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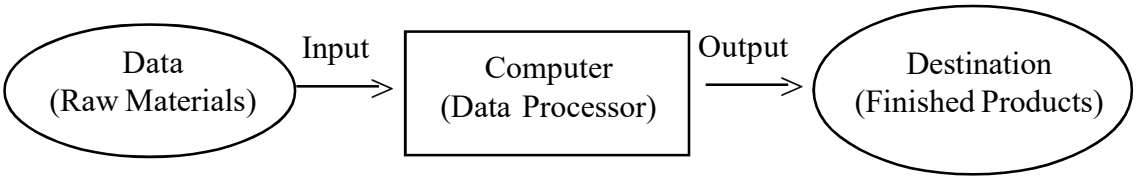
FUNDAMENTALS OF COMPUTER

* Computer referred to as data processor because it can store, process and retrieve data whenever desired.

* The activity of processing data using a computer is called data processing.

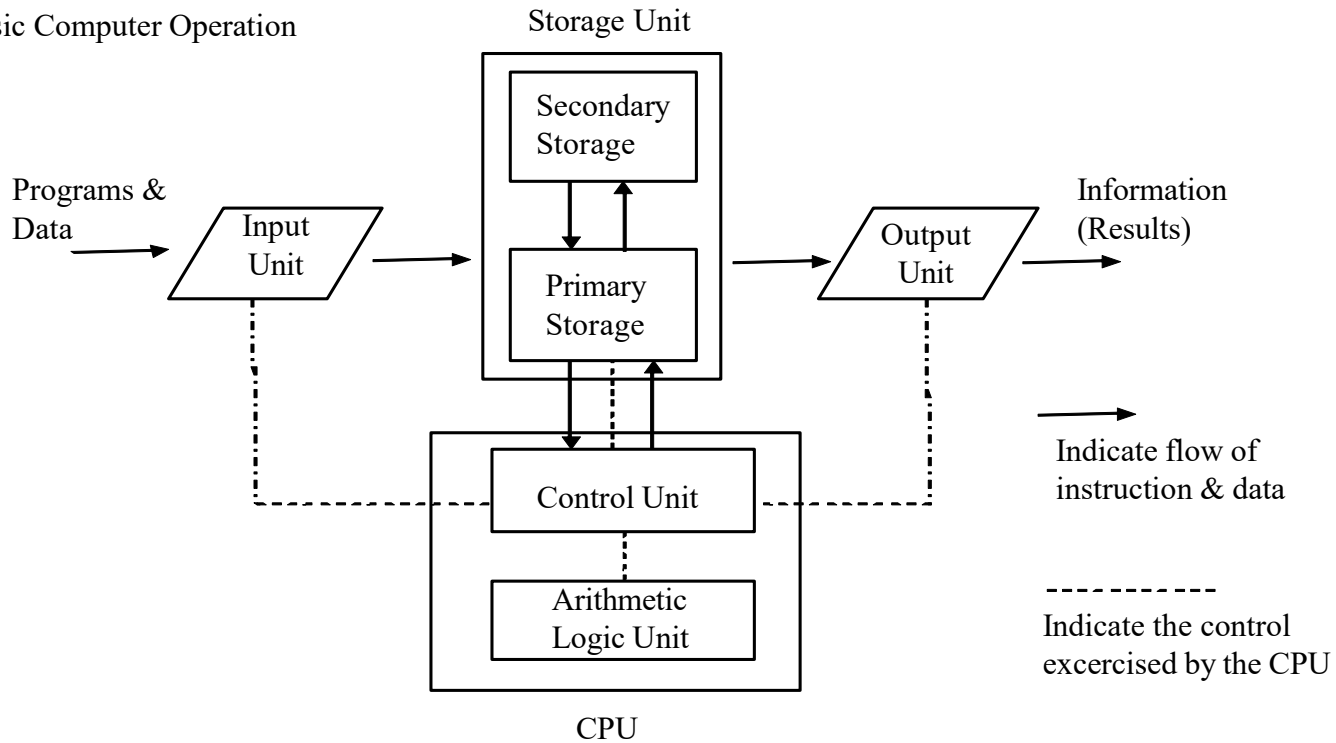


* Characteristics:
    1. Automatic - Carries out a job without human intervention
    2. Speed - Can perform several billion (10^9), trillion (10^{12}) operation per second
    3. Accuracy
    4. Diligence - Free from tiredness, lack of concentration
    5. Versitility - Wide variety of task
    6. Memory - Store huge amount of information
    7. No I.Q and no feelings.

* Blaise Pascal - First mechanical adding machine in 1642. Charles Babbage considered as Father of Computing design "Difference Engine" in 1822.

* 1st Generation (1942-1955) used Vacuum Tubes
2nd Generation (1955-1964) used Transistors
3rd Generation (1964-1975) used Integrated Circuit (Small Scale Integrator has 10 to 20 chips, Middle Scale Integrator has upto 100 chips)
4rd Generation (1975-1989) used Integrated Circuit (Large Scale Integrator has 30,000 chips, Very Large Scale Integrator has 1 Million chips)
5th Generation (1989-Present) used Integrated Circuit (Ultra Large Scale Integrator has 10 Million Chips)

* Basic Computer Operation



1. Inputting : Process of entering data & instructions into computer system
2. Storing : Process of saving data & instructions and used them when required
3. Processing : Perform arithmetic & logical operations on data
4. Outputting : Process of producing information on results for user
5. Controlling : Directing the manner & sequence of operations

* Primary Storage/Main Memory : Expensive, fast as CPU can access it directly. Volatile and it loses the information in it as soon as the computer system switches off or reset

* Secondary/Auxiliary Storage : Cheaper, non-volatile and it can retain information even when the computer system switches off or resets.

* Central Processing Unit (CPU) : Control Unit (CU) + Arithmetic Logic Unit (ALU) known as Brain of computer system and acts as central nervous system for computer. When entire CPU (CU+ALU) is contained on a single chip, it is called Micro-processor.

* Registers : Number of special memory units. Holds information on temporary basic and not part of CPU (Not main memory)
Memory Address(MAR): Holds address of the active memory location.
Memory Buffer(MBR): Holds information on its way, to & from memory
Program Control(PC): Holds address of the next instruction to be executed
Accumulator(A): Holds data to be operate & results
Instruction(I): Holds current instruction under execution
Input/Output(I/O): Communicates with I/O devices

* Processor Speed/Computer's Clock Speed : Pulses produced per second. Measured in MegaHertz (MHz) of GigaHertz(GHz)
Complex Instruction Set Computer (CISC)
Reduced Instruction Set Computer (RISC)
Explicity Parallel Instruction Computing (EPIC)

* Memory Read/Write Operation : Act of Retrieving data from storage location in Memory read and act of entering data into a storage location is Memory Write.

* Memory Capacity : 4 Bits (Half Byte) is known as Nibble
8 bit = 1 Byte ;
1024 Byte = 1 KiloByte (KB, 10^3) ;
1024 KB = 1 MegaByte (MB, 10^6)
1024 MB = 1 GigaByte (GB, 10^9)
1024 GB = 1 TeraByte (TB,10^{12})

* Memory Chips :
Random Access Memory (RAM) - Volatile and writable
Static RAM : Doesnot need special regenerator circuit to retain the stored data
Dynamic RAM : Use external circuit to regenerate or regresh storage charge to retain the stored data

Read Only Memory (ROM) - Non-volatile and read only
Manufacturer/Programmed - Users cannot alter data
User Programmed (ProgrammableROM) - User can program it. Once programmed, cannot alter the data
Erasable PROM - Users can re-program to store new information
Ultra-Violet EPROM - Requires exposing the chip to Ultra-Violet light for erasing information
Electrically EPROM - Requires high voltage electric pulses for erasing information

* Cache Memory : Extremely fast, small memory between CPU and main memory. Store temporarily very active data and instructions during processing.

* Primary storage has limited capacity and volatile. But Auxiliary/Secondary storage is non-volatile and has lower cost per bit stored, but operates generally at speeds far slower than that of primay storage.

* Sequential Access Storage is one in which the arrival at a desired location is preceded by sequencing through other locations so that access times varies according to locations. Direct Access/Random Access Storage is one in whgich we can reach and access any storage locations at random

* Secondary Storage Devices

Magnetic Tapes : Its surface has a coating (Iron Oxide or Chromium Oxide) that can record data by magnetization. There are 1/2 inch tape cartridge, 1/4 inch streamer tape and 4mm Digital tape.

Magnetic Disk : Is a thin, circular plate/platter made of metal or plastic and coated on both sides with a recording material which can be magnetized. Eg : Floppy and Hard Disk

Optical Disk : Consists of metallic or plastic coated with a highly reflective material.

Eg : CD-ROM, WORM (CD-R), CD-RW and DVD

Memory Storage Device : Flash Drive (Pen Drive) and Memory Card

* Access Time : Is the interval between a computer makes a request for transfer of data from a disk system to a primary storage and the time this operations completes

Seek time, Latency (Time required to spin the specified sector under the head), Transfer rate.

* Input Device : Device that accepts data form outside world and translate them into a form a computer can interpret

Keyboard, Mouse (Mechanical(Optical), TrackBall, JoyStick, Touch Screen), Data Scanning Device (OCR, OMR, Bar-Code Reader, MICR)

* Output Device : Device that accepts data form a computer and translates them into a form suitable for use by the users

Monitors - CRT and LCD

Printers

Dot-Matrix : Print one character at a time

Ink-Jet : From character and images by spraying small drops of ink on paper. One character at a time. 360 Dots per Inch (DPI)

Drum Printer and Chain/Band Printer : Entire line at a time

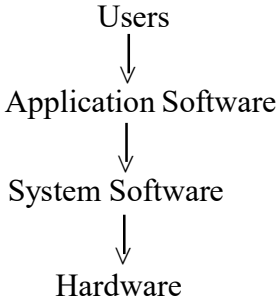
Laser Printer : One page at a time. 600 DPI

Drum and Flatbed Plotter and Projector

* Software : Set of program, procedures, documents describing the program and how they are to be used.

System Software : Set of one or more programs which controls the operation and/or extends the processing capability of a computer system. Eg: OS, Programming language translators, utility programs, performance monitoring software and communication software

Application Software : Set of one or more programs, which solves a specific problems or does a specific tasks. Eg: Word-processing, Spreadsheet software, Education software, Entertainment software.



* Software Development Life Cycle (SDLC)

Requirement Specification -> System Analysis and Design -> Implementation (Construction or Code Generation) -> Testing and Debugging -> Deployment (Installation) -> Maintenance

* Computer Language : A language acceptable to a computer system

Machine Language - A programming language that a computer understands without using a translation program. Normally written as strings of binary 0's and 1's.

Assembly Lanugage : It allows representations of instructions and storage locations by letters and symbols instead of numbers. Machine & Assembly language are referred to as low level language.

