# COMPUTER SOFTWARE

Software refers to a series of electronic instructions that tell a computer how to perform tasks.

**Considerations when choosing computer software**

1. Authenticity-genuine, valid, legitimate
2. Documentation-details to install, use and maintain
3. User needs-software solves the user problems
4. Reliability and security-software must do tasks its designed to do and provide safety to data.
5. Compatibility and system configurations like hard disk space, amount of memory , processor speed-the computer must support the software to be installed
6. User friendliness-ease of use and learning
7. Cost –price must be reasonable
8. Portability-software should be easily copied from one computer to another

**Computer software is divided into two categories:**

1. System software
2. Application software

**System software**

System software refers to programs which manages the operation of the computer itself.

System software consists of programs that control the operation of the computer and its devices.

**Functions of system software**

1. Starting up a computer
2. Transferring data between input and output devices
3. Storing and retrieving files
4. Formatting disks
5. Sorting data files

**System software is divided into three categories**

1. Operating system
2. Utilities
3. Programming languages

**Operating system**

An operating system is a set of programs that coordinate the operation of all hardware and application software components of a computer.

**Factors to consider when choosing an operating system**

1. Hardware configurations of a computer like processor type and hard disk space
2. Basic computer design like Apple computers
3. Applications intended for the computer
4. User friendliness-ease of use and learning
5. Availability on market
6. Cost
7. Reliability

**Functions of an operating system**

1. Memory management
2. Spooling print jobs
3. Configuring devices
4. Monitoring system performance
5. Administering security
6. Managing storage media and files

**Memory management**
The purpose of memory management is to allocate items to areas of memory, monitor carefully the contents of these items in memory and clear these items from memory when they are no longer required by the central processing unit.

**Spooling print jobs**
With spooling, print jobs are placed in a buffer instead of being sent immediately to the printer. As soon as a print job is placed in the buffer, the CPU is available to process the next instruction and the computer can be used for other tasks. Multiple print jobs are queued or line up in the buffer and the program that manages and intercepts print jobs and places them in the queue is called the printer spooler.

**Configuring devices**
Most operating systems today support plug and play and can configure devices automatically. Occasionally, a user needs to know the IRQ the device should use for communications. An interrupt request (IRQ) is a communications line between a device and the CPU. With plug and play, the operating system determines the best IRQ to use for the communications. An IRQ conflict occurs if the operating system uses an IRQ that already is assigned to another device.

**Monitoring system performance**
The operating system uses a performance monitor which is a program that accesses and reports information about various system resources and devices. The information in such reports can help identify problems with resources.

**Administering security**
Most multi-user operating systems require each user to log on. Some operating systems also allow a user to assign passwords to files so that only authorized users can open them. A multi-user operating system enables two or more users to run a program simultaneously (at the same time). Log on is the process of entering a user name and a password into the computer. A password is a combination of characters associated with a user name that allow a user to access a computer or a network.

**Managing storage media and files**
Most operating systems include a file manager program that performs functions related to storage and file management.

**A file manager is a program that performs functions related to storage and file management for example:**

**Formatting and copying disks, displaying a list of files on storage medium, checking the amount of used or free space on a storage medium and copying, renaming, deleting, moving and sorting files**

**Summary of the functions of an operating system**

1. Loading of programs and data files from the secondary storage to the memory when required.
2. Control of hardware resources of a computer by allocating the use of peripheral devices for example input, output, storage and processing devices.
3. Protects hardware, software and data from improper use.
4. Controls and interprets keyboard, mouse and other inputs.
5. Controls the computer systems security for example by monitoring the use of passwords.
6. The operating system provides a computer user with an interface that enables him or her to easily manage, control and operate a computer.
7. The operating system checks whether hardware is working properly, equipment malfunctioning and displays error handling and correct messages.
8. Keeping track and furnishing a complete record of all that happens during the processing.
9. Responsible for starting a computer
10. Provides a means to establish web connections and some include a web browser and email program.
11. Responsible for administering security where administrators establish user accounts that require a user name and password to access a computer system.
12. Responsible for managing and monitoring directories and files stored and the disks.

**Examples of operating systems**

1. Disk Operating System (DOS)
2. Windows operating system like windows 98, windows 2000,windows xp)
3. Mac operating system (Macintosh operating system)
4. Novell's NetWare
5. Operating system 2 (O/S 2)
6. UNIX
7. Linux
8. Solaris
9. EPOC
10. Pocket PC operating system
11. Palm operating system

**Types of operating systems**

**Single-user operating system:** A single user operating system allows only one user to run one program at a time.

**Multi-user operating system:** A multi user operating system enables two or more users to run a program simultaneously (at the same time).

