

**BANGLADESH METEOROLOGICAL
DEPARTMENT
LOCAL TRAINING**

MODULE 15: BASIC ICT



Project: Strengthening Meteorological
Information Services and Early Warning
Systems (Component-A)

Prepared By:
Grant Thornton Consulting Bangladesh Ltd



Purpose:

The purpose of this module is to acquaint the participants with the basic concepts of information and communication technology so that the participants can use ICT in their daily life to enhance their daily office works and improve their performance. Besides, it is also necessary for the officers to communicate with the IT department for various tasks. This module will also provide them with that capability to effectively communicate with the IT department.

Delivery and Description:

Methodology:

This module is designed in such a way that the participants get explicit idea regarding the basic ICT terms and concepts. Besides, we also wish that the participants will be able to incorporate the facilities of ICT in their everyday life to enhance their official works. To achieve this objective, we have made the sessions based on the most important topics of ICT that are used in everyday life. We have included sufficient practical exercises to ensure that the participants not only learn how to use ICT, but they can also implement them.

Key learning outcomes:

After attending the training, the participants will have explicit idea on the concepts of the Information and Communication Technology, and they will be able to apply this knowledge in their respective organization.





Disclaimer

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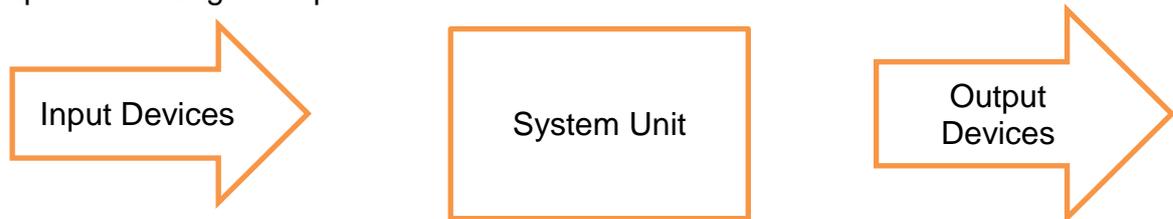
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SESSION 1: HARDWARE

1.1 Hardware Basics

The concept of hardware revolves around the concepts of the computer components, the physical and the tangible components of a computer, e.g. the electrical, electronic and mechanical parts that comprise a computer.

Computer Working Principle:



Through the input devices, we give data to computer. Computer then analyzes and processes that data and then based on that input data, computer provides us with output through the output devices. Common input devices include mouse, keyboard etc. CPU is a system unit whereas monitor is an output device.

1.2 Personal Computer

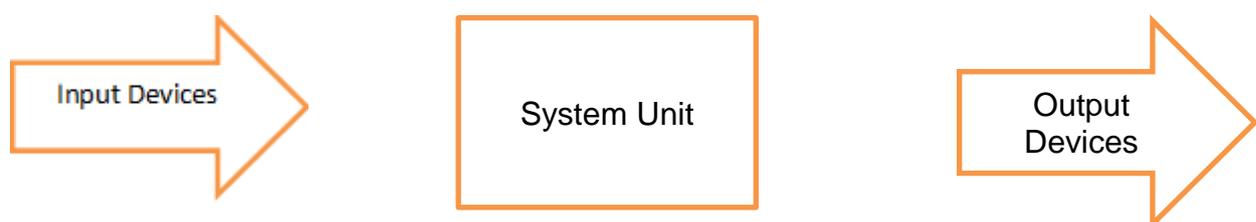
Personal computer (PC), as the name suggests, is meant for personal use, as opposed to the server, which is used by a larger number of people simultaneously, from different locations, often via terminals.

1.3 Laptop and Tablet PC

Laptop or tablet PC is used by individuals who have the need to travel with a computer or simply use them for aesthetic reasons when computing power is not an issue. Laptop computers, as opposed to tablet PCs, more closely resemble a personal computer when it comes to data input. Data entry is done via keyboard and mouse, while in the case of the tablet PC, data entry is done via touch screen.

1.4 Main Computer Components

As already stated, computer's functionality can be divided into:



The system unit (case) contains a computer's vital parts. There are two basic types of cases:

- Desktop casing is placed on a desk in a horizontal orientation.
- Towers come in 3 sizes (mini-tower, mid-tower and full-tower) and it is vertically orientated.

Motherboard, MBO is computer's basic circuit, to which all computer components are connected, directly or indirectly. Devices are connected to the motherboard through a system bus. System bus connects all devices, ensures data flow and communication between different devices using predefined protocols. Protocol describes a manner in which communication between devices is defined. It enables them to address each other and defines how they should look for each other on either system bus or network.

Central Processing Unit (CPU or processor) is a central part of a computer (and can be referred to as the computer's "brain"). It manages all other computer parts, monitors their mutual communication and performs arithmetic-logical operations. Processor speed is measured in hertz (or megahertz or gigahertz). Most famous manufacturers for personal computer processors are Intel and AMD.

Cache is a small capacity memory which allows quick access to data. By storing data from working memory in cache, the speed of communication between processor and RAM is increased. Microprocessors use three levels of fast cache, L1, L2 and L3, used to store often used data.

