Hardware The term hardware refers to mechanical device that makes up computer. Computer hardware consists of interconnected electronic devices that we can use to control computer's operation, input and output. Examples of hardware are CPU, keyboard, mouse, hard disk, etc. Hardware Components Computer hardware is a collection of several components working together. Some parts are essential and others are added advantages. Computer hardware is made up of CPU and peripherals

Software A set of instructions that drives computer to do stipulated tasks is called a program. Software instructions are programmed in a computer language, translated into machine language, and executed by computer. Software can be categorized into two types – System software Application software System Software System software operates directly on hardware devices of computer. It provides a platform to run an application. It provides and supports user functionality. Examples of system software include operating systems such as Windows, Linux, Unix, etc. Application Software An application software is designed for benefit of users to perform one or more tasks. Examples of application software include Microsoft Word, Excel, PowerPoint, Oracle, etc

Computer Language: Generally, we use languages like English, Hindi, etc., to make communication between two persons. That means when we want to make communication between two persons we need a language through which persons can express their feelings. Similarly, when we want to make communication between user and computer or between two or more computers we need a language through which user can give information to the computer and vice versa. When a user wants to give any instruction to the computer the user needs a specific language and that language is known as a computer language. The user interacts with the computer using programs and that programs are created using computer programming languages like C, C++, Java, etc.,

Low-Level Language (Machine Language) Low-Level language is the only language which can be understood by the computer. Binary Language is an example of a low-level language. Low-level language is also known as Machine Language. The binary language contains only two symbols 1 & 0. All the instructions of binary language are written in the form of binary numbers 1's & 0's. A computer can directly understand the binary language. Machine language is also known as the Machine Code. As the CPU directly understands the binary language instructions, it does not require any translator. CPU directly starts executing the binary language instructions and takes very less time to execute the instructions as it does not require any translation. Low-level language is considered as the First Generation Language (1GL)

Middle-Level Language (Assembly Language) Middle-level language is a computer language in which the instructions are created using symbols such as letters, digits and special characters. Assembly language is an example of middle-level language. In assembly language, we use predefined words called mnemonics. Binary code instructions in low-level language are replaced with mnemonics and operands in middle-level language. But the computer cannot understand mnemonics, so we use a translator called Assembler to translate mnemonics into binary language. Assembler is a translator which takes assembly code as input and produces machine code as output. That means, the computer cannot understand middle-level language, so it needs to be translated into a low-level language to make it understandable by the computer. Assembler is used to translate middle-level language into low-level language

High-Level Language A high-level language is a computer language which can be understood by the users. The high-level language is very similar to human languages and has a set of grammar rules that are used to make instructions more easily. Every high-level language has a set of predefined words known as Keywords and a set of rules known as Syntax to create instructions. The high-level language is easier to understand for the users but the computer can not understand it. High-level language needs to be converted into the low-level language to make it understandable by the computer. We use Compiler or interpreter to convert highlevel language to low-level language. Languages like COBOL, FORTRAN, BASIC, C, C++, JAVA, etc., are examples of high-level languages. All these programming languages use human-understandable language like English to write program instructions. These instructions are converted to low-level language by the compiler so that it can be understood by the computer

Assembler is a type of computer program that interprets software programs written in assembly language into machine language, code and instructions that can be executed by a computer. An assembler enables software and application developers to access, operate and manage a computer's hardware architecture and components. An assembler is sometimes referred to as the compiler of assembly language. It also provides the services of an interpreter.

A **compiler** is a software program that is responsible for changing initial programmed code into a more basic machine language closer to the "bare metal" of the hardware, and more readable by the computer itself. A high-level source code that is written by a developer in a high-level programming language gets translated into a lower-level object code by the compiler, to make the result "digestible" to the processor.