The Symbols used in the Assembly language are Mnemonics. Assembler converts Assembly language to Machine language

A high-level language (HLL) is a programming language such as C, FORTRAN, or Pascal that enables a programmer to write programs that are more or less independent of a particular type of computer. Such languages are considered high-level because they are closer to human languages and further from machine languages

Object-oriented programming (OOP) refers to a type of computer programming (software design) in which programmers define not only the data type of a data structure, but also the types of operations (functions) that can be applied to the data structure. In this way, the data structure becomes an object that includes both data and functions. In addition, programmers can create relationships between one object and another. For example, objects can inherit characteristics from other objects

* The following are some of the important characteristics of a good programming language –

The language must allow the programmer to write simple, clear and concise programs.
The language must be simple to use so that a programmer can learn it without any explicit training.
The language must be platform independent. That is, the program developed using the programming language can run on any computer system.
The Graphical User Interface (GUI) of the language must be attractive, user-friendly, and self-explanatory.
The function library used in the language should be well documented so that the necessary information about a function can be obtained while developing application.
Several programming constructs supported by the language must match well with the application area it is being used for.
The programs developed in the language must make efficient use of memory as well as other computer resources.
The language must provide necessary tools for development, testing, debugging, and maintenance of a program. All these tools must be incorporated into a single environment known as Integrated Development Environment (IDE), which enables the programmer to use them easily.
The language must be consistent in terms of both syntax and semantics.

* Compiler is a translator program that translates (converts) a high level language (Source Program) into its equivalent machine language (Object Program). It detects and indicate error in the program (Syntax Error). It cannot detect logic error.

* Interpreter : Translates high level language into machine language. It interpret/takes one statement, executes before the next statement.

* Classification of Computer : Traditionaly, computers were classified as MicroComputer, MiniComputer, Mainframes and Super Computer based on their size, speed and cost. Todays computers were classified based on their mode of use: Noteboook/Laptop, Personal Computer, Work Stations, Mainframe Systems, Super Computer, Client/Server Computer and Hand held Computer.

* The characteristics of the CU or control unit are as follows:
- This part of the of the CPU is the one that is in charge of all the operations being carried out.
- It is responsible to direct the system to execute instructions.
- It helps in communication between the memory and the arithmetic logical unit.
- It also aids in the loading of data and instructions residing in the secondary memory to the main memory as required.

* The characteristics of the ALU are as follows:
- The ALU is responsible for performing all logical and arithmetic operations.
- Some of the arithmetic operations are as follows: addition, subtraction, multiplication and division.
- Some of the logical operations are as follows: comparison between numbers, letter and or special characters.
- The ALU is also responsible for the following conditions: Equal-to conditions, Less-than condition and greater than condition.

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OPERATING SYSTEM

* An **Operating System** or **OS** is a software program that enables the computer hardware to communicate and operate with the computer software. Without a computer operating system, a computer and software programs would be useless. Examples are Microsoft Windows (XP, 7,8,10), Apple Mac OS, Ubuntu etc.

Important functions of an operating System :

Memory Management

1) Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.
2) In multiprogramming, the OS decides which process will get memory when and how much.
3) Allocates the memory when a process requests it to do so.
4) De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

1) Keeps tracks of processor and status of process. The program responsible for this task is known as traffic controller.
2) Allocates the processor (CPU) to a process.
3) De-allocates processor when a process is no longer required.

Device Management

1) Keeps tracks of all devices. Program responsible for this task is known as the I/O controller.
2) Decides which process gets the device when and for how much time.
3) Allocates the device in the efficient way.
4) De-allocates devices.

File Management

1) Keeps track of information, location, uses, status etc. The collective facilities are often known as file system.
2) Decides who gets the resources.
3) Allocates the resources.
4) De-allocates the resources.

Security : By means of password and similar other techniques, it prevents unauthorized access to programs and data.

Control Over System Performance : Recording delays between request for a service and response from the system.

Job Accounting : Keeping track of time and resources used by various jobs and users.

Error Detecting Aids : Production of dumps, traces, error messages, and other debugging and error detecting aids.

Coordination Between Other Software And Users : Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

* When referring to an operating system or GUI, the **Desktop** is a system of organization of icons on a screen. Some of the most common icons on the Desktop include those for My Computer, Recycle Bin, your Internet browser (e.g., Internet Explorer), and My Documents. On the Windows Desktop, you also have access to the Windows Start Menu through the Start button on the Taskbar, as well as the Windows Notification Area.

* An **Icon** is a small graphical representation of a program or file. When you double-click an icon, the associated file or program will be opened.

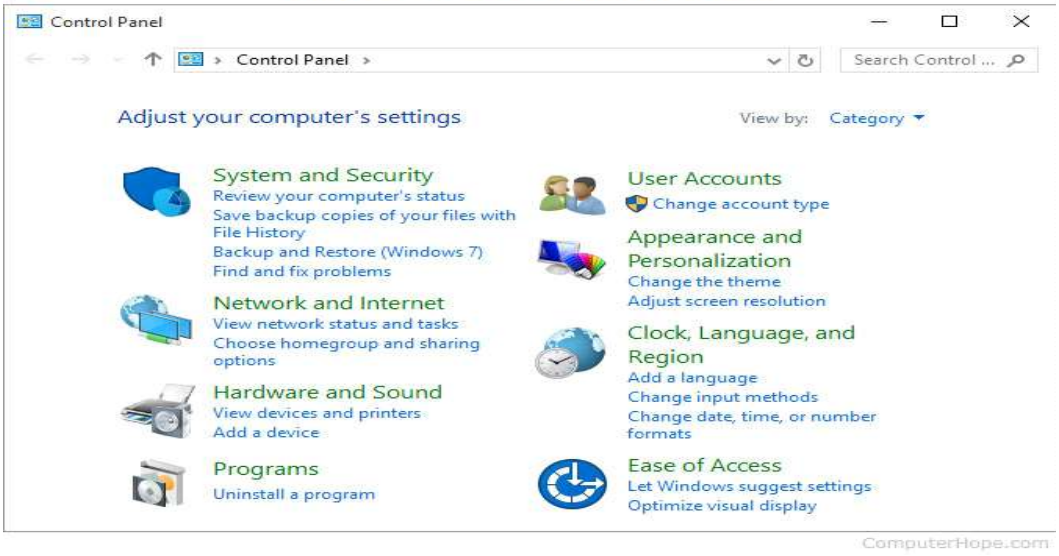
* The **Taskbar** allows you to locate and launch programs through the Start button or view any program that is currently open. It also allows them to check the date and time, items running in the background through the Notification Area, and with early versions of Windows access to the Quick Launch.

* The **Microsoft Windows Start Menu** is the primary location in Windows to locate your installed programs and find any files or folders. By default, the Start Menu is accessed by clicking the Start button, located in the bottom left-hand corner of the Windows Desktop screen.

* The **Control Panel** is a section of Microsoft Windows that enables a user to change various computer hardware and software features. Settings for the mouse, display, sound, network, and keyboard represent just a few examples of what may be modified in the Control Panel

Windows 7 Control Panel

Windows 10 Control Panel



* The **Disk Defragmenter** sorts out the files on your drive(s) to optimize the space you are using. Defragmenting you drive(s) perodically is a good tool for optimizing your computers performance.

* **Check Disks**: Disk errors related to bad sectors, cross-linked files, directory errors, etc. create problems in I/O operations. The check disk tool creates a status report of the disk based on its file system.

* The **Disk Cleanup** utility helps in determining the unused files in the disk and deletes them to significantly increase the free space.

* **DIR** : Display a list of files and subfolders

Syntax : DIR [pathname(s)] [display_format] [file_attributes] [sorted] [time] [options]

Key

[pathname] The drive, folder, and/or files to display. This can include wildcards:

* Match any characters
? Match any ONE character

[display_format]

/P Pause after each screen of data.
/W Wide List format, sorted horizontally.
/D Wide List format, sorted by vertical column.

[file_attributes] /A[:]attribute

/A:D Folder /A:-D NOT Folder
/A:R Read-only /A:-R NOT Read-only

/A:H Hidden /A:-H NOT Hidden
/A:A Archive /A:-A NOT Archive
/A:S System file /A:-S NOT System file
/A:I Not content indexed Files /A:-I NOT content indexed
/A:L Reparse Point /A:-L NOT Reparse Point (symbolic link)
/A:X No scrub file /A:-X Scrub file (Windows 8+)
/A:V Integrity /A:-V NOT Integrity (Windows 8+)
/A Show all files
Several attributes can be combined e.g. /A:HD-R

[sorted] Sorted by /O[:]sortorder
/O:N Name /O:-N Name
/O:S file Size /O:-S file Size
/O:E file Extension /O:-E file Extension
/O:D Date & time /O:-D Date & time
/O:G Group folders first /O:-G Group folders last
several attributes can be combined e.g. /O:GEN

[time] /T: the time field to display & use for sorting
/T:C Creation
/T:A Last Access
/T:W Last Written (default)

[options]
/S include all subfolders.
/R Display alternate data streams. (Vista and above)
/B Bare format (no heading, file sizes or summary).
/L use Lowercase.
/Q Display the owner of the file.
/N long list format where filenames are on the far right.
/X As for /N but with the short filenames included.
/C Include thousand separator in file sizes.
/-C Don't include thousand separator in file sizes.
/4 Display four-digit years. In most recent builds of Windows this switch has no effect.
The number of digits shown is determined by the ShortDate format
set in the Control Panel.

* **MD/MKDIR** : Make Directory - Creates a new folder.
Syntax : MD [drive:]path [[drive:]path...]
Key
The path can consist of any valid characters up to the maximum path length (260 Characters. Limitation of Window Explorer not NTFS).
Naming Restrictions : The set of CMD delimiters (Comma , Semicolon ; Equals = Space ' ' Tab ' ') can be used in a folder name, but they must be enclosed in quotation marks:
MD "aa=bb" will create a folder called 'aa=bb',
MD aa=bb will create two folders 'aa' and 'bb'
MD creates any intermediate directories in the path, if needed.
For example, assuming utils does not exist then:
MD utils\downloads\Editor is the same as:
MD utils
MD utils\downloads
MD utils\downloads\Editor

* DEL: Delete one or more files.
Syntax
DEL [options] [/A:file_attributes] files_to_delete

Key : files_to_delete : A filename or a list of files, may include wildcards.
Options:
/P Give a Yes/No Prompt before deleting.
/F Ignore read-only setting and delete anyway (FORCE)
/S Delete from all Subfolders (DELTREE)
/Q Quiet mode, do not give a Yes/No Prompt before deleting.
/A Select files to delete based on file_attributes
file_attributes:

R Read-only	-R NOT Read-only
A Archive	-A NOT Archive
S System	-S NOT System
H Hidden	-H NOT Hidden
I Not content indexed	-I content indexed files
L Reparse points	-L NOT Reparse points
X No scrub file attribute	-X Scrub file attribute (Windows 8+)
V Integrity attribute	-V NO Integrity attribute (Windows 8+)

Wildcards: These can be combined with part of a filename.
'*' - Match any characters
'?' - Match any ONE character

* **RD/RMDIR** : Delete folder(s)

Syntax :
RD pathname
RD /S pathname
RD /S /Q pathname
Key
/S : Delete all files and subfolders in addition to the folder itself. Use this to remove an entire folder tree.
/Q : Quiet - do not display Y/N confirmation

Without the /S option, RD will only delete an empty folder and RD /Q will silently fail to delete any folders that are not empty. RD does not support wildcards but you can remove multiple folders in one command:
RD C:\docs\Jan "C:\My Documents\Mar"