ROM (Read Only Memory) is a type of permanent, internal memory that is used solely for reading. BIOS (Basic Input/output System), a program which is located in a separate ROM on the motherboard, and defines, as the name suggests, basic input/output system, is a good example. Please note that not all BIOS programs are stored in ROM.

RAM (Random Access Memory) is a working memory in which analyzed data and programs are stored, while computer runs. It allows reading and writing data and is deleted/cleared when the computer shuts down.

Hard Disk Drive (HDD) is a place for permanent data storage (it does not delete/clear when computer shuts down). Its features are: large capacity, faster performance in comparison to optical devices but slower in comparison to RAM and are used for permanent data storage. We can distinguish between internal and external hard drives.

Soundcard is a device used for sound creation and production by means of computer speakers.

Graphics card is responsible for image processing and displaying it on a monitor. It has its own graphics processor and memory. Image quality depends on the strength of these components.

Modem enables computers to communicate via telephone lines. They connect computers to the Internet.

Connectors or ports are slots visible in the back and the front side of a computer.

Common Input/output Ports

- Universal Serial Bus (USB) is used to connect various devices (mouse, keyboard, USB memory).
- Serial port is used for example in connecting a mouse (labeled COM1 or COM2).
- Parallel port is used for connecting a local printer (LPT1 or LPT2).
- Network port is used for connecting computers to a network.
- Fire wire - used for connecting computers and audio-video devices (digital cameras, etc.).

1.5 Computer Performance

Factors affecting computer performance:

- Processor clock speed, amount of cache and number of kernels
- The amount of installed RAM
- Graphics card- its memory and processor
- Clock bus
- Number of running applications

Applications use computing resources. The processor runs applications and performs code that defines applications; therefore, processors get the most workload when it comes to running the application. In order for processors to execute the application, it is necessary for application code to be loaded into the system memory. As a result, running applications take up a certain amount of working memory. The more applications are running, the greater the load on the processor and RAM. That is why the computer's performance depends on both the processor (clock speed, number of cores, cache memory), and the amount of working memory, as well as the number of applications running.

Processor speed is measured in hertz (Hz), and due to a large working clock speed of today's processors, it is expressed in megahertz (MHz) or gigahertz (GHz). Besides the frequency, the processor performance depends on the number of operations that the arithmetic-logic unit (ALU) performs in one clock cycle.

1.6 Input and Output Devices

Input devices:

Mouse is an input device that facilitates work with the graphical user interface (GUI). These days, people usually use optical mice.

Keyboard is used for data entry and issuing commands. They can also be wired or wireless.

Scanner is used to load data (image, text, etc.) from the printed material into a computer. The result of scanning is an image, but with special programs, if we scan the text, we can get a text as a result. Software used to recognize text from image is called a *text recognition tool*.

Touchpad is used for transmission of hand movement, but unlike working with a mouse, the user is the one who determines the position of the cursor by touching the touchpad.

Lightpen enables handwriting on screen and can be used as a mouse. It requires an appropriate monitor type.

Microphone is a device that converts sound into an electrical signal, which can be stored on a computer. It is mainly used for recording sound, communication between players in online games, in combination with a web camera in video conferencing, for converting voice into text on a computer (speech-to-text processing (e.g., textual files or emails), etc.

Webcam is a camera that stores video signal in a format appropriate for video transfer over the Internet in Realtime.

Digital camera, unlike analog, stores photographs in digital format. It can be directly connected to a computer and photographs can be downloaded. Photograph quality is expressed in megapixels. More megapixels mean better quality of photograph, however more memory is occupied.

Output Devices

Monitor displays images from the computer, it enables us to see, work and control computers. In other words, working on a computer without a monitor would be inconceivable. Common types of monitors, with regard to manufacturing technology, are the CRT and LCD. **CRT monitors** have been present on the market for a long time, and other technologies are pushing them out. They are based on cathode tube technology. **LCD monitors use** liquid crystal technology. In comparison with CRT monitors, LCD monitors use less electrical energy, do not emit radiation and their price is higher, however due to smaller dimensions, more attractive design and a good picture quality, they are pushing CRT monitors out of the market. Monitor size is expressed by the size of screen diagonal and measured in inches ("). Picture quality is expressed with the notion of resolution, which is a number of horizontal and vertical dots (pixels) (e.g. 1920x1080).

Projector is a device used to project a computer image or other images from independent devices, such as DVD players, Blu-ray player, etc. onto canvas or a wall.

Printer is a device used for printing data from a computer onto a paper. We distinguish between local printer (connected directly to the computer) and network printer (connected directly to network using a network card). Also, printers also differ according to print technology: dot matrix, laser, inkjet, thermal printer and plotter.

SESSION 2: MEMORY AND STORAGE DEVICE

ROM (Read Only Memory) Previously discussed.

RAM (Random Access Memory) Previously discussed.

2.1 Measurement units

Bit (binary digit) is the basic unit used to measure the amount of information. A byte or octet contains eight bits.