An **interpreter** is a computer program that is used to directly execute program instructions written using one of the many high-level programming languages.The interpreter transforms the high-level program into an intermediate language that it then executes, or it could parse the high-level source code and then performs the commands directly, which is done line by line or statement by statement

Memory Hierarchy: The memory in a computer can be divided into five hierarchies based on the speed as well as use. The processor can move from one level to another based on its requirements. The five hierarchies in the memory are registers, cache, main memory, magnetic discs, and magnetic tapes. The first three hierarchies are volatile memories which mean when there is no power, and then automatically they lose their stored data. Whereas the last two hierarchies are not volatile which means they store the data permanently. A memory element is the set of storage devices which stores the binary data in the type of bits. In general, the storage of memory can be classified into two categories such as volatile as well as non-volatile. The memory hierarchy design in a computer system mainly includes different storage devices. Most of the computers were inbuilt with extra storage to run more powerfully beyond the main memory capacity. The following memory hierarchy diagram is a hierarchical pyramid for computer memory. The designing of the memory hierarchy is divided into two types such as primary (Internal) memory and secondary (External) memory.

Primary Memory : The primary memory is also known as internal memory, and this is accessible by the processor straightly. This memory includes main, cache, as well as CPU registers.

Secondary Memory : The secondary memory is also known as external memory, and this is accessible by the processor through an input/output module. This memory includes an optical disk, magnetic disk, and magnetic tape

Registers: Usually, the register is a static RAM or SRAM in the processor of the computer which is used for holding the data word which is typically 64 or 128 bits. The program counter register is the most important as well as found in all the processors. Most of the processors use a status word register as well as an accumulator. A status word register is used for decision making, and the accumulator is used to store the data like mathematical operation. Usually, computers like complex instruction set computers have so many registers for accepting main memory, and RISC-reduced instruction set computers have more registers

Cache Memory:Cache memory can also be found in the processor, however rarely it may be another IC (integrated circuit) which is separated into levels. The cache holds the chunk of data which are frequently used from main memory. When the processor has a single core then it will have two (or) more cache levels rarely. Present multi-core processors will be having three, 2-levels for each one core, and one level is shared.

Main Memory: The main memory in the computer is nothing but, the memory unit in the CPU that communicates directly. It is the main storage unit of the computer. This memory is fast as well as large memory used for storing the data throughout the operations of the computer. This memory is made up of RAM as well as ROM

Random Access Memory (RAM) is used to store the programs and data being used by the CPU in real-time. The data on the random access memory can be read, written, and erased any number of times. RAM is a hardware element where the data being currently used is stored. It is a volatile memory. Types of RAM: Static RAM, or (SRAM) Dynamic RAM, or (DRAM

Read Only Memory (ROM) is a type of memory where the data has been prerecorded. Data stored in ROM is retained even after the computer is turned off ie, non-volatile. Types of ROM: Programmable ROM, where the data is written after the memory chip has been created. It is non-volatile. Erasable Programmable ROM, where the data on this non-volatile memory chip can be erased by exposing it to high-intensity UV light. Electrically Erasable Programmable ROM, where the data on this non-volatile memory chip can be electrically erased using field electron emission. Mask ROM, in which the data is written during the manufacturing of the memory chip

Static Random Access Memory (SRAM) : Data is stored in transistors and requires a constant power flow. Because of the continuous power, SRAM doesn't need to be refreshed to remember the data being stored. SRAM is called static as no change or action i.e. refreshing is not needed to keep the data intact. It is used in cache memories. Advantage: Low power consumption and faster access speeds. Disadvantage: Less memory capacities and high costs of manufacturing.

Dynamic Random Access Memory (DRAM) : Data is stored in capacitors. Capacitors that store data in DRAM gradually discharge energy, no energy means the data has been lost. So, a periodic refresh of power is required in order to function. DRAM is called dynamic as constant change or action i.e. refreshing is needed to keep the data intact. It is used to implement main memory. Advantage: Low costs of manufacturing and greater memory capacities. Disadvantage: Slow access speed and high power consumption

Floppy Disk: A floppy disk is a flexible disk with a magnetic coating on it. It is packaged inside a protective plastic envelope. These are one of the oldest type of portable storage devices that could store up to 1.44 MB of data but now they are not used due to very less memory storage.

