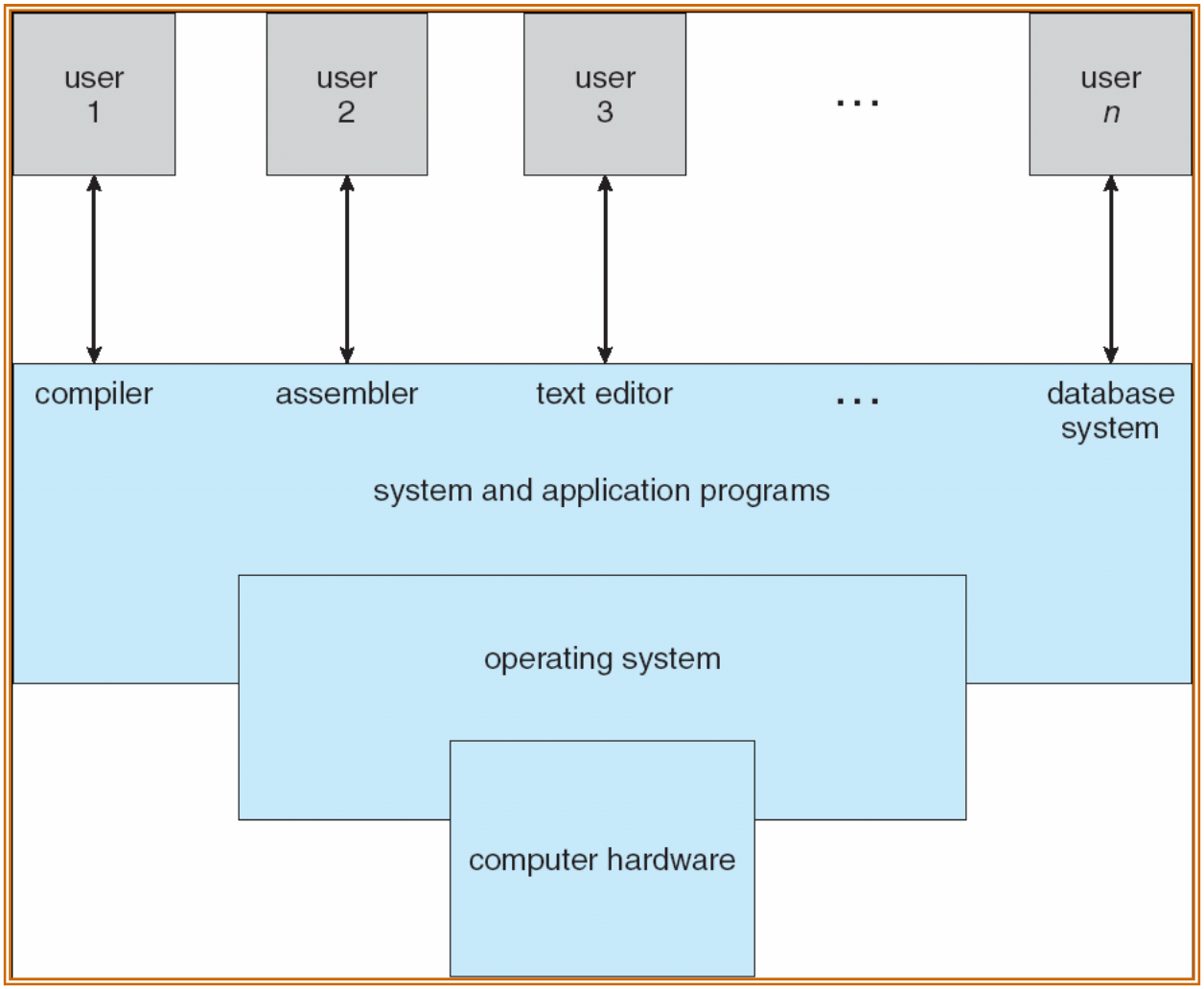
The **American Standard Code for Information Interchange** (acronym: ASCII; pronounced /ˈæski/, ASS-kee) is a character-encoding scheme based on the ordering of the English alphabet.

ASCII codes represent text in computers, communications equipment, and other devices that use text. Most modern character-encoding schemes, which support many more characters than did the original, are based on ASCII.

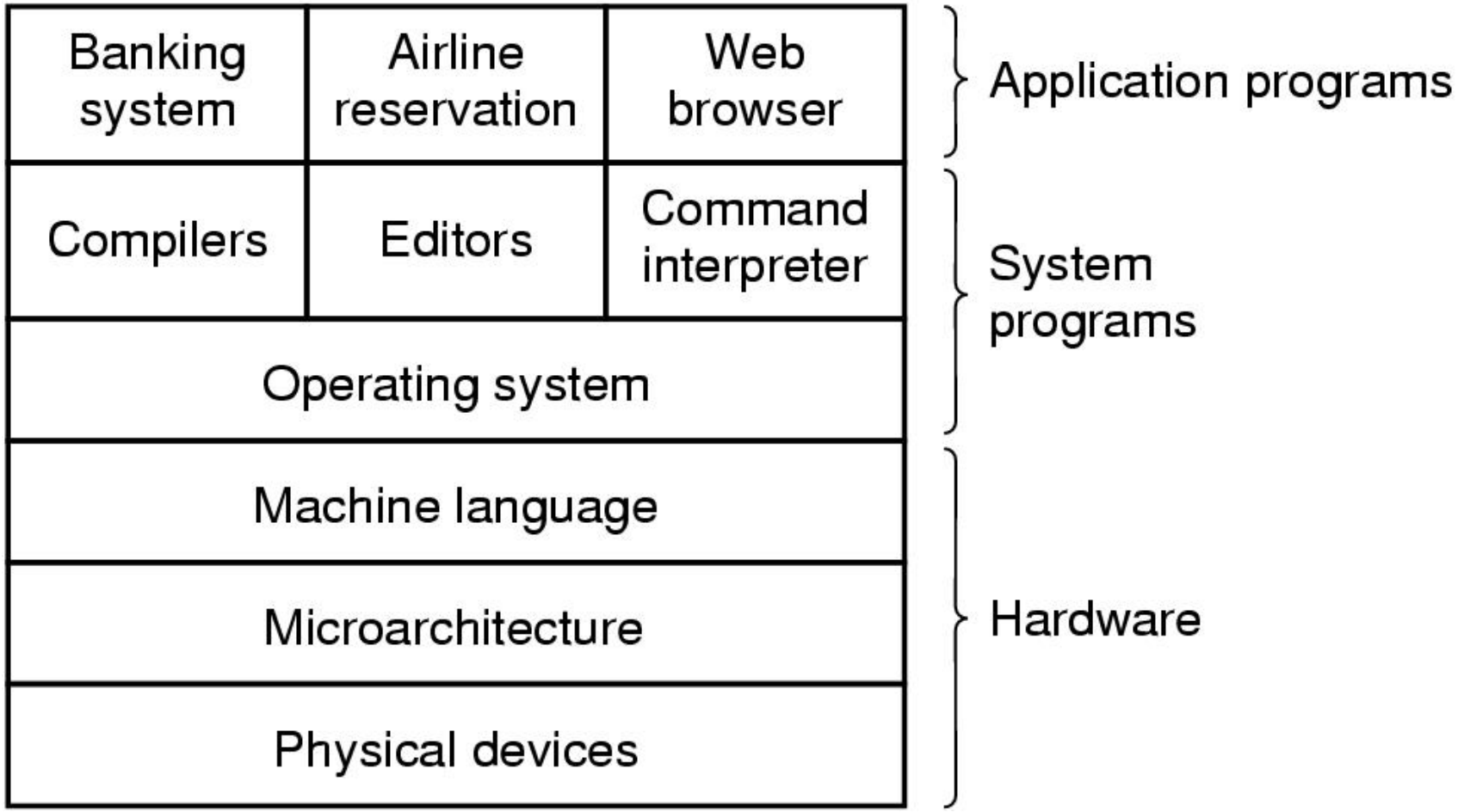
Bit

- In computing and telecommunications a **bit** is a basic unit of information storage and communication (a contraction of "**binary digit**").
- It is the maximum amount of information that can be stored by a device or other physical system that can normally exist in only two distinct states.
- These states are often interpreted (especially in the storage of numerical data) as the binary digits 0 and 1.
- They may be interpreted also as logical values, either "true" or "false"; or two settings of a flag or switch, either "on" or "off".
- **Claude E. Shannon** first used the word ***bit*** in his seminal 1948 paper "*A Mathematical Theory of Communication".*

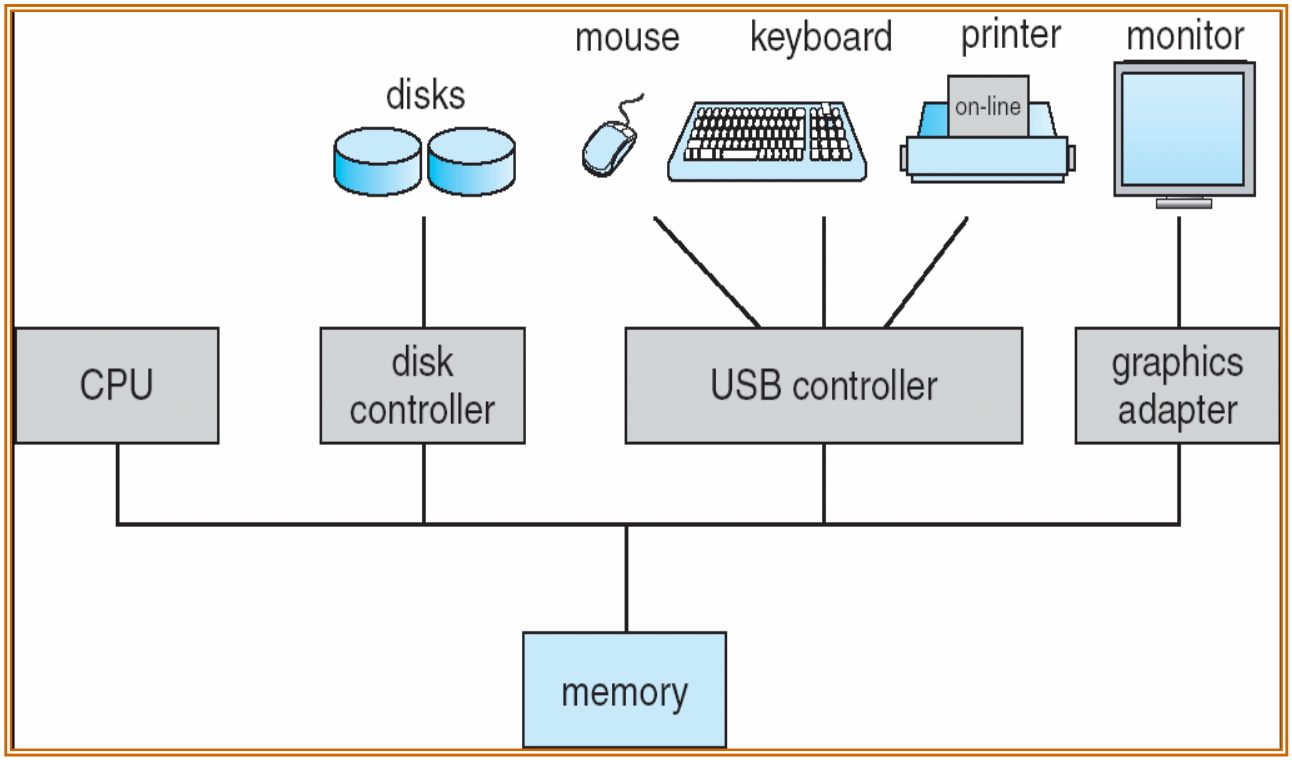
Computer Hierarchy



Computer Hierarchy

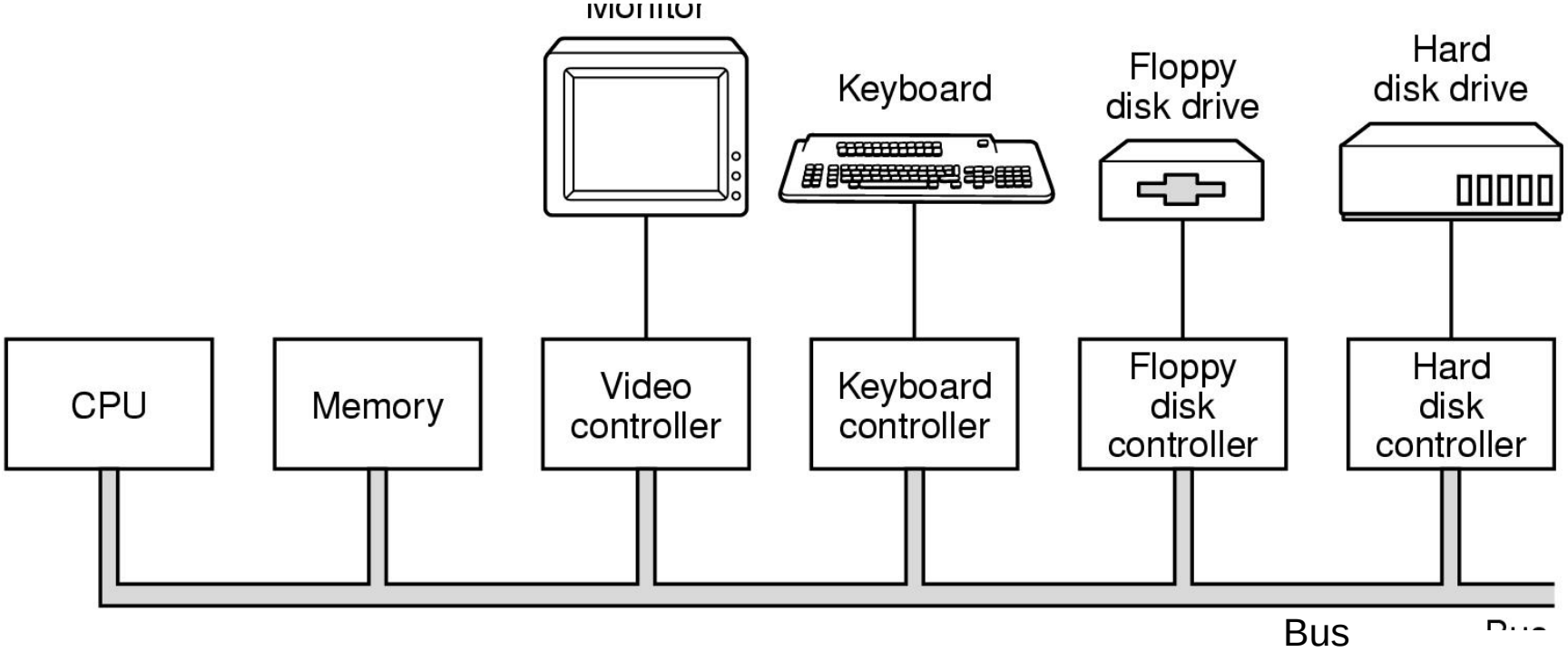


Computer Architecture



von Neumann Architecture

Controllers and Bus



System Board

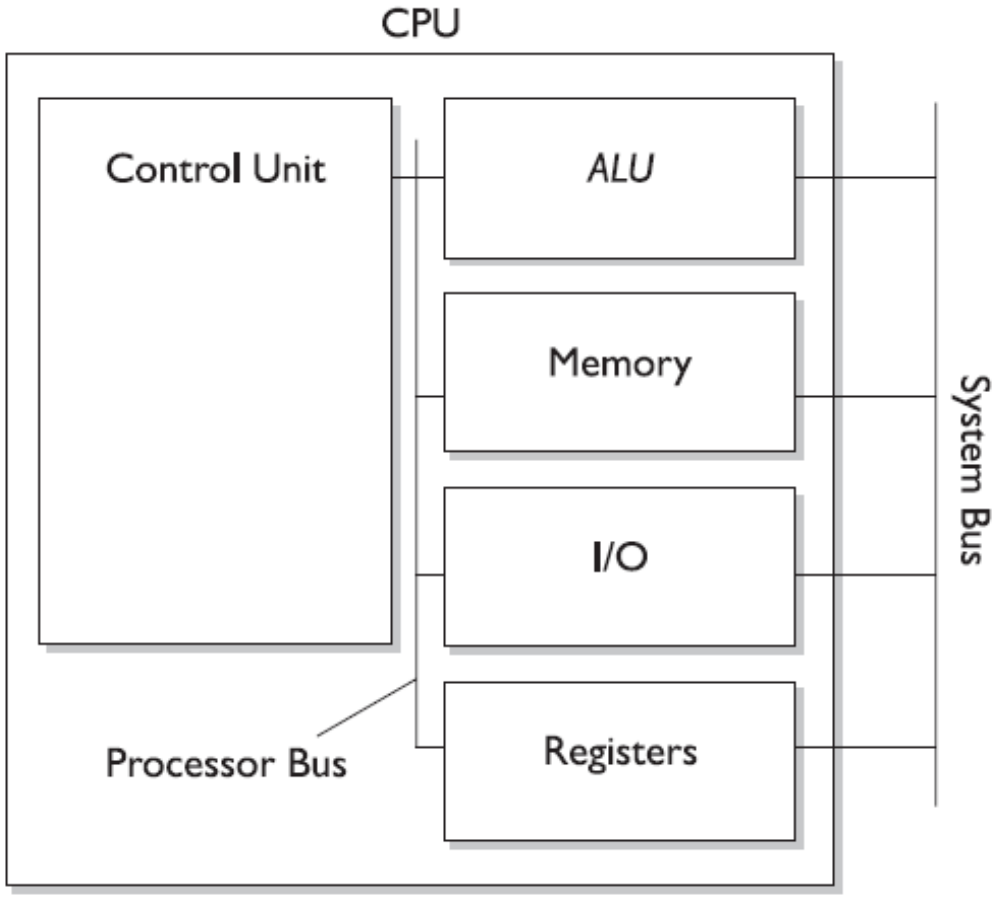
- Each internal and external component is connected to the *system board*.
- The system board, also referred to as the *main board*, the *motherboard,* or the *planar board*, is made of fiberglass and is typically brown or green, with a meshwork of copper lines.
- These “lines” are the electronic circuits through which signals travel from one component to another and are collectively called the *bus*.

