

Module 10 Applied Computer Studies

Unit 10.1 – Introduction to Personal Computers

Copyright © 1998 The Commonwealth of Learning
Revised July 2002

Screen shots reprinted with permission from Microsoft Corporation.

Contents

Introduction	3
About this Unit	3
How to use this manual	3
How you'll be assessed	4
Finding your way	5
Competency	5
Learning outcomes	5
Assessment Criteria	6
Section 1 – Introduction to Computers	7
1.1 What is a computer	7
1.2 History of computers	7
Exercise 1.1	10
1.3 How a computer works	11
1.3.1 The information processing cycle	11
1.3.2 Computer components	11
1.4 Categories of computers	12
1.4.1 The microcomputer	12
1.4.4.1 The laptop computer	12
1.4.2 The minicomputer	13
1.4.3 The mainframe	13
1.4.4 The supercomputer	13
Exercise 1.2	14
Section 1 Summary	15
Section 1 Solutions	16
Section 2 – Computer Hardware	17
2.1 What is computer hardware	17
2.2 Input devices	17
2.2.1 Keyboard	17
2.2.2 Mouse	17
2.2.3 Other input devices	17
2.3 The central processing unit (CPU)	18
2.3.1 Bits and Bytes	18
Exercise 2.1	19
2.4 Primary storage	20
2.4.1 RAM	20
2.4.2 ROM	20
2.5 Secondary storage	20
2.5.1 Magnetic disks	21
2.5.2 CD (Compact disk)	22
2.5.3 Storage capacity	23
Exercise 2.2	24
2.6 Output components	25
2.6.1 The monitor	25
2.6.2 The printer	25
2.6.2.1 Impact printers	25

2.6.2.2 Non-impact printers	25
2.6.3 Other output devices	26
2.7 Other hardware components	26
2.7.1 Modems	26
2.7.2 External drives	27
Exercise 2.3	28
Section 2 Summary	29
Section 2 Solutions	30
Section 3 – Computer Software	33
3.1 Types of software	33
Exercise 3.1	35
3.2 Overview of Operating Systems	36
Exercise 3.2	37
3.3 Word Processors	38
3.4 Spreadsheets	38
3.5 Databases	40
3.6 Presentation graphic programs	40
3.7 CAD/CAM	41
Exercise 3.3	42
Section 3 Summary	43
Section 3 Solutions	44
Section 4 – The Internet	47
4.1 What is the Internet?	47
4.2 What do you find on the Internet?	47
4.3 Why put information on the Internet?	47
4.4 Who puts information on the Internet?	48
4.5 Other features of the Internet	48
4.5.1 E-mail (electronic mail)	48
4.5.2 FTP (file transfer protocol)	49
4.5.3 Newsgroups, message boards, chat rooms & mailing lists	49
4.6 The value of the Internet and education	49
4.7 Internet addresses	50
4.8 Searching for information	52
4.9 Controlling Internet usage	52
Exercise 4.1	53
Section 4 Summary	54
Section 4 Solutions	55

INTRODUCTION

About this unit

Welcome to this unit on Introduction to Personal Computers.

The unit begins with a brief history of computer development. It then explains the difference between hardware and software, and introduces the concept of software applications. The important concepts of various operating systems are introduced. It concludes with a look at networks and the Internet, which play an important role in the understanding of computers.

How to use this Manual

As well as containing information about Personal Computers, this manual includes questions and exercises.

These activities do not play a part in your assessment for this unit; they are designed to help you check your progress. Read the information, and then complete the exercises as you work through this manual.

Answers and examples are provided throughout the manual for you to check your work as soon as you complete an exercise.

Your tutor will provide assessment tasks to assess your achievement of the learning outcomes.

It's these tasks that determine your competence in this unit.

How you'll be assessed

You will be given three assessments in this unit.

The assignments are to be done at the completion of certain sections of the work in the manual.

Your tutor will assist you towards understanding the requirements for the assignments--do not hesitate to ask for clarification of anything you do not understand.

Finding your way

As you work through the text you will see symbols below in the left margin of some pages. These 'icons' guide you through the content presented in this manual.



Read



Important—take note!



Assessment task



Activity to be done on computer



Competency

The curricula for this training programme for Technical and Vocational teachers is competency based. The competency for each unit is expressed as a number of learning outcomes and assessment criteria.

Assessment criteria specify what you must be able to do to show you have gained the knowledge and skills needed to achieve each learning outcome.

Each unit has its own assessment criteria specified. Recognition of prior learning is encouraged. If you feel confident you have the necessary level of competence to successfully complete the elements shown under Assessment Criteria on the next page, you may be able to take the assessment without studying the unit.

Learning outcomes

When you have completed this unit you should be able to:

- Define the term ‘computer’
- Discuss key technological advances in the development of modern computers
- Discuss the four basic computer functions: Input, process, output and storage
- Identify the varying types of computers
- Describe the relationship between computer hardware and software
- Identify and classify microcomputer components under one of four types: Input devices, processing devices, output devices or storage devices
- Discuss the difference between system software and application software
- Explain the role of an operating system and identify popular operating systems
- Describe the major categories of software applications including:
 - Word processing
 - Spreadsheets
 - Databases
 - Graphics
 - CAD/CAM
- Discuss varying uses of the Internet in education

Assessment criteria

1. Explain what a computer is.
 2. Identify the developments that separate generations of computers from the first computer to modern computers.
 3. Use a diagram to demonstrate how raw data is transformed into information via the information processing cycle.
 4. Identify and describe major categories of computers
 5. Explain the difference between computer hardware and software.
 6. Identify and classify computer components.
 7. Explain the difference between system software and application software.
 8. Discuss the role of an operating system and identify popular operating systems
 9. Describe features of major software applications and identify which tool is appropriate for given environments.
- .



Section 1 – Introduction to Computers

1.1 What is a computer?

A computer is an electronic device that accepts and processes data into information that can then be stored and/or outputted.

It performs complex tasks at high speeds and with great accuracy. Despite its power, a computer on its own is a useless piece of equipment. It needs to have programs (instructions written by humans in special codes) entered into it that serve to guide it as to what it needs to do.

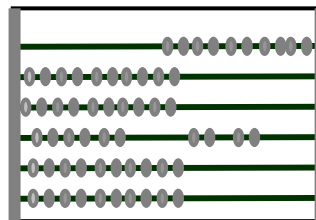
The computer is a very versatile instrument: it can accept and display information in different forms such as *text*, *video*, *sound* and *computer generated graphics*.

1.2 History of computers

Today's computers have developed in a natural progression from the earliest calculating aids used many hundreds of years ago. However, over the last five decades their development can only be described as phenomenal.

We can go back over 5000 years to the *abacus*, which even in this present age is still in use (sometimes by little children as an aid to counting).

An Abacus



This device consists of rods, which have beads strung over them, and which may be moved from side to side, when performing calculations. It is claimed that a skilful operator can work out sums faster with an abacus than someone using an electronic calculator.

Another significant development was the development of a machine known as the *difference engine* around the 1820's by Charles Babbage. Some people regard Babbage

as the father of computing. The machine was based on a mathematical method known as 'differences', which helped in speeding up mathematical computations. Unfortunately, the technology of that time was unable to make the parts for the mechanical machine to the degree of accuracy required.

Babbage was not deterred, and he proceeded to develop an even more sophisticated machine called the *analytical engine*. It is considered that at this point the concept of the modern computer was realised. Although it was not an electronic device, it had parts that corresponded to the principal parts of a modern computer.

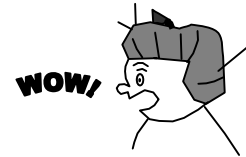
The advent of the Second World War saw tremendous development in computing. Electricity was now being used to control the flow of information in computers, as opposed to a strictly mechanical system.

When the **vacuum tube/valve** was invented, the important switching operations could be carried out quicker and electronic versions were then produced. Computers using this technology were known as *first generation computers*.

During this time, they were mainly used by the military to crack secret codes.

A machine known as *ENIAC (Electronic Numerical Integrator Automatic Computer)* was used in 1946 to correctly perform the following calculation:

$$97,367 \times 97,367 \times 97,367 \times 97,367$$



It performed this calculation in less than half a second. This was considered really impressive. To accomplish this feat, ENIAC was made with 18,000 vacuum tube/valves, and needed to be housed in a room the size of a school hall.