* **REN/RENAME :** Rename a file or files.
REN [drive:][path]SourceMask TargetMask
Examples : Rename Monday.txt as Tuesday.txt
C:\> REN Monday.txt Tuesday.txt

* **MOVE :** Move a file from one folder to another
Syntax
MOVE [options] [Source] [Target]
Key: source : The path and filename of the file(s) to move.
target : The path and filename to move file(s) to.
options:
/Y Suppress confirmation prompt, when overwriting files.
/-Y Enable confirmation prompt, when overwriting files.
Both Source and Target can be either a folder or a single file.
Examples:In the current folder
MOVE oldfile.wp newfile.doc
Full path specified
MOVE g:\department\oldfile.wp "c:\Files to Convert\newfile.doc"

* **ATTRIB** : Display or change file attributes. Find Filenames.
Syntax
ATTRIB [+ attribute | - attribute] [pathname] [/S [/D]]

Key
+ : Turn an attribute ON
- : Clear an attribute OFF
pathname : Drive and/or filename e.g. C:*.txt
/S : Search the pathname including all subfolders.
/D : Process folders as well
attributes:
R Read-only (1)
A Archive (32)
S System (4)
H Hidden (2)
extended attributes:
E Encrypted
C Compressed (128:read-only)
I Not content-indexed
L Symbolic link/Junction (64:read-only)
N Normal (0: cannot be used for file selection)
O Offline
P Sparse file
T Temporary
X No scrub file attribute (Windows 8+)
V Integrity attribute (Windows 8+)
For example, to clear the Hidden and System attributes for the RECORD.TXT file, type:
ATTRIB -S -H RECORD.TXT

* **TREE** : Display the folder structure of a drive or path as a graphical tree.
Syntax
TREE [drive:][path] [/F] [/A]
Key: [drive:][path] The startng directory for the tree listing.
/F Display the names of the files in each folder.
/A Use ASCII instead of extended characters.
Eg: Display a tree for the "C:\Program Files" folder:
tree "C:\program files"

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INTERNET TECHNOLOGY

* The Internet, sometimes called simply "the Net," is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). It was conceived by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1969 and was first known as the ARPANet. The terms Internet and World Wide Web are often used interchangeably, but they are not exactly the same thing; the internet refers to the global communication system, including hardware and infrastructure, while the web is one of the services communicated over the internet.

* Today, the Internet is growing exponentially in three different directions -- size, processing power, and software sophistication -- making it the fastest growing technology humankind has ever created:

Size. The graphs in the historical statistics show the exponential rate of growth in the number of people that use the Internet. Soon more than half the world's population will have access to the Internet.

Power. As first appreciated at the Dartmouth AI Conference in 1956, computer processors and storage continue to double in power and capacity about every 18 months, providing steadily more powerful computers for use by increasing sophisticated software.

Functionality. Software applications from routing programs to browser applications continually build on previous technology to become more sophisticated with every release, continuously evolving to incorporate new features and capabilities.

* Who Owns The Internet? If you think of the Internet as a unified, single entity, then no one owns it. There are organizations that determine the Internet's structure and how it works, but they don't have any ownership over the Internet itself. No government can lay claim to owning the Internet, nor can any company. The Internet is like the telephone system -- no one owns the whole thing. From another point of view, thousands of people and organizations own the Internet. The Internet consists of lots of different bits and pieces, each of which has an owner. Some of these owners can control the quality and level of access you have to the Internet. They might not own the entire system, but they can impact your Internet experience.

The physical network that carries Internet traffic between different computer systems is the Internet backbone. In the early days of the Internet, ARPANET served as the system's backbone. Today, several large corporations provide the routers and cable that make up the Internet backbone. These companies are upstream Internet Service Providers (ISPs). That means that anyone who wants to access the Internet must ultimately work with these companies, which include: UUNET, Level 3, Verizon, AT&T, Qwest, Sprint, IBM

* The Internet works because of a system of rules called **protocols**. By following these protocols, computers can send information across the network to other computers. As the Internet evolves, these protocols must also change. That means someone has to be in charge of the rules. There are several organizations that oversee the Internet's infrastructure and protocols. They are:

The Internet Society: A nonprofit organization that develops Internet standards, policies and education.

The Internet Engineering Task Force (IETF): An international organization with an open membership policy that has several working groups. Each working group concentrates on a specific topic, such as Internet security. Collectively, these working groups try to maintain the Internet's architecture and stability.

The Internet Architecture Board (IAB): An IETF committee, the IAB's mission is to oversee the design of Internet protocols and standards.

The Internet Corporation for Assigned Names and Numbers (ICANN): A private nonprofit corporation, ICANN manages the Internet's Domain Name System (DNS). ICANN is responsible for making sure that every domain name links to the correct IP address.

* Anatomy of Internet: The term 'Internet' includes both the hardware (satellites, cable, routing devices and computers) and the software (programs and network protocols) that enable computers to communicate with each other. Many types of hardware help the packets on their way. These are:

Hubs which link groups of computers together and let them intercommunicate through multiple ports.

Bridges which link local area networks (LANs) with each another.

Gateways which act like bridges, but also convey data between dissimilar networks.

Repeaters which amplify the data at intervals so that the signal doesn't weaken.

Routers which ensure packets of data arrive at their proper destination across different technologies, media, and frame formats.

Servers which deliver web pages and other services as requested.

Client computers which make the initial request for Internet services, and run applications to handle those services.

Cables and/or satellite communications which make the hardware connections.

Physical Internet connections are effected with:

1. Twisted wire: Two insulated copper wires twisted into pairs for ordinary telephone communications, and 4 pairs of copper cabling for Internet networks. Transmission speeds range from 2 Mbps to 100 Mbps. (Transmission speed or bandwidth is measured in bits per second, where K a thousand, M a million, and G is a thousand million.)

2. Coaxial cables: copper or aluminum wire wrapped with an insulating and flexible material: widely used for cable television systems, office buildings, and for local area networks generally. Transmission speeds range from 200 Gbps to over 500 Gbps.

3. Optical fiber cable: one or more filaments of glass fiber wrapped in protective layers: not affected by electromagnetic radiation. Transmission speeds may exceed 1000 Gbps.

Networks are commonly designated as LAN (local area network) WAN (wide area network), MAN (metropolitan area network), PAN (personal area network), VPN (virtual private network), CAN (campus area network) and SAN (storage area network).

* **Tim Berners-Lee**, a British scientist at CERN, invented the World Wide Web (WWW) in 1989. The web was originally conceived and developed to meet the demand for automatic information-sharing between scientists in universities and institutes around the world. The first website at CERN - and in the world - was dedicated to the World Wide Web project itself and was hosted on Berners-Lee's NeXT computer. The website described the basic features of the web; how to access other people's documents and how to set up your own server. On 30 April 1993 CERN put the World Wide Web software in the public domain.

In 1993, with the release of the **Mosaic web browser**, which allowed users to explore multimedia online. 1993 also saw the introduction of the first modern search engines. In this same year, Berners-Lee founded the **World Wide Web Consortium (W3C)** to help further develop ease of use and accessibility of the web, and made it a standard that the web should be available to the public for free and with no patent.

Web 2.0 is characterized by interactive websites, social knowledge sharing, user-generated content, online collaboration, embedded applications and multimedia, mobile connections, and — of course — social media.

Around the same time as the internet was making the transition to Web 2.0, the world wide web also began to see a shift away from stationary desktops and bulky laptops, as more users began to access online content via their mobile phones. At the same time, as smartphones and tablets became the dominant mobile technology, many websites also began to offer similar features and content via mobile apps, which allowed them to take advantage of features specific to mobile devices and connect to users with real-time notifications.

In 1996, that connectivity took a huge leap forward with the introduction of ICQ, a free instant messaging application. Suddenly, internet users could communicate across any distance in real time.The following year AOL released its own Instant Message program, AIM, popularizing the new technology. 1997 also saw the introduction of the world's first blogs.

Then in **2002, Friendster** introduced the world to social networking as we know it today, an online community designed to not only communicate with friends you already have, but to build new relationships through common friends and interests.

In **2003, MySpace and LinkedIn** joined the social networking arena. Targeted primarily at young adults with its flashy customizations, music integration, and built-in blogging, MySpace popularized social media to millions of users.

Three years later, the world of social media was forever changed with the public release of Facebook. Though it was launched in 2004, the site was restricted to college campuses for the first two years. After going public, the site quickly grew to hundreds of millions of users, and today it boasts over 1.5 billion active users each month.

* Basic Internet Terminologies:

Domain: While every computer has its own unique address, every user using the Internet has a unique address called a domain. A domain recognizes one or more IP addresses. An example of a domain is weather.com and is part of the URL such as http://www.weather.com. The standard top-level domains are:

com - Commercial business	edu - Educational institutions	gov - Government agencies
mil - Military	net - Networks organization	org - Organizations (nonprofit)

There are additional top-level domains that are now recognized on the Internet. They include:

aero - Air-transport industry	biz - Businesses	coop - Cooperatives
info - Unrestricted use	museum - museums	pro - Accountants, lawyers, physicians, and other professionals
	tv - Television	

Some countries use a sub-domain or geographical domain as part of their address. Fox example, an academic institution such as Oxford University in the United Kingdom can use ac.uk. An example of a URL with this domain is http://www.ox.ac.uk/.

Browser: A piece of software such as Mozilla Firefox and Internet Explorer that allows a computer to access and display documents, view pictures, hear sound, and view video clips from the World Wide Web.

E-mail: Mail that's electronically transmitted by your computer. As opposed to snail mail, e-mail sends your messages instantaneously, anywhere in the world. It has the capability to send messages at any time and to anyone.

File Transfer Protocol (FTP): The standard method for downloading and uploading files over the Internet. With FTP, you can login to a server and transfer files (meaning you can "send" or "receive" files).

Homepage: The first page that is viewed when the browser starts. It is also the page of a Web site that provides the introduction or content with links.

Hypertext Transfer Protocol (HTTP): It is the set of rules by which Web pages are transferred across the Internet. **HTTPS** is the acronym for **"Hypertext Transfer Protocol Secure."** This indicates that the webpage has a special layer of encryption added to hide your personal information and passwords from others. Whenever you log in to your online bank account or a shopping site that you enter credit card information into, look for "https" in the URL for security.

Internet Protocol (IP) Address: The Internet is composed of local, regional, national, and worldwide computer networks. Each computer on the Internet can be identified by a set of unique numbers that is called an internet protocol (IP) address. The IP address is composed of four different numbers separated by periods such as 205.134.120.60.

Link or Hypertext Link: An underlined word(s), phrase(s), or graphics on a Web page that transports the reader to additional or related information on the Internet.

TelNet: A terminal emulation protocol (or Internet program) used to connect a computer to a remote host or server. Telnet is one of the oldest Internet activities and is primarily used to access online databases or to read articles stored on university servers.

Uniform Resource Locator (URL): An addressing scheme that is used on the Internet to locate resources and/or services on the World Wide Web. Basically the URL is the address of a computer file that has been put on a computer server to access the Internet. Eg: http://www.examplewebsite.com/mypage

Web Page: A single hypertext file or a page that is part of a Web site.

Website: A collection of World Wide Web pages or files.