**Multi tasking operating system:** A Multi tasking operating system allows a single user to work on two or more applications that reside in memory at the same time.

**Multi processing operating system:** A Multi processing operating system can support two or more CPUs running programs at the same time.

**Embedded operating systems:** Designed to be used in embedded computer systems like PDAs

**Distributed operating system:** Manages a group of independent computers to make them appear to be a single computer.

**Real time operating system:** Handle real time applications like tracking aeroplanes

**Network operating system:** Designed to work on networked/linked or connected computers

***A kernel is the core of the operating system that manages memory and devices, maintains the computer clock, starts applications and assigns computer resources like devices, programs, data and information.***

**Utilities**
Utilities are a type of system software that performs a specific task usually related to managing a computer, its devices and its programs. Utilities are also called service programs.

Utilities are programs which improve the performance of the operating system. Utilities are used to generally enhance, support and expand the existing programs on a computer system.

**Examples of utilities**

1. File viewer
2. Backup utility
3. File compression
4. Screen saver
5. Diagnostic utility
6. Antivirus utility
7. Uninstaller
8. Sorting utility
9. Disk scanner
10. Data recovery
11. Disk defragmenter
12. Software monitors

**File viewer**
The file viewer allows you to display and copy contains of a file. Examples include windows explorer

**File compression**
The file compression utility shrinks/reduces/compresses the size of a file and frees up room on storage media. Examples of compression utilities include: PKZIP and WINZIP

**Diagnostic utility**
The Diagnostic utility compiles technical information about hardware and system software programs and prepares a report outlining any identified problem for example Dr. Watson

**Disk scanner**
The Disk scanner utility detects and corrects both physical and logical problems on hard disks and floppy diskettes and also searches and removes unnecessary files. Two disk scanner utilities included with windows are Scandisk and Disk Cleanup.

**Disk defragmenter**
The disk defragmenter utility reorganizes files and unused space on a computer's hard disk to access data more quickly and programs to run faster. Windows includes a disk defragmenter called disk defragmenter.

**Uninstaller**
The Uninstaller utility removes an application as well as associated entries in the system files for example McAfee's uninstaller.

**Backup utility**
The Backup utility allows you to copy selected files or your entire hard disk onto another disk or tape. The Backup utility is helpful to avoid loss of sensitive data in case the storage media crashes. Windows also includes a backup utility and a restore program.

**Antivirus utility**
An antivirus utility is a program that prevents, detects and removes viruses from a computer's memory or storage devices.

**Screen saver**
A screen saver is a utility that causes a monitor's screen to display a moving image or blank screen if no keyboard or mouse activity occurs for a specified time period.

**Sorting utility**
The sorting utility is a utility designed to arrange records into a pre-determined sequence. Such programs are often used to sort files or data in a specific order to ease their access and update.

**Data recovery**
The data utility is used to recover a file or information that has been accidentally deleted from a computer.

**Software monitors**
Software monitors are utilities designed to check the activity of specific aspects of a computer system to ascertain where the bottleneck exists and try to fix them for example software related problems which usually occur when there is a physical defect on storage media.

***Note the following about computer software:***

**Bug:** An error in a computer program that causes the program not to work well.

**Software version:** This is a major upgrade in a software product leading to even a change in the software interface and some procedures.

**Software release:** This is the public or private distribution of a new or upgraded version of a software product.

**Programming languages**

**Programming** is the process of developing computer instructions (programs) to solve a particular task.

A **programming language** is a special program used to write other programs using symbols and rules.

The grammar of a programming language is called the **syntax**.

**Characteristics of programming languages**

1. Suitability to the problem
2. Availability
3. Clarity and simplicity
4. Consistency
5. Efficiency

**Description of terms used in programming**

**Source program**

Source program refers to the program code that the programmer enters in the program editor window that is not yet translated into machine readable form.

**Object code**

Object code refers to the program code that is in machine readable form.

**Language translators**

Language translators are used to change high level programming languages codes to low level languages codes that processors can understand.

**Interpreters** are programs that read one of the source language instructions and change it into machine language.

**Compilers** take the entire source language module and change it into a machine language version.

**Assemblers** are computer programs which translate assembly language to an object file or machine language format.

**Classification of programming languages**

***Programming languages are classified into two major levels namely:***

1. Low level languages
2. High level languages

***These levels are further divided into five generations that is the first and second generations consist of low level languages while the third to the fifth generations consist of high level languages.***

**Low level languages** are programming languages used to write programs that control the CPU of a computer. Low level languages are easily understood by the computer directly.