1 KB (kilobyte)- 1024 B (approx. 1000 B)

1 MB (megabyte)- 1024 KB (approx. 1000 KB)

1 GB (gigabyte) -- 1024 MB (approx. 1000 MB)

1 TB (terabyte) – 1024 GB (approx. 1000 GB)

2.2 Basic types of Storage Devices

CD (Compact Disc) is an optical disc used for data storage. The standard capacity of a CD is 700MB. CD-R is used for reading and writing data onetime-only, while CD-RW for reading and writing data multiple times.

DVD (Digital Versatile Disc) is an optical disc which is, due to the larger capacity (about 4.7 GB), mostly used for video storage.

Blu-ray disc (BD) - the successor to DVD, is an optical disk storage, it comes in different capacities, depending on how many layers it has and the capacity of each layer. Currently, the capacity of one layer is between 27 GB and 33 GB, while the overall capacity is the product of the number of layers and capacity of each layer. (Source used: http://hr.wikipedia.org/wiki/Blu-ray_Disc).

Nero Software is used for writing data from computer/laptop to a CD/DVD/Blu-ray Disc.

Memory card is a type of flash memory used to store data in digital cameras, cell phones, MP3 players etc.

There is a difference between an internal **hard disk drive**, which is embedded in the computer case, and an external **hard disk drive**, which is connected to a computer by using an appropriate cable or USB port, and is usually used to transfer data from one computer to another or for backup.

SESSION 3: SOFTWARE

Software is, unlike hardware, intangible part of the computer. It consists of a sequence of commands, written according to strict rules. Programs are written by programmers, in various programming languages.

3.1 Software types:

Operating system is a program which manages computer hardware. First computers did not have operating systems; they had programs that were directly loaded into the computer (e.g. punch cards). Today, computers have an operating system which gets loaded into the computer's memory during its startup. Computer functions are based on its operating system. Within operating system, drivers (responsible for the functioning of a computer) and various utility programs (responsible for the functionality of a computer) are installed. The most famous operating systems are:

1. Linux (Debian, Ubuntu, Fedora, Knoppix,) - open source software
2. Microsoft Windows (XP, Vista, 7,) - proprietary software
3. Mac OS X (Cheetah, Panther, Snow Leopard,) - proprietary software

Application Software (Utility programs) are all programs that users use to perform different tasks or for problem solving. Users, according to their needs, install the appropriate utility software. Computer functions and tasks that computers can perform are defined by the installed utility software. Utility software can often cost more than computer hardware unless the software is open source. For running "pdf" documents, we use 'Foxit Reader' / 'Adobe Reader', for running music and video files we use 'VLC player' etc.

Common utility software is:

Text processing software is used for creating and forming text documents and nowadays, they can contain images, charts and tables. Examples of such programs are OpenOffice.org Writer (open source software) and Microsoft Word (proprietary software).

Spreadsheet calculations software is used for performing various calculations and presentation of results in charts. Examples of such programs are OpenOffice.org CalcWriter (open source software) and Microsoft Excel (proprietary software).

Software for presentations is used to create professional presentations that consist of slides with graphical and textual elements. Such a presentation can afterwards be displayed as a "slide show" by using a projector. Examples of such programs are OpenOffice.org Impress (open source software) and Microsoft PowerPoint (proprietary software).

Software for **creating and managing database** helps to manage a collection of structured data. Examples of such programs are OpenOffice.org Base (open source software) and Microsoft Access (proprietary software). Common utility software installed on a computer:

- Office programs - OpenOffice.org, Microsoft Office
- Antivirus programs – Avira, Sophos, Kaspersky, Antivir etc.
- Internet browser: Mozilla Firefox, Microsoft Internet Explorer, Opera, Safari etc.
- Programs for image editing: Adobe Photoshop, Canvas, CorelDraw, Draw etc.

SESSION 4: NETWORK

Computer network is comprised of at least two, connected, by wire or wireless, computers that can exchange data i.e. communicate. There are many reasons for connecting computers into a network, and some of them are:

- Exchange of data between users that have network access,
- Access to shared devices, such as network printers, network disks, etc.,
- Enables user communication and socializing, etc.
- Internet is the most famous and most widespread network with nearly 2 billion users and the number of users is still growing.

4.1 Types of Network

Types of networks according to their size:

- **LAN (Local Area Network)** - a network that covers a relatively small geographical area- it connects computers within a firm or household by wire.
- **WLAN (Wireless Local Area Network)** - a network that covers a relatively small geographical area - it connects computers within a firm or household wirelessly.
- **WAN (Wide Area Network)**- a network that covers a relatively large geographical area - it connects a greater number of computers and local networks.

4.2 Terms: client / server

Relationship client - server is defined in the following manner: client sends requests and server responds to those requests. We can use Internet as the best-known example. User's computer, connected to the Internet, sends requests to a certain web page (by entering page address into the Internet browser Address bar), and the server responds. Web page is loaded into the user's computer Internet browser as a result of server response. From this example, we can see that communication between client and server depends on connection speed (bandwidth). Since bandwidth is limited, the amount of data that can flow through network is limited too. Today, for instance, while purchasing access to mobile Internet, you will notice a limited amount of data that can be transferred within a package, i.e. amount of transferred data is what is charged.