Hard disk: A hard disk consists of one or more circular disks called platters which are mounted on a common spindle. Each surface of a platter is coated with a magnetic material. Both surfaces of each disk are capable of storing data except the top and bottom disk where only the inner surface is used. The information is recorded on the surface of the rotating disk by magnetic read/write heads

Magnetic Tape: This tape is a normal magnetic recording which is designed with a slender magnetizable covering on an extended, plastic film of the thin strip. This is mainly used to back up huge data. Whenever the computer requires to access a strip, first it will mount to access the data. Once the data is allowed, then it will be unmounted. The access time of memory will be slower within magnetic strip as well as it will take a few minutes for accessing a strip.

Magnetic Disks The magnetic disks in the computer are circular plates fabricated of plastic otherwise metal by magnetized material. Frequently, two faces of the disk are utilized as well as many disks may be stacked on one spindle by read or write heads obtainable on every plane. All the disks in computer turn jointly at high speed. The tracks in the computer are nothing but bits which are stored within the magnetized plane in spots next to concentric circles. These are usually separated into sections which are named as sectors.

Compact Disk: A Compact Disc drive(CDD) is a device that a computer uses to read data that is encoded digitally on a compact disc(CD). A CD drive can be installed inside a computer's compartment, provided with an opening for easier disc tray access or it can be used by a peripheral device connected to one of the ports provided in the computer system.Acompact disk or CD can store approximately 650 to 700 megabytes of data. A computer should possess a CD Drive to read the CDs

Pen Drive Pen drive is a portable memory device that uses solid statememory rather than magnetic fields or lasers to record data. Ituses a technology similar to RAM, except that it is nonvolatile. Itis also called USB drive, key drive or flash memory.

DVD:It stands for Digital Versatile Disk or Digital Video Disk. It looks just like a CD and use a similar technology as that of the CDs but allows tracks to be spaced closely enough to store data that is more than six times the CD's capacity. It is a significant advancement in portable storage technology. A DVD holds 4.7 GB to 17 GB of data.

Blue Ray Disk: This is the latest optical storage media to store high definition audio and video. It is similar to a CD or DVD but can store up to 27 GB of data on a single layer disk and up to 54 GB of data on a dual layer disk. While CDs or DVDs use red laser beam, the blue ray disk uses a blue laser to read/write data on a disk

Memory hierarchy characteristics Performance Previously, the designing of a computer system was done without memory hierarchy, and the speed gap among the main memory as well as the CPU registers enhances because of the huge disparity in access time, which will cause the lower performance of the system. So, the enhancement was mandatory. The enhancement of this was designed in the memory hierarchy model due to the system's performance increase. Ability The ability of the memory hierarchy is the total amount of data the memory can store. Because whenever we shift from top to bottom inside the memory hierarchy, then the capacity will increase. Access Time The access time in the memory hierarchy is the interval of the time among the data availability as well as request to read or write. Because whenever we shift from top to bottom inside the memory hierarchy, then the access time will increase Cost per bit When we shift from bottom to top inside the memory hierarchy, then the cost for each bit will increase which means an internal Memory is expensive compared with external memory

Input Unit: The input unit provides data to the computer system from the outside. So, basically it links the external environment with the computer. It takes data from the input devices, converts it into machine language and then loads it into the computer system. Keyboard, mouse etc. are the most commonly used input devices.

Output Unit: The output unit provides the results of computer process to the users i.e it links the computer with the external environment. Most of the output data is the form of audio or video. The different output devices are monitors, printers, speakers, headphones etc.

Storage Unit: Storage unit contains many computer components that are used to store data. It is traditionally divided into primary storage and secondary storage.Primary storage is also known as the main memory and is the memory directly accessible by the CPU. Secondary or external storage is not directly accessible by the CPU. The data from secondary storage needs to be brought into the primary storage before the CPU can use it. Secondary storage contains a large amount of data permanently.

Arithmetic Logic Unit: All the calculations related to the computer system are performed by the arithmetic logic unit. It can perform operations like addition, subtraction, multiplication, division etc. The control unit transfers data from storage unit to arithmetic logic unit when calculations need to be performed. The arithmetic logic unit and the control unit together form the central processing unit.