Due to the shortcomings of the vacuum tube/valve technology such as overheating, unreliability, and space requirement, more efficient components were sought. This led to the development of the *transistor* in 1948 and it quickly replaced the vacuum tube/valve, which had been used in the computers of the 1940's and 1950's.

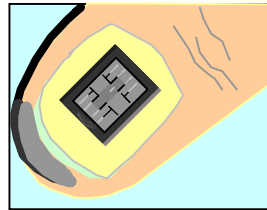
It allowed for computers to be of smaller physical size, yet to be able to operate faster, use less electricity, and reduce heat. Its impact was very great on this field. Computers using this technology were known as ***second generation computers***.

A transistor used in second generation computers (8 X 30 mm)



It soon became possible to place several transistors on a single base in what is known as an **integrated circuit (IC)**. The silicon chip in which integrated circuit technology was used resulted in the production of even smaller, faster, more efficient, and reliable computers. These were known as *third generation computers*.

An integrated circuit atop a human fingernail



In the period of the 1960's, it was only possible to pack a few transistors onto a silicon chip; today it is possible to pack millions on to just one.

This has resulted in further giant strides in computer development, utilising what is referred to as Large Scale Integrated Circuit technology (LSI), leading to what is known as *fourth generation computers*.



Exercise 1.1

The following exercise requires you to select words from the list below to fill in the blanks.

You need to note that more than one word from the list may sometimes fit a blank space, but there is only one way you can fill all the blanks using each item only once.

base, transistor, programs, computer, integrated, instructions, abacus

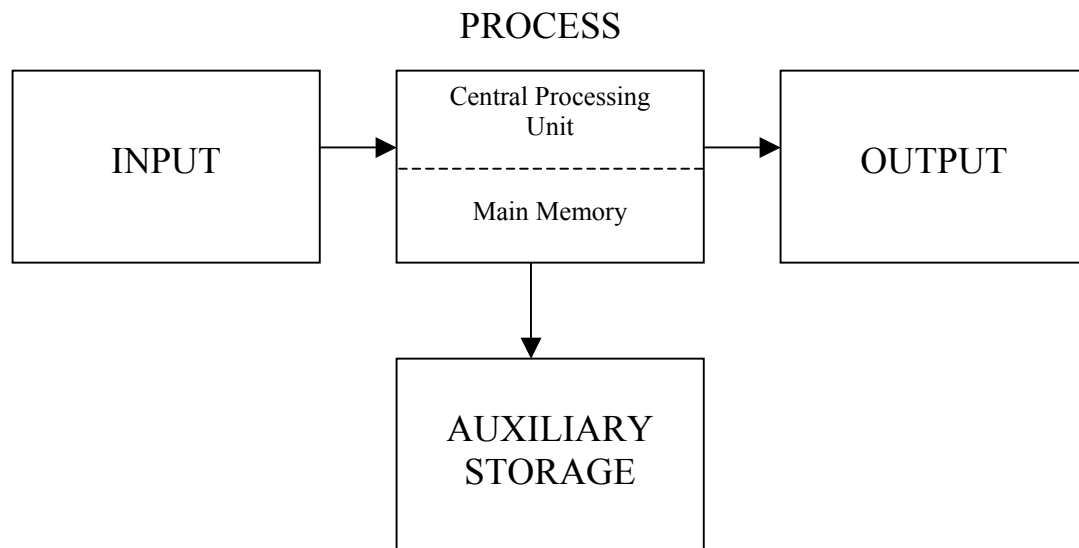
1. An electronic device that accepts, stores and processes data into information may be described as a
2. written by people which tell the computer what to do are referred to as computer
3. The was one of the earliest computing devices.
4. Second generation computers used technology.
5. Several transistors on a single form what is known as an circuit.

When you've finished, please go to page 16 and compare the answers.

1.3 How A Computer Works

1.3.1 The Information Processing Cycle

Any and all computer systems carry out four fundamental functions known as the *information processing cycle*. These functions are input, process, output and storage.



The Information Processing Cycle

1.3.2 Computer Components

The physical components that make up a computer system fall into one of four categories, they are:

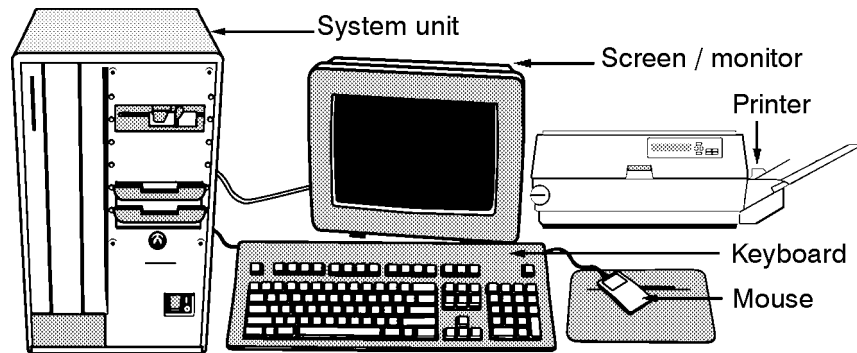
1. Input Devices: Considered the eyes and ears of the computer system, these hardware components are the means through which the user enters information into the computer.
2. System Unit: This is the box-like case containing the electronic components of the computer. The Central Processing Unit (CPU) (also called the processor) interprets and executes the basic commands that operate the computer.
3. Output Devices: Output devices are hardware components that display processed information for the user.
4. Auxiliary Storage Devices: Storage devices hold data for future use.

1.4 Categories of Computers

Computers may be broadly classified into *microcomputers*, *mini-computers*, *mainframes* and *supercomputers*. This broad categorisation is rather inadequate as there are quite a few new terms in the jargon.

1.4.1. The Microcomputer

Let us start by considering the microcomputer. These are usually the desktop models (i.e. models small enough to be placed on a desktop), and are the type usually utilised in homes, colleges and small businesses by individual users. For this reason they are also referred to as *Personal Computers (PCs)*. Simply put, we may say this is a computer that uses as its **central processing unit**, a single rather complex chip, which contains most of the basic units needed for a computer to operate. This chip is known as a **microprocessor**.



A Personal Computer

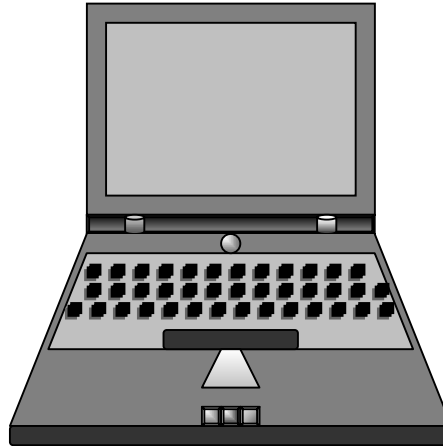
1.4.1.1 The Laptop Computer

The laptop computer is also referred to as a notebook computer. They are smaller than microcomputers, small enough to fit on your lap. They usually weigh less than 10 pounds. Most laptops can operate from the standard power supply, or alternatively from a battery, and may be carried around in briefcases or suitable carrying bags.

The relatively easy portability of a notebook computer makes them very convenient to use. These computers are also referred to as *portables*.

You can do just about everything a desktop model can and often challenge them in terms of power and speed. When compared to desktop with equal capabilities, laptops are generally more expensive.

We also have *palmtop* (also called handheld computers) which fit in the palm of your hands. These can perform powerful processing, but are limited in the range of features they offer.



A Notebook Computer

1.4.2. The Minicomputer

These are larger than desktop computers, but smaller than mainframe computers. They usually sit on the floor, but some modern ones can be placed on a desktop.

Minicomputers are designed for use by many persons simultaneously, and may support anything from 10 to 100 terminals (a device with a monitor and keyboard). They are also suitable for use in a medium-sized business, or perhaps within a single department in a college or university.

1.4.3. The Mainframe

Generally speaking, these provide an increase in processing speed and power when compared to minicomputers. Note however, they are not always faster or more powerful.

Mainframes are characterised by their size, often taking up much of the space in the room in which they are located. It is common for them to handle hundreds of users simultaneously.

1.4.4. The Supercomputer

Of all the varying types of computers, these are the fastest, most powerful and most expensive.