**Types of low level languages**

1. Machine language
2. Assembly language

**Machine language (first generation language)**
Machine language is the only language that can be directly used by a computer. All instructions in machine code are represented in the binary format for example:

**1010000000000001001**

**Advantages of machine language**

1. Machine language is highly efficient and allows control of each operation.
2. Machine language runs faster because no translation program is required for the central processing unit.

**Disadvantages of machine language**

1. Programmers have to write computer programs using 0s and 1s which are difficult to learn, read and debug (identify and correct errors).
2. The whole process is tedious, time consuming and error prone since the Code must be heavily documented.
3. Machine language is not user friendly at all and is designed for specific microprocessor therefore not portable from one computer to another.

**Assembly languages (second generation language)**

Consist of mnemonic (set of symbolic operation codes) symbols that stand for zeros and ones of machine language.

**This code 1010000000000001001 would be written as LOAD 5 in assembly language.**

**MOV AX, 15 Move 15 to register AX**

**Advantages of assembly language**

1. Assembly language has closer control over the computer hardware and executes very efficiently so is useful when writing operating systems and game programs which require fast and efficient use of the CPU.
2. Reduced errors
3. Symbolic codes are easier to read and follow
4. Faster translation time
5. Changes can be made faster and more easily

**Disadvantages of assembly language**

1. Assembly language is designed for a specific machine and specific processor therefore programs are not portable to other computers.
2. Source programs tend to be large and difficult to follow.
3. Many instructions are required to achieve small tasks.

**b) High level languages**

High level languages consist of statements that are closer to human language. High level languages use valid words, symbols and sentences.

**Advantages of High level languages**

1. High level languages are (user friendly) easier to learn, write, correct and revise.
2. Programmers pay more attention to the problem at hand and less attention to specific machine details.
3. High level languages have a wide vocabulary of words, symbols and sentences.
4. High level languages are portable that is transferable from one computer to another.
5. High level languages are far much more easy to debug that is correct errors.

**Disadvantages of High level languages**

1. High level languages require larger computer memory to run in.
2. High level languages have to be interpreted to machine readable form before the computer can execute them.

3. High level languages encourage use of many instructions in a word or statement hence the complexity of these instructions causes slower program processing.

**High level languages can be classified into five groups**

1. Third generation languages (3 GLs)
2. Fourth generation languages (4 GLs)
3. Fifth generation languages (5 GLs)
4. Object oriented languages
5. Web scripting languages

**Third generation languages (3 GLs)**

Third generation languages (3 GLs) are also called structured or procedural languages.

**Examples of Third generation languages (3 GLs)**

1. PASCAL-developed as an academic language to help in teaching and learning of structured programming.
2. FORTRAN-formula translator: developed for mathematicians, scientists and engineers for writing programs with mathematical expressions.
3. COBOL-common business oriented languages: designed for developing programs that solve business problems.
4. BASIC-beginners all-purpose symbolic instruction code: developed to enable students to easily learn programming.
5. C: designed to develop system software like operating systems.
6. Ada: suitable for developing military, industrial and real time systems.

**Fourth generation languages (4 GLs)**

Make programming an easier task by presenting the programmer with more programming tools like command buttons and forms.

**Examples of Fourth generation languages (4 GLs)**

1. Visual basic
2. Delphi Pascal
3. Visual COBOL

Enable quick and easy amendments and alterations. Reduce development and maintenance costs. Make languages user friendly.

**Fifth generation languages (5 GLs)**

These languages are designed around the concept of solving problems by enabling the computer to depict human like intelligence.

These programs are designed to enable the programmer to quickly come up with a working program that solves the problem at hand.

These languages are used in intelligent knowledge based system (IKBS) such as robots. Are extremely used in artificial intelligence projects like the recent mars exploration

**Examples of fifth generation languages (5 GLs)**

1. PROLOG
2. LISP
3. Mercury
4. OCCAM

**Object oriented languages**

Object oriented languages (OOLs) are the current state of art in programming technology. These use objects that combine data and behaviour. Enable rapid program development.

**Examples of object oriented languages:**

1. Visual basic
2. Object COBOL
3. Smalltalk
4. Hyper talk
5. Visual C++
6. Java
7. Turbo Pascal

OOP has contributed greatly to the development of graphical user interface operating systems and application programs.