* **Netiquette** is short for "Internet etiquette." Just like etiquette is a code of polite behavior in society, netiquette is a code of good behavior on the Internet. This includes several aspects of the Internet, such as email, social media, online chat, web forums, website comments, multiplayer gaming, and other types of online communication. While there is no official list of netiquette rules or guidelines, the general idea is to respect others online

* **Internet Applications :**

1. Search engine: It can be used to search anything and everything. Most popular search engines are google andyahoo searches.

2. Shopping: Shopping has become easier with the advent of internet. You can buy or sell online.

3. Communication : This is a major role of the internet. It helps people to communicate either with the use of social networking websites or through e mails. Even chatting is a major use of the internet.

4. Job search: Nowadays, many people search for their jobs online as it is quicker and there is a larger varietyof job vacancies present.

5. Hobbies: Those who are having certain hobbies can try to improve on it by reading up on many aspectsof their hobby.

6. Research: Research papers are present online which helps in the researcher doing aliterature review.

7. Studying: Now right from kinder garden children are exposed to internet and computers. They find manyuseful things to learn on the internet(though with supervision). Upto doctorate level education,people rely on internet for their education. Online educational books have even reduced theneed for a library.

* **Internet Commerce** is the use of the Internet for all phases of creating and completing business transactions. In its broadest sense we view Internet Commerce as also including:

The full sales and marketing cycle - for example, by analysing online feedback to ascertain customer's needs

Identifying new markets - through exposure to a global audience through the World Wide Web

Developing ongoing customer relationships - achieving loyalty through ongoing email interaction

Assisting potential customers with their purchasing decision - for example by guiding them through product choices in an intelligent way

Providing round-the-clock points of sale - making it easy for buyers to order online, irrespective of location

Supply Chain Management - supporting those in the supply chain, such as dealers and distributors, through online interaction

Ongoing Customer Support - providing extensive after-sales support to customers by online methods; thus increasing satisfaction, deepening the customer relationship and closing the selling loop through repeat and onging purchases.

* In 2005, the UN-sponsored World Summit on the Information Society defined **internet governance** as "the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the internet."

* **Cybercrime** is defined as a crime in which a computer is the object of the crime (hacking, phishing, spamming) or is used as a tool to commit an offense (child pornography, hate crimes). Cybercriminals may use computer technology to access personal information, business trade secrets or use the internet for exploitative or malicious purposes. Criminals can also use computers for communication and document or data storage. Criminals who perform these illegal activities are often referred to as hackers. Cybercrime may also be referred to as computer crime.

We could list following reasons for the vulnerability of computers:

Easy to access – The problem behind safeguarding a computer system from unauthorized access is that there are many possibilities of breach due to the complex technology. Hackers can steal access codes, retina images, advanced voice recorders etc. that can fool biometric systems easily and bypass firewalls can be utilized to get past many security systems.

Capacity to store data in comparatively small space – The computer has the unique characteristic of storing data in a very small space. This makes it a lot easier for the people to steal data from any other storage and use it for own profit.

Complex – The computers run on operating systems and these operating systems are programmed of millions of codes. The human mind is imperfect, so they can do mistakes at any stage. The cyber criminals take advantage of these gaps.

Negligence – Negligence is one of the characteristics in human conduct. So, there may be a possibility that protecting the computer system we may make any negligence which provides a cyber-criminal the access and control over the computer system.

Loss of evidence – The data related to the crime can be easily destroyed. So, Loss of evidence has become a very common & obvious problem which paralyzes the system behind the investigation of cyber-crime.

* Mode and manners of committing cyber crime:
  1)Email bombing
  2)Illegal access to computer systems or networks / Hacking.
  3)Logic bombs or Trojan attacks.
  4)Stealing of information restricted in electronic form.
  5)Data diddling or Salami attacks.
  6)Internet time thefts or Web jacking.
  7)Rejection of Service attack.
  8)Virus / worm attacks.

* PREVENTION OF CYBER CRIME: Prevention is always better than treatment. It better to take certain stipulation while working on the internet. We should make them part of life. 5P's should be kept in mind for online security: Precaution, Prevention, Protection, Preservation, Perseverance.

A netizen should keep in mind the following things-

1. To prevent cyber persecution avoids revealing any information affecting to one. This is as good as revealing your uniqueness to unfamiliar person in public place.
2. Always stay away from sending any photograph online for the most part to strangers and chat friends as there have been occurrences of misuse of the photographs.
3. Always use latest and up date anti virus software to guard against virus hits/ attacks.
4. Always keep back up volumes so that one may not put up with data loss in case of virus fault
5. Never send your credit card number to any site that is not protected, to protector against frauds.
6. Always keep a watch on the sites that your children are entrancing to prevent any kind of stalking or depravation in children.
7. It is better to use a security programme that gives control over the cookies and send information back to the site as departure the cookies careless might prove critical.
8. Web site holders should watch traffic and check any misdeed on the site. Putting host-based interruption detection devices on servers may do this.
9. Use of firewalls may be advantageous.
10. Web servers running public sites must be physically separate protected from internal corporate network

* E-Mail (Electronic Mail): E-mail or Electronic mail is a paperless method of sending messages, notes or letters from one person to another or even many people at the same time via Internet. E-mail messages usually take only few seconds to arrive at their destination.You have the privilege of sending something extra such as a file, graphics, images etc. along with your e-mail. The biggest advantage of using e-mail is that it is cheap, especially when sending messages to other states or countries and at the same time it can be delivered to a number of people around the world.

Features of E-mail:

1) One-to-one or one-to-many communications
2) Instant communications
3) Physical presence of recipient is not required
4) Most inexpensive mail services, 24-hours a day and seven days a week
5) Encourages informal communications

Eg: John@hotmail.com

In the above example 'John' is the username of the person who will be sending/receiving the email. 'Hotmail' is the mail server where the username John has been registered and 'com' is the type of organization on the internet which is hosting the mail/ server.

* **File Transfer Protocol**, is an Internet utility software used to uploaded and download files. It gives access to directories or folders on remote computers and allows software, data and text files to be transfer between different kinds of computers. FTP works on the basis of same principle as that of Client/ Server. FTP "Client" is a program running on your computer that enables you to communicate with remote computers. The FTP client takes FTP command and sends these as requests for information from the remote computer known as FTP servers. To

access remote FTP server it is required, but not necessary to have an account in the FTP server. When the FTP client gets connected, FTP server asks for the identification in terms of User Login name and password of the FTP client. If one does not have an account in the remote FTP server, still he can connect to the server using anonymous login. Using anonymous login anyone can login in to a FTP server and can access public archives; anywhere in the world, without having an account. One can easily Login to the FTP site with the username anonymous and e-mail address as password.

Objectives of FTP : 1) Provide flexibility and promote sharing of computer programs, files and data
2) Transfer data reliably and more efficiently over network
3) Encourage implicit or indirect use of remote computers using Internet
4) Shield a user from variations in storage systems among hosts.

* **Telnet** is a user command and an underlying TCP/IP protocol for accessing remote computers. Through Telnet, an administrator or another user can access someone else's computer remotely. On the Web, HTTP and FTP protocols allow you to request specific files from remote computers, but not to actually be logged on as a user of that computer. With Telnet, you log on as a regular user with whatever privileges you may have been granted to the specific application and data on that computer.

* **The World Wide Web**, or just **"the Web",** as ordinary people call it, is a subset of the Internet. The Web consists of pages that can be accessed using a Web browser. The Internet is the actual network of networks where all the information resides. Things like Telnet, FTP, Internet gaming, Internet Relay Chat (IRC), and e-mail are all part of the Internet, but are not part of the World Wide Web. The Hyper-Text Transfer Protocol (HTTP) is the method used to transfer Web pages to your computer. With hypertext, a word or phrase can contain a link to another Web site. All Web pages are written in the hyper-text markup language (HTML), which works in conjunction with HTTP.

* **Usenet** is a worldwide system for Internet discussion that consists of a set of newsgroups that are organized by subject. Users post articles or messages to these newsgroups. The articles are then broadcast to other computer systems, most of which now connect via the Internet. Usenet was conceived in 1979, making it one of the oldest network communications systems still in use today. It is also the predecessor of many of the forums online today.

* A **mail server** (sometimes also referred to an **e-mail server**) is a server that handles and delivers e-mail over a network, usually over the Internet. A mail server can receive e-mails from client computers and deliver them to other mail servers. A mail server can also deliver e-mails to client computers. A client computer is normally the computer where you read your e-mails, for example your computer at home or in your office. Also an advanced mobile phone or Smartphone, with e-mail capabilities, can be regarded as a client computer in these circumstances.

When you press the "Send" button in your e-mail program (e-mail client) the program will connect to a server on the network / Internet that is called an SMTP server. SMTP is an acronym for Simple Mail Transfer Protocol and it is a protocol that is used when e-mails are delivered from clients to servers and from servers to other servers

* E-Mail Protocols : 1) **Post Office Protocol version 3 (POP3)** is a standard mail protocol used to receive emails from a remote server to a local email client. POP3 allows you to download email messages on your local computer and read them even when you are offline. By default, the POP3 protocol works on two ports:

Port 110 - this is the default POP3 non-encrypted port
Port 995 - this is the port you need to use if you want to connect using POP3 securely

2) **The Internet Message Access Protocol (IMAP**) is a mail protocol used for accessing email on a remote web server from a local client. IMAP and POP3 are the two most commonly used Internet mail protocols for retrieving emails. Both protocols are supported by all modern email clients and web servers. While the POP3 protocol assumes that your email is being accessed only from one application, IMAP allows simultaneous access by multiple clients. This is why IMAP is more suitable for you if you're going to access your email from different

locations or if your messages are managed by multiple users. By default, the IMAP protocol works on two ports:

Port 143 - this is the default IMAP non-encrypted port

Port 993 - this is the port you need to use if you want to connect using IMAP securely

3) **Simple Mail Transfer Protocol (SMTP)** is the standard protocol for sending emails across the Internet. By default, the SMTP protocol works on three ports:

Port 25 - this is the default SMTP non-encrypted port

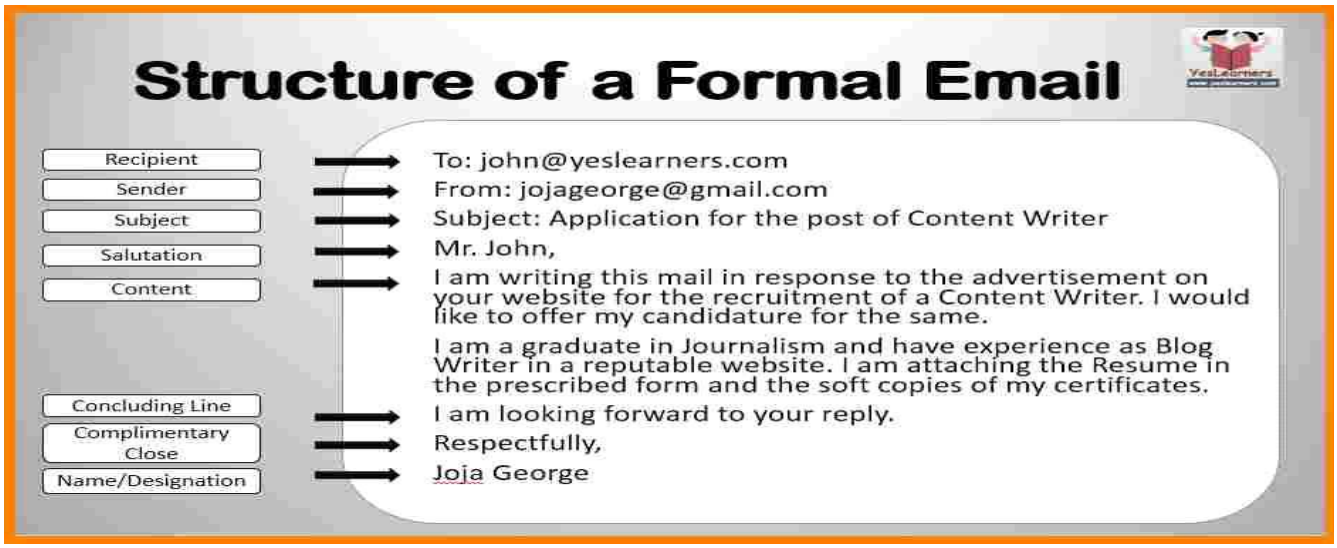
Port 2525 - this port is opened on all SiteGround servers in case port 25 is filtered (by your ISP for example) and you want to send non-encrypted emails with SMTP

Port 465 - this is the port used if you want to send messages using SMTP securely

4) **HTTP** : This is a commonly known protocol and stands for HyperText Transfer Protocol. This is not an email specific protocol. However, HTTP is used for email access using web-based emails. Hotmail or Gmail are examples of using HTTP as an email protocol. This is used to compose and retrieve emails from a web-based account. The default port for HTTP are:

Port 80 – This is default non-encrypted port.

Port 443 – This is default port for secure connections.



* **E-Mail Routing** : Incoming emails go through spam filtering gateways, and all clean messages are then sent to the destination mail server. Mail routing goes a step beyond spam filtering to make a carbon copy of specified emails based on rules and send this copy to additional recipient(s). The rules for the carbon copy generation can be based on the sender, recipient, or many other parameters. Messages are still delivered to the original recipient, or they can be redirected to a completely different destination.

* **Email encryption** involves encrypting, or disguising, the content of email messages in order to protect potentially sensitive information from being read by anyone other than intended recipients. Three primary things you should encrypt:

The connection from your email provider: Encrypting the connection prevents unauthorized users on the network from intercepting and capturing your login credentials and any email messages you send or receive as they leave your email provider's server and travel from server to server around the Internet.

Your actual email messages: Encrypting email messages before they're sent means that even if a hacker or anyone other than the intended recipient should intercept your email messages, they're unreadable, and essentially useless.

Your stored, cached, or archived email messages: Finally, if you store backed-up email messages in an email client, such as Microsoft Outlook, hackers may gain access despite password protection of your accounts and even your device. Email encryption ensures that even if access is obtained, the content of your email messages is unreadable.

* **Email client** is a desktop application that enables configuring one or more email addresses to receive, read, compose and send emails from that email address(s) through the desktop interface. It provides a central interface for receiving, composing and sending emails of configured email address(s). Email client is also known as email reader or mail user agent (MUA).

* **Java** is a high-level programming language developed by Sun Microsystems. It was originally designed for

developing programs for set-top boxes and handheld devices, but later became a popular choice for creating web applications. Unlike Windows executables (.EXE files) or Macintosh applications (.APP files), Java programs are not run directly by the operating system. Instead, Java programs are interpreted by the Java Virtual Machine, or JVM, which runs on multiple platforms. This means all Java programs are multiplatform and can run on different platforms, including Macintosh, Windows, and Unix computers. However, the JVM must be installed for Java applications or applets to run at all. Fortunately, the JVM is included as part of the Java Runtime Environment (JRE), which is available as a free download.

* **ActiveX** is a technology introduced by Microsoft in 1996 as part of the OLE framework. It includes a collection of prewritten software components that developers can implement within an application or webpage. This provides a simple way for programmers to add extra functionality to their software or website without needing to write code from scratch.Software add-ons created with ActiveX are called ActiveX controlsActiveX controls are similar to Java applets, but run through the ActiveX framework rather than the Java Runtime Environment (JRE). This means you must have ActiveX installed on your computer in order to view ActiveX controls in your Web browser. While ActiveX provide a convenient way for Web developers to add interactive content to their websites, the technology is not supported by all browsers. In fact, ActiveX is only officially supported by Internet Explorer for Windows. Therefore, ActiveX controls are rarely used in today's websites. Instead, most interactive content is published using Flash, JavaScript, or embedded media.

* **JavaScript** is a programming language commonly used in web development. It was originally developed by Netscape as a means to add dynamic and interactive elements to websites. While JavaScript is influenced by Java, the syntax is more similar to C and is based on ECMAScript, a scripting language developed by Sun Microsystems.

JavaScript is a client-side scripting language, which means the source code is processed by the client's web browser rather than on the web server. This means JavaScript functions can run after a webpage has loaded without communicating with the server. For example, a JavaScript function may check a web form before it is submitted to make sure all the required fields have been filled out. The JavaScript code can produce an error message before any information is actually transmitted to the server.

Like server-side scripting languages, such as PHP and ASP, JavaScript code can be inserted anywhere within the HTML of a webpage. However, only the output of server-side code is displayed in the HTML, while JavaScript code remains fully visible in the source of the webpage

* **VoIP(Internet Phone)** stands for **Voice over Internet Protocol**. In layman's terms, it refers to making phone calls that are made through the internet, rather than through a regular landline or a mobile network. A VoIP system works by taking your analogue voice signals, converting them into digital signals, then sending them as data over your broadband line.

It's a very useful way of making calls - for a start, once it's set up it's a lot cheaper than using normal phone lines. It means that, depending on your setup, you may not have to pay for your phone calls based on distance, which country you're calling, or how much time you spend chatting.

Your VoIP system could be:

With a phone and a VoIP adapter - Using a special adapter, you can make VoIP calls from a regular old landline phone. These adapters plug into either a phone socket in the wall or into your router.

With a computer - There are dozens of programs that let you make voice calls to anyone who also has it installed, including Skype, Google Talk, and Apple FaceTime. Some, such as Skype, can be used to call regular landline or mobile numbers too. Calling someone else who has the app is free, but calling an actual phone number will usually cost a little.

With a smartphone - You can use your smartphone to make voice calls using certain apps. Some broadband and home phone providers offer VoIP as part of their services, so they may do things a little differently.

* **Videoconferencing (or video conference)** means to conduct a conference between two or more participants at different sites by using computer networks to transmit audio and video data. The components to make this happen include:

• A microphone, webcam and speakers
• A display
• A software program that captures the voice stream from the microphone, encodes it, transmits to the other participant, and simultaneously decodes the digital voice stream being received from the remote participant in the video conference (most commonly referred to as a “Codec”).

• A software program that bridges both parties together across a digital connection, managing the exchange of voice and video between participants. At either end of the connection, the video and voice traffic is combined and delivered to each participant in the form of a real-time video image and audio stream.
Terminology used by video conferencing users to describe the process of dialing into and participating in a virtual meeting is known as "joining a bridge." Different virtual meeting rooms are assigned unique "bridge numbers," and users join a video call by "dialing a bridge number."

* **Internet Security Threats:**

Botnets: i)Send spam emails with viruses attached. ii)Spread all types of malware.iii) Can use your computer as part of a denial of service attack against other systems.

Hacking: Hacking is a term used to describe actions taken by someone to gain unauthorized access to a computer

i) Find weaknesses (or pre-existing bugs) in your security settings and exploit them in order to access your information.

ii) Install a Trojan horse, providing a back door for hackers to enter and search for your information.

Malware: i) Intimidate you with scareware, which is usually a pop-up message that tells you your computer has a security problem or other false information.

ii)Re-format the hard drive of your computer causing you to lose all your information.

iii)Alter or delete files. iv) Steal sensitive information. v) Send emails on your behalf.

vi)Take control of your computer and all the software running on it.

Pharming: A means to point you to a malicious and illegitimate website by redirecting the legitimate URL. Even if the URL is entered correctly, it can still be redirected to a fake website. Convince you that the site is real and legitimate by spoofing or looking almost identical to the actual site down to the smallest details. You may enter your personal information and unknowingly give it to someone with malicious intent.

Phishing: Fake emails, text messages and websites created to look like they're from authentic companies. They're sent by criminals to steal personal and financial information from you. This is also known as "spoofing".

i) Trick you into giving them information by asking you to update, validate or confirm your account. It is often presented in a manner than seems official and intimidating, to encourage you to take action.

ii) Provides cyber criminals with your username and passwords so that they can access your accounts (your online bank account, shopping accounts, etc.) and steal your credit card numbers.

Ransomware is a type of malware that restricts access to your computer or your files and displays a message that demands payment in order for the restriction to be removed. The two most common means of infection appear to be phishing emails that contain malicious attachments and website pop-up advertisements.

i) Lockscreen ransomware: displays an image that prevents you from accessing your computer

ii) Encryption ransomware: encrypts files on your system's hard drive and sometimes on shared network drives, USB drives, external hard drives, and even some cloud storage drives, preventing you from opening them

Spam: The mass distribution of unsolicited messages, advertising or pornography to addresses which can be easily found on the Internet through things like social networking sites, company websites and personal blogs.

i)Annoy you with unwanted junk mail.

ii)Create a burden for communications service providers and businesses to filter electronic messages.

iii)Phish for your information by tricking you into following links or entering details with too-good-to-be-true offers and promotions.

iv)Provide a vehicle for malware, scams, fraud and threats to your privacy.

Spoofing: A website or email address that is created to look like it comes from a legitimate source. An email address may even include your own name, or the name of someone you know, making it difficult to discern whether or not the sender is real.

Spyware & Adware: Software that collects personal information about you without you knowing. They often come in the form of a 'free' download and are installed automatically with or without your consent. These are difficult to remove and can infect your computer with viruses.

i)Collect information about you without you knowing about it and give it to third parties.

ii)Send your usernames, passwords, surfing habits, list of applications you've downloaded, settings, and even the version of your operating system to third parties.

iii)Change the way your computer runs without your knowledge.

iv)Take you to unwanted sites or inundate you with uncontrollable pop-up ads.

Trojan Horses: A malicious program that is disguised as, or embedded within, legitimate software. It is an

executable file that will install itself and run automatically once it's downloaded.

i)Delete your files.

ii)Use your computer to hack other computers.

iii)Watch you through your web cam.

iv)Log your keystrokes (such as a credit card number you entered in an online purchase).

v)Record usernames, passwords and other personal information.

* **Viruses**: Malicious computer programs that are often sent as an email attachment or a download with the intent of infecting your computer, as well as the computers of everyone in your contact list. Just visiting a site can start an automatic download of a virus.

i) Send spam. ii) Provide criminals with access to your computer and contact lists.

iii)Scan and find personal information like passwords on your computer.

iv) Hijack your web browser. v) Disable your security settings. vi)Display unwanted ads.

When a program is running, the virus attached to it could infiltrate your hard drive and also spread to USB keys and external hard drives. Any attachment you create using this program and send to someone else could also infect them with the virus.