Motherboard

CPU

- In a PC, the central processing unit (CPU) is the primary control device for the entire computer system.
- The CPU is technically a set of components that manages all the activities and does much of the “heavy lifting” in a computer system.
- The CPU interfaces, or is connected, to all of the components such as memory, storage, and input/output (I/O) through communications channels called *busses*.
- The CPU performs a number of individual or discrete functions that must work in harmony in order for the system to function.
- Additionally, the CPU is responsible for managing the activities of the entire system.
- The CPU takes direction from internal commands that are stored in the CPU as well as external commands that come from the operating system and other programs.
- It is important to note that these functions occur in all CPUs regardless of manufacturer.

CPU - Central Processing Unit



Pentium

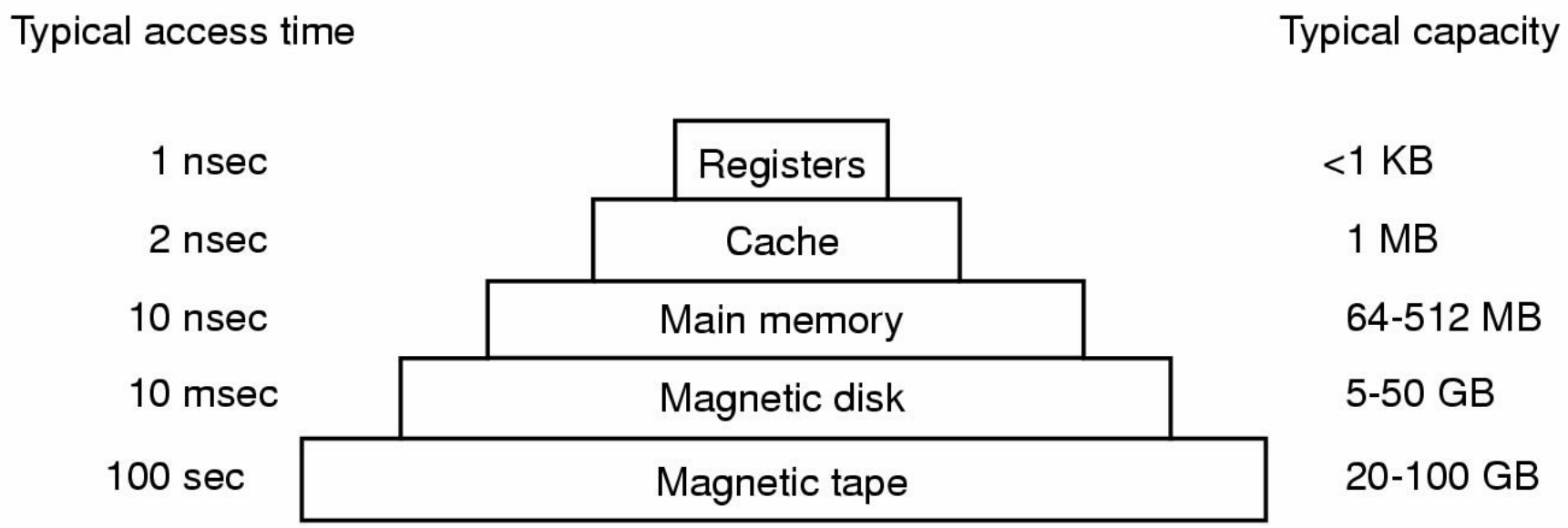

ADVANCED
MICRO
DEVICES


intel
pentium
intel
pentium
w/ MMX™ tech

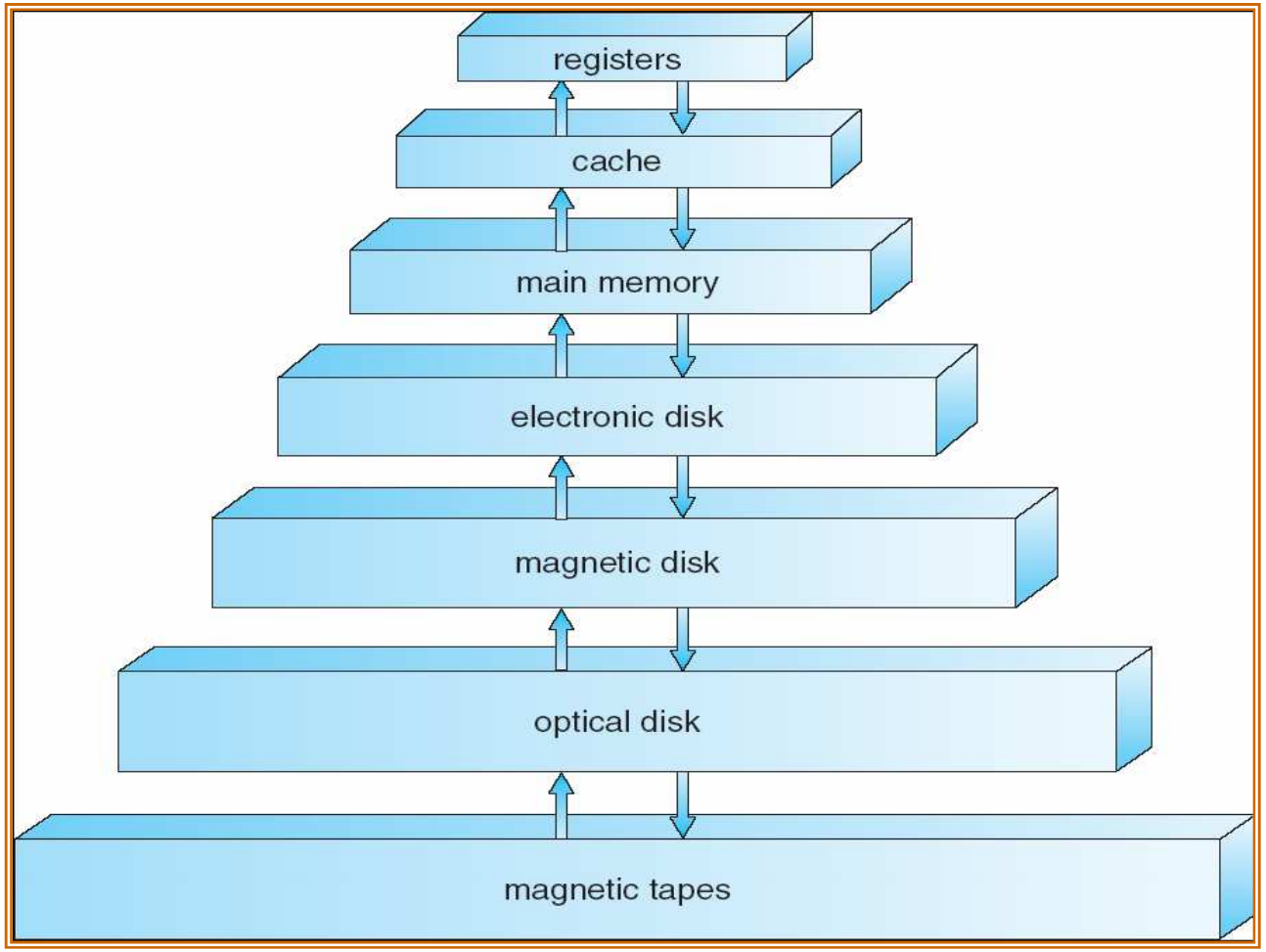
Memory

- *Memory* is one of the most important but perhaps most misunderstood computer components.
- Its function is often mistaken for that of hard drive space.
- Computers use several types of memory, each with a different function and different physical form.
- Typically, when people discuss memory, they are referring to *random access memory,* or ***RAM***.

Memory hierarchy



Memory hierarchy



ROM

- Although *read-only memory,* or *ROM,* has an important function, it is rarely changed or upgraded, so it typically warrants less attention by most computer users.
- Unlike RAM, ROM is read-only, meaning its instructions can be read by the processor, but ROM cannot be used to store new information.
- ROM is *nonvolatile***,** so it does not lose its contents when the computer's power is turned off. This makes ROM ideal for storing a device's most basic operation and communication instructions.
- A number of computer components include ROM chips, which contain device-specific basic instructions. Information on these ROM chips is said to be *hardwired* or *hard coded* because it cannot be changed.
- These types of devices are termed *firmware*, to indicate that they are a mixture of hardware and software.

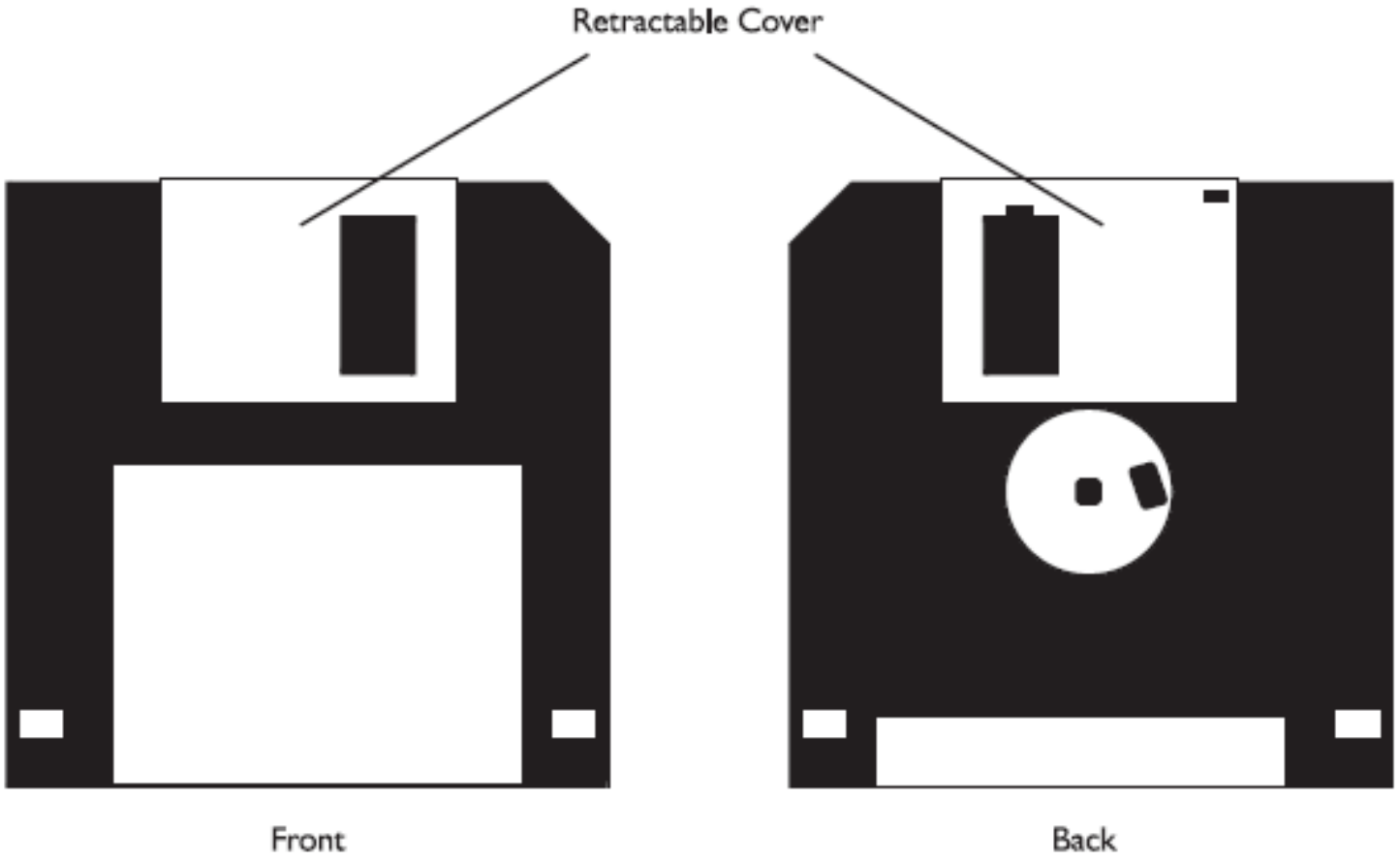
Problem Solving

SCENARIO & SOLUTION	
Which type of memory is responsible for…	**Solution**
Maintaining a device's basic operating instructions?	ROM
Anticipating processor requests and making the proper data available?	Cache
Providing temporary storage for application files?	RAM

Floppy disks

- Floppy disks themselves are available in several different forms and capacities.
- The first floppy disks used in PCs were 5.25 inches square and could hold either 360KB or 1.2MB of information.
- However, these are no longer considered standard computer equipment.
- The newer 3.5-inch disk can hold 720KB (double density), 1.44MB (high density), or 2.88MB (extra high density) of information.
- The most commonly used such disk is the 1.44MB. Floppy drives are limited in the types of disks they can access.
- The obvious size difference precludes a 5.25-inch drive from using a 3.5-inch disk, and vice versa. A 720KB drive can read only 720KB disks.
- However, a 1.44MB drive can access either a 1.44MB or a 720KB disk, and the 2.88MB drive can read all three 3.5-inch disk densities.