They are not usually used for data processing in a business environment in the same manner as mainframes, but are utilised by governments and research agencies to perform very high-speed computations. Some of the areas these are used include weather forecasting, genetic decoding or aerodynamics.



Exercise 1.2

Answer the following *true* or *false*:

1. _____ Microcomputers are often small enough to be placed on a desktop.
2. _____ A microcomputer is sometimes referred to as a personal computer.
3. _____ A computer can continue to function if its Central Processing Unit fails.
4. _____ Notebook computers are larger than hand held computers.
5. _____ Notebook computers may alternatively operate by use of a battery.
6. _____ Notebook computers cannot perform the same tasks as desktop computers.
7. _____ Minicomputers are often used by medium sized businesses.
8. _____ The most powerful type of computer is the Supercomputer.

When you've finished, please go to page 16 and compare the answers.



Section 1 Summary

- A computer is an electronic device that accepts, processes and stores data. It can accept and display information such as text, video, sound, and graphics.
- Forms of computers were known to exist as many as 5000 years ago. The modern computer, which is electronic in nature, was first developed around the period of the 1940's.
- Computers of all types and sizes have several common components: (1) input devices, (2) the processor, (3) output devices and (4) auxiliary storage devices.
- There are various categories of computers in different sizes, but the type you are most likely to encounter in homes, schools and small offices are *microcomputers*. These are small enough to be placed on top of your desk.



Section 1 Solutions

Exercise 1.1 (See exercise on page 10)

1. An electronic device that accepts stores and processes data may be described as a **computer.**
2. **Instructions** written by people which tell the computer what to do are referred to as computer **programs.**
3. The **abacus** was one of the earliest computing devices.
4. Second generation computers used **transistor** technology.
5. Several transistors on a single **base** form what is known as an **integrated** circuit.

Exercise 1.2 (See exercise on page 14)

1. **True** Microcomputers are often small enough to be placed on a desktop.
2. **True** A microcomputer is sometimes referred to as a personal computer.
3. **False** A computer can continue to function if its Central Processing Unit fails.
4. **True** Notebook computers are larger than hand held computers.
5. **True** Notebook computers may alternatively operate by use of a battery.
6. **False** Notebook computers cannot perform the same tasks as desktop computers.
7. **True** Minicomputers are often used by medium sized businesses.
8. **True** The most powerful type of computer is the Supercomputer.



Section 2 – Computer Hardware

2.1 What is computer hardware?

Computer hardware consists of the physical parts of your computer. By this we mean the parts of your computer that you can see and touch, e.g. the keyboard, the monitor, the mouse, etc.

This is opposed to **Computer software**, which consists of the sets of instructions known as programs written by programmers. These instructions serve to tell the computer what it must do.

Computer hardware can be classified under the four functions included in the information processing cycle, namely: input, processing, output and storage.

2.2 Input Devices

An input device is any hardware that allows the user to enter information into the computer.

2.2.1 Keyboard

This is the most used type of input device. It is similar in design to that of the old typewriter keyboard, with additional special keys such as 'Ctrl', 'Enter', 'Alt' and function keys. A computer keyboard allows you to type letters, numbers, spaces and symbols into the computer.

2.2.2 Mouse

The mouse is a pointing device, held in your hand, which can be used to control the movement of a symbol on the screen called a pointer. As you move the mouse on a flat surface, the mouse pointer moves on the screen correspondingly. Selections may be made by clicking or double-clicking a button on the mouse.

2.2.3 Other input devices

Other input devices include hardware such as a microphone, digital camera and scanner. A microphone allows the user to speak to the computer to enter data. A digital camera allows you to take photos and enter the photo images directly into the computer. With a scanner, you can read text and pictures from printer material and input the images into the computer the way they appear on the printer material. The scanner works similarly to the photocopier, except the images and characters are copied into the computer, instead of onto paper.

2.3 The Central Processing Unit (CPU)

As mentioned earlier, this is a chip in a microcomputer known as a microprocessor. The CPU is referred to as the brain of the computer. As a result of improvements in technology, modern CPUs process data much more rapidly and efficiently than CPUs of the past. The speed of the CPU is measured in Megahertz (MHz). One MHz = 1 million cycles per second.

The CPU is made up of two main parts, the *arithmetic-logic unit (ALU)* and the *control unit*. It is the part of the computer that fetches (accesses), decodes (interprets) and executes (carries out) instructions.

e.g. Consider that you instructed the computer to calculate:

$$2 + 3$$

The CPU is responsible for taking these instructions that you have sent and translating them (decoding) into machine language, which it uses to perform its work, and carrying out the actual calculation of $2 + 3$, giving a result 5.

Q. Why does it have to decode instructions first?

A. It needs to do this first, since it does not use ordinary language like we do, but rather uses various combinations of zeros and ones (0's and 1's) in performing its work.

2.3.1 Bits and Bytes

Electricity can only be either on or off. Consequently, the base 2 number system (binary system), which uses 0's and 1's, is an appropriate basis for the machine language used by the CPU. Each **binary digit** is called a *bit*. A unique collection of eight (8) bits or **one byte** represents each character on the keyboard. For example, one standard code known as **ASCII** (American Standard Code for Information Interchange) would interpret the word *mouse* as indicated below:

Letter	Binary Code
M	01001101
O	01001111
U	01010101
S	01010011
E	01000101

In addition to the use of the binary system to perform addition, subtraction, etc. the CPU also performs comparisons such as '*greater than*', '*less than*' and logical operations, along with a few others.

Do not worry too much about these logical operations, they can be easily understood, but it is not necessary to be familiar with them to be able to use a computer effectively.



Exercise 2.1

In each case select the word/term from the list given below each item which best completes the sentence.

1. The _____ is considered as the brain of the computer.
keyboard, monitor, central processing unit, hard drive
2. The parts of your computer which you can see and actually touch are referred to as _____.
software, fieldware, hardware, microware
3. Software may be thought of as the set of _____ which you run on your computer.
programs, games, graphics, chips
4. How many bits are in 2 bytes? _____
2, 4, 8, 16
5. The _____ is the most common type of input device.
monitor, scanner, keyboard, mouse
6. You can copy text or graphics directly into the computer with the aid of a _____.
monitor, scanner, keyboard, mouse

When you've finished, please go to page 30 and compare the answers

2.4 Primary Storage

This is often referred to as **main memory** or sometimes just simply ‘memory’ and is an internal storage component of the computer. *Primary storage is measured in bytes. Terms such as Kilobyte (KB), Megabyte (MB) and Gigabyte are commonly used when discussing storage. Further discussion of these terms will be done later.*

There are two types of primary storage: **Random-Access-Memory (RAM)** and **Read-Only-Memory (ROM)**.

2.4.1. RAM

It is important to understand that programs are loaded into RAM before they are executed. All work being done on the computer is stored temporarily in RAM until it is transferred to secondary storage. It is **volatile**, and by this we mean that its contents will be lost if the power supply is interrupted.

Attention must be paid to the amount of RAM in your computer since it determines what software you can run. Some programs require larger amounts of RAM than others for execution, and if your computer does not have enough for a particular program, you will be unable to use that piece of software. By today’s standard a new computer would contain approximately 32MB of RAM although 16MB may still be used. However, the general rule of thumb is the more RAM you have the better.

2.4.2 ROM

To confuse ROM and RAM is one of the easiest things in the world to do. The task is made a lot simpler, if you remember that ROM means Read Only Memory it only allows its contents to be read and is set by the computer’s manufacturer at the time it is produced. It is **non-volatile** which means that it is not lost even when the power is switched off. A good example of ROM is the computer’s BIOS (Basic Input/Out-put System) Chip.

2.5 Secondary Storage

Another term for Secondary Storage is Auxiliary Storage. These storage devices hold data permanently for future use. Common storage devices include floppy disks, hard disks, CD-ROMs, Zip Disks and DVD. This second type of storage is essential if information is to be retained for future use.