* **A Computer Firewall** is a software program that prevents unauthorized access to or from a private network. Firewalls are tools that can be used to enhance the security of computers connected to a network, such as LAN or the Internet. They are an integral part of a comprehensive security framework for your network. A firewall absolutely isolates your computer from the Internet using a "wall of code" that inspects each individual "packet" of data as it arrives at either side of the firewall — inbound to or outbound from your computer — to determine whether it should be allowed to pass or be blocked.

Basically, firewalls need to be able to perform the following tasks: i) Defend resources ii) Validate access

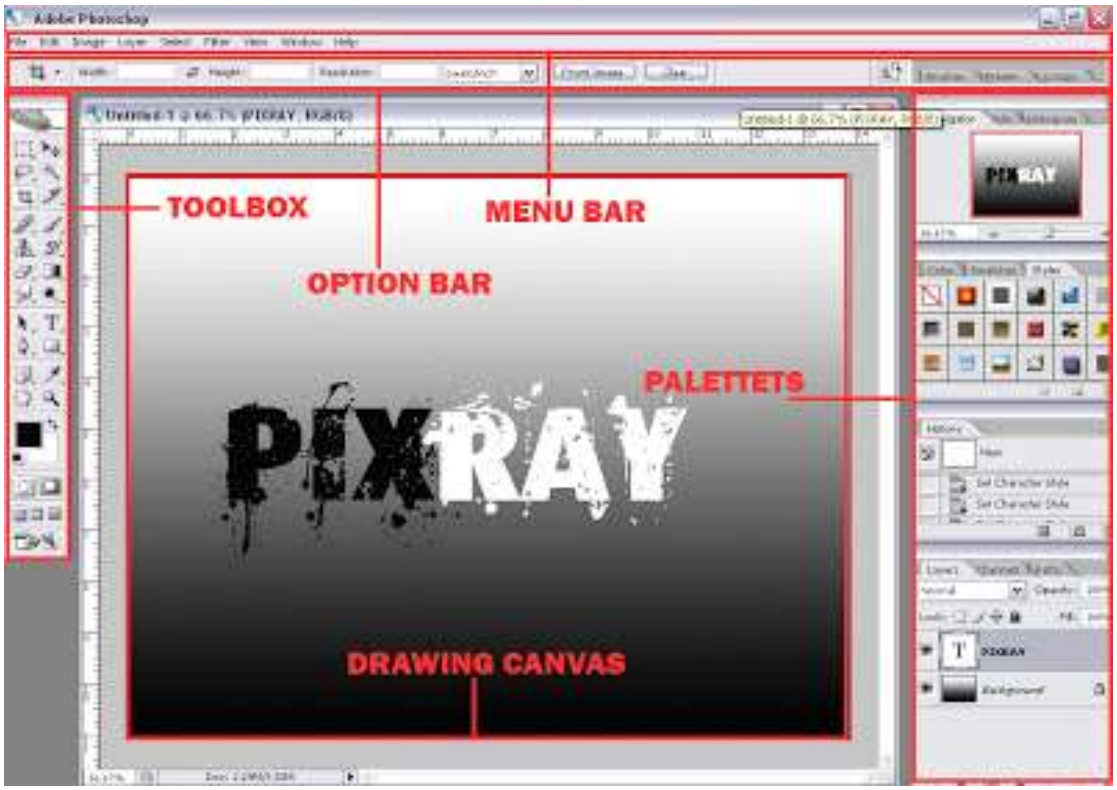
iii) Manage and control network traffic iv) Record and report on events v) Act as an intermediary

STANLEY COMPUTER INSTITUTE
Thlanmual Peng, Diakkawn, Kolasib

ADOBE PHOTOSHOP

ADOBE PHOTOSHOP IS A POWERFUL PHOTO EDITING SOFTWARE.

There are mainly 5 powerful components of photoshop which will help you get your desired photo. These Components are MENU BAR, OPTION BAR, TOOL BOX, DRAWING CANVAS, PALETTES



MENU BAR: It is basic component just like other softwares contains file, edit, image, layer, select, filter, view, window, help.

OPTION BAR: It controls contextualized options for different tools present . It also contains work space menu, where we can save and load arrangements of palettes.

TOOL BOX: It is the main component of photoshop which include all the useful photo editing tools like selection tool.move tool,crop tool,brush,pen,eraser etc.

DRAWING CANVAS: It present in the center of PS where all the photo editing takes place.like whatever photo you want to edit will open in this drawing canvas window where you can edit it with the help of various tools available in photoshop.

PALETTES: Each "panes" that carry options for working with your file in PS, known as palettes (also known panels), It float on the right-hand side of PS window. Each palette is tagged with a tab, and can be minimized, closed, grouped with other palettes, or dragged in and out of a panel dock available in PS.

USING THE TOOLBOX

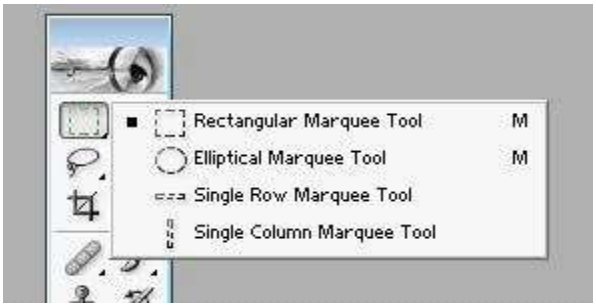
Marquee (M key): The Marquee tools let you make simple selections in the shape of rectangles, ellipses, or single-pixel rows and columns. Find out more.

Rectangular Marquee: Click in the image and drag to select a rectangular area. Shift-drag to select a square area.

Elliptical Marquee: Click in the image and drag to select an elliptical area. Shift-drag to select a circular area.

Single Row Marquee: Click in the image to select a single row of pixels. Drag to select a different row.

Single Column Marquee: Click in the image to select a single column of pixels. Drag to select a different column.



Move (V key): The Move tool lets you click and drag a layer to move it around the document. Shift-drag to lock movement to 45-degree angles. Alt/Option-drag to make a copy of the layer and position the copy. (You can quickly access the Move tool from most other tools by holding Control/Command). You can also move a layer in 1-pixel steps with the keyboard arrow keys. Hold Shift to move in 10-pixel steps.

Lasso (L key) : The Lasso tools let you make irregularly-shaped selections by drawing in the document window. Find out more.

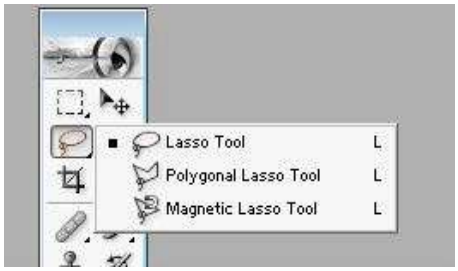
Lasso: This tool lets you make freeform selections. Click in the image and drag to select an area. Release the mouse button to complete the selection. You can hold down Alt/Option while drawing to use the Polygonal Lasso tool temporarily.

Polygonal Lasso: This tool lets you make polygonal selections. Click in the image to add a new point to the polygon. To complete the selection, double-click or Control/Command-click with the mouse, or click the first point. You can hold down Alt/Option and drag to use the regular Lasso tool temporarily.

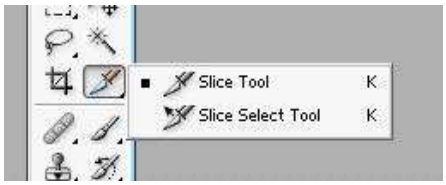
Magnetic Lasso: This tool snaps the selection border to hard edges in the image as you draw. This makes it easy to select objects in the image that have complex, high-contrast edges.

Click in the image to add the first point. Move the mouse around the edge of the object to select it. Click to add further fastening points if required. To complete the selection, double-click or Control/Command-click with the mouse, or click the first point.

Use the Feather, Width, Contrast and Frequency tool options in the options bar to fine-tune the tool's behaviour. You can hold down Alt/Option and drag to use the regular Lasso tool temporarily, or Alt/Option-click to use the Polygonal Lasso tool temporarily.



Magic Wand: This works well for selecting objects of uniform colour. Click inside the object to select it. To add to a selection, Shift-click. To subtract from a selection, Alt/Option-click.



Crop (C key): The Crop tool is for cropping an image down to a new size. Drag in the document window to create a crop box. You can resize the box by dragging the handles around the box edges and corners. Shift-drag to maintain the aspect ratio. Drag outside the crop box to rotate it. When you're ready to crop, press Enter/Return.

Slice (K key): The Slice and Slice Select tools let you cut up an image into sections for using in a Web page.

Slice: Click and drag in the image to make a slice. Shift-drag to make a square slice. Alt/Option-drag to draw from the centre.

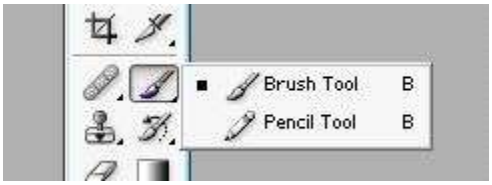
Slice Select: Use this tool to select slices for modifying. Click a slice to select it. Shift-click to select multiple slices. (Hold down Control/Command to switch temporarily from the Slice to the Slice Select tool (and vice-versa).

Healing Brush: The Healing Brush works in a similar way to the Spot Healing Brush, except that you manually specify the area of the image to sample from. You can also sample from a pattern. Use the Healing Brush if you want more control over the sampled area, or if you're retouching a large area of the image.

First set a brush size, then Alt/Option-click the area in the image that you want to sample pixels from. You can then click or drag over the area to heal.

Patch :Patch works like Healing Brush, except that you draw the outline of an area to patch, rather than painting with a brush. It's good for fixing up a large well-defined area.

To use the Patch tool, select Source in the options bar and drag to select the area to patch. Then drag the selection to the area to sample pixels from. Release the button to apply the patch. You can also do it the other way around: Select Destination in the options bar, then drag to select the pixels to sample from. You can then drag the selected pixels on top of the area to patch.



Brush: Use the Brush tool to paint soft-edged brush strokes on the image with the current foreground colour. Click the Brush drop-down in the options bar to choose different brushes, sizes and options, then drag in the document window to paint.

Pencil: The Pencil tool draws with hard-edged pencil strokes. As with the Brush tool, you can set various brush options using the Brush drop-down in the options bar.

Clone Stamp: The Clone Stamp tool lets you duplicate areas of your image. This is useful for removing problems in an image, but you can also use it for artistic effect. Essentially, the Clone Stamp tool is similar to the Healing Brush tool, except that the Clone Stamp just makes an exact copy — it doesn't attempt to match textures, lighting, and so on.

To use the Clone Stamp, first choose a brush size, then Alt/Option-click the area you want to copy. You can then click and drag elsewhere in the image to paint pixels from the original area. If you want to copy from the same original point each time, deselect the Aligned option in the options bar.

Pattern Stamp: Whereas Clone Stamp paints with pixels from elsewhere in the image, Pattern Stamp paints with a predefined pattern. Select the pattern you want to use from the drop-down in the options bar, then click and drag in the image to start painting.

By default, the pattern always matches up no matter where you start drawing. To turn this off, deselect the Aligned option in the options bar.