Main Memory Unit (Registers) – 1.Accumulator: Stores the results of calculations made by ALU.2.Program Counter (PC): Keeps track of the memory location of the next instructions to be dealt with. The PC then passes this next address to Memory Address Register (MAR).3.Memory Address Register (MAR): It stores the memory locations of instructions that need to be fetched from memory or stored into memory.4.Memory Data Register (MDR): It stores instructions fetched from memory or any data that is to be transferred to, and stored in, memory. 5.Current Instruction Register (CIR): It stores the most recently fetched instructions while it is waiting to be coded and executed.6.Instruction Buffer Register (IBR): The instruction that is not to be executed immediately is placed in the instruction buffer register IBR

Control Unit This unit controls all the other units of the computer system and so is known as its central nervous system. It transfers data throughout the computer as required including from storage unit to central processing unit and vice versa. The control unit also dictates how the memory, input output devices, arithmetic logic unit etc. should behave

Buses –Data is transmitted from one part of a computer to another, connecting all major internal components to the CPU and memory, by the means of Buses. Types: Data Bus: It carries data among the memory unit, the I/O devices, and the processor. Address Bus: It carries the address of data (not the actual data) between memory and processor. Control Bus: It carries control commands from the CPU (and status signals from other devices) in order to control and coordinate all the activities within the computer

Von Neumann Bottleneck The term "Von Neumann architecture" has evolved to mean any stored-program computer in which an instruction fetch and a data operation cannot occur at the same time because they share a common bus. Whatever we do to enhance performance, we cannot get away from the fact that instructions can only be done one at a time and can only be carried out sequentially. Both of these factors hold back the competence of the CPU. This is commonly referred to as the 'Von Neumann bottleneck' and often it limits the performance of the system

In **the top-down approach**, a complex algorithm is broken down into smaller fragments, better known as 'modules.' These modules are then further broken down into more smaller fragments until they can no longer be fragmented. This process is called 'modularization.' However, during the modularization process, you must always maintain the integrity and originality of the algorithm. By breaking a bigger problem into smaller fragments, the top-down approach minimizes the complications usually incurred while designing algorithms. Furthermore, in this approach, each function in a code is unique and works independently of other functions. The topdown approach is heavily used in the C programming language

The Bottom-Up Approach

Contrary to the top-down approach, the bottom-up approach focuses on designing an algorithm by beginning at the very basic level and building up as it goes. In this approach, the modules are designed individually and are then integrated together to form a complete algorithmic design. So, in this method, each and every module is built and tested at an individual level (unit testing) prior to integrating them to build a concrete solution.

The **World Wide Web Consortium (W3C)** is the main international standards organization for the World Wide Web. the consortium is made up of member organizations that maintain full-time staff working together in the development of standards for the World Wide Web W3C is an international community of member organizations that articulates web standards so that websites look and work the same in all web browsers. Its mission is to lead the World Wide Web to its full potential by developing standards, protocols and guidelines that ensure its long-term growth. The World Wide Web Consortium (W3C) develops international Web standards: HTML , CSS , and many more. W3C's Web standards are called W3C Recommendations . All W3C standards are reviewed for accessibility support by the Accessible Platform Architectures (APA) Working Grou

The **Hypertext Transfer Protocol (HTTP**) is an application-level protocol for distributed,collaborative, hypermedia information systems. This is the foundation for datacommunication for the World Wide Web (i.e. internet) since 1990. HTTP is a generic andstateless protocol which can be used for other purposes as well using extensions of itsrequest methods, error codes, and headers.Basically, HTTP is a TCP/IP based communication protocol, that is used to deliver data(HTML files, image files, query results, etc.) on the World Wide Web. The default port is TCP80, but other ports can be used as well. It provides a standardized way for computers tocommunicate with each other. HTTP specification specifies how clients' request data will beconstructed and sent to the server, and how the servers respond to these requests.

Basic Features: There are three basic features that make HTTP a simple but powerful protocol: 1.HTTP is connectionless: The HTTP client, i.e., a browser initiates an HTTP request andafter a request is made, the client waits for the response. The server processes the requestand sends a response back after which client disconnect the connection. So client and serverknows about each other during current request and response only. Further requests aremade on new connection like client and server are new to each other. 2.HTTP is media independent: It means, any type of data can be sent by HTTP as long asboth the client and the server know how to handle the data content. It is required for theclient as well as the server to specify the content type using appropriate MIME-type. 3.HTTP is stateless: As mentioned above, HTTP is connectionless and it is a direct result of HTTP being a stateless protocol. The server and client are aware of each other only during acurrent request. Afterwards, both of them forget about each other. Due to this nature of theprotocol, neither the client nor the browser can retain information between different requestsacross the web pages.

Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript.Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as minteractive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as <img /> and <input /> directly introduce content into the page. Other tags such as <p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.HTML can embed programs written in a scripting language such as JavaScript, which affects the behavior and content of web pages. Inclusion of CSS defines the look and layout of content. The World Wide Web Consortium (W3C), former maintainer of the HTML and current maintainer of the CSS standards, has encouraged the use of CSS over explicit presentational HTML

XHTML stands for EXtensible HyperText Markup Language. It is a cross between HTML and XML language. XHTML is almost identical to HTML but it is stricter than HTML. XHTML is HTML defined as an XML application. It is supported by all major browsers. Although XHTML is almost the same as HTML but It is more important to create your code correctly, because XHTML is stricter than HTML in syntax and case sensitivity. XHTML documents are well-formed and parsed using standard XML parsers, unlike HTML, which requires a lenient HTML-specific parser

HTML Table: The <table> tag defines an HTML table.Each table row is defined with a <tr> tag. Each table header is defined with a <th> tag. Each table data/cell is defined with a <td> tag.By default, the text in <th> elements are bold and centered.By default, the text in <td> elements are regular and left-align

HTML Table - Add a BorderTo add a border to a table,

HTML LIST• Unordered List• Ordered list• Definition list

unordered HTML List: An unordered list starts with the <ul> tag. Each list item starts with the <li> tag.The list items will be marked with bullets (small black circles) by default

Ordered HTML List: An ordered list starts with the <ol> tag. Each list item starts with the <li> tag.The list items will be marked with numbers by default:

HTML Description ListsHTML also supports description lists. A description list is a list of terms, with a description of each term. The <dl> tag defines the description list, the <dt> tag defines the term (name), and the <dd> tag describes each term:

HTML LINKS : External links are links that lead from one site to another site or a file located on another site. Internal links are links that link from one page of a site to another page on the same site or to sections of the same page There are two types of links to pages you can create. There is the "Internal Link" and the "External Link". An "Internal Link" is a link in your site that navigates the visitor to another page in your website. The "External Link" navigates the visitor away from your site to another website in the internet (like https://google.com). Below are examples of an external and internal link. The <a> in an HTML tag called an "anchor". The anchor can have different attributes inside. The "href" attribute is the location the link takes you when clicked

HTML Links – Syntax The HTML <a> tag defines a hyperlink. It has the following syntax:link textThe most important attribute of the <a> element is the href attribute, which indicates the link's destination.The link text is the part that will be visible to the reader.Clicking on the link text, will send the reader to the specified URL address

HTML Links - The target Attribute By default, the linked page will be displayed in the current browser window. To change this, you must specify another target for the link.The target attribute specifies where to open the linked document.

The HTML <audio> Element To play an audio file in HTML, use the <audio> element:The controls attribute adds audio controls, like play, pause, and volume.The <source> element allows you to specify alternative audio files which the browser may choose from. The browser will use the first recognized format.The text between the <audio> and </audio> tags will only be displayed in browsers that do not support the <audio> element.HTML <audio> AutoplayTo start an audio file automatically, use the autoplayattribute

The HTML <video> ElementTo show a video in HTML, use the <video> element:The controls attribute adds video controls, like play, pause, and volume.It is a good idea to always include width and height attributes. If height and width are not set, the page might flicker while the video loads.The <source> element allows you to specify alternative video files which the browser may choose from. The browser will use the first recognized format.The text between the <video> and </video> tags will only be displayed in browsers that do not support the <video> element.HTML <video> AutoplayTo start a video automatically, use the autoplay attribute

HTML Attributes

•All HTML elements can have attributes

•Attributes provide additional information about elements

•Attributes are always specified in the start tag

•Attributes usually come in name/value pairs like: name="value"

The href Attribute The <a> tag defines a hyperlink. The href attribute specifies the URL of the page the link goes to:

The src Attribute:The <img> tag is used to embed an image in an HTML page. The src attribute specifies the path to the image to be displayed:

The alt Attribute: The required alt attribute for the <img> tag specifies an alternate text for an image, if the image for some reason cannot be displayed. This can be due to slow connection, or an error in the src attribute, or if the user uses a screen reader.

