Computer Science Programming and Computational

Computer is an electronic device that is designed to work with Information. *The term [computer](#) is* *derived* *from* *the* *Latin* *term* '**computare**', this means to *calculate* or *programmable* *machine*. **Computer can not do anything without a Program**. It represents the decimal numbers through a string of [binary digits](#). The Word 'Computer' usually refers to the Center Processor Unit plus Internal memory.

File management in windows can be done through Windows explorer or My Computer. Windows Explorer displays the hierarchical list of files, folders, and storage drives (both fixed and removable) on your computer. It also lists any network drives that have been mapped to as a drive letters on your computer. Windows Explorer can be used to copy, move, rename, and search for files and folders. For example, to copy a file, you can open a folder that contains the desired file to be copied or moved, and then just drag and drop the file to target folder or drive.

Contents

[[hide](#)]

When files or folders are deleted from hard disk, Windows places them in the Recycle Bin, from where they can be retrieved, until the Recycle Bin is made empty. Files or folders deleted from a

File Management in Windows

removable storage media such as network drive are permanently deleted and are not sent to the Recycle Bin

Thinking Revision of the basics of Python Functions: scope, parameter passing, mutable/immutable properties of data objects, pass arrays to functions, return values, functions using libraries: mathematical, and string functions. File handling: open and close a file, read, write, and append to a file, standard input, output, and error streams, relative and absolute paths. Using Python libraries: create and import Python libraries Recursion: simple algorithms with recursion: factorial, Fibonacci numbers; recursion on arrays: binary search Idea of efficiency: performance defined as inversely proportional to the wall clock time, count the number of operations a piece of code is performing, and measure the time taken by a program. Example: take two different programs for the same problem, and understand how the efficient one takes less time. Data visualization using Pyplot: line chart, pie chart, and bar chart. Data-structures: lists, stacks, queues.

Computer Science Object Oriented Programming in CPP (OLD) Object Oriented Programming: Concept of Object Oriented Programming – Data hiding, Data encapsulation, Implementation of Object Oriented Programming concepts in C++: Definition of a class, Member of a class Constructor and Destructor Special Characteristics, declaration and definition of destructor Inheritance (Extending Classes Data File Handling: Need for a data file, Types of data files – Text file and Binary file basic file operations on text file Binary File Components of C++ to be used with file handling Header file: fstream.h; ifstream, ofstream, classes Introduction to Pointer

 Data Structures (OLD) Introduction to data structure- array, stack queues primitive and non-primitive data structure, linear and non-linear structure, static and dynamic data structure. One and two Dimensional arrays: Sequential allocation and address calculation; Stack (Array and Linked implementation of Stack): Introduction to stack (LIFO_Last in First out Operations) Queue: (Array and Linked Implementation) Introduction to Queue (FIFO – First in First out operations) Operations on Queue (Insert and Delete and its Implementation in C++, circular queue using array.

DBMS and SQL (OLD)

Download CBSE Revision Notes for CBSE Class 12 Computer Science DBMS and SQL (OLD) Data base Concepts: Introduction to data base concepts and its need. Relational data model: Concept of domain, tuple, relation, key, primary key, alternate key, General Concepts: Advantages of using SQL, Data Definition Language and Data Manipulation Language SQL functions: SUM ( ), AVG ( ), COUNT ( ), MAX ( ) AND MIN ( ); Obtaining results (SELECT query) from 2 tables using equi-join, Cartesian product and Union Note: Implementation of the above mentioned commands could be done on any SQL supported software on one or two tables.

Boolean Algebra (OLD)

Download CBSE Revision Notes for CBSE Class 12 Computer Science Boolean Algebra (OLD) Role of Logical Operations in Computing. Binary-valued Quantities, Boolean Variable, Boolean Constant and Boolean Operators: AND, OR, NOT; Truth Tables; Closure Property, Commutative Law, Associative Law, Identity law, Inverse Law, Principle of Duality, Idempotent Law, Distributive Law, Absorption Law, Involution Law, DeMorgan's Law and their applications; Obtaining Sum of Product (SOP) and Product of Sum (POS) form the Truth Table, Reducing Boolean Expression (SOP and POS) to its minimal form, Use of Karnaugh Map for minimization of Boolean expressions (up to 4 variables); Application of Boolean Logic: Digital electronic circuit design using basic Logic Gates (NOT, AND, OR, NAND, NOR) Use of Boolean operators (NOT, AND, OR) in SQL SELECT statements Use of Boolean operators (AND, OR) in search engine queries.