The reason for that is limited bandwidth of mobile networks, and since companies that are offering mobile Internet access do not want networks to be congested, they de-stimulate their users by charging amounts of money related to the amount of transferred data. That was the case with ADSL Internet access. Today, once Internet providers have developed communication infrastructure, they do not need to de-stimulate users by charging based on the amount of transferred data, therefore they are offering so called "flat rate" access) charging only based on the access speed. That is why you will, while listening or reading news about communication

technologies, have the opportunity to hear how important it is to develop communication infrastructure.

Types of networks according to their architecture:

- client-server - all clients are connected to the server.
- P2P (peer to peer) - all computers are clients and servers at the same time.

4.3 Internet / Intranet / Extranet

Internet ("network of all networks") is a global system comprised of interconnected computers and computer networks, which communicate by means of using TCP/IP protocols.

An **intranet** is a private network that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network. Typically, an intranet includes connections through one or more gateway computers to the outside Internet. The main purpose of an intranet is to share company information and computing resources among employees. An intranet can also be used to facilitate working in groups and for teleconferences.

An **extranet** is a private network that uses Internet technology and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company's intranet that is extended to users outside the company. It has also been described as a "state of mind" in which the Internet is perceived as a way to do business with other companies as well as to sell products to customers.

4.4 Data Flow / Transfer

Download is a term that implies taking a copy of digital data from a network computer on a local computer, and upload means placing digital content on a network computer. **Bitrate** represents speed at which data is transferred through a modem (network). It is measured in bit/s (bit per second). Bit/s is a measurement unit for speed of digital data flow through the network. The number of bits transferred in one second tells us how many bits can be transferred through a network in one second.

- 1,000 bit/s rate = 1 kbit/s (one kilobit or one thousand bits per second)
- 1,000,000 bit/s rate = 1 Mbit/s (one megabit or one million bits per second)
- 1,000,000,000 bit/s rate = 1 Gbit/s (one gigabit or one billion bits per second)

Speed of data flow can be expressed in bytes per second. Since one byte has eight bits, such is the relation between bit/s and Bp/s, i.e. bits per second and bytes per second.

4.5 Ways to connect to the Internet:

- **Dial-up** Internet access method uses a modem (56k) and a telephone line.
- **Broadband** is characterized by a high-speed data transfer, permanent access to the Internet, and thus the risk of unauthorized access to the network or your personal computer. In the beginning of broadband Internet access, due to underdeveloped communication infrastructure, Internet providers charged based on the data traffic but not time spent on the Internet (unlike dial-up Internet access). Today, in large cities, telecommunications infrastructure is developed, therefore Internet providers do not charge money based on the time spent on the Internet or the amount of transferred data but they do charge by access speed.
- **Mobile** connecting by using a mobile network (GPRS, EDGE, UMTS, HSPA).
- **Wireless (Wi-Fi)** - data is transferred between computers by using radio frequencies (2,4 GHz) and the corresponding antennas. For Wi-Fi connection at home, we use router.
- **Cable** - connecting to the Internet through television cable network using a cable modem.

SESSION 5: DATA SECURITY

Information security is defined as:

- Preservation of information confidentiality, integrity and availability
- Information security measures are the rules of data protection on physical, technical and organizational level.

User authentication involves user identification, so individuals can gain access to a certain content (data). For example, to check e-mail via browser, i.e., access an account, it is necessary to enter a username and password. If the required information is entered correctly, access is granted. Passwords should, for security reasons, be kept confidential. Password is a key (like a key to access your home or a car) that allows access. As you would not share your apartment or car keys with just anyone, you should not share your password either. Nowadays, many people have home security doors with locks whose keys are difficult to copy, with the aim of blocking unauthorized home intrusion. Passwords should be created with the same caution. The more complex your password is, the harder it will be to break through (*crack it*), therefore it is less likely that someone will gain unauthorized access to your data. When choosing a password, it is advisable to use punctuation, numbers and a mix of uppercase and lowercase letters. A minimum length of 8 characters is recommended (shorter passwords are easier break through). From time to time, it is necessary to change the password. That way, the possibility of its detection decreases. Some of the most common mistakes when choosing passwords are:

- Using words from a dictionary
- Passwords based on personal information, such as name or birth date, employment place etc.
- Characters that follow the order given on a keyboard: 123, qwert, etc.

How to choose a good password:

- Select a sentence: e.g. The world is a beautiful place to live in.
- Take the first letters, i.e.: TwlabPtLi
- Add numbers: for example, Twlab3Pt7Li

This password has a combination of numbers, uppercase and lowercase letters and 11 characters. Thus, this is password is difficult to break through.

5.1 Data Backup

All of us do lots of important works in our computer and save them. We might think that our data is safe in the computer. But it might happen that your computer system crashes and thus you will have to lose all your important data that took a lot of effort to be created. To circumvent this situation, we can create a backup copy of our data and save it in some other 'devices'. Some of us might think that by the word 'Device', we are implying to use another computer or laptop that is usually costly to save data. For saving the backup copy of your data, you won't have to buy another computer or laptop. We can use portable hard disc drive for saving our data. Usually, portable hard disc drives can store 1 terabytes of data or more. Besides, the top IT companies like Microsoft and Google also provide the option of saving your data in

their server so that you can retrieve them from anywhere you want just by logging into their account. For example, Google has created “Google Drive” which is a cloud-based file storage service through which you can save your important files on Google’s servers. Google allows us to save at most 15 gigabytes of data to store on their servers without any cost. If you need to store more than 15 gigabytes of data, then you have to purchase storage from them, and they have got customer friendly pay plans. Besides, “Dropbox” is another file storage platform.