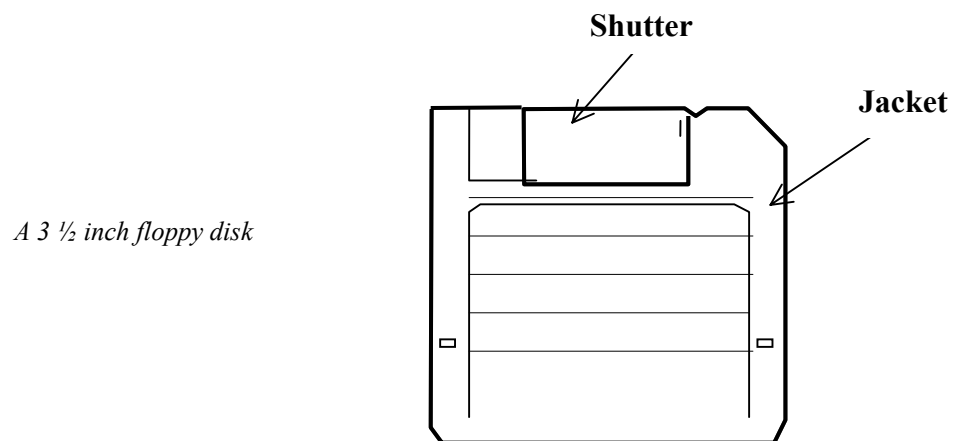
Over the years storage devices have improved steadily, and today there are a variety available for use.

2.5.1 Magnetic Disks

These are round platters made of either plastic or metal coated with magnetizable material.

The kind made of metal are usually referred to as **hard disks** while the kind made of plastic are referred to as **floppy disks**. Hard disk are generally made up of several platters that are built into a case thus they are often referred to as **fixed disks**. They can store larger amounts of data than the floppy disks. Storage capacity of hard disk can vary from around one Gigabyte (GB) (common in 1995) to 15 GB (today).

Floppy disks come in different sizes, but the most popular size is the 3½-inch that has a storage capacity of 1.44 MB.



In the case of the 3½ inch floppy disk (also referred to as a **diskette**), the round platter is housed in a square, hard plastic jacket. **You must be careful not to touch the actual platter**, as your data could be corrupted as a result. However, it can be viewed by pulling aside the shutter at the top of the jacket.

The input/output device that transfers data to and from a hard disk is known as a **hard disk drive**, while the one used for a floppy disk is called a **floppy disk drive**. The two main differences between the hard disk and the floppy disk are that the hard disk is built in or fixed and store more information while the floppy disk is portable and stores significantly less information.

Disk drives have read/write heads, which allow data to be either read from or written to disks.

In the case of hard disks the read/write head floats above its surface at an extremely small distance it is about the diameter of a human hair – reduced to one hundredth its usual size.

While it is floating so close to the disk surface the disk rotates allowing the information to be written to or read from the disk.

2.5.2 CD (Compact Disk)

There are four basic categories of these:

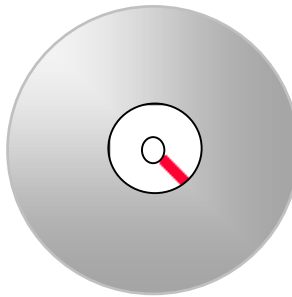
- Read Only (CD-ROM)
- Write Once, Read Many (WORM)
- Erasable (CD-RW)
- DVD (Digital Video Disk)

The most well known type of CD is the CD-ROM (Compact Disk Read Only Memory). They are made of plastic and can store data in the form of sound, audio, graphics, motion picture video and animated sequences.

As the name CD-ROM implies the computer may read from, but not write to them.

They are exactly the same size as the CD, which plays music in your stereo set and are created using the same type of technology.

CD-ROM's are not suitable for applications where data change, but their strong point lies in the fact that they can hold vast amounts of data. Storage capacity of CDs range from approximately 650 MB (CD-ROM) to 4.7 GB (DVD).



A compact disk

The acronym WORM stands for Write Once Read Many and hence these types of devices are useful for storing large quantities of data.

Another type of CD is the erasable one. These can be written to and erased just like floppy disks, but are more expensive and can store a larger volume of data than a floppy disk.

A recent type of compact disk is the DVD-ROM. These disks, which are read only, have a far greater storage capacity than the CDs discussed above.

2.5.3 Storage Capacity

As previously discussed, memory is measured in bytes.

8 bits = 1 byte (1 character)

1024 bytes (usually rounded to 1,000) = 1 kilobyte (KB)

1 million bytes = 1 megabyte (MB)

1 billion bytes = 1 gigabyte (GB)



Exercise 2.2

Answer the following *true* or *false*:

1. _____ Information in secondary storage may be retrieved after the computer is turned off.
2. _____ The amount of primary storage in your computer does not have any effect on whether it can run a particular program.
3. _____ RAM is an example of secondary storage.
4. _____ You can either read or write to RAM.
5. _____ Floppy disks are made of plastic.
6. _____ ROM is a volatile form of storage.
7. _____ Floppy disks and hard disks are the only two types of secondary storage devices.
8. _____ Hard disks are usually made of plastic.
9. _____ The read/write head of a hard disk actually touches the disk surface when reading or writing to it.
10. _____ CD-ROM disks hold about the same amount of data as a 3½-inch floppy disk.

When you've finished, please go to page 30 and compare the answers.

2.6 Output Components

Output devices display processed information. Some common output devices are the monitor, the printer, and speakers.

2.6.1 The Monitor

A monitor displays text, graphics and video. Originally monitors were known as **Video Display Unit (VDU)**; today, most people refer to it as the computer screen. In desktop computers, it bears a strong resemblance to a television screen and its internal design is similar.

Earlier monitors employed monochrome displays (one colour), but today most computer monitors employ full colour displays.

Notebook computers have flat screens, which often use a **Liquid Crystal Display (LCD)**. This is the type of display commonly found in pocket calculators and is very energy efficient when compared to the **Cathode Ray Tube (CRT)** display found in desktop computers. Some modern monitors are interactive. An example of this are the *touch screen monitors*, which are popular at Automatic Teller Machines (ATM) at used by banks.

2.6.2 The Printer

These output devices allow '*hard copies*' (permanent copies) of work to be conveniently viewed on paper or transparency film. Printers fall into two general categories: **Impact Printers** (printers that strike the paper as they are printing) and **non-Impact Printers** (printers that do not strike the paper when printing). There are a variety of printers available, and over the years their quality has improved significantly while their prices have tended to drop.

2.6.2.1 Impact Printers

Dot Matrix Printers form characters and graphics by creating patterns of tiny dots to print the characters or graphics. They are far more versatile than the older **daisy wheel printer**, which imprinted characters on a sheet of paper in a manner similar to that of typewriters.

The quality of the output from the dot matrix printer, while improving in recent years, is considered to be of relatively low quality.

2.6.2.2 Non-Impact Printers

Ink-jet Printers produce characters and graphics by spraying tiny drops of ink onto a piece of paper or a transparency film. They can produce black-and-white or coloured images and characters. While the quality of the output from an ink-jet printer is higher

than that produced by dot matrix printers, it is still not as good as the output from laser printers, the next printer type we will consider.

Laser Printers produce a high quality print. The principle by which they work is very similar to that of photocopiers, using laser beams and powdered ink (called toner) to form images. The laser beam produces images on a special drum inside the printer. The toner sticks to drum in the pattern of the characters or images being printed, and the characters and images are transferred to the paper through the applying of heat and pressure. Laser printers can be either black-and-white or colour and are generally considerably more expensive than the ink-jet printers.

2.6.3 Other Output Devices

Other output devices include speakers and data projectors. Most personal computer users add external speakers to produce a high quality of sound (music, speech, etc) from their computer. Data projectors are devices used to take the images from your computer and project them onto a larger screen so an audience can better view what is on the computer.