Communication Technologies (OLD)

Download CBSE Revision Notes for CBSE Class 12 Computer Science Communication Technologies (OLD) Evolution of Networking:

ARPANET, Internet, Interspace Data Communication terminologies Transmission mediaNetwork devices Network Topologies and types Network ProtocolMobile Telecommunication Technologies Protocols for Chat and Video Conferencing VOIP Network Security Concepts India IT Act, Cyber Law, Cyber Crimes, IPR issues, hacking.Introduction To Web services Domain Names E-commerce payment transactions using online banking, mobile banking and payment apps and services.

Chapter 2 – Concept of Object Oriented Programming

- Chapter 3 – Classes in Python
- Chapter 4 – Inheritance
- Chapter 5 – Linear List Manipulation
- Chapter 6 – Stacks & Queues in list
- Chapter 7 – Data File Handling
- Chapter 8 – Exception Handling & Green Functions
- Chapter 9 – Databases Concepts and SQL
- Chapter 10 – Structure Query Language
- Chapter 11 – Boolean Algebra
- Chapter 12 – Boolean Functions & Reduce Forms
- Chapter 13 – Application of Boolean Logic
- Chapter 14– Networking Concepts (Part 1)
- Chapter 15 – Networking Concepts (Part 2)
- Chapter 16 – Networking Protocols
- Chapter 17 – Mobile Telecommunication Technologies, Network Security and Internet Services

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Interactive Mode: Interactive Mode, as the name suggests, allows us to interact with OS.

Script Mode: In script mode, we type Python program in a file and then use interpreter to execute the content of the file.

Number: Number data type stores Numerical Values.

Sequence: A sequence is an ordered collection of items, indexed by positive integers.

Arithmetic operators: +, -, *, /, %, ** and //.

Relational operators: <, <=, >, >=, != or <> and ==.

Logical operators: or, and, and not

Assignment Operator: =, +=, -=, *=, /=, %=, **= and //=

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 (Concept of Object Oriented Programming)

inner to outer.

G. Global (module) - It searches for global modules or for names declared global

B. Built-in (Python) - Finally it checks for any built in functions in Python.

Class definitions should be given before it is referenced.

__init__ is a special method used to initialize the members of a class.

self is the first argument that is passed to the methods of a class.

A class object can be used in two ways - Instantiation and Attribute reference Class attributes belong to the class and will be shared by all

instances Instance attributes belong to a particular instance of a class only.

The attributes - data and methods can be added to the class dynamically.

getattr(obj, name,[default]): is used to access the attribute of the object

hasattr(obj,name): is used to check if an attribute exists or not

setattr(obj,name,value): is used to set an attribute with a value.

delattr(obj,name) : is used to delete an attribute

__dict__ : gives the dictionary containing class namespace

__doc__: returns the docstring of a class

__name__: it gives the class name

__module__: specifies the module name in which the class is defined

__bases__: it gives a tuple containing base classes

__del__: is invoked when the module is being deleted

__str__: returns the string representation of the objects Private variables can only be accessed from inside the objects.

Name Mangling: A name is prefixed with two leading underscores and no more than one trailing underscore.

Static Method: is a method that does not obey the usual convention in which self, an instance of the class, is the first argument to the method.

Python uses two strategies for memory allocation-
Reference counting and Automatic garbage collection.

Reference Counting: works by counting the number of times an object is referenced by other objects in the system. When an object's reference count reaches zero, Python collects it automatically.