The other popular method of data storage is CD/DVD. Usually, DVDs have a higher data storage capacity that is of 4.7 gigabyte whereas CDs have a low data storage capacity that is of 700 megabytes.

5.2 Data Security

Firewall is a software (or network device) that is used to control authorized access and protect against unauthorized access to your computer. Figuratively speaking, computers are connected via network port. In the computer world, the term port is used to describe the network of connections through which computers can connect to a computer network, or someone can connect to your computer from outside of your network. All data traffic between a computer and the rest of network is done through ports. Control port controls data flow from our computers to the network and vice versa. Control is done through a firewall; some ports are opened, some closed, and some allow temporary traffic. To protect data from unauthorized access and theft, we use a username and password to confirm our identity and prevent unauthorized data access. Similarly, in case we need to briefly step away from a computer, it is necessary to lock it.

5.3 Malware

Malware (malicious + software) is a software, which infiltrates an operating system in a seamless manner, whether by human mistake or due to shortcomings of the operating system and software support, with malicious intentions. Malicious software includes:

- ✓ Virus is a malicious program with the possibility of self-replication. In a computer it seeks other files, trying to infect them and the ultimate goal is to spread to other computers. Depending on what malicious code it contains, it may cause more or less damage to your computer.
- ✓ Worms like viruses, they possess the ability of self-replication, and however they cannot infect other programs. Their usual intent is to take control of your computer and allow remote control by opening, the so-called, 'backdoor'.
- ✓ Trojan horses can be presented in the form of games or files in e-mail attachments, with different purposes, such as: to allow remote control to your computer, delete data, allow spreading of viruses, send spam from the infected computer, etc. Unlike viruses and worms, it does not replicate, and it needs to

be

executed, that is, it is not autonomous.

- ✓ Spyware is a program that secretly collects data about computer users (passwords, credit card numbers, etc.), therefore it spies on users. The most common spyware infections usually occur while visiting suspicious sites with illegal or pornographic content.
- ✓ Adware is a program that uses collected data about a user in order to display advertisements in a way regarded as intrusive. It usually manifests itself in the form of many pop-up windows that display ads.
- ✓ Hoax is a false message being spread by e-mail in order to deceive users. Their goal is to obtain data of, for instance, a bank account, or persuade users to pay some fees in order to win the lottery (which they never applied for), or pay costs of money transfers from an exotic prince to help him withdraw money from a country that is falling apart and, in return, will receive an impressive award, etc.

In order to demystify malicious programs, it is necessary to explain that malicious software is nothing more than a computer program. Like any other computer program, it must be installed on your computer (operating system) to act. Without making the distinction between malignant and benign programs, let us think of them as just a computer program.

Taking this into consideration, ask yourself the following questions:

- ✓ **Question: How can I install a computer program?**
Ans: We must have a program installation/update file.
- ✓ **Question: How can I get software installation?**
Ans: Installations are available on CD/DVD, USB stick, network drive, the Internet (need to be downloaded), in electronic mail, etc. i.e. through any electronic medium capable of storing and distributing digital data.

From these questions and answers, it is evident how you can become infected by malicious programs. Unlike legal and non-malicious programs, malicious programs are designed in a way that they do not have to be looked for, i.e. you do not need to search for them, you do not need to have any computer knowledge to install them, indeed, the less you know, the better it is for them. So, the more you know, the more likely it is that you will be safe from an infection, with the use of professional protection programs against malicious programs. Therefore, to evade getting attacked by the malwares, we should follow the following steps:

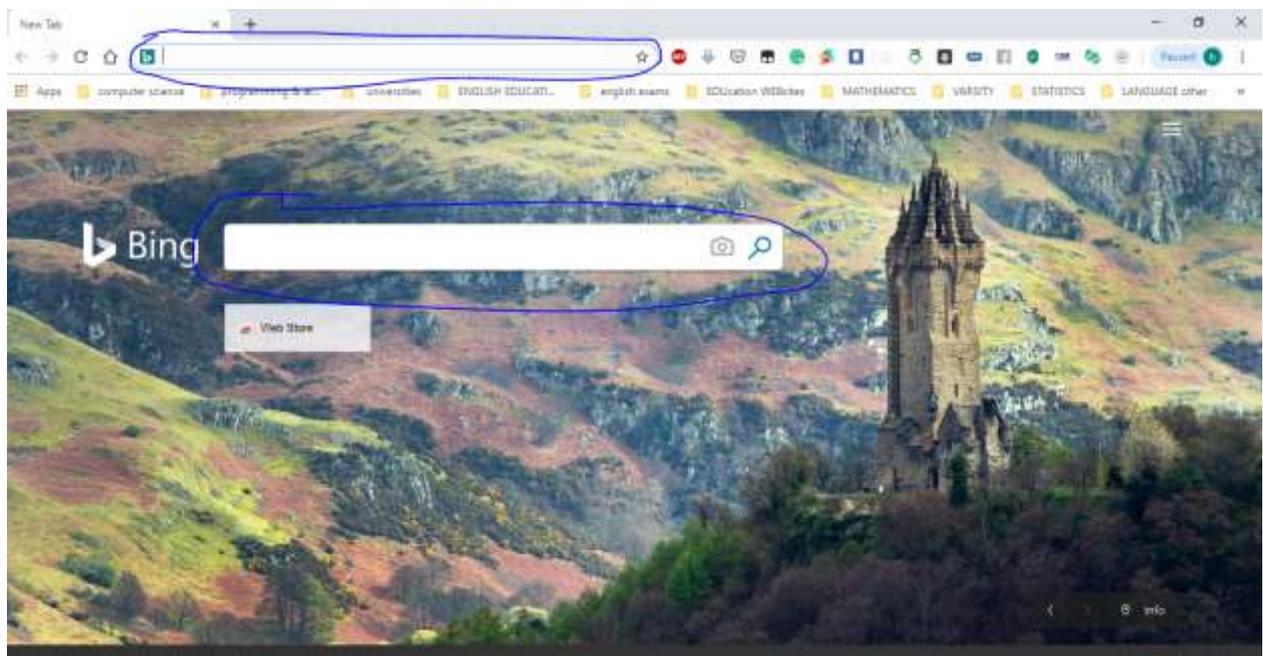
- ✓ We can use good antivirus programs like Kaspersky, Avast, Bitdefender, Norton etc.
- ✓ Try to gain as much ICT knowledge as you can so that no one can outwit you while using technology.

SESSION-6: WEB BROWSING AND COMMUNICATION

In our day-to-day life, we are confronted with many problems that can easily be solved through the help of internet. These problems are not only regarding ICT, but they also concern our day-to-day life, works, business etc. For example, there is a platform named 'Quora' where you can ask any question you want that is concerning anything like politics, cricket, entertainment, ICT etc. In this session, we shall introduce you how to solve your everyday life's problems using Internet rather than seeking help from other people.

Whenever we encounter any problem, the first point that should come to our mind is to find the solution of that problem on the Internet. This work is termed as "Google it". It means that whenever you encounter any problem, find the problem's solution through Google, because in these days, almost all the problems' solutions are posted on Internet and Google will help you find that solution.

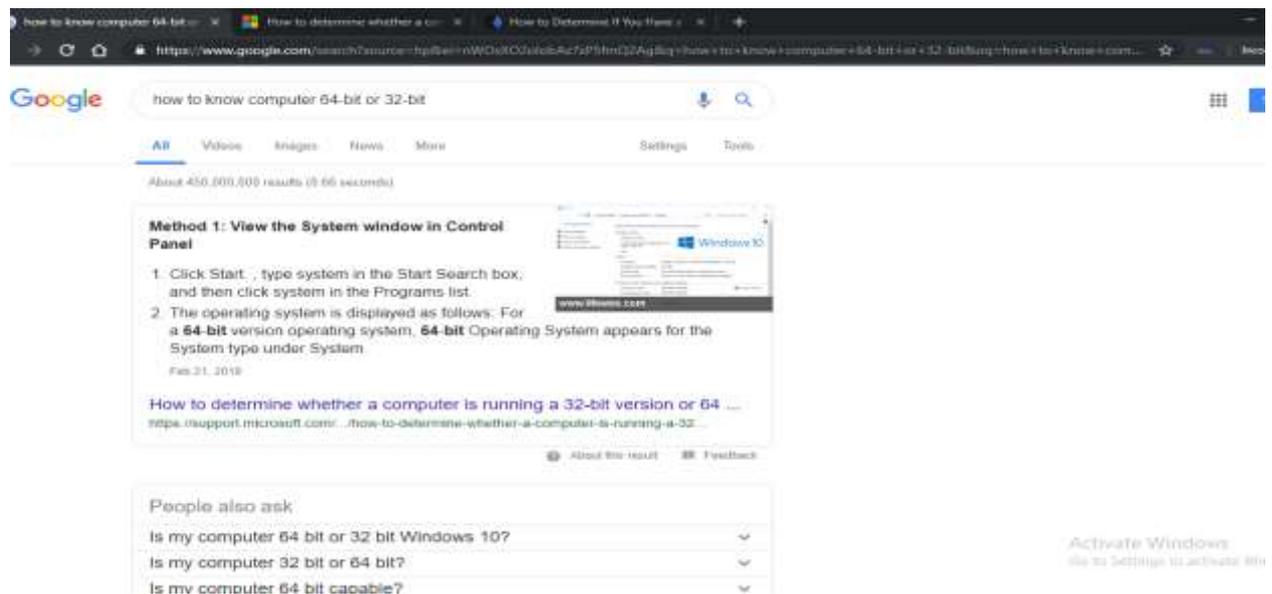
To find any problem's solutions on the Internet, you need to get your device connected to the network first. Then open any browser. The most commonly used browsers are Google Chrome and Firefox. After that, you might select your favourite search engine, but it is not necessary since you can search in any of the search options. When I open my Google Chrome browser, I get the following interface and I have marked the options where you can place your query or search.