Floppy disks



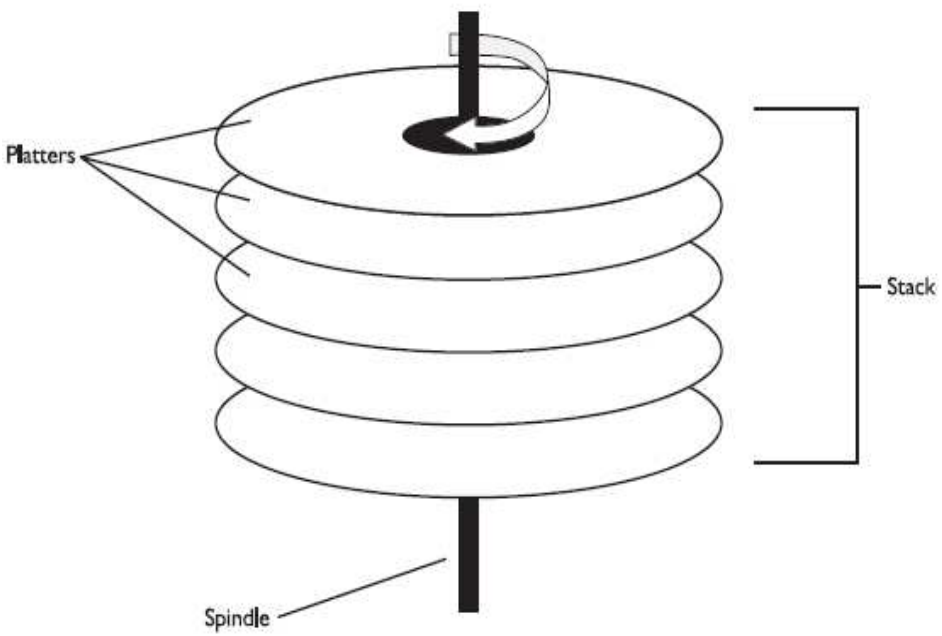
Hard Disk

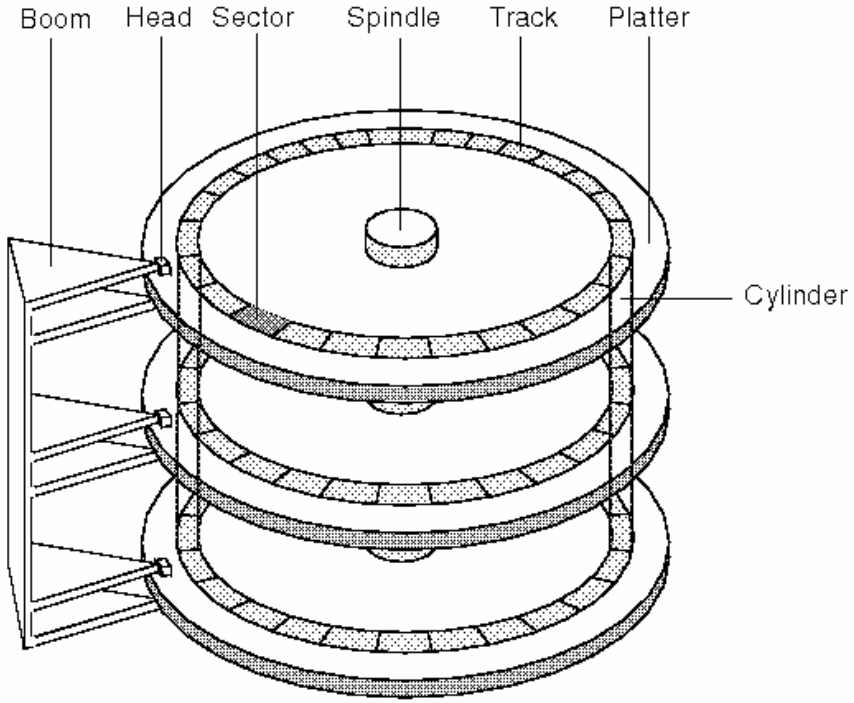
- *Hard drives* store data in a similar fashion to floppy drives, but they typically are not removable and have a different physical structure.
- A hard drive, also referred to as a *fixed drive*, consists of one or more hard platters, stacked on top of but not touching one another.
- Hard drives are available in a wide range of capacities and can hold much more data than a floppy disk. Most new hard drives have a capacity between 30GB and 120GB.
- The disk must be divided into smaller units, called *clusters*, before it can store data. This division is accomplished through formatting. Depending on the capacity and file system used, each cluster can hold between 512B to 32KB of data.

Hard Disk


Cover Mounting Holes
(Cover not shown)
Base Casting
Spindle
Slider (and Head)
Actuator Arm
Actuator Axis
Actuator
Case
Mounting
Holes
Platters
Ribbon Cable
(attaches heads
to Logic Board)
SCSI Interface
Connector
Jumper Pins
Jumper
Power
Connector
Tape Seal

Hard Disk





- The stack of platters is attached through its center to a rotating pole, called a *spindle*.
- Each side of each platter can hold data and has its own read/write head.
- The read/write heads all move as a single unit back and forth along the stack.

CD-ROM

- *Compact disc–Read-Only Memory (CD-ROM)* offers a balance between the portability of a floppy disk and the capacity of a hard drive.
- CD-ROMs are composed of a hard medium that contains very small depressed and raised areas, called *pits* and *lands*, respectively.
- CD-ROM drives read data from the CD using a laser instead of a read/write head.
- CD-ROMs can hold roughly 650MB of data and generally cannot be written to, except in the case of CD-Rs (recordable) or CD-RWs (rewritable).
- Data can be accessed faster from a CD than a floppy disk but much more slowly than from a hard drive.

CD-ROM

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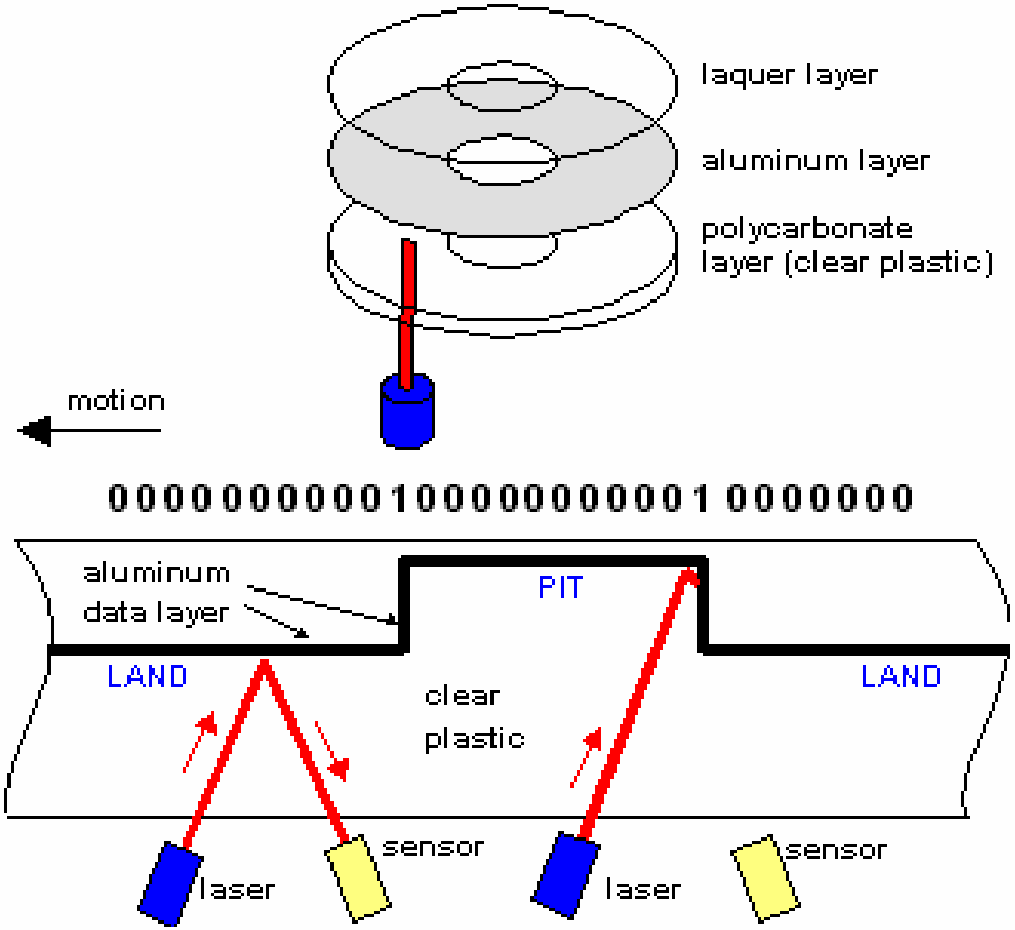
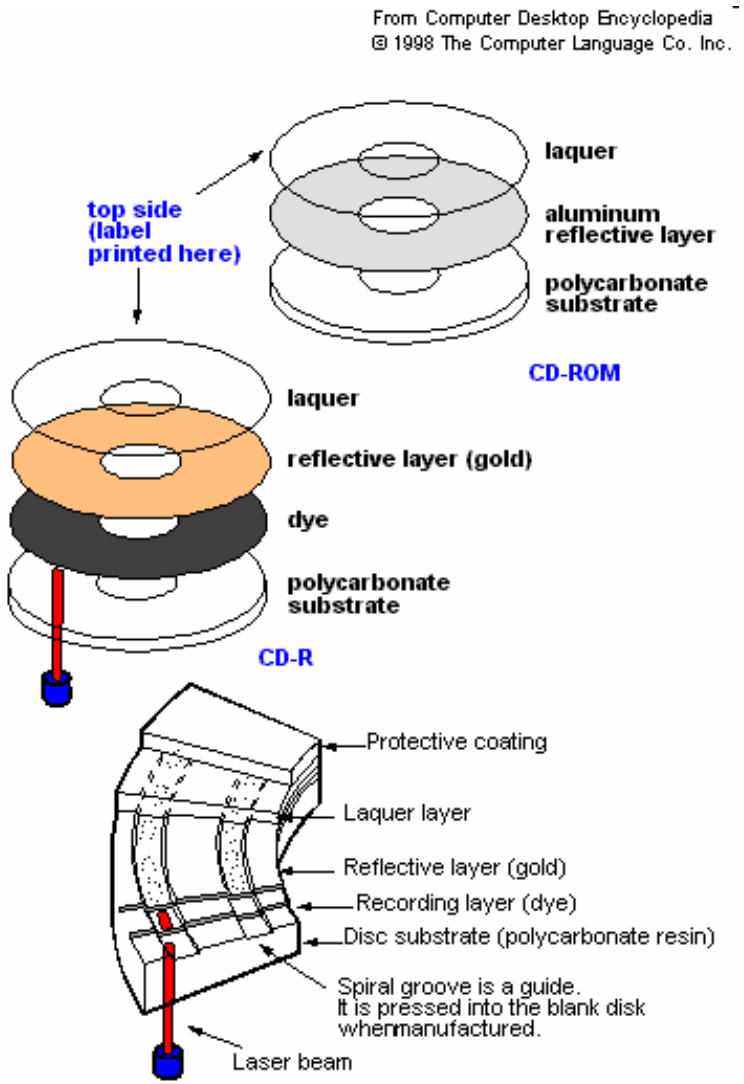


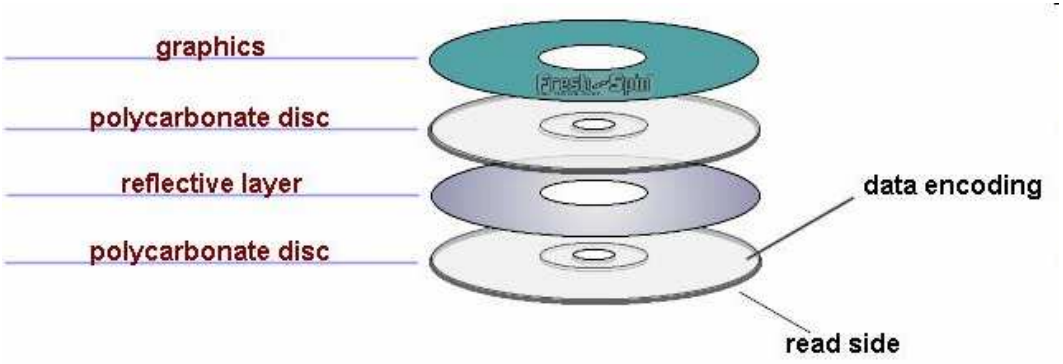
CD-ROM

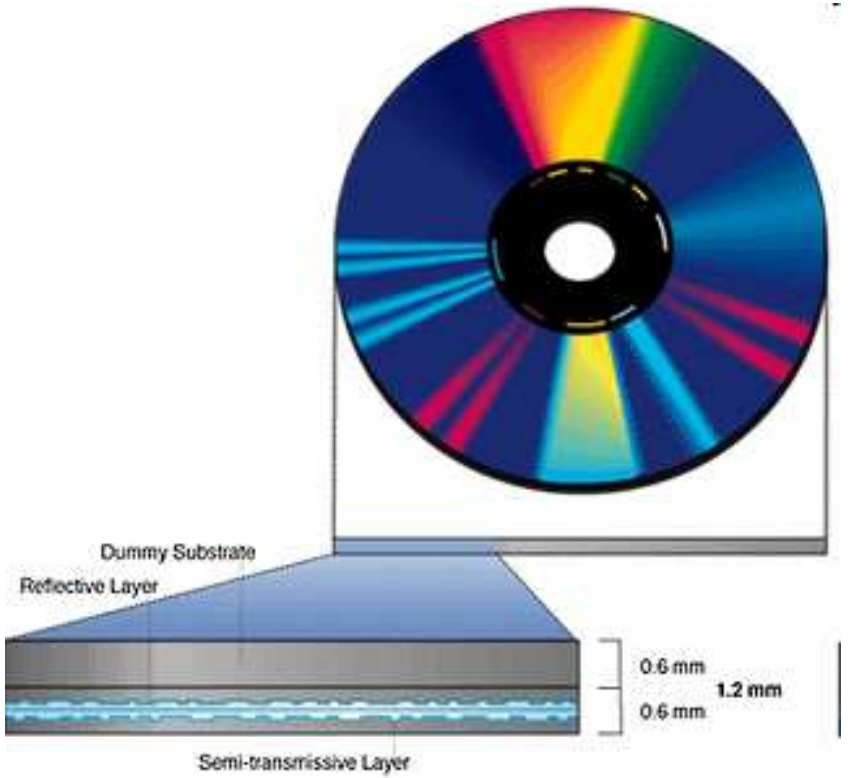

From Computer Desktop Encyclopedia
© 1998 The Computer Language Co. Inc.
top side
(label
printed here)
laquer
aluminum
reflective layer
polycarbonate
substrate
CD-ROM
laquer
reflective layer (gold)
dye
polycarbonate
substrate
CD-R
Protective coating
Laquer layer
Reflective layer (gold)
Recording layer (dye)
Disc substrate (polycarbonate resin)
Spiral groove is a guide.
It is pressed into the blank disk
whenmanufactured.
Laser beam

DVD

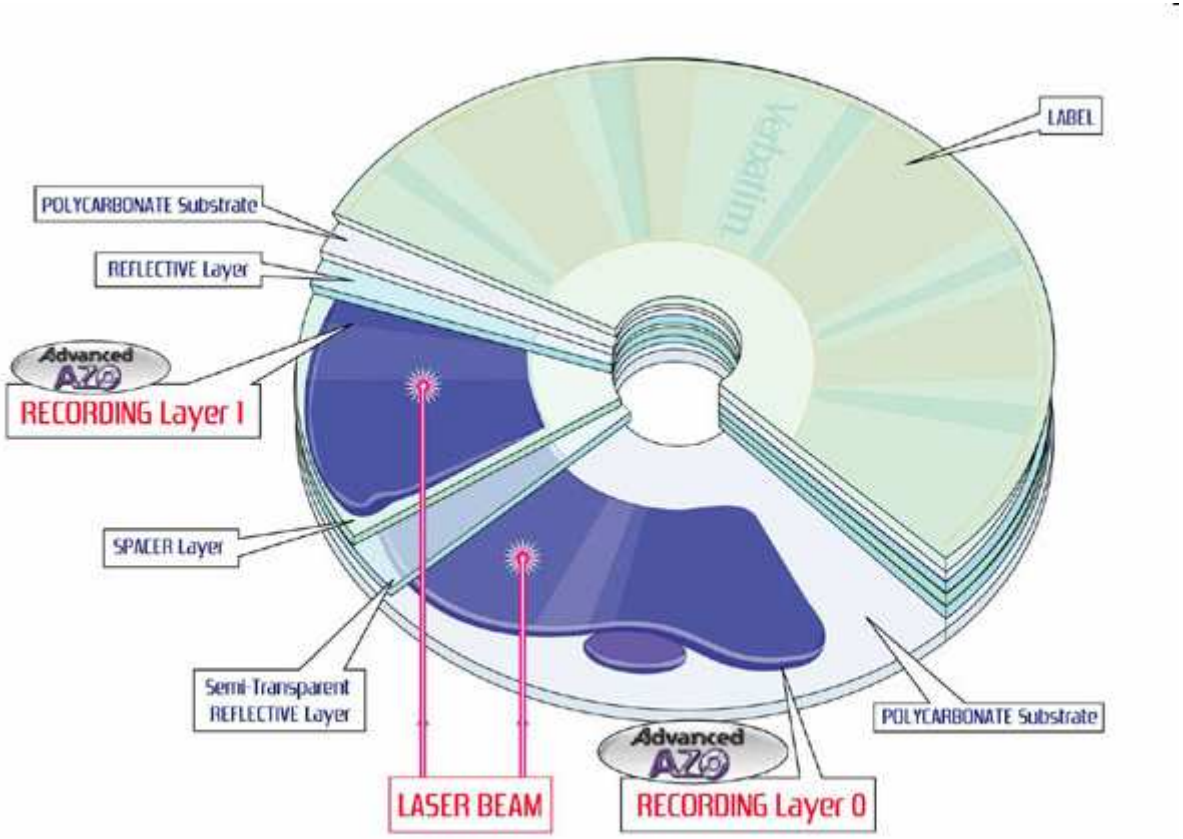
- Digital versatile discs (DVDs) are similar in technology to CD-ROMs but have a higher storage density.
- DVDs are used extensively for video storage as well as large amounts of data storage.
- DVD-recordable (DVD-R) can be recorded on only once. Unlike a CD-RW, which can have multiple recording sessions, a DVD-R can have only one session.
- DVDs can typically store on the order of 5 to 8GB of data. There are new types of DVD devices coming on the market every day.