Automatic Garbage Collection: Python schedules garbage collection based upon a threshold of object allocations and object de-allocations. Whe the number of allocations minus the number of deallocations are greater than the threshold number, the garbage collector is run and the unused block of memory is reclaimed.

(Inheritance)

Inheritance: In object oriented programming, inheritance is a mechanism in which a new class is derived from an already defined class. The derived class is known as a subclass or a child class. The pre-existing class is known as base class or a parent class or a super class.

Single Inheritance: In single inheritance a subclass is derived from a single base class.

Multilevel Inheritance: In multilevel inheritance, the derived class becomes the base of another class.

Multiple Inheritance: In this type of inheritance, the derived class inherits from one or more base classes.

Hierarchical Inheritance: In this type of inheritance, the base class is inherited by more than one class.

Hybrid Inheritance: This inheritance is a combination of multiple, hierarchical and multilevel inheritance.

Overriding Methods: The feature of overriding methods enables the programmer to provide specific implementation to a method in the subclass which is already implemented in the superclass.

Abstract Methods: An abstract method is a method declared in a parent class, but not implemented in it. The implementation of such a method can be given in the derived class.

From a template or wizard

1.　　　On the File menu, click New.

2.　　　In the New Document task pane, under New from template, click General Templates.

3.　　　Click the tab for the type of document you want to create, and then double-click the icon for the template or wizard you want.

Tips:

Creating file from a copy of an existing document

1.　　　On the File menu, click New.
2.　　　In the New Document task pane, under New from existing document, click Choose document.

3.　　　Click the document you want to create a new document from.

If you want to open a document that was saved in a different folder, locate and open the folder.

4.　　　Click Create New.

This document is created in the folder that contains the original document.

Save a document

To quickly save a document, click Save on the Standard toolbar. To save a document in a different location or format, use the procedures below.

Saving a document with different name

On the File menu, click Save As.

1.　In the File name box, enter a new name for the file.

2. Click Save.

<u>Saving a document with different format and file name</u>
On the File menu, click Save As.

1. The File name box, enter a new name for the file.

2. From Save as Type select the format.

3. Click on Save.

In computers, parallel computing is closely related to parallel processing (or concurrent computing). It is the form of computation in which concomitant ("in parallel") use of multiple CPUs that is carried out simultaneously with shared-memory systems to solving a supercomputing computational problem. Parallelism is the process of large computations, which can be broken down into multiple processors that can process independently and whose results combined upon completion. Parallelism has long employed in high-performance supercomputing.

Computer is an electronic device that is designed to work with Information. *The term computer* is *derived from the Latin term* '**computare**', this means to *calculate* or *programmable machine*. **Computer can not do anything without a Program**. It represents the decimal numbers through a string of binary digits. The Word 'Computer' usually refers to the Center Processor Unit plus Internal memory.

Charles Babbage is called the "Grand Father" of the computer. The First mechanical computer designed by Charles Babbage was called **Analytical Engine**. It uses read-only memory in the form of punch cards.

Computer is an advanced electronic device that takes raw data as input from the user and processes these data under the control of set of instructions (called program) and gives the result (output) and saves output for the future use. It can process both numerical and non-numerical (arithmetic and logical) calculations.
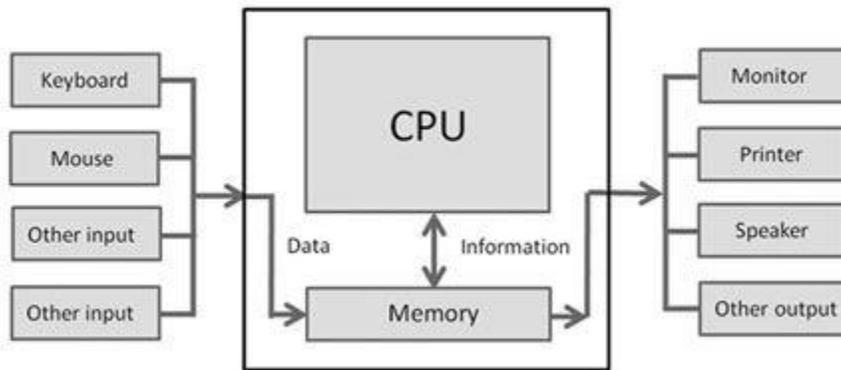
Input (Data):

Input is the raw information entered into a computer from the input devices. It is the collection of letters, numbers, images etc.