**Web scripting languages**

Are used to develop or add functionalities on web pages. Web pages are hypertext documents created in a language called hypertext markup language (HTML).

**Other scripting languages are:**

1. JavaScript
2. VBScript
3. Hypertext preprocessor (PHP)

**Application software**

Application software refers to programs and their associated documentation designed to solve specific user problems.

A **cross platform** application is one that runs identically on multiple operating systems.

An **application service provider** is a third party organisation that manages and distributes software and services on the web.

An **application package** is computer software, which is mainly designed to help the user to perform singular or multiple related specific tasks.

**Characteristics of application packages**

1. Targeted to a wide range of users with a popular and common objective.
2. Are user friendly-easy to use and learn
3. Designed for power and flexibility that is most of the capabilities of the package are addressed irrespective of the hardware.
4. Machine independent that is the packages are designed to work on a range of computer systems and data can be transferred from one computer to another cheaply.

**Forms of software**

**Freeware**
Copyrighted software provided at no cost to users

**Shareware**
Copyrighted software that is distributed free for a trial period and payment is required for using the software beyond that trial period.

**Public domain software**
Free software donated for public use and has no copyright restrictions.
**Open source software**
This is software that can be freely used, changed and shared. This is software whose source code is available for modification, enhancement by anyone.

**Advantages of open source software**
1. Can open most documents and files by proprietary software
2. Easy to use and learn
3. Easier to customize the source code to suit your particular needs

**Disadvantages of open source software**
1. May not contain as many features as the equivalent commercial applications
2. May not have much bug fixing support and security patches as commercial applications
3. Not all the software applications that you wish to use have an open source version available

**Categories of application software**
1. Special purpose software
2. General purpose software

**Special purpose software/bespoke software/tailored software/custom-made software/customized software**

These are application programs designed to meet a client's particular needs that cannot be usually satisfied by other sources of software.

**Examples include:**
4. Accounting packages like sage, sand systems, pastel, tally, point of sale
5. Stock control packages
6. Library software systems
7. Statistical analysis (statistical presentation software systems) (SPSS)
8. School management system
9. Banking system
10. Insurance system
11. Payroll systems

**Advantages of special purpose software**

1. Easy to use because they work the way you work.
2. Changes can be implemented quickly to meet new legislations or client requirements.
3. Precisely match your working practices resulting in improved efficiency, less supervision and fewer errors.
4. Increased productivity and reduces costs by automating repetitive tasks.
5. Differentiates the owner from competitors with unique and better products and services.
6. Information can be integrated from existing applications, suppliers and customers.

**Disadvantages of special purpose software**

1. Developing the software designed to meet specific purposes ca prove to be quite costly for developers.
2. Some bespoke programs may not be compatible with other general software.
3. Developing bespoke software takes a lot of time because there is need for constant communication between the developer and the customer/user/owner.
4. Selecting the appropriate developers is extremely difficult since there are many inexperienced and unprofessional programmers.
5. If you don't have a copy of the source code for your application, you are dependent on the developer of the software.
6. There will be little in the way of user support and online help.

**General purpose software/pre-written software/software package/packaged software/off the shelf software**

General purpose software refers to programs that are ready to run when purchased and installed on computers. This type of software is used for a wide variety of purposes.

**Advantages of off the shelf software**

1. Are usually provided with extensive documentation to help the user.
2. Are easy to use and are suitable for people with little or no computing knowledge.
3. Are appropriate for a large variety of applications
4. Are relatively low priced since they are sold in large numbers.
5. Are readily available
6. Can be customized
7. Have less errors

**Disadvantages of off the shelf software**

1. The package may allow only clumsy (uncoordinated) solution to the task at hand.
2. Some packages need developing for example databases so require thorough knowledge that is quite expensive.
3. The user has to be provided with documentation for the particular application created.
4. It is easy to forget commands to use the package especially if it is not used frequently.

**Examples of off the shelf software include:**

1. Computer aided design (CAD) software
2. Multimedia software
3. Project management software
4. Personal information managers (PIM)
5. Presentation software
6. Graphics processing software
7. Desktop publishing software
8. Database software
9. Spread sheet software
10. Word processing software
11. Paint/image editing software
12. Video and audio editing software
13. Web page authoring software
14. Communication software
15. Education software
16. Personal finance software
17. Reference software
18. Entertainment software

**Word processing** software is used to create, edit, format, save and print documents that contain text and graphics. Examples: Microsoft word, Word pad, Notepad and AmiPro.