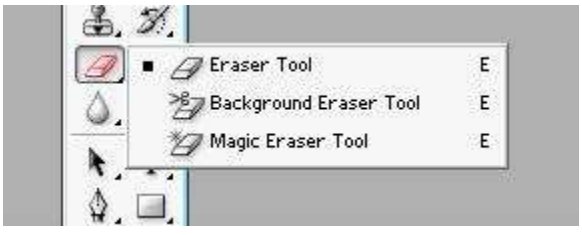
History Brush: With the History Brush you can paint on your image using pixels retrieved from an older version of the image. To do this, first bring up the History panel and find the history state you want to retrieve pixels from. Now click the little square to the left of the history state — you'll see a little brush icon appear.

You can now paint in your image, and the History Brush will use the pixels from your selected history state. You can also paint from pixels in a snapshot by clicking the little box to the left of the snapshot in the History panel.

Art History Brush: Whereas the History Brush paints exact pixels from a previous state, the Art History Brush adds various artistic effects to the brush strokes. This is great for making a photo look like a painting.

Use the Style option in the options bar to choose a style for the brush strokes, and set the brush size and type using the Brush drop-down. Then start painting! You can use a previous history state or snapshot as the source image for the Art History Brush, or you can use the current state.

Eraser: Click and drag with the Eraser tool to erase pixels in the current layer. For a regular layer, this makes the pixels transparent. For the Background layer, it fills them with the current background colour. You can set brush options in the options bar, much like using a regular brush. Use the Mode option to make the eraser behave like the Brush tool, like the Pencil tool, or as a solid block. You can also erase parts of an image to a previous history state — much like using the History Brush — by selecting the Erase to History option in the options bar.



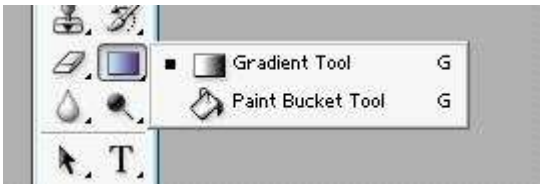
The Background Eraser tool selectively erases pixels of the same (or similar) colour, while avoiding bleeding into edge boundaries. This makes it useful for turning the background areas of an image transparent, leaving the foreground pixels alone. This tool is very similar to the Color Replacement tool, except that it turns pixels transparent instead of changing their colour.

To use the Background Eraser, first set your brush, sampling, limits and tolerance options in the options bar,

then click part of the background and drag to erase. You might need to adjust the brush size and tolerance as you go in order to quickly erase all parts of the background.

Magic Eraser: This tool works like the Paint Bucket tool, except that it makes pixels transparent instead of filling them with colour. Set your tolerance and other options in the options bar, then click an area of colour in the image to erase those pixels.

Gradient: Use the Gradient tool to fill the whole image — or a selection — with a smooth gradient. Pick the gradient by clicking the drop-downs in the options bar. You can also specify the type of gradient: Linear (straight line), Radial (circular), and so on. When you've set your options, create the gradient by clicking and dragging in the document window.

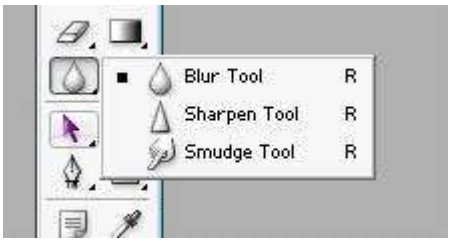


The Paint Bucket tool fills adjacent pixels of similar colour. To use it, first set the foreground colour to the colour you want to fill with, then click in the image. Use the Tolerance and other options in the options bar to fine-tune the fill.

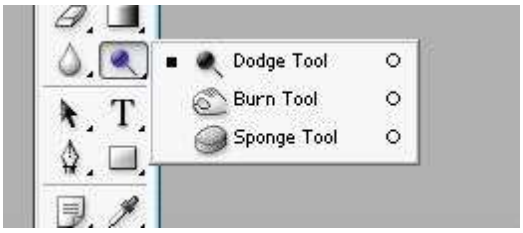
Blur: Click and drag in the document window to selectively blur areas of the image. You can choose a brush to use from the options bar, and adjust the strength of the blur effect with the Strength option.

Sharpen :This is the opposite of the Blur tool. Click and drag over an area of the image to sharpen it.

Smudge: Drag in the image to smudge it, much like dragging a finger through wet paint. Select the Finger Painting option to start each stroke using the current foreground colour — the equivalent of dipping your finger in a bucket of paint first!



Dodge: The Dodge tool lightens an area of the image. The effect is similar to selectively decreasing exposure with an enlarger in a dark-room. Click and drag in areas of an image to progressively lighten them. You can selectively lighten different tonal ranges (shadows, midtones and highlights) using the Range option in the options bar. Use the Exposure option to control the amount of the dodge effect.



The Burn tool is the opposite of the Dodge tool. Click and drag in an area of the image to darken it.

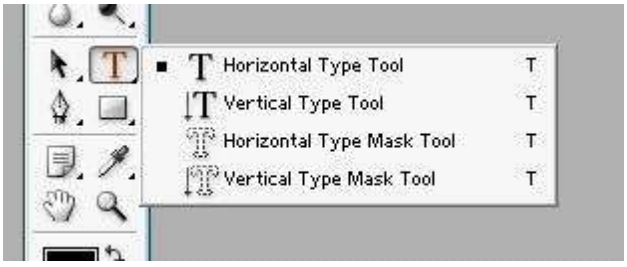
Sponge

The Sponge tool lets you selectively alter the colour saturation in parts of your image. Select Desaturate for the Mode option to remove saturation (make the image more black & white). Select Saturate to add saturation (make the image more colourful). Then choose a brush and start painting on the image.

Path Selection: Click to select an entire path component (such as a shape created with a shape tool). Shift-click to select multiple components.

Direct Selection: Click an individual point or path segment to select it. Shift-click to select multiple points and segments.

Type (T key): The tools in the Type group let you add text to your images.



Horizontal Type: Use this tool to add text horizontally. Click in the image to add point type (that is, a single line of type). Drag in the image to add paragraph type (multiple lines of type). Use the options bar to set the font, size, and other options.

Vertical Type: This works like the Horizontal Type tool, except that the text flows down the page instead of across. You can change existing text between horizontal and vertical by clicking the change text orientation icon in the options bar (to the left of the font family drop-down).

Horizontal Type Mask: This works like the Horizontal Type tool, but it creates a selection in the shape of your text, rather than a new type layer.

Vertical Type Mask: This works like the Vertical Type tool, but it creates a selection in the shape of your text, rather than a new type layer.

Pen: Use the Pen tool to create straight lines and curves. Click in the document to add straight line points. Drag in the document to create curve points.

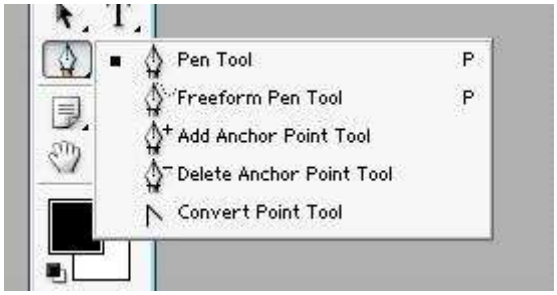
Freeform Pen: Lets you draw paths by just clicking and dragging — no need to create points manually.

Add Anchor Point: Use this tool to add additional points to a path. Click on the path to add a point.

Delete Anchor Point: Using this tool, you can click a point on a path to remove it.

Convert Point: Lets you turn a smooth anchor point into a corner point and vice-versa.

You can temporarily use the Convert Point tool when you're working with the Pen tool by holding down Alt/Option.

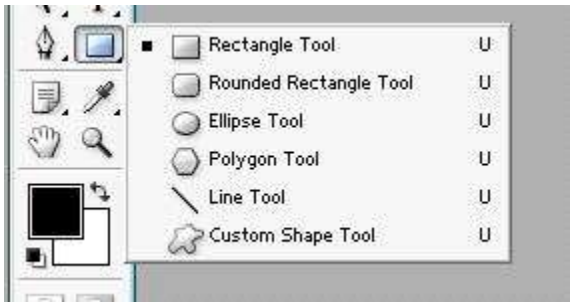


Rectangle: Draws a rectangle in the image. Use the options in the options bar to choose how to create the rectangle:

Shape layers creates a new shape layer for the shape. A shape layer is a fill layer with a vector mask for the shape. You can edit the shape later by modifying the vector mask using the path tools.

Paths creates a new path component for the shape. You can then use the path however you like: fill it, stroke it, turn it into a selection, and so on. Again, you can edit the shape later using the path tools if desired.

Fill pixels applies the shape's pixels permanently to the current layer. Once you do this, the shape is no longer editable.



Now click and drag in the image to create the rectangle. Shift-drag to draw a square. Hold down Alt/Option while dragging to draw from the centre.

Rounded Rectangle: Works like the Rectangle tool, but draws a rectangle with rounded corners. Choose the corner radius using the Radius option in the options bar.

Ellipse: Click and drag in the image to create an ellipse. Shift-drag to draw a circle. Hold down Alt/Option while dragging to draw from the centre.

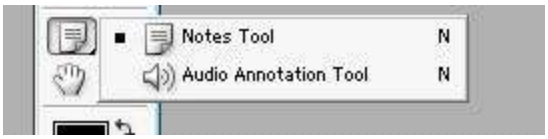
Polygon: Use this tool to create regular polygons. Choose the number of sides using the Sides option in the options bar. Now click and drag in the image to create the polygon. Shift-drag to constrain the polygon's rotation to 45-degree steps.

Line: With this tool you can draw straight lines. Set the line thickness using the Weight option, then click and drag to create the line. Hold down Shift to constrain the line to 45-degree steps. You can also add arrowheads by clicking the little downward arrow to the left of the Weight option in the options bar.

Custom Shape: Use this tool to draw arbitrary shapes from a library. Click the Shape option in the options bar to choose a shape from the library, then drag in the image to draw it. Shift-drag to maintain the aspect ratio; Alt/Option-drag to draw from the centre.

Notes: Click in the image where you'd like to add a note, and start typing. To remove a note, right-click its icon and choose Delete Note.

Audio Annotation: Click in the image where you'd like to add an annotation, then click Start and talk into your mic. Click Stop when you're done. To remove an annotation, right-click its icon and choose Delete Audio Annotation.



Eyedropper (I key): The tools in the Eyedropper tool group let you pick colours from an image, add colour samplers to the image, and measure distances and angles in the image.

Eyedropper: Move the eyedropper around the image and read the colour values in the Info palette. Click to set the foreground colour to the colour of the pixel under the eyedropper. Alt/Option-click to set the background colour.

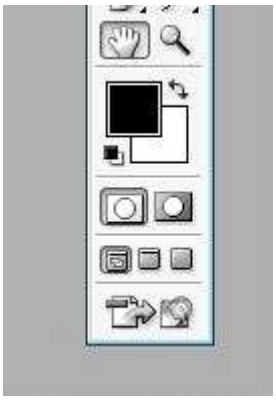
Color Sampler: Click in the image to add up to 4 colour samplers. You can read the colour values in the

Info palette. The samplers are saved with the document.Drag a sampler to reposition it. To delete a sampler, drag it out of the document window.