Process:

Process is the operation of data as per given instruction. It is totally internal process of the computer system.

Output:

Output is the processed data given by computer after data processing. Output is also called as Result. We can save these results in the storage devices for the future use.

Computer Classification: By Size and Power

Computers differ based on their data processing abilities. They are classified according to purpose, data handling and functionality.

According to functionality, computers are classified as:

• **Analog Computer:** A computer that represents numbers by some continuously variable physical quantity, whose variations mimic the properties of some system being modeled.
• **Personal computer:** A personal computer is a computer small and low cost. The term"personal computer" is used to describe desktop computers (desktops).
• **Workstation:** A terminal or desktop computer in a network. In this context, workstation is just a generic term for a user's machine (client machine) in contrast to a "server" or "mainframe."
• **Minicomputer:** A **minicomputer** isn't very mini. At least, not in the way most of us think of mini. You know how big your personal computer is and its related family.
• **Mainframe:** It refers to the kind of large computer that runs an entire corporation.
• **Supercomputer:** It is the biggest, fastest, and most expensive computers on earth.
• **Microcomputer:** Your *personal computer* is a **microcomputer**.

Basic Ideas of the Web

The World Wide Web (Web) is a hypermedia system. It has largely achieved the goal of Tim Berners-Lee, its British inventor, of a universal information space. Thanks to the global reach of the Internet, there is potentially universal access to an enormous volume of documents over the Internet. (Of course, in many developing countries, access is poor, which raises issues of disenfranchisement and disempowerment.) Many organisations make publicly available collections of hypermedia documents as part of either their marketing programme, customer service or global operations. Computer suppliers, for example, now publish very detailed specifications of their products via the Web.

Web servers and clients may be located at any part of the world and connected to each other by telecommunication links. If the Web is in some sense a digital library, it is one with no single geographical location. When it comes to commerce, distance begins to lose importance. As long as a supplier can provide goods or services where they are required, the location of the vendor and the consumer will not matter. (This gives rise to issues about jurisdiction for taxes, consumer laws, legality of product, etc.) This absence of distance is supported by the ease with which Web documents may be located world-wide; the mechanism is straightforward thanks to the way the location of such 'resources' are identified by a Uniform Resource Location (URL). The URL format unambiguously specifies locations of 'documents' on the Web. This location mechanism allows the actual implementation of geography-independent feature of the Web.

Generally speaking, there is no central authority controlling the Web, although fully qualified domain names are subject to controlled allocation, and Internet Service Providers may be subject to the laws of the countries in which they operate. Furthermore, the World-Wide Web Consortium (W3C), headed by Tim Berners-Lee at the Massachusetts Institute of Technology, is influencing — and to a large degree controlling — how technologies are deployed on the Web. The W3C specifies HTML and XML, but others bodies, such as the European Computer Manufacturers Association (ECMA), have standardised other Web technologies, such as what we mostly call JavaScript. JavaScript is a programming language originally developed by Netscape.

Anyone with the appropriate knowledge, and with access to server space, can create a Web document. These Web documents can make reference to any other document. Moreover, a user does not require specific, proprietary software on their computer platform to access the Web, with many Web browsers being free software. While browsers can access and display the information on the Web, not all of them can supply the user with the interactive portions of the Web pages. For example, if Java applets are prohibited or a browser does not support JavaScript, interactivity with the Web document will be limited; some information may even be missing if that information required the presence of these interactive components.

The implications are easy to predict. With different browsers supporting different features, and with the navigation difficulties associated with hypertext's mesh / graph connections, chaos might ensue. However, even the most inexperienced users currently cope and the Web, and it is becoming both a universal world of information, and a universal place for doing business.