**Spreadsheet software** is used to organise data in rows and columns and to perform calculations on the data. Examples: Microsoft Excel, Corel Quattro pro, Lotus 123, VisiCalc and SuperCalc.

**Database software** is used to create and access a database. Examples: Microsoft access, D-base, Fox pro and Paradox.

**Desktop publishing software** refers to specialised programs that combine text with pictures to produce higher quality documents. Examples: Adobe in design, Adobe page maker, Microsoft publisher and Corel Ventura.

**Advantages**

1. Specifically designed to support page layout which involves arranging text and graphics on a document on a page-by-page basis.
2. Includes colour libraries to ensure that colours will print exactly as specified.
3. Supports colour separation for producing the master copies used in the final presswork.

**Graphics processing software** refers to programs that enable users to create drawings and artworks that can be exported to other programs. Examples: Corel drawing, Microsoft photo draw and Adobe photo shop.

**Presentation software** is used to create presentations which to communicate ideas and other information to a group of people or audience. Examples: Microsoft power point, Corel presentations, Lotus freelance graphics and Harvard graphics.

**Personal information managers** are programs used to organize personal information like calendars. Examples: Microsoft outlook, Corel CENTRAL, Lotus organizer and Palm desktop.

**Project management software** refers to programs that allow a user to plan, schedule and analyse the events, resources and costs of a project. Examples: Corel catalyst, Microsoft project and Primavera sure track project manager

**Multimedia software** refers to programs that combine text, graphics, audio, video and animation into interactive presentations. Examples: Macromedia author ware, Macromedia director and Macromedia flash.

Multimedia is commonly used in video games, electronic newspapers, electronic books, simulations, virtual reality and computer based training.

Simulations are computer based models of real-life situations.

Simulations usually replace costly and hazardous demonstrations in teaching and learning.

**Virtual reality** (VR) is the use of computers to create an artificial environment that appears and feels like a real environment.

**Computer based training** (CBT) allows students to learn and complete exercises with instructional software.

**Advantages of computer based training**

1. Students can learn any time and anywhere provided a computer system is available.
2. Students can receive instant feedback for their actions.
3. Students can learn at their own pace

**Advantages of web based training**

1. Materials provided by WBT can always be up-to-date

**Advantages of distance learning**

2. Save time and money for traveling to school
3. Students can learn and complete their coursework at home and at anytime that fits their schedules.

**Computer aided design** (**CAD**) software refers to programs mainly used to create engineering, architectural and scientific drawings. Examples: Autodesk Auto CAD and Microsoft Visio technical.

**Paint/image editing software** refers to programs that allow users to create and modify graphics, images.

**Paint software** allows a user to draw pictures, shapes and other graphical images using various tools such as pen, brush and paint bucket which come with the program.

**Image editing software** allows a user to retouch photographs, adjust or enhance image colours and add special effects like shadows and glows. Examples: Adobe illustrator, Paint photo shop, Corel draw, Macromedia free hand, Microsoft PhotoDraw, Adobe Photoshop and Meta creations painter

**Video and audio editing software** refers to programs that help users to modify a segment of a video or audio clip. Examples: Adobe premiere, Ulead media studio pro and Ulead video studio.

**Web page authoring software** refers to programs that enable users to create fascinating web pages that include graphic images, video, audio animation. Examples: Fireworks, Adobe Go live, Adobe page Mill, Macromedia dream weaver, Macromedia flash and Microsoft front page

**Entertainment software** includes interactive games, videos and other programs designed to support a hobby or provide amusement and enjoyment. Software that is both educational and entertaining is called edutainment software. Examples: Windows and Nero media player and Power DVD

**Reference software** refers to software that provides valuable and thorough information for reference purposes. (Encyclopedias, dictionaries, health and medical guides) examples: Microsoft Encarta, Mosby's medical encyclopedia and Webster's dictionary and thesaurus.

**Personal finance software** refers to simplified accounting programs that help a user to pay bills, balance the cheque book, track personal income and expenditure. Examples: Microsoft money and Inuit quicken.

**Educational software** refers to software designed to teach a particular skill about any subject. Examples: Encarta and Mavis Beacon Teaches Typing.

**Communication software** refers to programs designed to access information and data on one computer and transmit it to another computer across a network or data link. Examples: Web browsers (Internet explorer and Netscape navigator), E-mail software (Microsoft outlook), Chat rooms, Newsreader, Video conferencing software, Instant messenger and Groupware.