DVD


graphics
polycarbonate disc
reflective layer
polycarbonate disc
data encoding
read side


Dummy Substrate
Reflective Layer
0.6 mm
1.2 mm
0.6 mm
Semi-transmissive Layer

DVD


LABEL
POLYCARBONATE Substrate
REFLECTIVE Layer
Advanced AZO
RECORDING Layer 1
SPACER Layer
Semi-Transparent REFLECTIVE Layer
LASER BEAM
Advanced AZO
RECORDING Layer 0
POLYCARBONATE Substrate

Monitor

- *Color graphics adapter (CGA) monitors* are an older type and can display combinations of red, green, and blue at different intensities, resulting in 16 different colors.

- The maximum resolution of a CGA monitor is 640×200 pixels in monochrome mode and 160×100 pixels in 16-color mode.

- *Enhanced graphics adapter (EGA) monitors* are capable of generating up to 64 colors,16 of which can be displayed at any one time. EGA monitors have a maximum resolution of 720×350 when displaying text only and 640×350 in graphics mode.

Monitor

- *Virtual graphics array (VGA) monitors* were the first to use analog rather than digital output.
- Instead of creating displays based on the absence or presence of a color (as in digital CGA and EGA monitors), VGA monitors can display a wide range of colors and intensities.
- They can produce around 16 million different colors but can display only up to 256 different colors at a time.
- This color setting is often called *16-bit high color*. VGA monitors have a maximum resolution of 720×400 in text mode and 640×480 in graphics mode.

Monitors

Monitor	Total Number of Colors	Number of Colors That Can Be Simultaneously Displayed	Maximum Resolution	Input
CGA	16	16	Monochrome: 640×200 Color: 160×100	Digital
EGA	64	16	Text mode: 720×350 Graphics mode: 640×350	Digital
VGA	More than 16 million	256	Text mode: 720×400 Graphics mode: 640×480	Analog
SVGA	More than 16 million	More than 16 million	1280×1024	Analog

Modem

- A *modulator/demodulator* (*modem)* allows computers to communicate with one another over existing phone or cable lines.
- Internal modems attach directly to a computer's motherboard and connect to a regular phone jack using the same connector as a phone.
- External modems also connect to the phone jack but are attached to the computer via an external port.
- External modems are typically easier to configure and troubleshoot than internal modems and have the benefit of being easily transported to another computer.

Modem

Modems

Peripherals

- The term *peripheral* is typically used to refer to external and internal computer components that are not essential for system operation.
- On a PC, virtually any device that is not memory or CPU can be considered a peripheral. Interestingly enough, monitors are external devices and are not considered a peripheral.
- Keyboards, mice, and external devices such as a scanner or Zip drive are considered peripherals.
- Disk drives, floppy drives, network cards, and other devices that are installed internally to the PC are considered internal peripherals.
- Many peripheral devices use a proprietary interface or connection to the system, though the trend is to use standardized interfaces as much as possible.

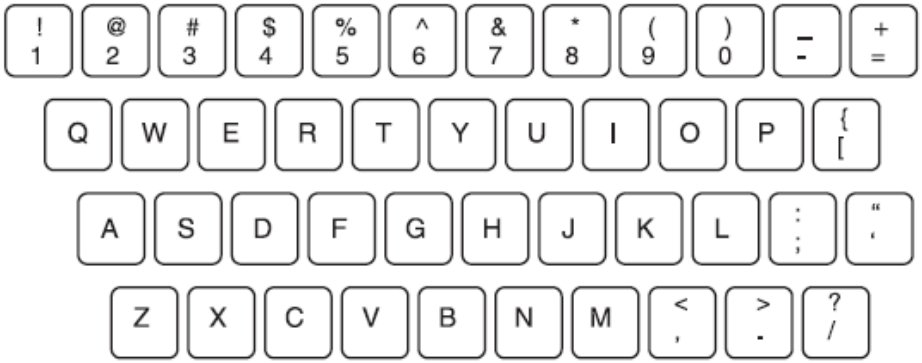
Mouse and Keyboard

Two mini-DIN connectors used for mice and keyboards

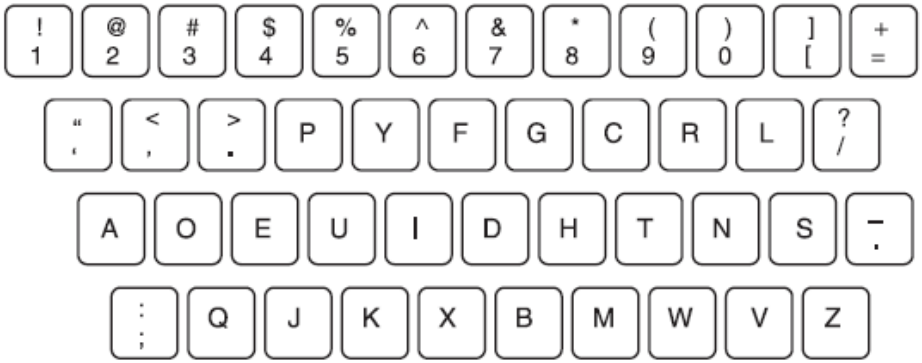
IEEE (Institute of Electrical and Electronics Engineers) is the largest standards organization.

Keyboard layout

Qwerty



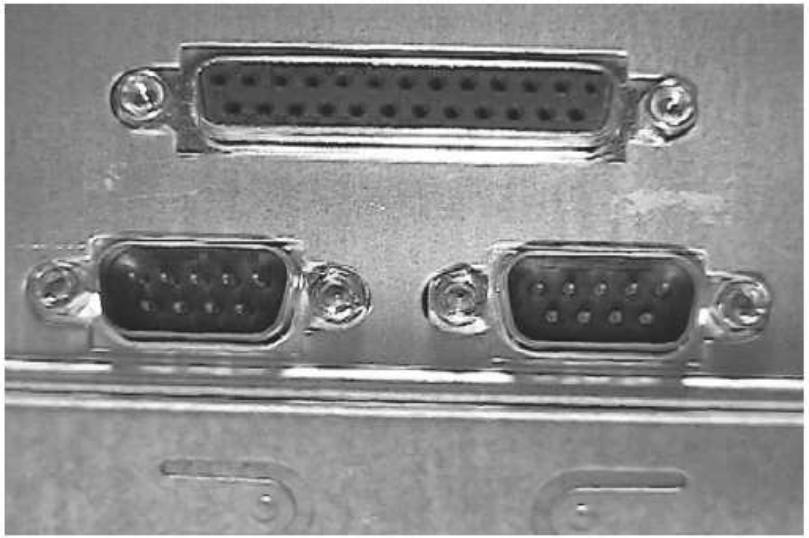
Dvorak



Switching to the Dvorak Keyboard Layout

1. Double-click the My Computer icon.
2. Double-click the Control Panel icon.
3. Double-click the Keyboard icon.
4. Select the Language tab in Windows 9*x* or the Input Locales tab in Windows NT.
5. Click the Properties button.
6. Select U.S.-Dvorak from the Keyboard Layout drop-down list.
7. Click OK, then click OK again.
8. If you want, you can physically change the keycaps on the keyboard to correspond to their new settings.

Printers and scanners



DB-25 connectors are D-shell connectors with 25 pins or holes, with 13 in one row and 12 in the other.
Most computers include one or two DB-25 connectors for devices such as printers and scanners.
Female DB-25 connectors are typically used for parallel communications; the male ports are used for serial communications.

USB

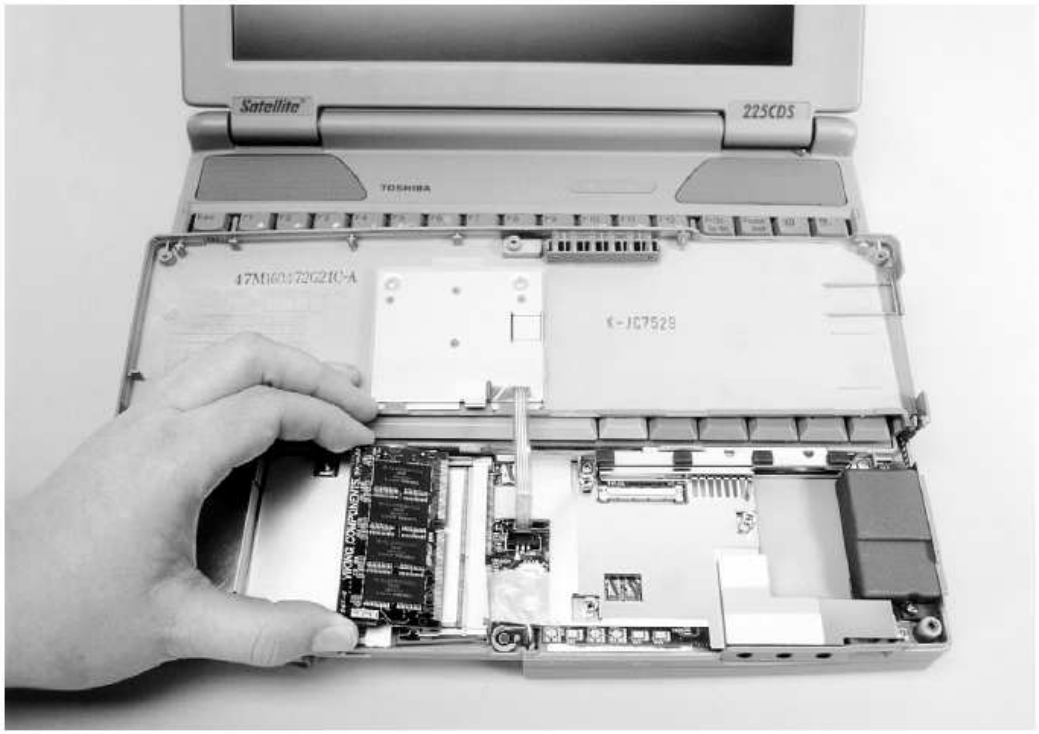
IEEE-1394 is a computer bus standard that supports very high speeds for external devices. IEEE-1394 (also called FireWire) supports many of the same features as USB

A USB hub that provides 4 additional USB connections

Laptops

A battery located on the
underside of a portable system

Laptops

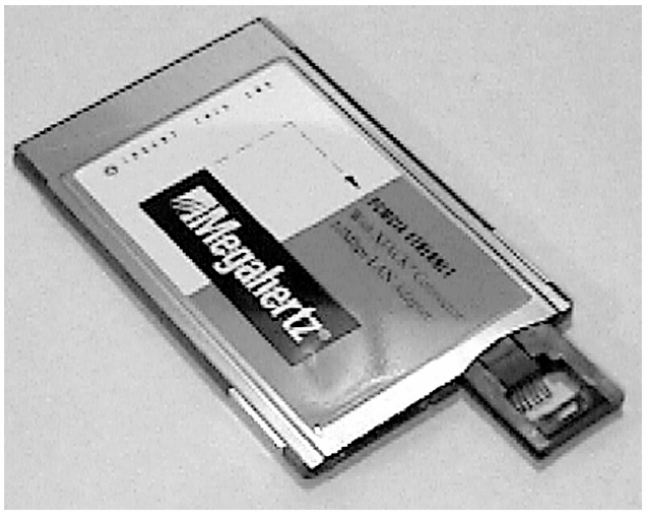


Installing a RAM module in a portable system

PC Cards

An easier way to add more RAM to your portable is to use a memory PC Card.
PC Cards are small cards that can be easily inserted in a portable to enhance or expand its abilities.
In fact, PC Cards originated as PCMCIA cards specifically for the purpose of adding more memory. PCMCIA stands for *Personal Computer Memory Card International Association,* a bit of a misnomer because these cards are usually used in laptops, not in PCs (desktops).

A PC Card network adapter



PC Cards

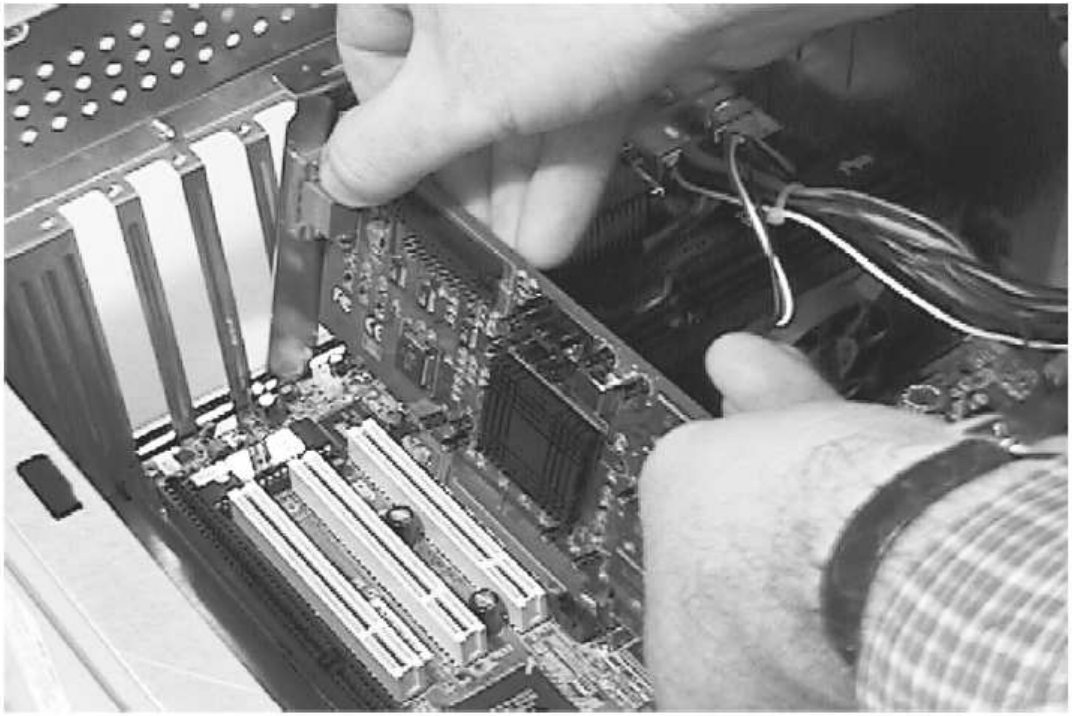
Mouse

CLEANING THE MOUSE

1. Unplug the Mouse, turn it upside-down and remove the retaining ring (usually by twisting it counter-clockwise).
2. Slowly invert the mouse so that the ball drops into your hand.
3. If the ball is dirty or sticky, you can clean it with soapy water.
4. Locate the rollers inside the mouse (see Figure 3-1). There are typically two long black rollers and one small metallic roller.
5. Use your fingers to remove the “ring” of dust from each roller, taking care not to let any material fall even further into the mouse.
6. If the rollers are sticky or if Step 5 is insufficient to clean the rollers, use a cotton swab dipped in isopropyl alcohol to clean them.
7. When you are finished, replace the mouse ball and retaining ring, ensuring that they are secured in place.

The internal rollers in a typical mouse

Video Cards



The installation of a PCI video card

Problem Solving

SCENARIO & SOLUTION	
Why do mice use serial communications?	Because they tend to send intermittent, small bursts of data.
Why do printers tend to use parallel communications?	Because parallel communications are faster at transmitting the large data packets typically sent to printers.
How can I tell a serial port from a parallel port at the back of the computer?	Serial ports tend to be male and parallel ports tend to be female.