Dynamic pages can respond interactively to user input. It is possible to have portions of a hypertext document be produced by a programme as the document is requested. In this way, Web pages are increasingly being used as a front end to databases.

This allows the user to fill out a query and send it off for processing by the hypertext document. The server queries the database using the user's information and returns the output as HTML. To allow data to be sent in such a way to and from Web servers, a standard called the Common Gateway Interface (CGI) has been created. The difference between dynamic Web pages and non-dynamic (so called 'static') Web pages is transparent to the browser and user.

It is also possible to embed programmes inside HTML. When the browser loads such a page, the code is immediately executed. This mechanism supports remote transactions for the commercial aspect of the Web

To Do:

Read about the World-Wide Web in your textbooks.

Summary of Web Terminologies

Here we briefly summarise some of the terms you will need in the module; they will be studied to varying extents in later chapters.

Network Protocols

A network protocol is a standard way of regulating data transmission between computers. Just as diplomats adhere to protocols — rules of behavior — when in foreign lands, network communications do the same. They have to obey agreed rules if they are to communicate and 'get on with each other'. After many years of both public and private research and development, two network protocols are now dominant: TCP (Transaction Control Protocol) and IP (Internet Protocol), together known as TCP/IP. (These were actually unlikely protocols to be so widely accepted, as faster, standardized protocols had been agreed upon, but none had the same robustness and extensibility as TCP/IP.)

Very often protocols were implemented without any formal acceptance and, because they worked most of the time, they became standards by default. Although TCP/IP is an accepted, de facto standard, work on Internet protocols continue in order to improve communication quality and support the continued growth of the Internet. There is no dictating authority for the Internet. Without a controlling authority, interim proposals about protocol changes are made by groups of interested individuals and then opened up for discussion. Documents containing the various proposed standards are published as Requests For Comment documents (RFCs). You may see references to a specific RFC as the best description of a protocol!

Uniform Resource Locator (URL)

An URL is needed to locate any resources on the Web. It is an address format that specifies how and where to find a document. The general format is as follows, where the various items in italics must be substituted with part of a real URL, or omitted altogether.

```
http://machine_name:port/path/file_name.file_extension
```

machine_name is either an IP address, for example 137.234.33.89, or a Fully Qualified Domain Name (also known as a DNS name, because Domain Name Servers map between Domain Names and IP addresses), for example, **www.apple.com**

port is the TCP port to connect to; this is an entry point to software on the server; an optional part of a URL

path is a relative file path from the server's document root; the server will start looking for a file in a specific directory and paths are relative to this

file_name is the name of the file to be browsed, e.g. welcome

file_extension is one of a number of suffixes which, by convention and operating system setup, indicate the type of data contained within the file, e.g. htm,html, txt.

HyperText Markup Language (HTML)

This language provides the format for specifying simple logical structure and links in a hypertext document. As a markup language, special formatting commands are placed in the text describing how the final version should appear. These formatted documents are interpreted by a Web browser which uses the HTML code to format the page being displayed. Several units in this module deal with HTML extensively. Although most professionals use special authoring tools to write HTML documents and to manage sites, developers of e-commerce sites and applications need to know the nitty-gritty detail of HTML, and this is what you will study.

HyperText Transfer Protocol (HTTP)

HTTP is a network protocol used to retrieve documents from a variety of machines in a minimum of time. It was invented by Tim Berners-Lee to support a project in developing a distributed hypertext system. Distributed hypertext requires the retrieval of documents from many different machines. File Transfer Protocol (FTP), which predates the Web, would be too slow for this purpose as it is a connection-oriented protocol that requires a permanent connection to a server, thus requiring a connection-maintenance overhead when accessing different machines.

Therefore, to support browsing, HTTP has the following characteristics:

- connection-less: a connection is established only for the period of transfer, and the connection need not be maintained after thereafter;
- stateless: the server has no 'history' of client visits (although the implementation of cookies overcomes this);
- comprehensive addressing: diverse files on any HTTP server world-wide can be referenced via URLs
- diverse data: using extensible MIME-types (see later), HTTP servers can supply information of every possible data types;
- rapid: allows request-response cycles of less than 100 milliseconds

HTTP is not mandatory for distributed hypertext; there are other techniques and protocols that can be used to access or transfer information. However, like TCP/IP and HTML it is ubiquitous, and so enables investment to develop e-commerce.