**Accounting software** refers to programs used by companies to record and report their financial transactions. Examples: Intuit QuickBooks and Peachtree complete accounting.

**Software suite** refers to a collection of individual application software packages sold as a single package. Examples of software suites: Microsoft office, Lotus SmartSuite and Corel word perfect suite

**Advantages of software suites**

1. Normally costs significantly less than purchasing each of the application packages separately.
2. Ease of use because applications within a suite usually use a similar interface and share common features.

**Integrated software** refers to programs that combine application programs such as word processing, spreadsheet and database into a single easy to use package. Applications within the integrated software cannot be purchased individually. Examples of integrated software Microsoft works and Symphony

**Advantages**

1. Normally costs significantly less than purchasing each of the application packages separately.
2. Ease of use because applications within a suite usually use a similar interface and share common features.

**Disadvantages**

1. Applications within the integrated software normally do not have all the capabilities of stand-alone application software of the same kind.

**Speech recognition software** translates voice patterns into text.

**Workgroup software** helps groups and teams work together by sharing information and by controlling workflow within the group.

**Middleware** is software designed to link application modules developed in different computer languages and running on heterogeneous platforms.

**Enterprise software** consists of programs that manage the vital operations of an organization.

**Component ware** is a term to describe a form of application software in which each program manages one type of operation.

**Presence technology** can detect when you are online and what kind of device you are using.

**Schematics software** can create schematics, space plans and layouts.

**COMPUTER HUMAN INTERFACES**

A user interface is a combination of hardware and software that you use to communicate with and control the computer.

Through the user interface you are able to make selections on the computer, request information from the computer and respond to messages displayed by the computer.

**User friendliness**: A user friendly interface is one that the end user finds helpful, easy to learn and easy to use.

The goal of an effective user interface is to be user friendly which means the software can be used easily by individuals with limited training.

**What makes a computer human interface user friendly?**

1. The system should behave in a logical and consistent manner enabling the user to reason and apply what has been learnt.
2. The user should be made to feel in control of what is going on.
3. The user should be insulated from unexpected or spurious system action that is it should be robust and reliable.
4. Minimal effort and information should be required to get the system to complete required tasks.
5. The system should be self contained that the user is not forced to access manuals.
6. It should be relatively easy for the user to try to start using the system.

**Types of computer human interfaces**

**Command driven interface**:
Under this, commands help users to quickly and simply instruct a computer on what to do. The end user should have some knowledge so as the commands to be user friendly. Simple and consistent set of rules should be available for more complex commands or variations on a single command.

A user types keywords or presses special keys on the keyboard to enter data and instructions. Provided with a virtually empty screen with a blinking cursor where commands are keyed and the computer executes them on pressing the enter key. Examples include: DOS-disk operating system, UNIX and LINUX.

**Menu driven interfaces** provide users with a number of options and simple means of selecting between them. The user has a choice hence needs no remembrance of the commands. Menu driven interfaces are suitable for beginners and infrequent users.

**Graphical user interface** (**GUI**) combines text with graphics to make software easier to use. GUI allows a user to use menus and visual images such as icons, buttons and other graphical objects to issue commands. You are provided with a coloured screen with icons each representing a program. A mouse may be used.

Examples include: Windows (3.1, 95, 98, 2000, XP, Vista), Susie Linux and Novel Netware.

The graphical user interface displays graphics in addition to text when it communicates with the user.

**The GUI includes features like:**

**Windows**: Rectangular areas of the screen used to present information. It is called so since you see into another part of a program.

***An application window contains the running application whereas the document windows are windows that are contained in the application window.***

**Icons**: Pictures or symbols used to represent processing options.

**Menus**: Lists of options from which the user can choose. Menus also contain a list of commands, instructions that cause the computer software to perform a specific action.

**Buttons**: Icons that cause a specific action to take place. It is easier to feed commands and different applications look and behave alike so it is easier to learn them.

***Note the following***

A **text box** is a box you can type in.

A **list box** contains a list of options one of which is selected.

A **check box** is a box that can either be blank or contain a check mark.

A **radio button** is a group of round buttons that can either be blank or contain a dot.

A **pull-down menu** is a box with a downward pointing triangle button at its right end.

A **command button** is a box you can click to perform a command.

A **dialogue box** is a window that contains settings from which you can choose, to complete a task.

A **folder** is a special kind of file that contains a list of other files.

A **combo box** allows the user to either type a value directly into the control or choose from the list of existing options.