What should you do if…

SCENARIO & SOLUTION	
What Should You Do If…	Answer
You receive an "A: is not accessible" error?	Check for the presence of a floppy disk in the drive.
You receive an "Invalid drive" error?	Make sure that the drive works and is properly attached. Check to ensure that the BIOS settings match the drive type.
The floppy drive light comes on and won't go off?	Reverse the orientation of the ribbon cable in the floppy drive port.

Problem Solving

SCENARIO & SOLUTION	
How do I replace a bad integrated parallel port?	If the parallel port is integrated with the motherboard, you must replace the motherboard.
The computer continually asks me for the time at startup. What should I do?	Replace the CMOS battery.
What should I do with a computer that keeps rebooting itself?	Replace the power supply.
What should I do when the mouse pointer doesn't move smoothly on the screen?	Clean the mouse.

Problem Solving

SCENARIO & SOLUTION	
How can I determine if a monitor has gone bad?	Try it in a working system.
What should I do if an application has been incorrectly installed?	Uninstall then reinstall it.
My sound system is bad. Where should I start to look for the problem?	Start with the speakers, and work your way into the computer.

Problem Solving

SCENARIO & SOLUTION	
What should I use to clean the CRT monitor's screen?	Use glass cleaner. Spray the cleaner on a cloth, not directly on the monitor.
How can I remove dust from the computer?	Vacuum it or use compressed air to blow it out.
What should I use to remove dirt from the computer case?	Use mild, soapy water on a damp (not wet) cloth.

Problem Solving

SCENARIO & SOLUTION	
Which device can absorb excess power?	A suppressor.
What can I use to remove EMI from the power source?	A noise filter.
What should I use to provide backup battery power?	A UPS.
How can I prevent problems from blackouts, surges, and EMI all at the same time?	Get a UPS that has an integrated suppressor and noise filter.

Comparing CPUs

	Pentium	Pentium Pro	Pentium MMX	Pentium II	Pentium III	Pentium 4
Form	273- or 296-pin PGA	387-pin PGA	296-pin PGA	242-pin SEC	242-pin SEC or 370-pin PGA	423- or 478-pin PGA
Socket	4, 5, or 7	8	7	Slot 1	Slot 1 or PGA370	Socket 478 or Socket 423
Voltage (vDC)	3.3 or 5	3.1 or 3.3	3.3	3.3	2	1.44 or 1.75
Speeds	60–200MHz	150–200MHz	166–233MHz	233–333MHz	450MHz–1.13GHz	1.3GHz–3.2 GHz
L1 cache (KB)	16	16	32	32	32	8

Printers

An inkjet printer

A typical laser printer

Questions

SCENARIO & SOLUTION	
What is the function of the laser in a laser printer?	To reduce the drum's charge in areas that will later hold toner.
How does the image get from the drum to the paper?	The transfer corona wire applies a positive charge to the paper. As the paper passes the drum, the negatively charged toner is attracted to the page.
How is the drum cleaned?	A cleaning blade removes residual toner from the drum, and an erasure lamp removes any remaining charge from the drum.
What makes the toner stick to the paper?	The toner contains resin, which is melted onto the paper when it passes through the heated fusing rollers.

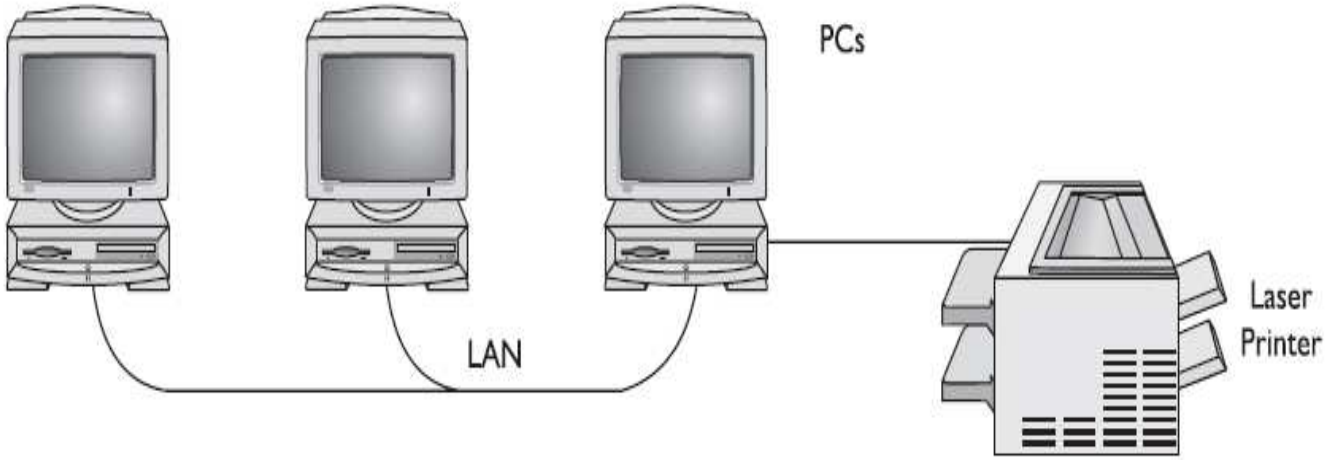
Questions

SCENARIO & SOLUTION	
What type of medium does each printer type use to create images?	Dot matrix printers use ink ribbons, inkjet printers use ink, and laser printers use toner.
What is an impact printer?	An impact printer is one that uses physical impact to create images, such as the pins on a dot matrix printer.
What are two types of nonimpact printers?	Inkjet and laser printers do not "strike" the print medium onto the page, so they are considered nonimpact printers.
What is a line printer?	A line printer is one that creates an image one line at a time. Dot matrix and inkjet printers are line printers.
Is the laser printer a line printer?	No. The image is created one page at a time, not one line at a time. The laser printer is therefore considered a page printer.
What is the difference between a true inkjet printer and a bubblejet printer?	An inkjet printer uses a small pump to spray ink on the paper. A bubblejet printer uses heat to cause ink bubbles to burst onto the paper.

Problem Solving

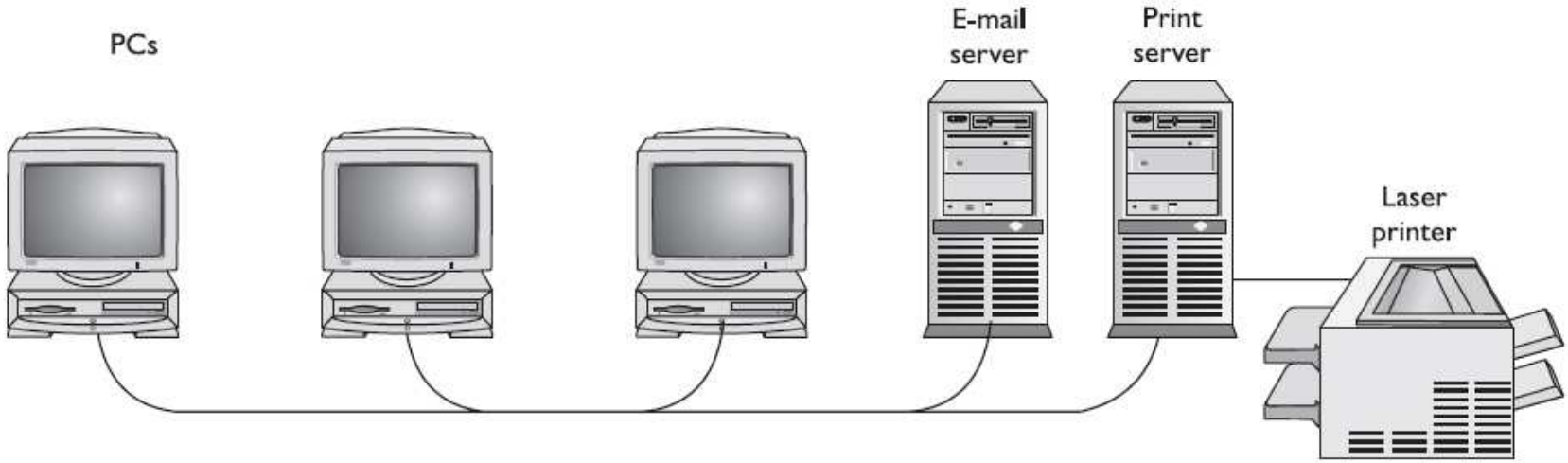
SCENARIO & SOLUTION	
My laser printer produces the same blotch over and over again. What should I do?	Clean the printer, especially the rollers. If this doesn't work, replace the drum.
My inkjet printer is producing smudged printouts. Why?	There is probably something coming in contact with the page before the ink has had a chance to dry.
What is a "ghosted" image?	It is an image from a previous printout that appears on subsequent printouts. This appears in laser printers only. Replace the drum. If this doesn't work, replace the cleaning components.
Why does my printout contain the wrong colors?	You are probably using an inkjet printer that is low in a particular color or has a clogged cartridge nozzle.

Networking



A peer-to-peer network in a home

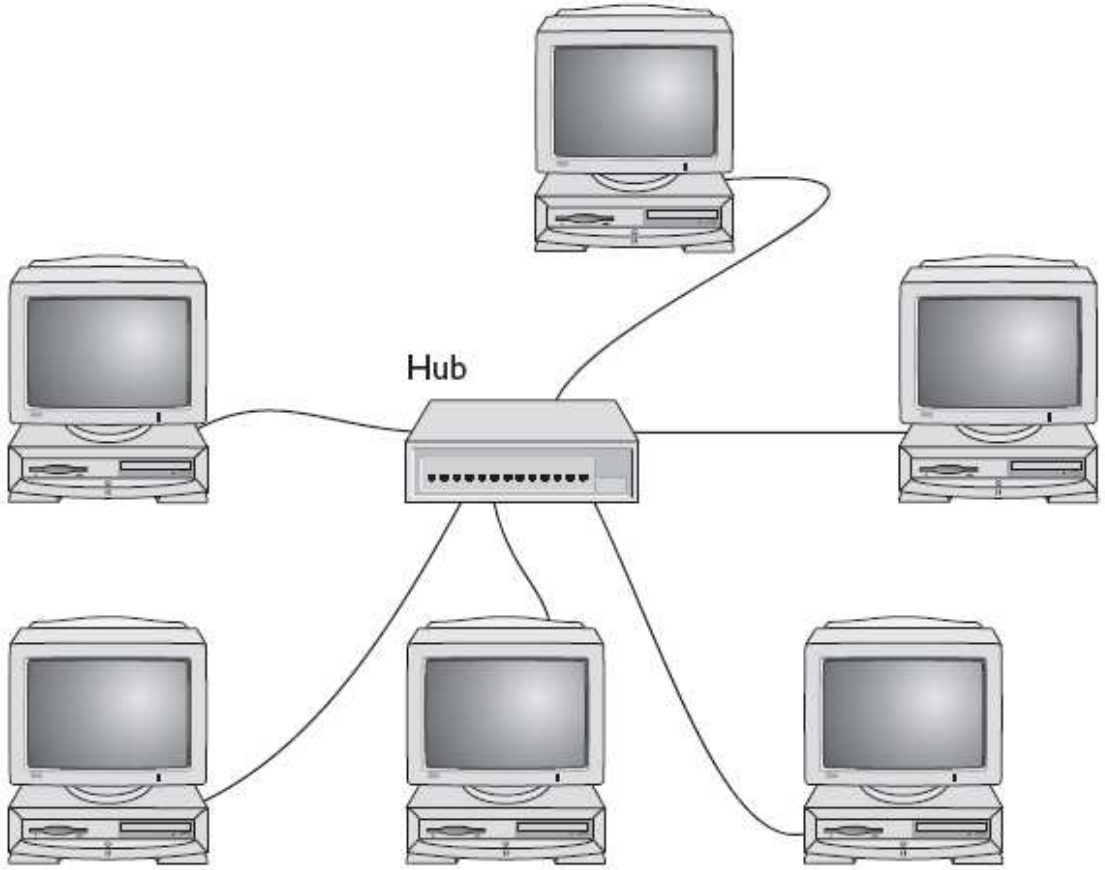
Client/server



A client/server environment where dedicated or special purpose servers perform assigned functions.

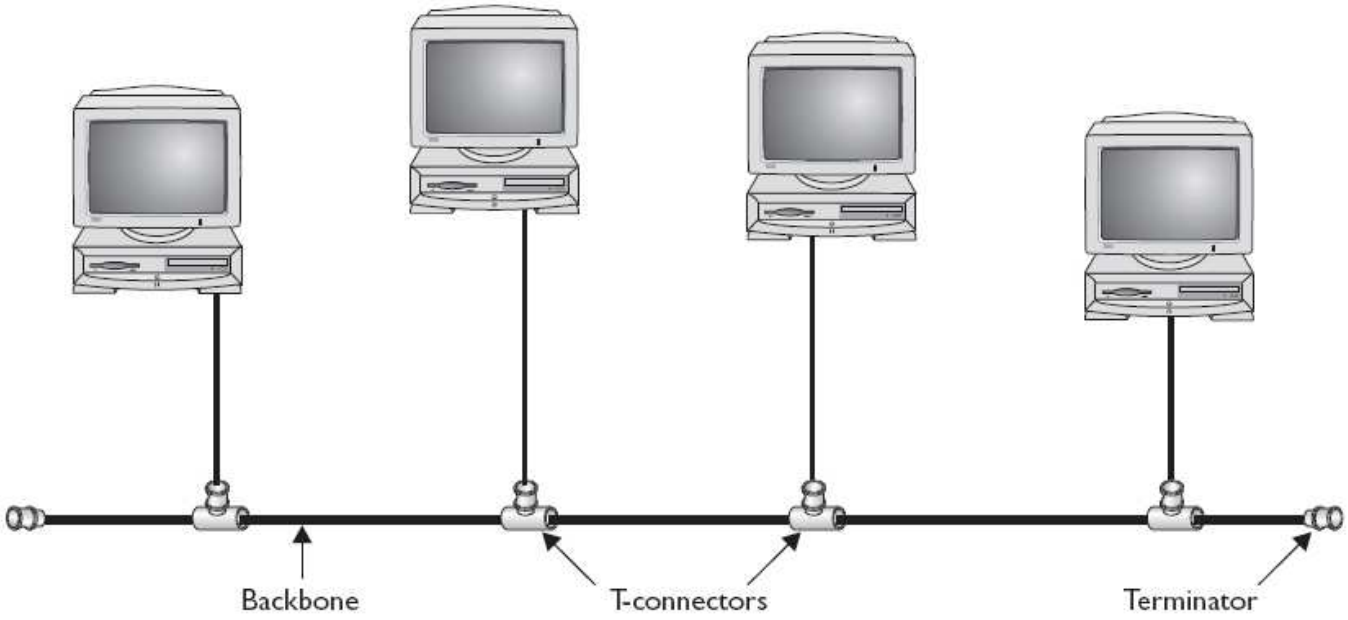
The difference between a peer-to-peer network and a client/ server-based network is that in a peer-to-peer network all of the workstations operate essentially as both workstations and servers. In a client/server environment, servers are not used as clients.