The title Attribute: The title attribute defines some extra information about an element. The value of the title attribute will be displayed as a tooltip when you mouse over the element:

The style Attribute: The style attribute is used to add styles to an element, such as color, font, size, and more

The HTML Style Attribute: Setting the style of an HTML element, can be done with the style attribute.The HTML style attribute has the following syntax:<tagname style="property:value;">

Background Color:The CSS background-color property defines the background color for an HTML element.

Text Color The CSS color property defines the text color for an HTML element:

Fonts: The CSS font-family property defines the font to be used for

Text Size:The CSS font-size property defines the text size for an HTML element

Text Alignment:The CSS text-align property defines the horizontal text alignment for an HTML element:

Web server is a computer where the web content is stored. Basically web server is used to host the web sites but there exists other web servers also such as gaming, storage, FTP, email etc.

Web site is collection of web pages whileweb server is a software that respond to the request for web resources.

Web Server Working: Web server respond to the client request in either of the following two ways:Sending the file to the client associated with the requested URL. Generating response by invoking a script and communicating with database

Web Hosting is a service that allows hosting/post web-server applications(website or web page) on a computer system through which web-browser client can have easy access to electronic content on the Internet. Web Server or Web Host is a computer system that provide web hosting. When Internet user's want to view your website, all they need to do is type your website address or domain into their browser. The user's computer will then connect to your server and your web pages will be delivered to them through the browser. Basically, the web hosts allows the customers to place documents, such as html pages, graphics, and other multimedia files etc. onto a special type of computer called a web server. It provides constant and high speed connection to the backbone of Internet.

Different types of Web hosting services are

1. Free Hosting : This is a free non-paid web hosting service. This type of hosting is available with many prominent sites that offer to host some web pages for no cost. Advantages : Free of cost, Use websites to place advertisements. banners and other forms of,advertising media Disadvantages: Customer support is missing, Low bandwidth and lesser data transfer, No control over your website

2. Shared/Virtual Hosting : Its a web hosting service where many website reside on one web server connected to the internet. This type of hosting is provided under one's own domain name, www.yourname.com. With a hosting plan with the wed b hosting company, one can present oneself as a fully independent identity to his/her web audience .Advantages : Easy and affordable, Secured by hosting provider 24/7 Technical support Disadvantages: Shared resources can slow down the whole server, Less flexible than dedicated hosting

3. Dedicated Hosting : Hosted on a dedicated server, this type of hosting is best suited for large websites with high traffic. In this, the company wishing to go online, rents an entire web server from a hosting company. This is suitable for companies hosting larger websites, maintaining other's sites or managing a big online mall etc. Advantages : Ideal for large business, Strong database support, Unlimited software support, Powerful e-mail solutions, Complete root access to your servers Disadvantages: Its very expensive, Requires superior skill sets

4. Co-located Hosting : This hosting lets you place your own web server on the premises of a service provider. It is similar to that of dedicated hosting except for the fact that the server is now provided by the user-company itself and its physical needs are met by the hosting company. Advantages : Greater Bandwidth High Up-Time Unlimited Software Options, High Security Disadvantages: Difficult to configure and debug, Its expensive, Require high skills

A **domain** is a **worldwide unique and unambiguous name** for a logically defined section of the internet; a website, for example. Domains appear in this form:www.example.com A domain is an essential part of a uniform resource LIocator (URL) and indicates where a web resource can be found within a hierarchically structured **domain name system (DNS)**. The name server is in charge of translating the domain into an IP address. Specialized web servers are then entrusted with **resolving IP addresses**. This process works in a similar way to a directory assistance service: a user writes the domain www.example.com into the browser's search bar and a request is then sent to the corresponding name server . Upon arrival www.example.com is then retrieved from the database and the deposited IP address is transmitted to the browser.