2.7 Other Hardware Components

2.7.1 Modems

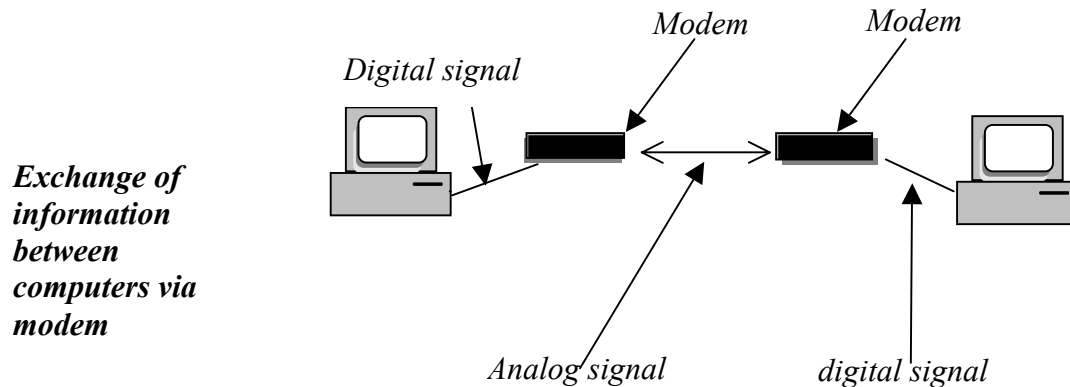
Today, it is now possible, that you can stay in your home, and use your personal computer as a part of a huge global network (the Internet), allowing you to communicate with other computers in any part of the world. This link is readily facilitated by the use of the ordinary telephone line and an incredibly useful device called a **modem**.

It took a little bit of ingenuity to get these devices (modems) to work, because computers utilise what are known as **digital** signals (suitable for transmitting 1's and 0's), while the regular telephone lines use **analog** signals (suitable for voice communication).

To make data transfer possible, the digital computer signals must be converted into analog signals. This is a process known as **modulation**.

Modulation only solves half the problem. Once the digital signals have been converted to analog signals and transmitted to another computer, they must be reconverted to digital ones so that the receiving computer can make sense of the data. This process is known as **demodulation**.

Each computer must then have its own **modulating- demodulating device (modem)** to send and receive data to another computer.



Modems may be **internal** (i.e. part of the internal circuitry of the computer with only the phone jack connection visible) or they may be **external**, in which case they are readily visible as a peripheral device that sits on your desktop next to your computer.

2.7.2 External drives

Earlier we mentioned types of magnetic disks as secondary storage media. Some of them use drives, which are peripheral to the computer, and as such are referred to as **external drives**. For example hard disks drives, floppy disk drives, tape backup drives, zip drives and CD drives. These are normally used to increase storage capacity and facilitate portability.

Although technological advances have allowed the amount of secondary storage within computers to be increased, backup of data is continues to be extremely important and as a result there is a strong market for external drives.



Exercise 2.3

1. List the two (2) output devices:

Output

Output

2. Why are dot matrix printers considered impact printers?

.....

.....

3. What popular office machines operate on a similar principle to laser printers?

.....

.....

4. What is the name of the computer device that allows the computer based in someone's home to communicate with another computer thousands of miles away?

.....

When you've finished please go to page 31 and compare the answers.



Section 2 Summary

- The term *computer hardware* refers to the physical components of the computer whether internal or external. Examples include:
 - CPU
 - RAM
 - Disk Drives
 - Keyboard
 - Mouse
 - Monitor
 - Printer
 - Scanner
- The term *computer software* refers to the sets of instructions by which the computer operates. These instructions are referred to as programs and are usually stored on some medium like magnetic tape, cd or disk.
- The processor contains the central processing unit and main memory) this is where the computing actually occurs.
- The two general categories of computer storage are *Primary storage* and *Secondary storage*.
- Input devices such as the keyboard and mouse are used to enter data while Output devices such as the monitor and printer allow inputted data to be displayed.
- The device, which allows two or more computers to communicate with each other via the telephone line, is called a *modem*.



Section 2 Solutions

Exercise 2.1 (See exercise on page 19)

1. The brains of the computer may be described as the **central processing unit**
2. The parts of your computer which you can see and actually touch are referred to as **hardware**
3. Software may be thought of as the set of **programs** which you run on your computer.
4. How many bits are in 2 bytes? **16**
5. The **monitor** is the most common type of input device.
6. You can copy text or graphics directly into the computer with the aid of a **scanner**.

Exercise 2.2 (See exercise on page 24)

1. **True** Information in secondary storage may be retrieved after the computer is turned off.
2. **False** The amount of primary storage in your computer does not have any effect on whether it can run a particular program.
3. **False** RAM is an example of secondary storage.
4. **True** You can either read or write to RAM.
5. **True** Floppy disks are made of plastic.
6. **False** ROM is a volatile form of storage.
7. **False** Floppy disks and hard disks are the only two types of secondary storage devices
8. **False** Hard disks are usually made of plastic
9. **False** The read/write head of a hard disk actually touches the disk surface when reading or writing to it.

10. **False** CD-ROM disks hold about the same amount of data as a 3½-inch floppy disks.

Exercise 2.3 (See exercise on page 28)

1. List two (2) output devices:

The monitor, scanner, data projector, or the printer. (List any two)

2. How do dot matrix printers imprint characters or graphics onto paper?

Dot matrix printers imprint characters/graphics by striking the paper.

3. What popular office machines do laser printers operate on a similar principle to?

Laser printers operate on a similar principle to office photocopiers.

4. What is the device that allows the computer based in someone's home to communicate with another computer thousands of miles away?

The modem makes it possible for communication to take place between computers that are very far apart.



Assignment No. 10.1 – 1

Unit 10.1 Introduction to Personal Computers

You are now required to do **Assignment 10.1 – 1** which will be found at the end of this unit or distributed by your tutor.

Please ensure you:

- read the questions carefully
- fill in the corresponding *Assignment Attachment Form*
- return by the due date

If you have any questions relating to the assignment or the assessment, please don't hesitate to contact your Tutor.



Section 3 – Computer Software

3.1 Types of Software

Software may be seen as the set of instructions that tell the computer hardware what to do. Computer software is also called computer programs. There are two categories of software, **system software** and **application software**.

System software consists of programs that have the function of directly controlling the utilizing of the computer hardware. The types of system software are the operating system and the utility programs. The *operating system* is a group of programs that coordinate the activities among your hardware devices and contain instructions that allow you to use the application software on your computer. When you boot up your computer, the operating system is loaded into memory from the hard disk. It remains running while the computer is turned on. Popular examples of operating system software include versions of Unix, DOS, Windows, Macintosh and Linux.

Utility programs is a category of system software that carry out a particular task, usually have to do with managing your computer, its programs or devices. One example of a utility program is a printer driver, which enables a specific printer print out data from your computer.

System software is often *transparent* to the user of a computer system, i.e. we are not usually aware as it is performing tasks.

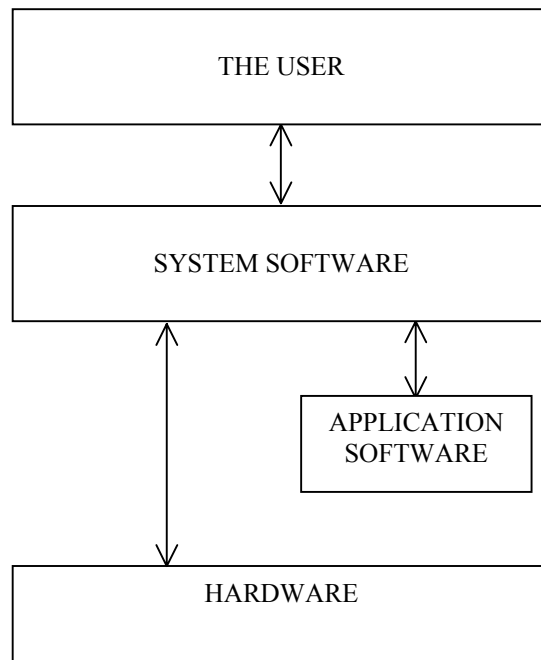
Application software consists of programs that complete specific tasks for the user. The following are example of popular application software:

- Word processors: used to produce letters, memos, reports, etc.
- Spreadsheets: used for accounting tasks such as budgets or inventory.
- Databases: used as a means of organising information, as with a library catalogue.
- Presentation Graphics: used as a visual aid for presentations.
- CAD/CAM: used in architectural drafting and designs.
- Desktop Publishing: used to produce newsletters, flyers and other publications.

System software and application software combine together to direct the hardware to produce the output you desire. When you use an application program and, for example, you give a print command, the application program that you are using does not directly control the hardware causing you to obtain the printout. In a process, which we cannot directly observe, the applications program requests of the system software that the print job be performed, and the system software directs the printer to perform this task.

Acting in this manner the system software is described as an *interface*. An interface is a connection between two parts, which serves to allow interaction between them. An analogous situation is found when you sit behind the wheel of a car and drive. In the case of a manual (standard) shift car you cannot directly interact with the gearbox to select the appropriate gear as you travel. Rather, you control the gear selection process via the clutch and gearshift lever. In that way, they are acting as an interface between you and the gearbox.