Fields of Application

The Web began as a tool to share knowledge and has successfully evolved into a general communications mechanism. With the support of transactions and synchronous communications, the Web has application in many different fields.

A primary use is the dissemination of knowledge, which takes many forms. For example, chat rooms and bulletin boards are integral to interactive discussion of all kinds of subjects. Frequently Asked Questions (FAQs), published on Web sites, offer answers to users' questions on how to do certain kinds of tasks. The variety of information that can be pulled out of the Web is wide-ranging.

Education includes a variation of the dissemination of knowledge. Open- or distance-learning programmes spearhead this aspect of the Web. Basically, any kind of demonstration on how to carry out certain tasks can be considered education. For example, a user can learn how to create a Web page from the numerous websites publishing such instructions.

With the possibilities of online trading, business transactions are carried out on the Web. The user supplies their order and credit card details so as to buy products advertised on the Web. The Selling module would cover this subject area in depth.

The Web as Digital Library

The Web as a vast digital library is becoming what is known as a 'Global Information Structure'. It will have a profound effect on how we live, work and play. We shall now look into a few of the social implications of the Web as a digital library and a marketplace.

Different Literacy

The hypermedia concept includes not only text and illustrations, but also music, animation, digital movies, video games and computer software. This diversity changes the form of literacy required when using the Web. The literacy needed when listening to music and watching a movie is different from that used when reading a book. Less literacy may be required with

innovative ways of using this digital library. For example, software that reads text aloud can assist people with visual handicaps.

Indeterminate Quality and Value

Editors and publishers employing traditional methods of publishing have little to gain from this type of publishing. As digital works can be copied at low costs, stored in almost no space and transported instantly anywhere in the world, writers can be their own publishers. Therefore, the works published are of indeterminate quality and value. Web publishing may provide no evaluation of work published.

Specialist Audiences

An article may perhaps interest a group of specialists in that field. With the Web, an average reader may browse through the article according to their degree of interest in the field. He or she may not want to be burdened with an additional flood of technicalities, or perhaps would navigate further to extract more in-depth information to supplement a deeper interest in the field.

Copyright Issues and Ease of Purchasing

The ease of copying digital works causes difficulties in protecting copyrights. It may be tempting to make illegal copies rather than finding the rightful owners and paying them a fee. On the other hand, the non-issue of distance and the 24-hour, 365-day activity on the Web means that much can be easily bought through on-line shops. Consumers may come from distant areas or different time zones. With the Web, this market place is open at all times and can serve a very large global region. New technology even allows computational agents to staff the market place rather than people. Therefore, businesses are not constrained by distance or time.

Sense of Place

Despite the irrelevance of distance, an electronic marketplace may be attractive as it goes to the consumers instead of them physically moving to the business environment. Its sense of place is created as an illusion for the benefit of the consumers.

Benefits of Hypertext

We shall proceed with an analysis of hypertext documents.

Exercise 1

Write down your ideas about the possible benefits of hypertext using the following headings. If you like, go on-line to discuss these with colleagues before writing them down.

- Ease of insertion of new information
- Pointers to external materials

- Browsing

Knowledge Additivity

Links can be created to associate related subjects. Therefore the information given can be extensive and wide. The combination of two related subject areas is known as knowledge additivity.

Let's say you want to find out how to tailor a shirt using a sewing machine. You would probably look in a book on tailoring a shirt and another on using a sewing machine. The information read would then be linked together in your brain. However, with the hypertext concept, this knowledge additivity would be simpler with association links. You can just continue clicking to read on both subject areas within the perceived single document.

Drawbacks of Hypertext

There are difficulties with working with hypertext, and hence also in providing or obtaining goods or services.

Exercise 2

Write down your ideas about the possible drawbacks of hypertext using the following headings. If you like, go on-line to discuss these with colleagues before writing them down.