Ruler: Drag in the window to create 2 points and a line. Drag the points as required. Read the distance between the points, and the angle of the line, in the Info palette. To create an additional line, Alt/Option-drag on one of the points. You can then measure the 2 lengths in the Info palette, as well as the angle between the 2 lines.

Hand (H key): Drag in the document window to view different parts of the image. You can also access this tool from most other tools by holding down the spacebar.

Zoom (Z key): Click in the document window to zoom into the image. Alt/Option-click to zoom out. To zoom into a particular area of the image, drag out a box around the area.



Foreground Color: The colour used for painting and other operations. Click in the box to pick a different colour.

Switch Foreground/Background Colors (X key): Click this to swap over the current foreground and background colours.

Default Foreground/Background Colors (D key): Reverts the foreground and background colours to the default (usually black and white respectively).

Background Color: The colour used for erasing and other operations. Click in the box to pick a different colour.

Toggle Quick Mask Mode (Q key): Click this button to enter or exit Quick Mask mode. Quick Mask mode lets you create and modify selections by painting in the image.

Change Screen Mode (F key): Click this button to cycle through 4 different screen modes:

Standard: The default layout
Maximized: The document window fills as much space as possible
Full Screen Mode With Menu Bar: The document fills the whole screen
Full Screen Mode: The document fills the whole screen and the menu bar is hidden

STANLEY COMPUTER INSTITUTE
Thlanmual Peng, Diakkawn, Kolasib

ADOBE PAGEMAKER

Adobe PageMaker 7.0 is the most popular and advanced graphic publication program which is developed by Adobe Corporation of USA. In this program, we can create visiting cards, Wedding cards, news papers, magazines, books, ID cards etc.

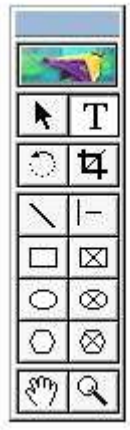
Exe or Application file name: **pm70.exe**
File extension: **.pmd**

Open or Load Adobe PageMaker 7.0: Click on Start > Programs > Adobe > PageMaker 7.0 > Adobe PageMaker 7.0
Or,
Click on Start > Run. Type PM70 into the run box > Click on Ok.

To Create New Document
Click on File Menu > New (Ctrl+N)
Specify the Page size (eg. A4 / Letter / A3 / A5 etc), Page Orientation (Tall or Wide), Page Option, Number of pages, Page Margins (Inside / Outside / Top / Bottom), Resolution output and printer default. Click on Ok.

To display current publication in Actual Size/Fit in Window
Right click on publication window.
Click on Actual Size/Fit in Window (or) Hold **CTRL + Right Click** to change into Actual Size/Fit in Window

To Show or Hide Tools: Click on window menu > Click on Show or Hide Tools.



Pointer Tool – Use the Pointer tool to select, move and resize text objects and graphics.
Rotating Tool – Use the rotating tool to select and rotate objects.
Straight Line Tool – Use the straight line tool to draw straight lines in any direction.
Rectangle Tool – Use the rectangle tool to draw squares, rounded rectangles and rectangles.
Ellipse Tool – Use the ellipse tool to draw circles and ellipses.
Polygonal Tool – Use the polygonal tool to draw polygons, triangles, stars etc.
Hand Tool – Use the hand tool to scroll the page, or to preview and test hyperlinks.
Text Tool – Use the text tool to type, select text and edit text.
Crop Tool – Use the crop tool to trim imported graphics.
Constrained Line Tool – Use the constrained line tool to draw vertical and horizontal lines.
Rectangle Frame Tool – Use the rectangle frame tool to create placeholder rectangle and square shape.
Ellipse Frame Tool – Use the Ellipse frame tool to create placeholder ellipse and circle shape.
Polygonal Frame Tool – Use the polygonal frame tool to create placeholder polygonal / triangle or star shape.
Zoom Tool – Use the zoom tool to magnify or reduce an area of the page.

To Show or Hide Color Palette: Click on Window menu > Click on show or hide colors. (Ctrl + J)

To Show or Hide Control Palette: Click on Window menu > Click on show or hide control palette (Ctrl + ")

Group: It is used to combine the two or more objects. Select the objects > Click on Element > Group (Ctrl + G)

Ungroup: It is used to separate or ungroup the grouped object. Select the grouped object > Click on Element > Ungroup (Ctrl + Shift + G)

Arrange: It is used to arrange the selected object.
Select the object which you want to arrange > Click on Element > Arrange > Choose proper arrange option.
Bring to front (Ctrl + Shit +])
Bring forward (Ctrl +])
Send backward (Ctrl + [)
Sent to back (Ctrl + Shift + [)

Fill: It is used to fill or change the fill color style of selected graphics. Select the object > Click on Element > Fill. Choose proper fill option.

Stroke: It is used to change the outline or stroke style of selected object.
Select an object > Click on Element menu > Stroke. Choose proper stroke option.

Fill & Stroke: It is used to fill and change the fill color and stroke style, width and color of selected object.
Select the object > Click on Element menu > Fill & Stroke > Choose proper fill color, stroke style, color and width. Click on Ok.

Align Object's: It is used to define the alignment of selected object. Select the two or more objects.
Click on Element menu > Align Object's > Define the alignment as you need. Click on Ok.

Bullets and Numbering: It is used to insert the bullets and numbering into selected paragraphs.
Select the paragraphs > Click on Utilities menu > Bullets and Numbering > Choose Bullets or Numbers Tab and their style > Specify the number of paragraphs. Click on Ok.

Indents / Tabs: It is used to define the indents / tabs of selected parapgraphs or bulleted or numbered paragraphs.
Select the bulleted or numbered paragraphs > Click on Type menu > Indents / Tabs (Ctrl + I)
Define the tab stop. Click on Apply > Ok.

To Place an Image or Import image. (Before placing/import an image, first click the Pointer Tool)
Click on File menu > Place (Ctrl + D) > Specify the location and choose required image file.
Click on Open. Now drag the mouse pointer by holding down its primary button then release it.

Document Setup: It is used to define the page size, page orientation, number of pages, page options, page margins, resolution output of current publication.
Click on File menu > Document Setup (Ctrl + Shift + P)
Specify the page size (A4 / Letter / A3 / B4 / A5 etc.), Page orientation (Tall / Wide) , Page Options, Number of pages, Page Margins (Inside / Outside / Top / Bottom) , Resolution Output ets.
Click on Ok.

To Increase Resolution Output of an image(Preference Command)
Click on File menu > Preference > General (Ctrl + K)
Choose High Resolution. Click on Ok.

Note: This command helps you to set the properties of current publication.

Undo: It is used to repeat the previous action of current publication. Click on Edit > Undo (Ctrl + Z)

Cut or Copy and Paste: It is used to Cut (Ctrl +X) or Copy(Ctrl + C) and Paste(Ctrl + V) the selected object or text.

Clear: It is used to delete the selected object or text. Select the text or object. Click on Edit > Clear.

Paste Multiple: It is used to paste the copied object in number of define paste copies.
Cut or Copy any object or text. Click on Edit > Paste Multple. Define the number of paste copies. Click on Ok.

Paste Special: It is used to paste the copied object from current publication or different application.
Cut or copy any object. Click on Edit > Paste Special. Choose proper paste option. Click on Ok.

Insert Object: It is used to insert or import an object or image from specified application.
At first save the current application. Click on Edit > Insert Object. Choose Create New and choose proper object application. Click on Ok. Open or create any object in specified application.Click on File > Close & return to pmd.

Edit Story / Edit Layout: It is used to edit the text of current publication.
Select the text. Click on Edit > Edit story. Edit the text as required and Re-again Goto Edit menu > Edit Layout (Ctrl + E)

Insert Pages: It is used to insert the number of pages in current publication.
Click on Layout menu > Insert Page. Choose After or Before option and define the number of inserting pages.
Click on Ok.

Remove Pages: It is used to remove or delete the page.
Click on Layout menu > Remove Page. Define the page number which you want to remove. Click on Ok.
(or) Right click on the Page Icon at the bottom left corner. It will display, "Add One Page", "Insert Pages" and "Remove Pages" and select accordingly.

Sort Pages: It is used to arrange the page with its contents.
Click on Layout menu > Sort pages. Arrange the page as required. Click on Ok.

Column Guide: It is used to define the number of columns and space between the columns of current publication.
Click on Layout menu > Column Guide. Define the number of columns and space between the columns. Click Ok.

Change Case: It is used to change the case of selected sentences or paragraphs.
Select the sentence. Click on Utilities > Plug-Ins > Change Case. Choose proper case option. Click Apply > Ok.

Drop Cap: PageMaker lets you quickly add a drop cap--a large initial character--to one or more paragraphs at a time. The drop cap's baseline falls one or more lines below the baseline of the first line of a paragraph.
To create the drop-cap effect, PageMaker resizes and subscripts the initial character in the paragraph, and shifts the baseline of the subscript character. To wrap paragraph lines around the character, PageMaker also inserts tabs at the start of each line and line breaks at the end of each line that wraps around the drop-cap character. (Line breaks prevent the tab at the start of each line from flowing back to the previous line.)
Click an insertion point any where in the paragraph you want to begin with a drop cap.
Click on Utilities > Plug – ins > Drop Cap.
Specify the number of lines to wrap around the drop cap.
Click on Apply to view the drop cap without leaving the dialog box.
Click on Close.

Text Wrap: One of the best ways to create visual impact in a publication is to wrap text around graphics.
Select a graphic or image.
Click on Element > Text Wrap (Ctrl + Alt + E).
Click on middle wrap option icon. (The right-most icon is not available unless you have customized the text wrap, as described later.)
Add a new handle by clicking on the graphics boundary where you want the handle to appear.
Reshape the boundary by dragging handles or line segments. (You can hold down Shift as you drag handles or segments, to constrain movement to vertical or horizontal.)

Mask: Masking is a way of covering part of an object so that only a portion of it appears through a shape drawn with the rectangle, ellipse, or polygon tool. The masking object can be behind the object being masked. In that case, if the masking object has a fill, the fill will show through the transparent areas of the object being masked.
Draw or select the object you want to use as a masking object.
Position the masking object you drew in Step 1 over the objects you want to mask.
Select the mask and the objects you want to be masked.
Click on Element > Mask. (Ctrl + 6)
Note: You cannot mask a frame or use a frame as a masking object.

Unmask: It is used to release or separate the masked object or image.
Select the masked object or image. Click on Element > Unmask (Ctrl + Shift + 6)

Lock Position: You can lock individual objects in place in order to help preserve the design of your pages through all stages of production. You cannot cut or delete a locked object without unlocking it first, but you can copy a locked object; it will be pasted as an unlocked object.
Select the object or image or graphics. Click on Element > Lock Position (Ctrl + L)
Unlock: Select the locked object. Click on Element > Unlock (Ctrl + Shift + L)

Polygon Setting: It is used to change the polygon settings of selected polygon.
Select the polygon. Click on Element > Polygon settings. Define the polygon style. Click on Ok.

Rounded Corners: It is used to change the sides of selected rectangle.
Select the rectangle. Click on Element > Rounded Corners. Choose proper corner sides. Click on Ok.