The diagram below illustrates the relationship between application software, system software, hardware and the user.



Note that application software can only access the hardware via the system software.

We may also view the situation from the user's perspective, in which case we see that the user has to go through system software, or a combination of system and application software to access the hardware.



Exercise 3.1

1. What are the two basic types of software?

.....

.....

2. Give three examples of popular operating system software?

.....

.....

.....

3. What is the function of system software?

.....

.....

4. Fill in the blanks with words chosen from the list below:

application, interface, Windows, transparent

The function of operating system software is often _____ to the user. It is useful to know that _____ software is used to perform a specific task such as produce letters. However, system software act as an _____ between the application software, hardware and the user.

See page 44 for answer

3.2 Overview of Operating Systems

Application software is normally written based on one of several operating systems. There are many different operating system on the market today, that basically perform the same tasks which may include starting a computer, providing a user interface, printing a document you have created, loading an application program (e.g. a word processor), saving your work on a floppy disk or hard drive, controlling the Video Display Unit (monitor) and displaying the files you have saved on your diskette

The particular operating system that a computer uses is often referred to as the platform. Two of the most popular platforms are Macintosh and Windows operating systems. When you purchase application software, the package identifies the platform the particular software is designed to function on. When selecting software to purchase it is important to ensure that the software is compatible with the operating system installed on your computer. However, this is becoming less of an issue as there is a trend toward producing cross-platform software (software able to run on more than one platform).

The operating system may be directly/indirectly instructed to manage the hardware in performing a number of tasks.

The table below summarizes the progression of popular operating systems (OS).

DATE	NAME	FEATURES
1973	CP/M	Text Based Interface
1981	MS-DOS	Text based (similar to CP/M)
1985	WINDOWS 3.x	Graphical environment combined with DOS, later versions supported networking.
1995	WINDOWS '95	Graphical User Interface (GUI), Multitasking, downward compatible to DOS, Plug and Play technology.
1998	WINDOWS '98	GUI, Internet enhanced, support multimedia technology.
2000	WINDOWS 2000	GUI, Focus primarily on networking, improved compatibility with other platforms (e.g. Macintosh, Unix, and Linux)
1984	MACINTOSH	GUI, multitasking, network support Early '90s MAC OSGUI, Cross Platform support, e-mail.



Exercise 3.2

1. *Complete the sentence below by selecting the correct answer from the list given:*

The letters OS stand for _____

- Operating Standard
- Operating Software
- Operating System
- Operating Service

2. Software with the ability to run on more than one platform is known as:

- Cross Platform
- Windows or Macintosh
- Operating System
- Application Software

3. Which OS is **NOT** an example of a graphical user interface:

- Windows '95
- MS-DOS
- Macintosh
- Windows 2000

4. Which of the following is **NOT** true of the OS.

- It manages computer hardware
- It interfaces with the user
- It interfaces with the application software
- It replaces the application software

5. Give two examples of text-based operating systems.

Please compare your answers with those on page 45.

3.3 Word Processors

Perhaps the most commonly used application software is word processing software. Word processing programs make life easy for us by allowing us to create documents on the computer and then to go back and make changes as often as we wish without having to rewrite the entire document.

At some point you may have prepared a document (e.g. letter, lesson plan, etc.) by hand and at a later time found that you needed to make changes to it. Wasn't it a frustrating experience to have to rewrite the entire document, if you wanted to insert an extra paragraph or make some other correction? In fact, how would you feel if after making major changes, you discovered that there were yet other changes needed?

Word processing software allows you to create, make changes to, and print documents in a much more convenient manner.

In addition, a word processor also allows us to make documents look professional by giving options of various fonts and font sizes. A small sample is shown below.

This font is Arial in regular style and of size 8

This font is Comic Sand MS in Italic style and size 14

This font is Edwardian Script in bold style and size 24

This font is Helvetica in regular style and of size 12

This manual that you are now reading was prepared with the use of a word processor. It was not written first by hand and then entered into the computer. Rather, it was prepared directly at the keyboard.

Another feature that makes the word processor an invaluable tool is the spell checker that alerts the user to errors and provides a method for correction.

Word processors are also equipped with a thesaurus, grammar, and punctuation facilities.

Two popular word processing software packages are Microsoft Word and Corel Word Perfect.

3.4 Spreadsheets

Traditionally a spreadsheet is a large sheet of paper on which people add up rows and columns of numbers to help them with accounting. Today spreadsheets are computerised and they have tremendous value in business applications. A spreadsheet program helps you to manage, analyse and present information.

Below we illustrate a section of a spreadsheet, as it may appear when you start up the spreadsheet program.

	A	B	C	D	E
			*		

A spreadsheet is a collection of *columns* and *rows* that intersect to form *cells*. There are letters at the top of each column, and numbers at the beginning of each row, allowing each cell to be identified by a cell reference. For example, the cell containing the asterisk (*) is called **C3**.

Spreadsheet Terms

Cell: Box created by the intersection of a column and row.

Row: Collection of cells running horizontally.

Column: Collection of cells running vertically.

Formula: Mathematical statements that use five basic operators as illustrated below:

+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponential

Range: A collection of adjacent cells (e.g. The range A1:D1 is shaded.)

	A	B	C	D

The power of a spreadsheet lies in the fact that it is very easy to manipulate formulae based around the cell references.

3.5 Databases

A **Database Management System (DBMS)** is software that allows the storage, manipulation, retrieval, display and printing of data. When large amounts of data need to be gathered and stored, DBMS readily allow organizations to do this as well as keep track of the data.

A **field** in a database is a storage location in which we store data **entries**, which may be of various types. Some examples of fields could be:

- Name
- Age
- Date
- Number of items in stock

A collection of related fields form a **record**.

	Name	Age		
	Bethel, I	13 yrs	01/05/99	8
	Brown, R	14 yrs	01/05/99	9
	Hanna, Q	15 yrs	01/05/99	10
	Johnson, P	13 yrs	01/05/99	8
	Johnson, T	15 yrs	01/05/99	10

Other Database Terms

Query: A subsection of the database that meet specified criteria.

Report: Information printed from the database.

Popular examples of Database Management Systems include Access, Paradox and FoxPro.

3.6 Presentation Graphics Programs

Microsoft PowerPoint is a popular example of a presentation graphic program. These programs are of great value as visual aids to a lecture, speech or other presentation. Information is organised on individual slides. A collection of slides make up a presentation file.

Presentation graphics programs are versatile and are often used by artists, teachers, and salesmen and are very popular at conferences.

When used properly, these graphics packages can serve to greatly enhance the quality of a presentation.

3.7 CAD/CAM

Computer Aided Design and Computer Aided Manufacturing (CAD/CAM) are special examples of graphics programs that allow people in the field of engineering to design parts much faster than would be facilitated if they were employing manual methods.

With the use of these packages parts of designs can be altered without having to redraw the design-- completely. Testing of these designs may also be done on the computer under simulated conditions.

The design of parts for machinery, electronic circuitry, houses and other structures may all be done by CAD/CAM usage.



Exercise 3.3

Fill in the blanks with suitably chosen words/phrases chosen from the list below:

Microsoft Word, Presentation Graphics package, Microsoft Access, CAD, related, Database

1. A record is a collection of _____ fields.
2. Microsoft PowerPoint is an example of a _____
3. Persons in the field of engineering use _____ packages to allow faster design of parts.
4. _____ is an example of a word processing package.
5. _____ is an example of a Database Management System.

Please compare your answers with those on page 45.