Now, we discuss some ICT related problems and their solutions below.

While downloading and installing softwares, we often need to know whether our laptop/personal computer is a 64-bit or 32-bit device. To solve this problem, just do a

search on “how to know computer 64-bit or 32-bit”. For doing this search on my computer, I get the following result:



Several websites will follow the search box and you have to go the websites to find the answer to your problem.

To find solution to any problem, find out the appropriate query and then place it in the search box. After that, several websites will follow, and you need to go to the websites to find the solution to your problem. You may have to check several websites for finding the solution.

SESSION-7: ICT IN EVERYDAY LIFE

The acronym ICT (Information and Communication Technology) includes all technical means that are used for handling information and facilitating communication, including computers, network hardware, communication lines and all the necessary software. In other words, ICT is comprised of information technology, telephony, electronic media, and all types of process and transfer of audio and video signals, and all control and managing functions based on network technologies.

7.1 Internet services

E-commerce is a form of trade that allows customers to browse and purchase products online.

E-banking allows users to have control over their accounts (view balances and transactions), transactions from one account to another, credit payment, shopping vouchers for mobile phones etc. The benefits are saving time (which would otherwise be spent waiting in lines), lower service fees, and access from anywhere, anytime.

E-government is the use of information technology to provide better public access to government information, therefore providing citizens with their human right to information.

Teleworking means the use of information technology (IT) and telecommunications to replace work-related travel. Teleworking allows employees to work at home or at a local telework center for one or more days per week using communication tools, such as phone, fax, modem, Internet teleconferencing, e-mail or IM, to perform work duties from a remote location. Teleworking is also known as telecommuting.

SESSION-8: MICROSOFT OFFICE

Microsoft Office (or simply Office) is a family of client software, server software, and services developed by Microsoft. It was first announced by Bill Gates on August 1, 1988, at COMDEX in Las Vegas. It contains several useful software for official and academic purposes. The names of the software that the Microsoft Office package contains are:

- ❖ Microsoft Word: a word processor included in Microsoft Office. It is the most used software for writing reports, letters, applications etc.
- ❖ Microsoft Excel: a spreadsheet editor. It is used for preserving and analysing data.
- ❖ Microsoft PowerPoint: a presentation program used to create slideshows composed of text, graphics, and other objects, which can be displayed on-screen and shown by the presenter or printed out on transparencies or slides.
- ❖ Microsoft Access: a database management system for Windows that combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools.
- ❖ Microsoft Outlook: a personal information manager that includes an email client, calendar, task manager and address book.
- ❖ Microsoft OneNote: a note taking program that gathers handwritten or typed notes, drawings, screen clippings and audio commentaries.

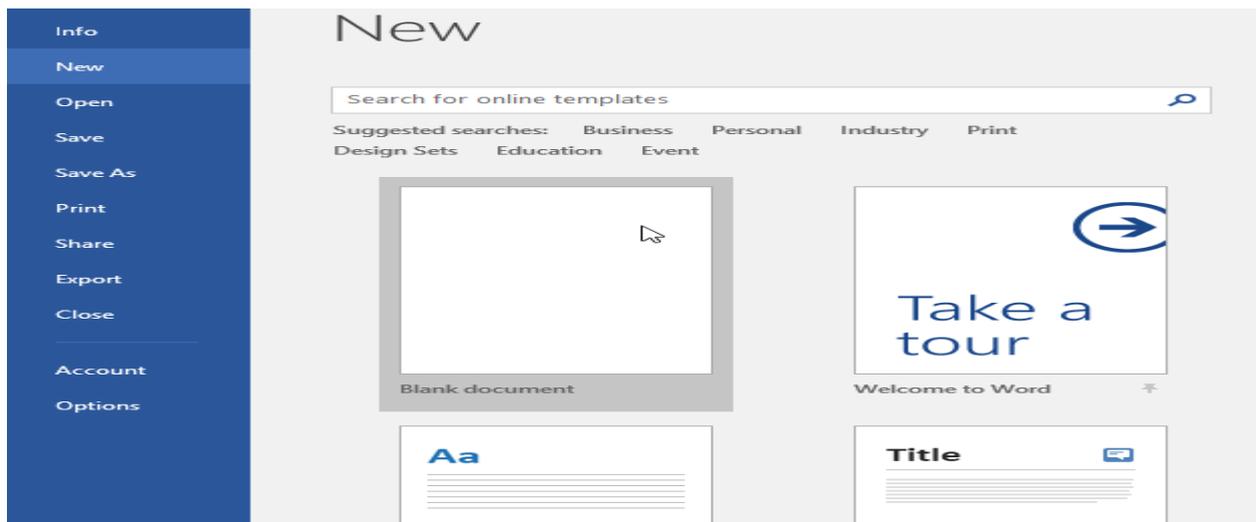
There are several other applications in the Microsoft office package, but the most used ones are Microsoft Word, Microsoft Excel and Microsoft PowerPoint.

8.1 Microsoft Word

Microsoft Word is a word processing application that allows you to create a variety of documents, including letters, resumes, and more. The default file format of Microsoft Word is 'docx'. In this lesson, you'll learn how to navigate the Word interface and become familiar with some of its most important features, such as the Ribbon, Quick Access Toolbar, and Backstage view.