- Navigation Difficulties
- No Main Catalogues
- Network Overload
- Link Fossilisation

Discussions and answers can be found at the **end of the chapter**

Activity 1: Analyzing Hyperlinks

Visit your favourite site and try to identify the following:

1. A chain of links
2. A loop
3. A guided tour
4. An operating system (OS) is the program which coordinate flow of information to user, it coordinate flow of information to the user.

   o/s is the collection of softwares that manages hardware resources of a computer and provides collective services to the user. Different types of Computer

Operating Systems refer to the collection of various softwares. Every computer possesses an operating system to run other programs present in it.

The Client-server Computing Model

When you are surfing the Web, you are using a Web browser. When you go to a website for documents, the site delivers them using software called the Web server. The browser is considered to be a client in the relationship with the server as it is requesting information services from the server. This is just one particular example of the client-server model of computing.

The client-server model has been defined as:

A software partitioning paradigm in which a distributed system is split between one or more server tasks which accept requests, according to some protocol, from (distributed) client tasks, asking for information or action. There may be either one centralized server or several distributed ones. This model allows clients and servers to be placed independently on nodes in a network.

Client-server computing is mainly about the client computer possessing its own computing power. In the days of mainframes, all the processing power took place on central computers. The client 'terminals' were little more than a television that could send and receive characters. When microprocessors became available, it was possible to make the terminals more powerful so that they could handle some of the processing. Over time this has meant that mainframes have been replaced by smaller server machines and terminals have been replaced by more powerful client workstations.

The client-server model provides a good division of processing power, since the server primarily provides information to the client which is responsible for interpreting and displaying it. This means that servers do not have to be powerful machines, allowing more people to become service providers.

A more important characteristic is that because the client-server model provides for significant processing power at the (remote) client end, the operator of the client system has considerable autonomous power in contributing to the enterprise of which he or she is a part. This means that local decisions can be made, possibly faster than if they were made remotely, and action taken.

You may hear client-server computing being talked about as a modern computing 'paradigm'. Other than being part of a sales pitch, this is likely to mean that the model has made a significant impact on, and change to, the way we design and use computer systems. In particular, it is the current model for distributed business systems, and fits nicely into the emerging Web.

Functionality

In the context of the Web, users run client programmes (i.e. Web browsers) which provide the following functionality:

- They allow the user to send a request for information to the server.
- They format the request so that the server can understand it.
- They format the response from the server in a way that the user can read it.

Server programmes carry out the following:

- They receive a request from a client and process the request.
- They respond by sending the requested information back to the client.

Exercise 3

The client-server model applies to a lot of things outside of computers. Imagine going to a bank to withdraw some money? Who is the client and who is the server? Clearly, you are the client and the bank is the server.

One of the advantages of the client server model is that one server can handle many clients. The teller in the bank (server) handles many customers (clients). Also, you can use lots of different servers to get the service you need. (That is there are a lot of tellers, and for that matter, bank branches and cash machines.)

For any website, say the **University of Cape Town Computer Science website** or the University's **Vula site** , think about the following questions and write down your answers:

1. Are there multiple clients?
2. Who are these clients?
3. Are there multiple servers?
4. Why would there be multiple servers?

Discussions and answers can be found at the **end of the chapter**

Information and Processing on the Web

Information is passed from the server to the browser. This information may be in the form of HTML documents, GIF files, Excel spreadsheets, movies — just about any digital content.

Information can also be passed from the browser to the server. When you click on a hyperlink you are sending information to the server, and when you fill in an online form, you are usually sending information to the server.

In addition to passing information backwards and forwards, some processing can also be done in the browser. For instance, you might have a simple Web page that calculates the overall cost

of a loan once the initial value of the loan, the interest rate and the length of the loan have been entered.

But where does the processing take place? Does the server process the information and generate the result, or is it the client that processes the information? If the client does the processing, then this is a client-side application; if it is the server, it is a server-side application.