DNS DNS stands for a Domain Name System. resolves names to numbers, to be more specific it resolves domain names to IP addresses. So if you type in a web address in your web browser, DNS will resolve the name to a number because the only thing computers know are numbers.

Working : If you wanted to go to a certain website you would open up your web browser and type in domain name of that website. Let us use google.com. Now technically you really do not have to type in google.com to retrieve Google web page, you can just type in IP address instead if you already know what google's IP address is, but since we are not accustomed to memorizing and dealing with numbers, especially when there are millions of websites on Internet, we can just type in domain name instead and let DNS convert it to an IP address for us. So back to our example, when you type google.com on your web browser DNS server will search through its cache to find a matching IP address for that domain name, and when it finds it it will resolve that domain name to IP address of Google web site, and once that is done then your computer is able to communicate with a Google web server and retrieve the webpage. So DNS basically works like a phone book, when you want to find a number, you do not look up number first, you look up name first then it will give you the number. So to break this down into further detail, let us examine the steps that DNS takes. So when you type in google.com in your web browser and if your web browser or operating system cannot find IP address in its own cache memory, it will send a query to next level to what is called resolver server. Resolver server is basically your ISP or Internet service provider, so when resolver receives this query, it will check its own cache memory to find an IP address for google.com, and if it cannot find it it will send query to next level which is root server. The root servers are the top most server in the DNS hierarchy.There are 13 sets of these root servers from a.root-servers.net to m.root-servers.net and they are strategically placed around world, and they are operated by 12 different organizations and each set of these root servers has their own unique IP address. So when root server receives query for IP address for google.com, root server is not going to know what IP address is, but root server does know where to send resolver to help it find IP address. So root server will direct resolver to TLD or top-level domain server for .com domain. So resolver will now ask TLD server for IP address for google.com. The top-level domain server stores address information for top-level domains such as .com and .net, .org, and so on. This particular TLD server manages .com domain which google.com is a part of. So when a TLD server receives query for IP address for google.com, TLD server is not going to know what IP addresses for google.com. So the TLD will direct resolver to next and final level, which are authoritative name servers. So once again the resolver will now ask authoritative name server for IP address for google.com. Authoritative name server or servers are responsible for knowing everything about domain which includes IP address. They are final authority. So when the authoritative name server receives query from resolver, name server will respond with IP address for google.com. And finally, resolver will tell your computer IP address for google.com and then your computer can now retrieve google web page. It is important to note that once resolver receives IP address, it will store it in its cache memory in case it receives another query for google.com. So it does not have to go through all those steps again.DNS servers has different types of records to manage resolution efficiently and provide important information about a domain. These records are the details which are cached bu DNS servers. Each records have a TTL(Time To Live) value in seconds associated with it, these values set time for the expiration of cached record in DNS server which ranges to 60 to 86400 depending on the DNS provider.

URL stands for Uniform Resource Locator. A URL is a formatted text string used by Web browsers, email clients and other software to identify a network resource on the Internet. Network resources are files that can be plain Web pages, other text documents, graphics, or programs.

URL strings consist of three parts (substrings):protocol designation, host name or address, file or resource location

CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML based markup language. What is CSS? CSS stands for Cascading Style Sheets CSS describes how HTML elements are to be displayed on screen, paper, or in other media CSS saves a lot of work. It can control the layout of multiple web pages all at once External stylesheets are stored in CSS file

When a browser reads a style sheet, it will format the HTML document according to the information in the style sheet. Three Ways to Insert CSS There are three ways of inserting a style sheet: External CSS Internal CSS Inline CSS

Properties of CSS: Inline CSS has the highest priority, then comes Internal/Embedded followed by External CSS which has the least priority. Multiple style sheets can be defined on one page. If for an HTML tag, styles are defined in multiple style sheets then the below order will be followed. As Inline has the highest priority, any styles that are defined in the internal and external style sheets are overridden by Inline styles. Internal or Embedded stands second in the priority list and overrides the styles in the external style sheet. External style sheets have the least priority. If there are no styles defined either in inline or internal style sheet then external style sheet rules are applied for the HTML tags