Star network



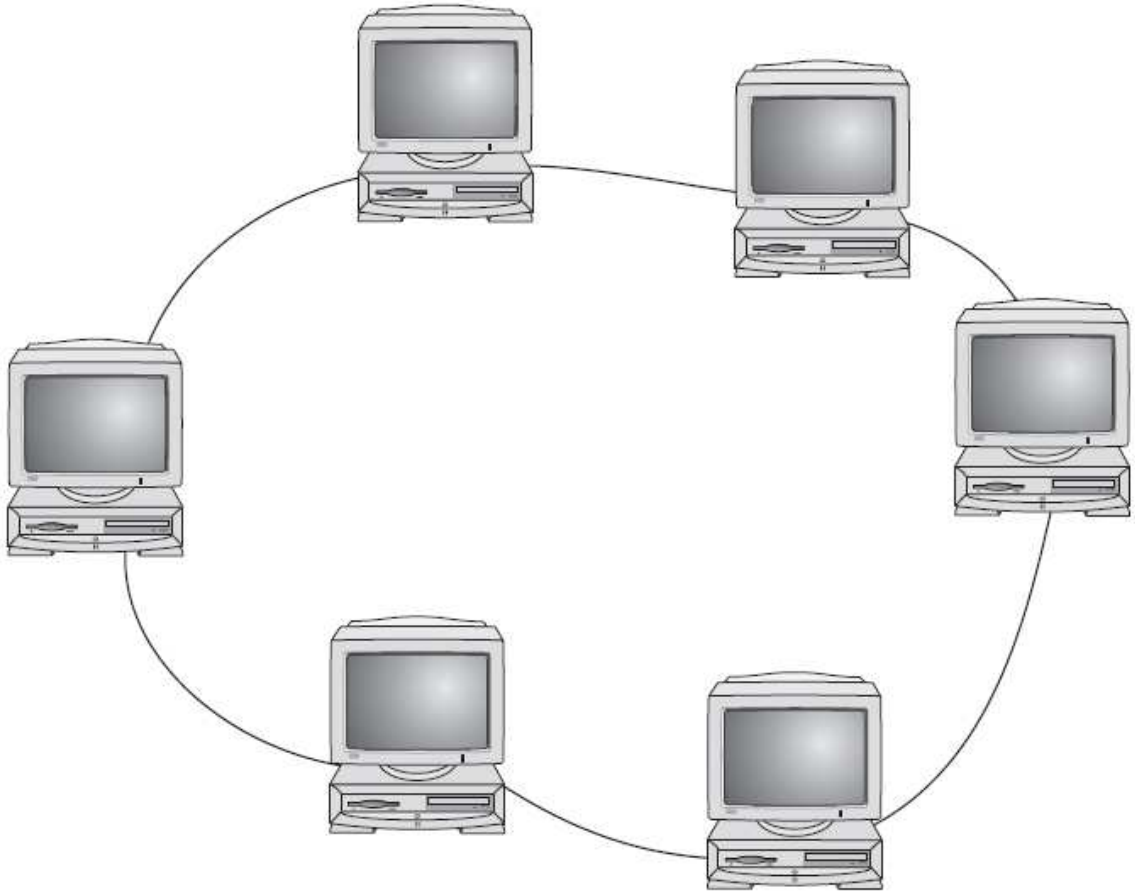
In a star network, computers are attached to a central hub

Bus topology



In a bus topology, each computer is attached to a cable backbone

Ring network



In a ring network, each computer is attached to the next in a circular formation

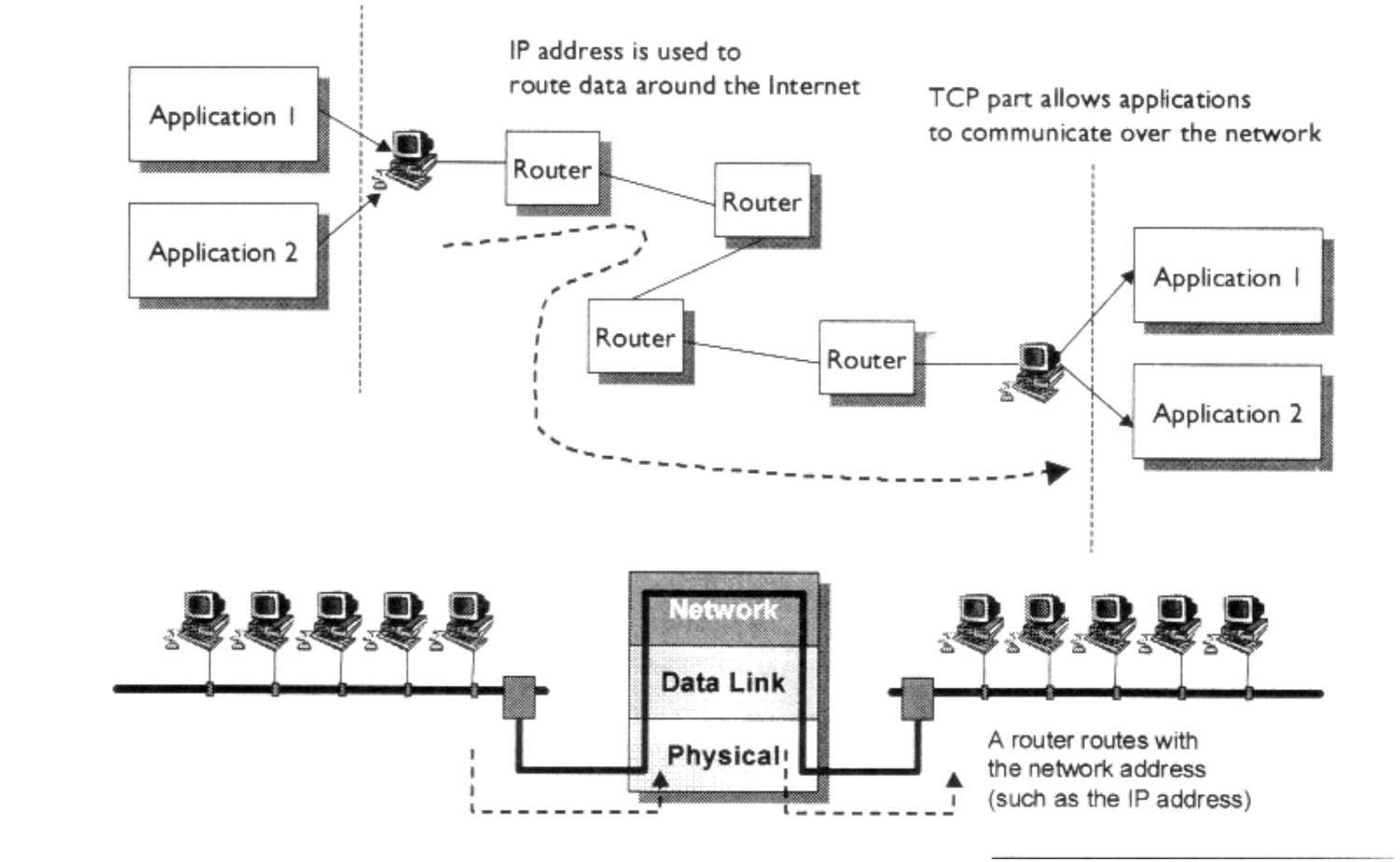
Problem Solving

SCENARIO & SOLUTION	
How is a star network arranged?	Each computer is attached to a single hub using a separate cable.
What are the advantages of a bus network?	It is simple to implement and uses less cable.
Which topology has the highest number of potential failure points?	A ring. If any cable or computer fails, the entire network will go down.
How many computers can transmit on each type of topology?	Star and bus topologies are limited to one transmission at a time; ring topologies are not.

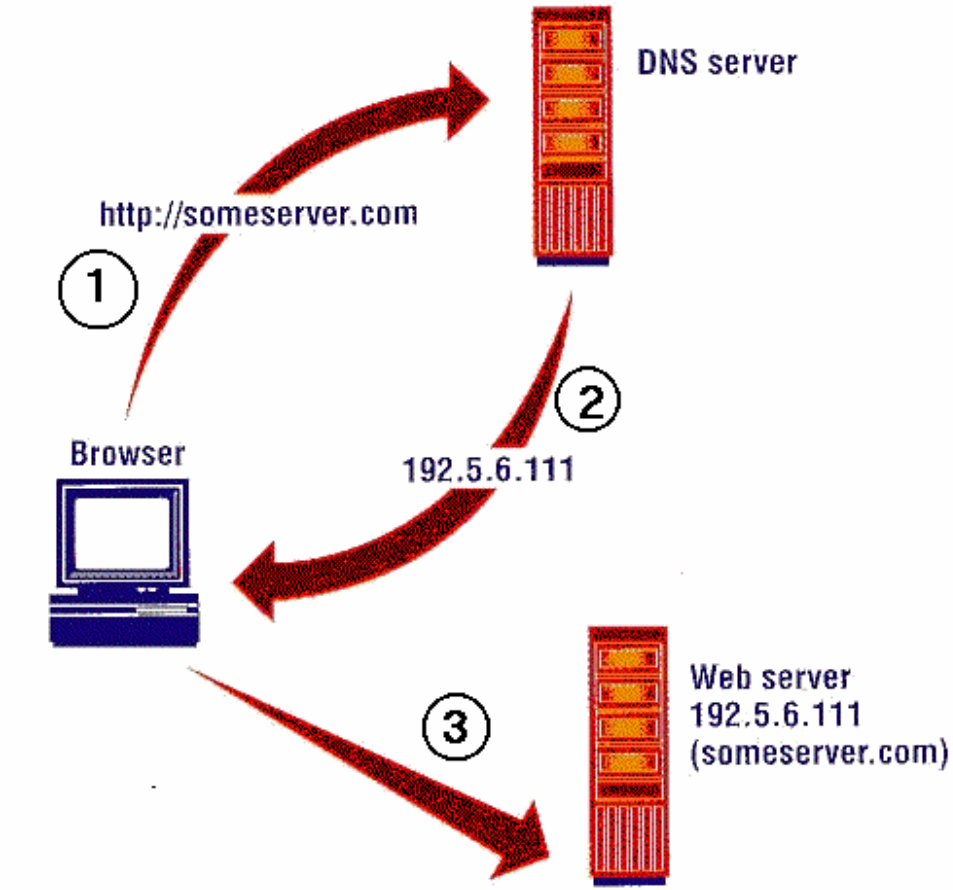
TCP/IP

- *Transmission Control Protocol/Internet Protocol (TCP/IP)* is by far the most common protocol on internal networks and is the protocol of the Internet.
- TCP/IP requires more configuration than other protocols but is the most robust, can be used on very large networks, and is routable.
- The term *routable* refers to the ability to send data to other subnetworks, typically connected by a bridge or router.
- TCP/IP allows for cross-platform communication.
- That means that computers using different OSes (such as Windows and Unix) can send data back and forth, as long as they are both using TCP/IP.
- Each computer in a Windows TCP/IP network must be configured with a computer name and workgroup (or domain) and a unique IP address.
- An *IP address* is a 128-bit address that is indicated by four numbers from0–255, each separated by a period. An example IP address is 238.14.82.31.

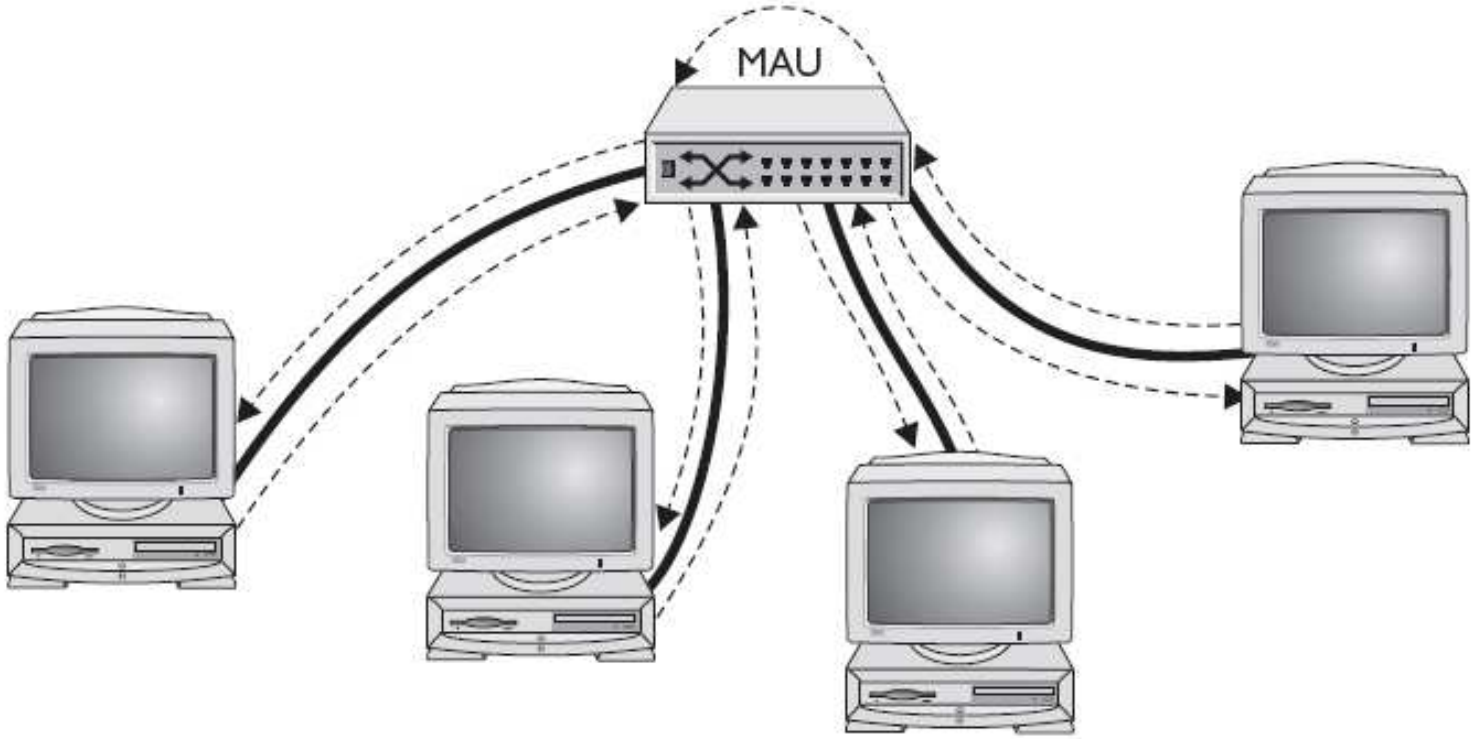
TCP/IP


IP address is used to
route data around the Internet
TCP part allows applications
to communicate over the network
Application 1
Application 2
Router
Router
Router
Router
Application 1
Application 2
Network
Data Link
Physical
A router routes with
the network address
(such as the IP address)

TCP/IP and DNS

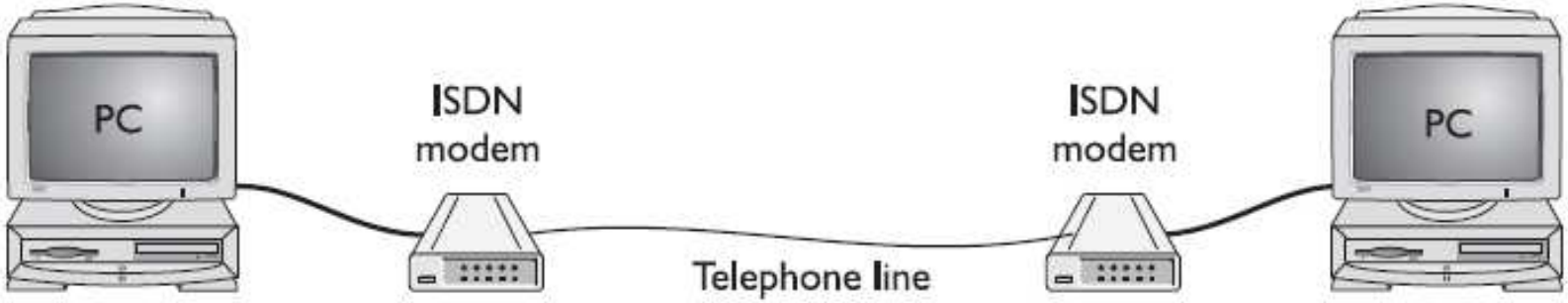


Connection through MAU



A conceptual ring on a physical star network
MAU: Multiple Access Unit

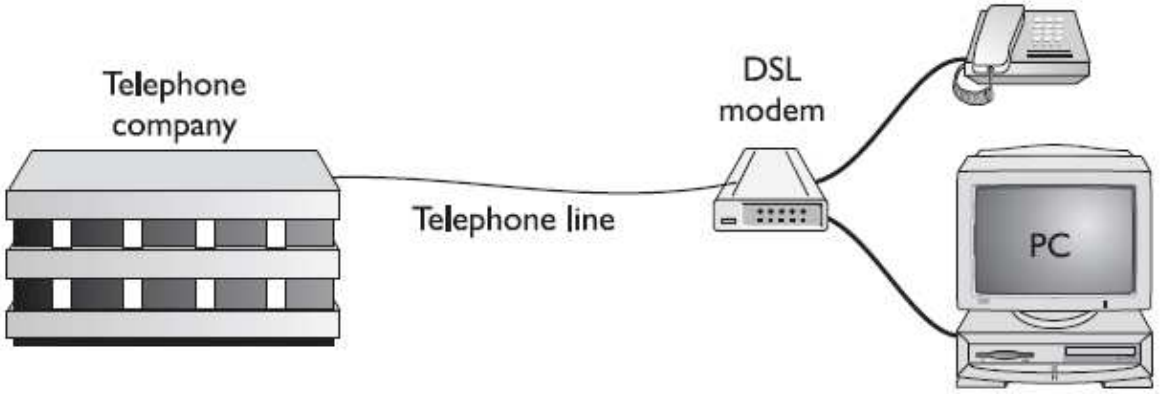
ISDN



An ISDN network connection between two computer systems

• Integrated Service Digital Network (ISDN) was an early international standard for sending voice and data over digital or normal telephone wire;
• These days it is being largely replaced by newer technologies such as DSL and cable.
• ISDN uses existing telephone circuits or higher speed conditioned lines to get speeds of either 64K or 128K.