Section 3 Summary

- *System software* directly controls the computer hardware. An example of system software is an operating system program such as Windows.
- *Application software* allows you to perform specific tasks such as preparing letters, spreadsheets, etc.
- Six common types of application software include:
Word processors, Spreadsheets, Databases, Presentation Graphics, CAD/CAM and Desktop Publishing software
- The term *interface* is used to describe the way in which the computer communicates with the user and hardware.
- The operating system is an interface between the user, application software, and the hardware. There are a variety of operating systems available. In selecting application software you must ensure that it is compatible with your operating system
- Older operating systems were text-based. DOS for a long time dominated the market; however, with the introduction of graphical user interfaces computers became and continue to be more user friendly.
- *Word Processors* are a very widely used form of application software. They allow us to produce high quality documents, through the provision of facilities for extensive editing, formatting, insertion of graphics etc
- *Spreadsheets* are used in many business applications. Data is entered into cells, which may be easily referenced. The performance of a large number of mathematical operations is then readily accommodated.
- *Databases* are also used widely in business environments. Their strength lies in the fact that they allow the storage of data in fields. As such this is very useful when we wish to store data in the form of records with varying field types.
- *Presentation Graphics programs* is especially suited for the display of graphics, which for example, may be in the form of graphs, charts etc. When you wish to make a presentation before a group, the use of a this type of program can add substantially to the quality of the presentation.
- *CAD/CAM software* is often used to assist in the design of parts in industrial settings. Engineers find this type of application software very useful.



Section 3 Solutions

Exercise 3.1 (*See page 35 for exercise*)

1. What are the two basic types of software?

Application software

System software

2. Give three examples of popular operating system software?

Unix, Macintosh, Linux, DOS, Windows [any three]

3. What is the function of system software?

System software directly controls and utilizes the computer hardware.

5. Fill in the blanks with words chosen from the list below:

The function of operating system software is often **transparent** to the user. It is useful to know that **application** software is used to perform specific task such as produce letters. However, system software acts as an **interface** between the application software, hardware and the user.

Exercise 3.2 *(See exercise on page 37)*

Complete the sentence below by selecting the correct answer from the list given:

1. The letters OS stand for ***Operating System***
2. Software with the ability to run on more than one platform is known as:

Cross Platform

3. Which OS is **NOT** an example of a graphical user interface?

MS-DOS

4. Which of the following is **NOT** true of the OS?

It replaces the application software

5. Give two examples of text-based operating systems.

CP/M and MS-DOS

Exercise 3.3 *(See page 42 for exercise)*

1. A record is a collection of **related** fields.
2. Microsoft PowerPoint is an example of a **presentation graphics package**
3. Persons in the field of engineering use **CAD** packages to allow faster design of parts.
4. **Microsoft Word** is an example of a word processing package.
5. **Microsoft Access** is an example of a Database Management System.

Assignment No. 10.1 – 2

Unit 10.1 Introduction to Personal Computers

You are now required to do **Assignment 10.1 – 2** which will be found at the end of this unit or distributed by your tutor.

Please ensure you:

- read the questions carefully
- fill in the corresponding *Assignment Attachment Form*
- return by the due date

If you have any questions relating to the assignment or the assessment, please don't hesitate to contact your Tutor.



Section 4 – The Internet

4.1 What is The Internet?

The Internet is a world-wide collection of millions of inter-connected computer networks. A service of the Internet is the World Wide Web (WWW) or 'the *Web*'. It is via the *Web* that information is exchanged over the Internet from various *Web Sites*. To fully appreciate the structure of the Internet, it is essential to have a basic understanding of networks.

One of the first types of networks is the **Local Area Network** (LAN). In this type, we have a group of computers exchanging data and sharing hardware equipment in a relatively small geographical area (e.g. a building). On the other hand, a **Wide Area Network** (WAN) covers a wider geographical area (e.g. branches of international banks). This exchange of information is done by means of communication equipment such as special cables, modems, satellites and telephone lines. A new trend in Information Communication Technology (ICT) is the use of wireless technology.

The 'fantastic' news nowadays is that it is possible for you to stay in your home and exchange information with someone thousands of miles away by means of the **Internet**. The Internet is not only useful for contacting persons, but it is of tremendous importance for the wide range of information available on it.

4.2 What do you find on the Internet?

Actually, you can find information on almost any topic on the Internet.

Information may be found on education, library catalogues, major news events, stock prices, scientific data, business, health, shopping, home and family, sports, etc.

4.3 Why put information on the Internet?

The purpose of placing information on the Internet is usually to allow easy access to it by as many people as possible. However, in some cases it is desired that this access be restricted to a particular set of people for whom it is intended. In this case, security locks are placed on the information in the form of *passwords*.

A computer *password* is a particular combination of characters, which must be keyed in to the computer, before it will allow a user to gain access to particular data or to start a particular program.

What the use of a password means is that information is still available to individuals in almost any location, but only if they have been granted permission (at least in theory). An where password usage would be employed is in the assessing of databases where private information is stored by governments.

Sometimes persons known as *hackers*, who specialise in infiltrating sites that hold restricted information, manage to either gain the password for them, or find some other means by which they can trick a computer system into allowing them access to the restricted information.

4.4 Who puts information on the Internet?

Information is placed on the Internet by a variety of organisations such as universities and colleges, government agencies, business houses, banks, non-profit organisations, as well as by individuals.

Educational organisations may place information there for the purpose of spreading and encouraging the exchange of knowledge, without seeking a direct monetary profit. They may also use it as a means of conducting distance-learning programs.

A business organisation, which places information on the Internet, is usually seeking to benefit financially through the advertisement its products receive.

Individuals, who place information, may be doing so in the hope that information will also be exchanged with them in return.

4.5 Other Features of the Internet

4.5.1 E-mail (Electronic Mail)

E-mail allows you to send mail/messages electronically to someone by means of your computer.

Of course, the other person must also have access to a computer with an Internet connection, and you both need to have e-mail addresses. An e-mail address consist of four parts: (1) the *username* or the name of the person with the account (eg. cathy), (2) the *host* or the name of the computer providing the Internet access, (3) the *subdomain* or the business/owner of the host computer (eg. batelnet) and (4) the *domain* that indicates the type of institution (eg. com refers to commercial organization). E-mail addresses are written without spaces. A typical e-mail address might be cathy@grouper.batelnet.com.

The advantage of using e-mail lies in the fact that the mail usually reaches the designated email account within seconds. This has prompted people to coin the phrase *snail mail* to describe the traditional mail system, which often takes days to weeks to deliver.

4.5.2 FTP (File Transfer Protocol)

FTP is a commonly used service of the Internet when there is a need to transfer files. Software, software updates, manuals, games and other files are normally downloaded using this feature.

4.5.3 Newsgroups, Message Boards, Chat Rooms and Mailing Lists

A *Newsgroup* is a group of persons conducting a discussion online in a specific area. Persons in the group take turns typing in messages that are read and replied to by the group online. Another similar arrangement to the Newsgroup is the *message board*. Message boards are Web based, free of charge and simple to use. A *chat room* on the other hand is different in that communication in a chat room is very much like live conversation. An exception is that persons in the chat room must be online at the same time. *Mailing lists* allow groups of persons to e-mail the entire group under a single name. Therefore, when a message is sent to the mailing list, every name on the list will get a copy of the message.

There are other features of the Internet such as Telnet, Instant Messaging, and Portals. However, the ones discussed give a good basis on which to build an understanding of the phenomenal appeal of the Internet.

4.6 The Value of the Internet to Education

Many institutions of learning place information on the Internet. This allows students and other interested persons to gain information from the comfort of their homes or classrooms.

If your institution of learning has an Internet connection available to its members, you may be able to make a connection by consulting your tutor and/or other relevant authorities. Connecting in this case will usually involve as a first step, being assigned a user name and a password.

If you wish to obtain your own Internet connection at your home, you need to sign up with a company, which provides Internet services, referred to as an *Internet service provider (ISP)*. You will need to ensure that your computer has a modem installed either internally or externally, which is necessary for this type of network connection.

In the case of Windows users, you may already have an *Internet Connection Wizard program*, (that is, software that guides you through the configuration process for an Internet connection), as well as a *browser program*. A *browser program* is one, which will enable you to *surf* (explore) the Internet when you start it up (the browser program).

Two popular browsers are *Microsoft Internet Explorer* and *Netscape Communicator*.

If your computer does not already have the software necessary to enable you to configure it to connect to the Internet, the ISP will supply this software, along with the relevant instructions allowing you to connect via the service provided by the company.

It must be borne in mind that the company will charge a fee for these services. Care must be exercised in choosing an Internet Service Provider. For example, a provider may charge \$15.00 per month, which may allow 5 hours of Internet access, with a charge of \$2.00 per hour for the subsequent hours. Another may charge \$40.00 for unlimited access to the Internet.