In the loan example above, the client has the information (the principle, rate and time). It could send this information to the server to process the information, generate the result and send it back to the client. Alternatively, the server could send a programme to the client that will carry out the processing. In the latter case, since the client has all the information and the programme is pretty small, it is probably better to run the application on the client side.

Of course, there is also a problem of who has the information. If the server has a database, and the client wants to query it, then there are two possibilities. The server could send the database and the querying programme to the client to process it or the server could process it and simply send the result. In this case, it would probably be better to do the processing on the server side.

To summarize, where the processing is undertaken largely depends on where the information is, but also depends on the processing loads of the machines as well as the size of the programme being run.

MIME Types

A browser receives binary data from the server which it has to cope with. How does it know if the binary data is an HTML document, a GIF picture file or something entirely different? Even if it does know what kind of document it is, how does it process it? The answer to this is MIME types.

MIME types — Multipurpose Internet Mail Extensions — were created to identify the differing types of possible email attachments. The MIME types have been extended to include new multimedia types as they have been introduced, and are now used with a variety of protocols including HTTP. When information is sent to a browser, a MIME header identifies the file type of the document. Attaching a MIME type to a file allows the browser to process the file's contents correctly without the browser having to guess at the data type from the file's extension. This is important, since while MS-DOS files require a three letter extension to identify a file type (and Windows XP uses a similar file extension system), not all operating systems do this.

Processing MIME types

Mime types are processed as follows.

1. Somehow the HTTP server must decide what type a file is. The server administrator can provide this information by instructing the server to map file extensions to certain file types. The server administrator must therefore supply a list of all the different file

extensions for the files found on the server, along with the equivalent MIME types for each of these file extensions.

2. The client browser must also be configured to know how to deal with these different types. Most browsers have been preconfigured, but they sometimes need to be updated to deal with new file types. On Netscape Navigator 7.1, for instance, you use the Edit/Preferences... /Navigator/Helper Applications menu.

- View it in the browser. (Files such a GIFs, JPGs etc. can all be handled by the browser)
- Use a plug in. (Plug-ins are special pieces of code that software companies distribute to allow browsers to cope with new file formats.)
- Launch another application on your computer that can process the format.
- If all else fails, the file can be saved to disk until a suitable programme is found.

3. Linux Operating S

4.

5. what is linux

6. Linux □□ computer operating system (OS) □□ □□□□□ □□ free and open-source software development and distribution model □□ project □□ design □□□□□ □□□ □□ | □□□□□ □□□□□ important component □□ Linux kernel | operating system □□ kernel □□□□□ □□□□□ October 5, 1991 □□ Linus Torvalds □□ release □□□□□ □□ | Linux □□ originally Intel x86 architecture based personal computers □□ □□□ as free OS develop □□□□□ □□□ □□ |

7. □□□□□□□ □□ development free and open-source software collaboration □□ □□□□□ □□□ example □□ | □□□□□ □□□□□ □□□□ □□□ □□ □□ source code □□ □□□ □□, respective licenses □□ terms and conditions □□ (□□□□□ □□ GNU General Public License) commercially or non-commercially □□□ □□ □□ □□□□□ □□, modify or distribute □□ □□ □□□□□ □□ | Linux □□ □□ customize package □□ deliver □□□□□ □□□□□ □□ □□□□□□ □□ Linux distribution □□□□□ □□ □□□ □□ package desktop and server □□□□□□ □□ □□□ □□□□□ □□□□□ □□ | □□□ popular Linux distributions □□ □□□ □□ Arch Linux, CentOS,Debian, Fedora, Gentoo Linux, Linux Mint, Mageia, openSUSE and Ubuntu, □□□ □□□ commercial

distributions package 　　 – Red Hat Enterprise Linux and SUSE Linux Enterprise Server.

8. ## What is Operating System

An operating system (OS) is the program which coordinate flow of information to user, it coordinate flow of information to the user.

the collection of softwares that manages hardware resources of a computer and provides collective services to the user. Different types of Computer Operating Systems refer to the collection of various softwares. Every computer possesses an operating system to run other programs present in it.