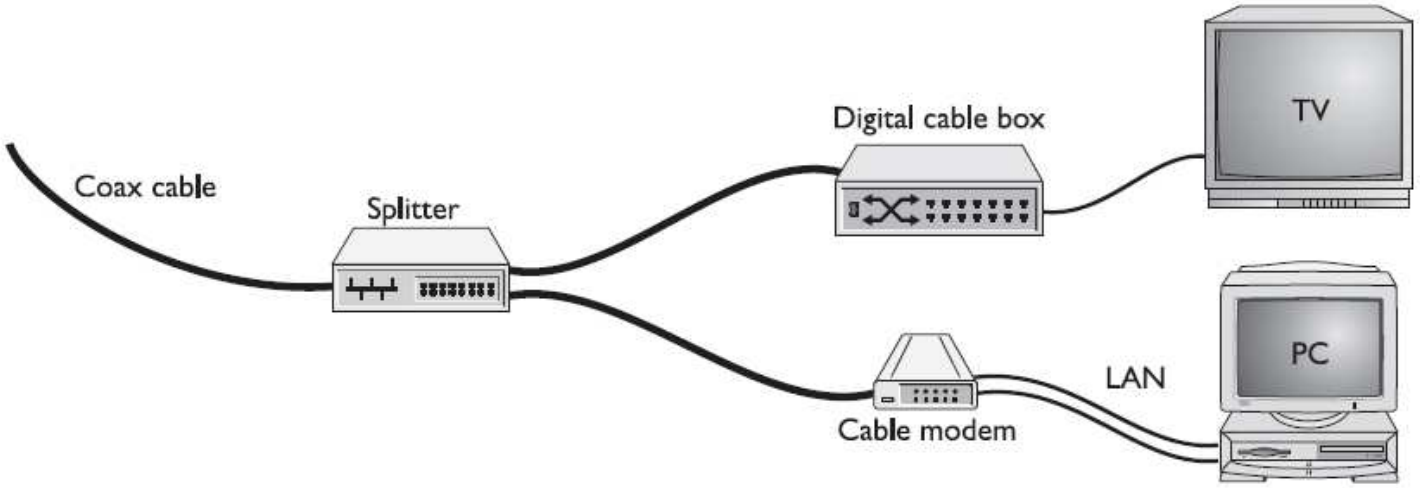
DSL



DSL connection showing both data and voice over a single phone line

- Digital subscriber line (DSL) is a relatively new entry into the data market.
- DSL uses existing copper telephone wire for the communications circuit.
- The existing phone line is split into two bands to accomplish this, and the frequency below 4,000Hz is reserved for voice transmission while everything else is used for data transmission.

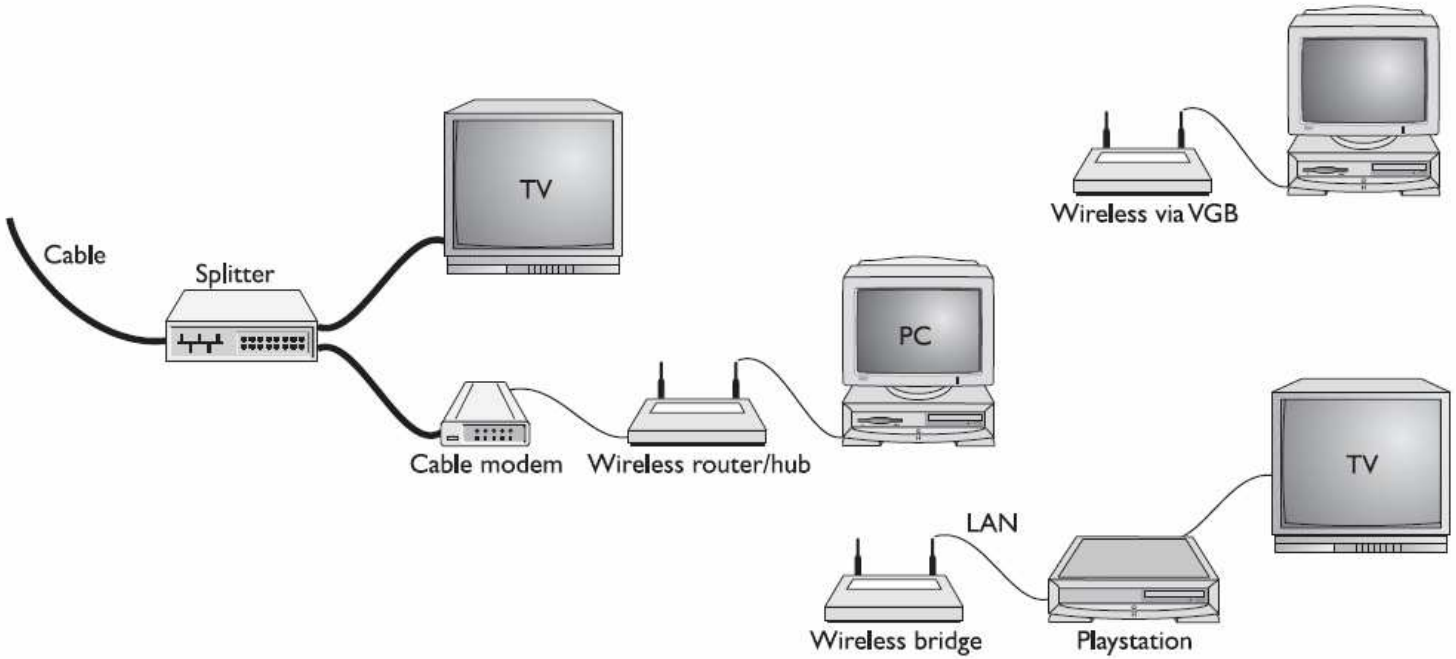
Cable connection



Cable modem configuration in a house

•Cable communications or cable modems use existing cable TV connections for data transmission.
•The cable provider uses an existing channel in the cable network for data communications, which are connected via a cable modem.
•The cable modem provides a network connection for a local computer or is installed directly in a PC system.
•This allows for very high-speed, always-on networking for clients that have
•cable TV installed.

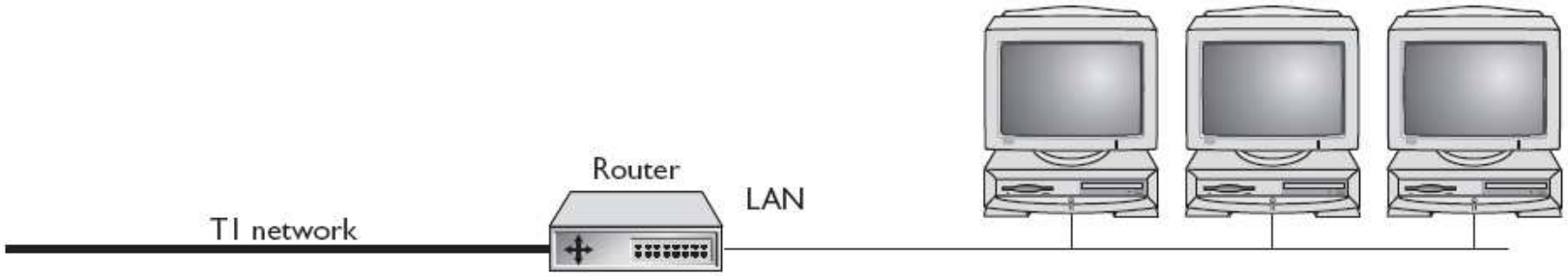
Home network



Typical home network environment using a wireless router

In this example, the teenage son even has his Sony Playstation connected to the Internet using a wireless bridge.
The Playstation provides a LAN connection option using the 802.3 Ethernet standard.

Router



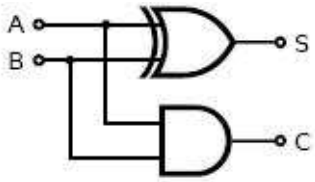
A router connecting a LAN to an T-1 network

Keep in mind

Exp.	Explicit	Prefix	Exp.	Explicit	Prefix
10^{-3}	0.001	milli	10^{3}	1,000	Kilo
10^{-6}	0.000001	micro	10^{6}	1,000,000	Mega
10^{-9}	0.000000001	nano	10^{9}	1,000,000,000	Giga
10^{-12}	0.000000000001	pico	10^{12}	1,000,000,000,000	Tera
10^{-15}	0.000000000000001	femto	10^{15}	1,000,000,000,000,000	Peta
10^{-18}	0.000000000000000001	atto	10^{18}	1,000,000,000,000,000,000	Exa
10^{-21}	0.000000000000000000001	zepto	10^{21}	1,000,000,000,000,000,000,000	Zetta
10^{-24}	0.000000000000000000000001	yocto	10^{24}	1,000,000,000,000,000,000,000,000	Yotta

Binary

Decimal	Binary
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
10	1010



The circuit diagram for a binary half adder, which adds two bits together, producing sum and carry bits.

$0 + 0 \rightarrow 0$
$0 + 1 \rightarrow 1$
$1 + 0 \rightarrow 1$
$1 + 1 \rightarrow 0$, carry 1 (since $1 + 1 = 0 + 1 \times 10$ in binary)

There are 10 kinds of people in the world, those that understand binary and those that don't.

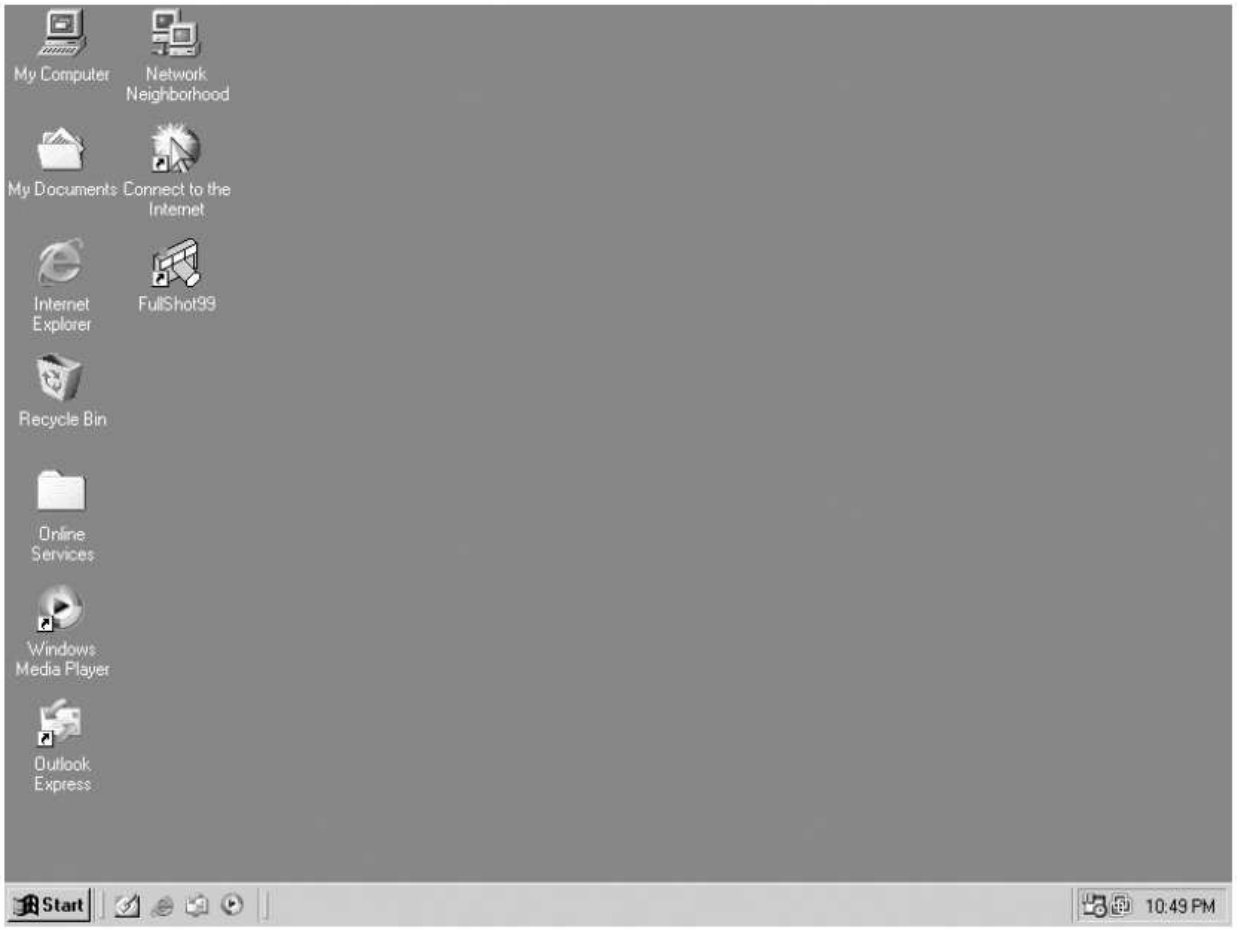
Binary system

Decimal	Hexadecimal	Binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111

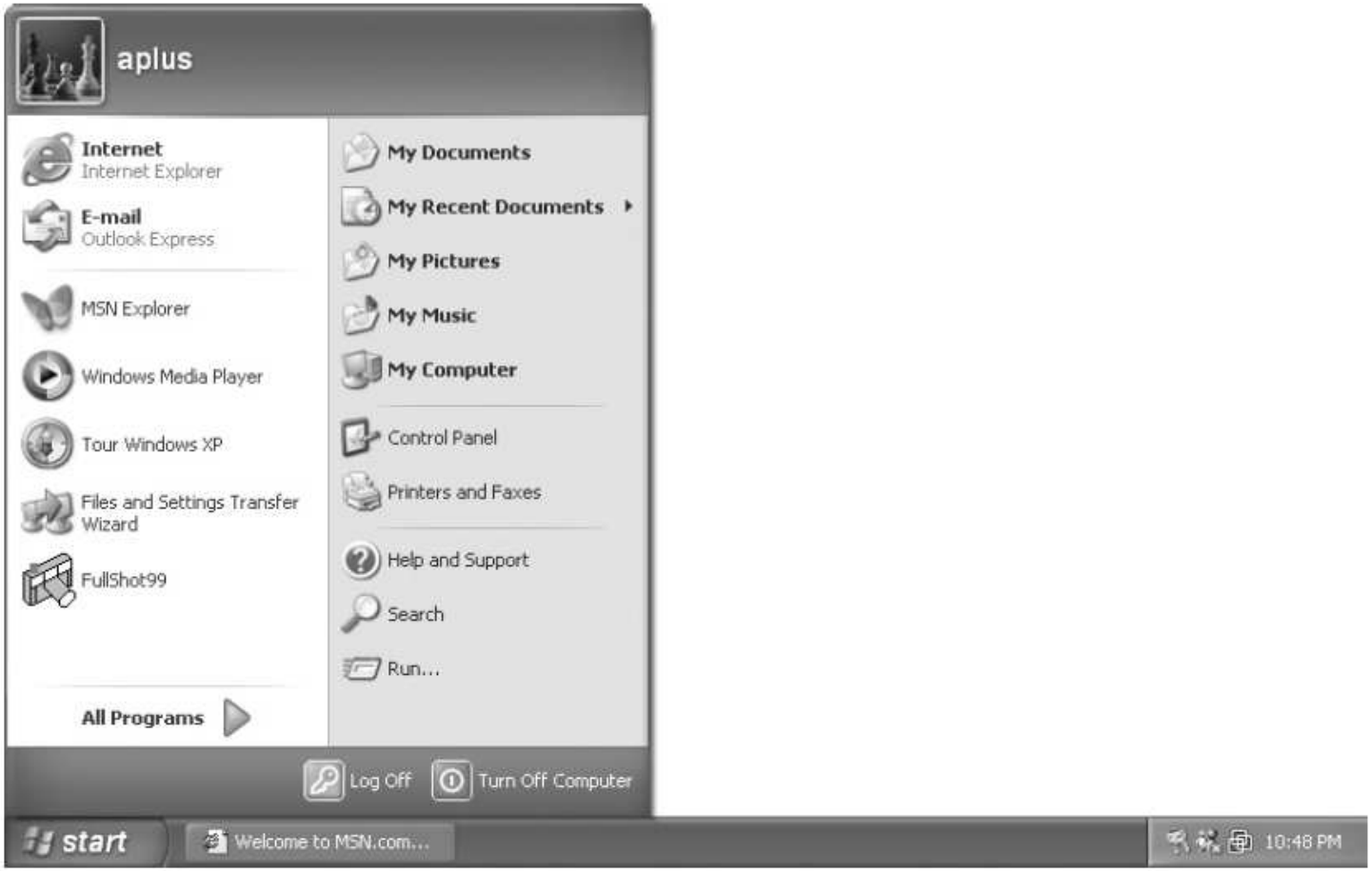
Decimal	Hexadecimal	Binary
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