Depending upon which country/region you are in, you may then pay for the phone call every time you connect. If you choose a provider out of your local area, you will then have to pay long distance charges, so it would make sense to choose a local provider and avoid the additional long distance connection charges.

Once you have signed up, and your computer already has the necessary hardware installed (modem), you can then use an *Internet Connection Wizard* program to configure your computer for Internet access.

On completion, after making sure that your modem is plugged into a telephone outlet, you may then start the program by first clicking the *My Computer* icon on the desktop and then *Dial Up Connection*, followed by the Dial-up Connection for your ISP.

After your connection is made, you need to select a browser, and then you are off and surfing.

Without the Internet, it may have been necessary to go to a library and spend time searching catalogue sections and, in many cases, within restricted time frames. Alternatively, persons seeking the information may have had to buy expensive books, write and request it, or conduct their own research. In some cases the information on the Internet would not have been available to the person accessing it by any other means. The Internet saves the user from these chores and in addition it is available 24 hours a day, with information often arriving a few minutes or less after being requested.

Students and tutors with Internet access may utilise it in distance learning programs, since they may contact their tutors via the Internet and have information sent to them or submit exercises to them using *electronic mail*.

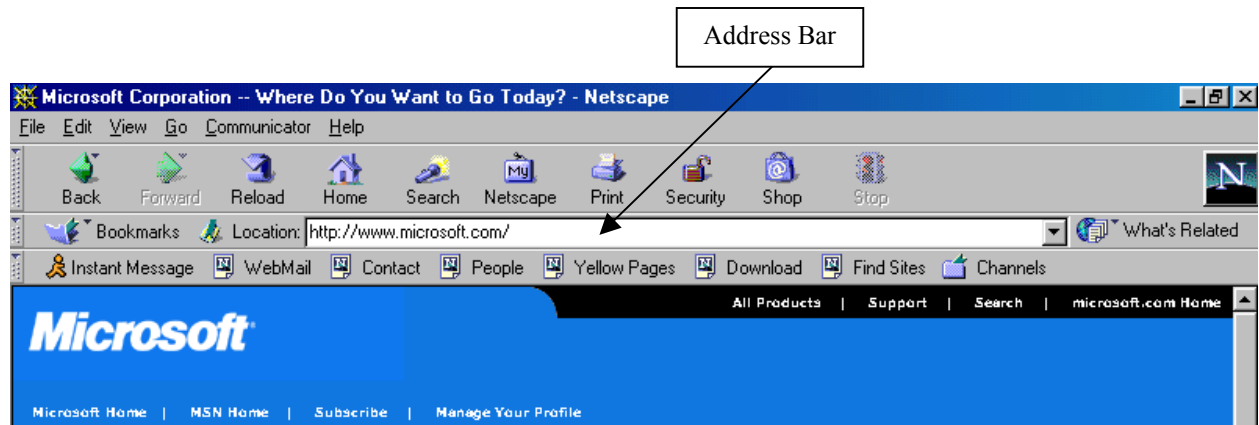
4.7 Internet addresses

There are two main ways that you can locate information on the Internet. You can do a *search*, which would entail using a special program such as a *search engine* (which lists references to locations where the information you seek may be found). Alternatively,

you can direct the browser you are using to the *Internet address* of the database you wish to access by typing in its address in a section of your browser provided for this.

An Internet address is sometimes referred to as a ***Universal Resource Locator (URL)***. It is a reference to where something is located on the Internet. It works very much like a regular postal address in the sense that in order to locate someone in any part of the world, by the regular mail system, you must have directions as to where the person may be found.

If the URL of an Internet site is known, then the site may be located by typing in the URL in the *Address bar* usually located near the top of the browser page beneath the menu items.



The front page of Microsoft's site using Netscape Communicator browser

The URL consists of the following sections:

- ***Protocol name-*** This is a set of rules and standards that allow computers to communicate with each other. E.g. *http*
- ***Organisation name-*** This is the name of the organisation that maintains the site e.g. *www-* which stands for World Wide Web
- ***Web server location-*** This gives the location of the server that maintains the site e.g. *msn-* which stands for Microsoft Network
- ***Institution-*** This informs as to the type of institution e.g. *edu-* which stands for educational institution

An example of a URL is <http://home.microsoft.com>. This is the address for Microsoft's home page. Here the *com* at the end of the address shows the site is a commercial one.

Addresses of sites may also be obtained by clicking on ***hyperlinks***, also called *links*, which may appear as in the Microsoft home address above. Hyperlinks are usually underlined and often (but not necessarily) in the colour blue. You can tell when you have reached a hypertext mark-up link by observing the mouse pointer change shape to a hand when it is placed over the link

4.8 Searching for information

A major reason for the immense popularity of the Internet is the fact that searches can be performed to find current information on a wide range of topics. As we mentioned before, the implication of this for use in education is vast.

If we wish to contact an individual or organisation in a country, for which we do not have a telephone directory, we may find a full telephone directory listing available for that country on the Internet. Time and currency converters are also available, online, as it is called, among many other things.

Tutorials may also be found giving step-by-step instructions on a wide variety of topics.

You may also shop on the Internet, and this is very useful for us in education circles, when a particular book we wish to have is not available in our area. There are online bookstores on the Internet with hundreds of thousands of books available on order.

If you are using Internet Explorer 5.0 as your *web browser*, you may perform searches by clicking on *Go* in the Menu bar at the top of the page and then from the menu options, which appear selecting *search the web*.

You may then type into a *search engine* a word or words which characterise the topic you wish to search for information on, and a list of references will then be displayed. A popular search engine you can use is Google at www.google.com. When the page displays, simply put the topic you want further information on in the space provided on the page. Depending on what you are searching for information on, you may get a list of thousands of sites to explore in just seconds.

4.9 Controlling Internet Usage

The Internet is a very powerful and influential media. It may be used as an almost incomparable tool of education. Yet, because of the fact that it is very open and just about anyone can publish information on it, it is sometimes desirable to place restrictions on the types of sites that may be visited.

This may be done by downloading certain programs from the Internet that allow controls to be placed on which sites may be accessed. These programs include *Cyber Patrol* and *Web Nanny*. In a situation where we have very young children accessing the Internet, or in a school or college-type environment it is advisable to obtain a copy of one of these programs as a means of regulating the type of information that may be displayed. You can set the software to restrict access to any site containing certain information.

Although there is not substitute to teaching Internet users responsibility in choosing which sites they access, these software give added protection from a lot of potentially damaging information on the Internet.



Exercise 4.1

1. Answer the following *True* or *False*:

“The Internet is very restricted in nature, with only a few thousand computers around the world hooked up to it.”

.....

2. List three ways in which the Internet could be of benefit to a student of Food and Nutrition:

.....

.....

.....

3. What is the name given to a company which provides Internet connection services for people?

.....

4. State whether the following is *True* or *False*.

“You do not need any special software to browse the Internet”

.....

Compare your answers with those on page 55



Section 4 Summary

- The *Internet* is a collection of computer networks linking millions of computers around the world.
- A lot of material which is very useful in varying fields of education may be found on the Internet
- *Browser programs* (for example, **Microsoft Internet Explorer** and **Netscape Navigator**) allow us to explore the Internet after we have made a connection to it.
- *Universal Resource Locators (URL's)* are references to where we may find sites on the Internet



Section 4 Solutions

Exercise 4.1 (See exercise on page 53)

1. Answer the following *True* or *False*:

“The Internet is very restricted in nature, with only a few thousand computers around the world hooked up to it.

False. There are actually millions of computer around the world that are connected to the Internet, and the number is growing.

2. List three ways in which the Internet could be of benefit to a student of Food and Nutrition:

- ***Obtaining information on the subject area***
- ***Locating dealers of relevant books***
- ***Communicating with other teachers in the same subject area***

3. What is the name given to a company which provides Internet connection services for people?

Internet Service Provider

4. State whether the following is *True* or *False*.

“You do not need any special software to browse the Internet”

False. Browsers are needed to surf the Internet.

Assignment No. 10.1 – 3

Unit 10.1 Introduction to Personal Computers

You are now required to do **Assignment 10.1 – 3** which will be found at the end of this unit or distributed by your tutor.

Please ensure you:

- read the questions carefully
- fill in the corresponding *Assignment Attachment Form*
- return by the due date

If you have any questions relating to the assignment or the assessment, please don't hesitate to contact your Tutor.