Windows Operating System

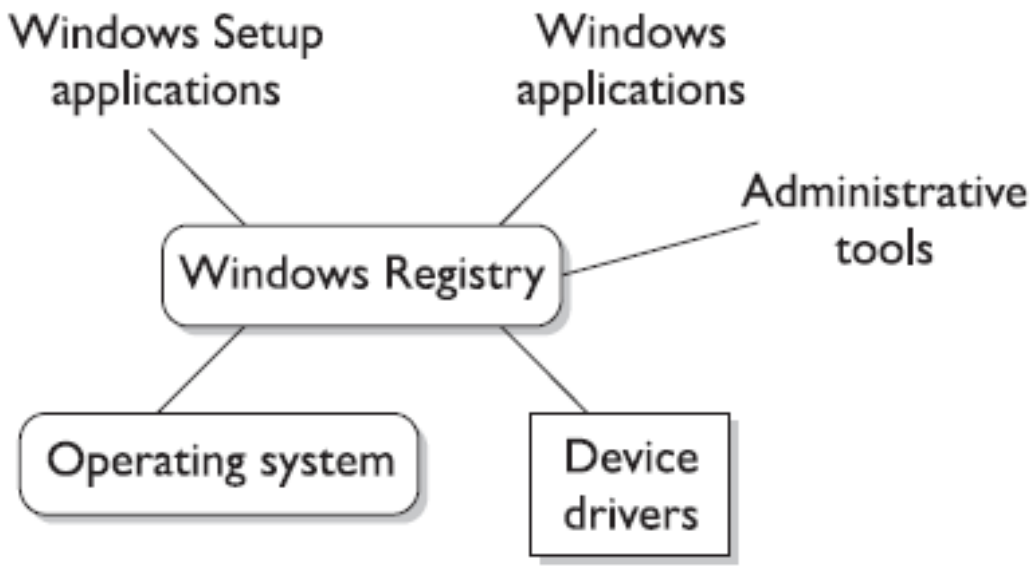
The Windows 9*x* desktop



Start

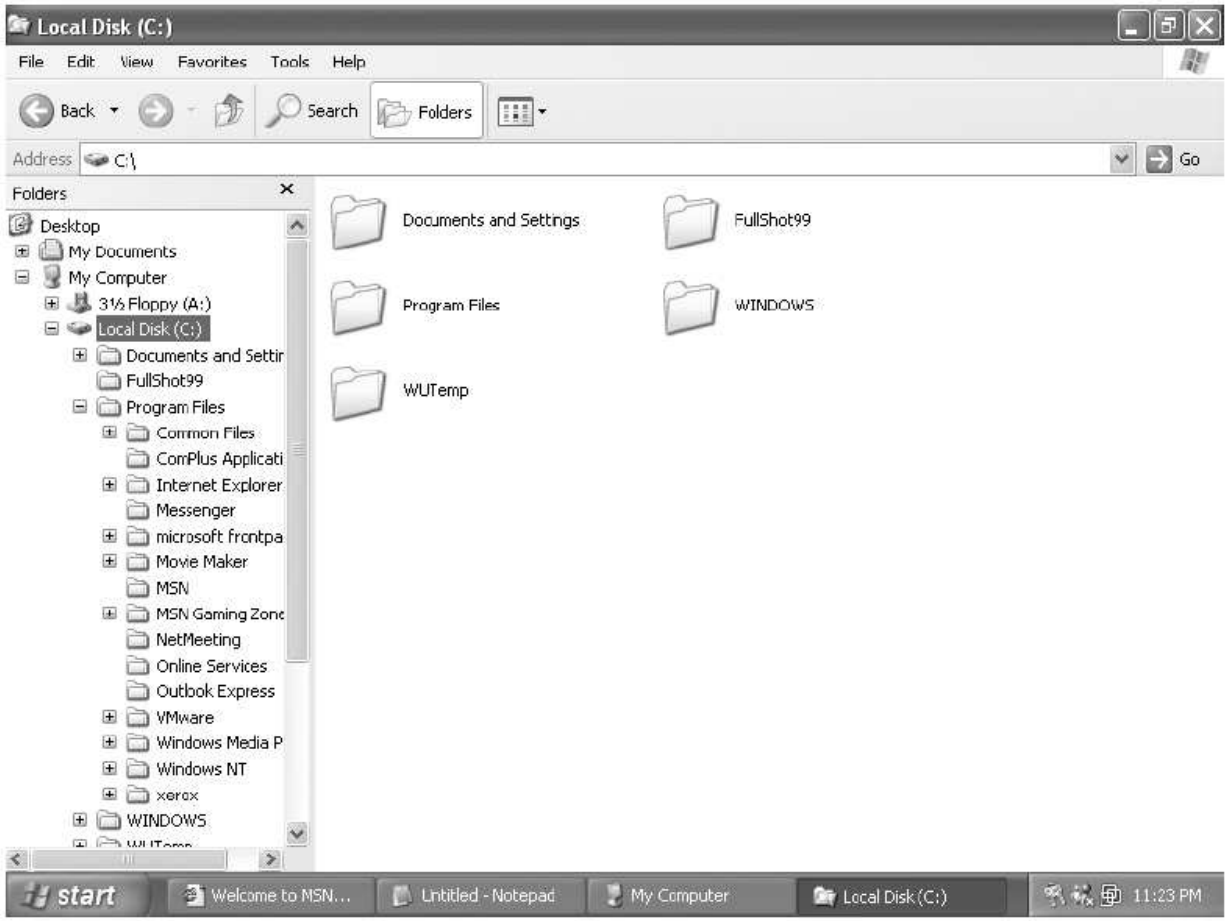

aplus
Internet
Internet Explorer
E-mail
Outlook Express
MSN Explorer
Windows Media Player
Tour Windows XP
Files and Settings Transfer Wizard
FullShot99
All Programs
My Documents
My Recent Documents
My Pictures
My Music
My Computer
Control Panel
Printers and Faxes
Help and Support
Search
Run...
Log Off
Turn Off Computer
start
Welcome to MSN.com...
10:48 PM

Registry



The Registry is a database-oriented environment that Microsoft introduced in Windows 95 to make the task of tracking configuration, applications settings, and other system information easier to maintain.

Explorer


Local Disk (C:)
File Edit View Favorites Tools Help
Back Search Folders
Address C:\
Go
Folders
Desktop
My Documents
My Computer
3½ Floppy (A:)
Local Disk (C:)
Documents and Settir
FullShot99
Program Files
Common Files
ComPlus Applicati
Internet Explorer
Messenger
microsoft frontpa
Movie Maker
MSN
MSN Gaming Zone
NetMeeting
Online Services
Outbok Express
VMware
Windows Media P
Windows NT
xerox
WINDOWS
Documents and Settings
FullShot99
Program Files
WINDOWS
WUTemp
start
Welcome to MSN...
Untitled - Notepad
My Computer
Local Disk (C:)
11:23 PM

Determining the Operating System Type

1. Right-click the My Computer icon.
2. Select Properties from the shortcut menu that appears. The System Properties dialog box will appear.
3. Ensure that the General tab is displayed. The OS version and edition are listed under System.

File Extentions

Extension	Function or Application
EXE	An executable file (a program)
BAT	A batch file (a program)
COM	A command file (a program)
DOC	A document, typically associated with Microsoft Word or WordPad
BMP	A bitmap (graphic)
SYS	A system file
TXT	A text file
CFG	A configuration file

SCENARIO & SOLUTION

What is the purpose of a file's extension?	To identify the file type or the application with which it is associated.
What is an .EXE file?	An executable file—a program or small application. When you double-click its icon, the application will be launched.

Minimum Configurations for Windows Systems

	Windows 95	Windows 98	Windows NT	Windows 2000	Windows XP
Processor	386DX	486DX 66	Pentium	Pentium 133	Pentium 233
RAM	4MB	16MB	16MB	64MB	64MB
Hard Disk	55MB	165MB FAT16 175MB FAT32	110MB	2GB	1.5GB

Recommended Configurations for Windows Systems

	Windows 95	Windows 98	Windows NT	Windows 2000	Windows XP
Processor	486DX	Pentium	Pentium	Pentium 300	Pentium III
RAM	8MB	24MB	32MB	128MB	128MB
Hard Disk	84MB	355MB	200MB	3GB	3GB
Video	SVGA	SVGA	SVGA	SVGA	SVGA

Viruses

SCENARIO & SOLUTION	
Where do viruses come from?	They are created by programmers. They are spread via the Internet, sharing disks, and e-mail.
What is the function of a virus?	To replicate itself and deliver its payload, which is the effect the virus has on the computer, such as deleting files or displaying messages.
How can I prevent viruses from attacking my system?	Keep an antivirus utility running in the background. Do not start the computer with floppies in the drive unless necessary. Scan all incoming files.
How can I eradicate a virus from my system?	Run an antivirus utility. If the virus is not detected and removed, get the latest utility update from the manufacturer.

Linux

Mandriva Linux

ALinux


32G Media
HOWTO
Xterm
5.0G Media
Home
Yahoo
8.0M Removable...
Icq
http://icecast.org/
CDROM
MC
http://shoutcast.c...
GHOST_DOG
MSN
http://www.webtvliste...
Xgames
Mozilla
sGMixer
Floppy
System
G-FTP
Trash
Gimp
WWW
aLinux™
Start

Linux

- Linux is an operating system just like Windows.
- Linux is open-source that means you can freely use and modify it.
- There are many versions of Linux
  - Ubuntu
  - Suse
  - Fedora
  - Red Hat and more….
- Most Linux versions now support most of the available devices in the market.
- Linux open-source projects offer thousands of programs (**packages**) for free. You can download and use them without any fee.
- There are linux packages for almost everything:
  - Astronomy, statistics, business, finance, chemistry, computer science.
-

Microsoft Office

- A suite of software programs for office utilities
- Microsoft Word
  - Document processing
  - First released in 1983 under the name **Multi-Tool Word**
  - Word 5.0, Word 6.0, Word 98, word 2000, Word XP, Word 2003, Word 2008, Word 2010.
  - Some extensions: .doc or .docx file extensions.
- Microsoft Excel
  - a spreadsheet-application
  - marketed a spreadsheet program called Multiplan in 1982,
  - Calculation, graphing tools, pivot tables and a macro programming language called VBA (Visual Basic for Applications).
  - Excel 2002 included in Windows XP, Excel 2003 included in Office 2003.
  - Some extensions: .xls or .xlc extenions

Microsoft Office

- Microsoft Access
  - a relational database management system
  - combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools.
  - released in November 1992
  - It is used by programmers and non-programmers to create their own simple database solutions.
  - Access 2003: Windows 2000, XP, Vista.
- Microsoft PowerPoint
  - Create complex presentations
  - PowerPoint was initially developed on 14 August 1984 Forethought, Inc. of Sunnyvale, California. Then it was bought by Microsoft for $14 Million USD.
  - PowerPoint 2003, PowerPoint 2007.

Microsoft Office

- Microsoft FrontPage
  - is a WYSIWYG (what you see is what you get) HTML editor and web site administration tool
  - It was branded as part of the Microsoft Office suite from 1997 to 2007.
  - FrontPage was initially created by the Cambridge, Massachusetts company Vermeer Technologies Incorporated, 1996.
  - FrontPage 2002 in Office XP
  - FrontPage 2003 not included anymore in Microsoft Office but sold separately.

Open Office

- **OpenOffice.org** (**OO.o** or **OOo**), commonly known as **OpenOffice.**
- Office application suite available for a number of different computer operating systems.
- It is distributed as free software and written using its own GUI toolkit. It supports the ISO/IEC standard OpenDocument Format (ODF).
- OpenOffice.org was originally derived from StarOffice, an office suite developed by StarDivision and acquired by Sun Microsystems in August 1999.
-

OpenOffice.org compatibility with Operating Systems

- FreeBSD: v3.1
- Linux
- OpenBSD
- Solaris
- Mac OS X v10.2: up to v1.1.2
- Mac OS X v10.3: up to v2.1
- Mac OS X v10.4–v10.5 (PowerPC): up to v2.4.1 (v3.0 under test)
- Mac OS X v10.4–v10.5 (Intel): v3.1
- Mac OS X v10.6: v3.1 [23]
- Windows 95: up to v1.1.5
- Windows 98–ME: up to v2.4.3
- Windows 2000–Vista: v3.1
- OS/2 and eComStation: up to v2.4.0 (v3.0 under test)

OpenOffice.org components

- Writer
  - A word processor similar to Microsoft Word and WordPerfect. It can export Portable Document Format (PDF) files with no additional software, and can function as a basic WYSIWYG editor for creating and editing web pages.
- Calc
  - A spreadsheet similar to Microsoft Excel and Lotus 1-2-3. Calc provides a number of features not present in Excel, including a system which automatically defines series for graphing, based on the layout of the user's data. Calc can also export spreadsheets to the PDF format. (See ooWriter entry, above, for details of PDF).

OpenOffice.org components

- **Impress**
  - A presentation program similar to Microsoft PowerPoint and Apple Keynote. It can export presentations to Adobe Flash (SWF) files, allowing them to be played on any computer with a Flash player installed. It also includes the ability to create PDF files, and the ability to read Microsoft PowerPoint's .ppt format. Impress lacks ready-made presentation designs. However, templates are readily available on the Internet
- **Base**
  - A database management program similar to Microsoft Access. Base allows the creation and manipulation of databases, and the building of forms and reports to provide easy access to data for end-users. As with Access, Base may be used as a front-end to a number of different database systems, including Access databases (JET), ODBC data sources and MySQL/PostgreSQL. Base became part of the suite starting with version 2.0. Native to the OpenOffice.org suite is an adaptation of HSQL. While Base can be a front-end for any of the databases listed, there is no need for any of them to be installed. Raw SQL code can be entered by those who prefer it, or graphical user interfaces can be used.

OpenOffice.org components

- **Draw**
  - A vector graphics editor and diagramming tool, similar to Microsoft Visio and comparable in features to early versions of CorelDRAW. It features versatile "connectors" between shapes, which are available in a range of line styles and facilitate building drawings such as flowcharts. It has similar features to Desktop publishing software such as Scribus and Microsoft Publisher. Draw can also export its creations to the PDF format. (See ooWriter entry, above, for details of PDF).
- Math
  - A tool for creating and editing mathematical formulae, similar to Microsoft Equation Editor. Formulae can be embedded inside other OpenOffice.org documents, such as those created by Writer. It supports multiple fonts and can export to PDF.

OpenOffice.org components

- OpenOffice.org Basic
  - A programming language similar to Microsoft Visual Basic for Applications (VBA) based on StarOffice Basic.
- OpenOffice.org pioneered the ISO/IEC standard OpenDocument file formats (ODF), which it uses natively, by default.
- It also supports reading (and in some cases writing) many legacy and current proprietary file formats (e.g.: WordPerfect through libwpd, StarOffice, Lotus Software, MS Works through libwps, Rich Text Format), most notably including Microsoft Office formats.
- Sun Microsystems has developed an ODF plugin for Microsoft Office which enables users of Microsoft Office Word, Excel and PowerPoint to read and write ODF documents.

End of Lesson 1

- Readings
  - Slides: take these from course website