8.2 The Word Interface

When you open Word for the first time, the Start Screen will appear. From here, you'll be able to create a new document, choose a template, and access your recently edited documents. From the Start Screen, locate and select Blank document to access the Word interface.

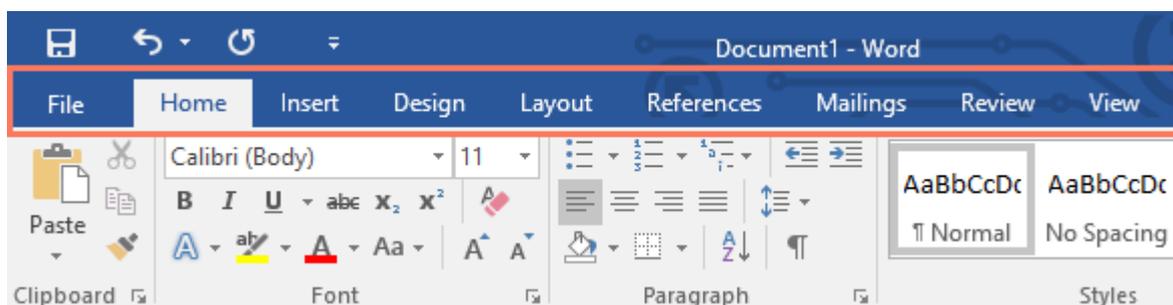


Working with the Word Environment

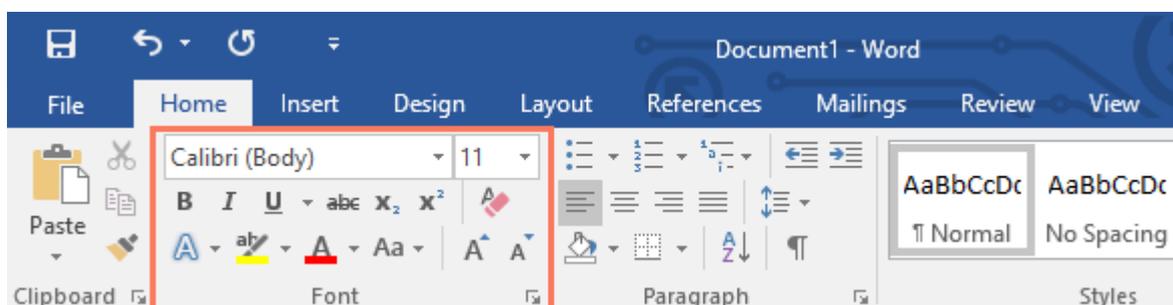
All recent versions of Word include the Ribbon and the Quick Access Toolbar, where you'll find commands to perform common tasks in Word, as well as Backstage view.

The Ribbon

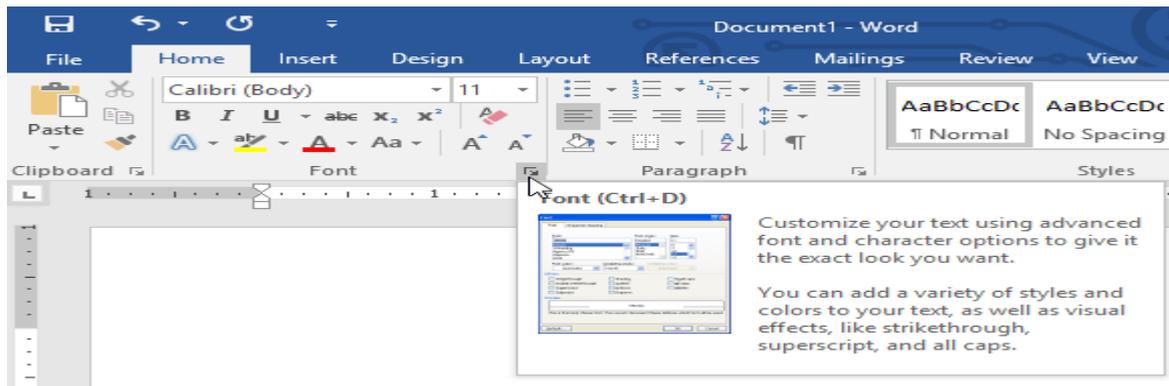
Word uses a tabbed Ribbon system instead of traditional menus. The Ribbon contains multiple tabs, which you can find near the top of the Word window.



Each tab contains several groups of related commands. For example, the Font group on the Home tab contains commands for formatting text in your document.

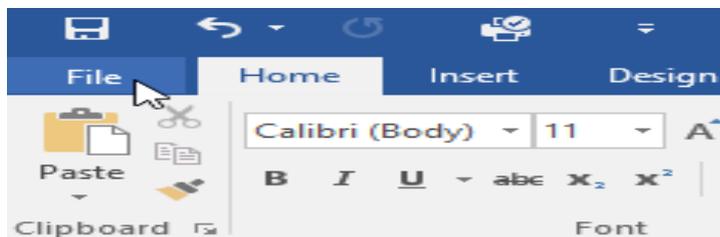


Some groups also have a small arrow in the bottom-right corner that you can click for even more options.

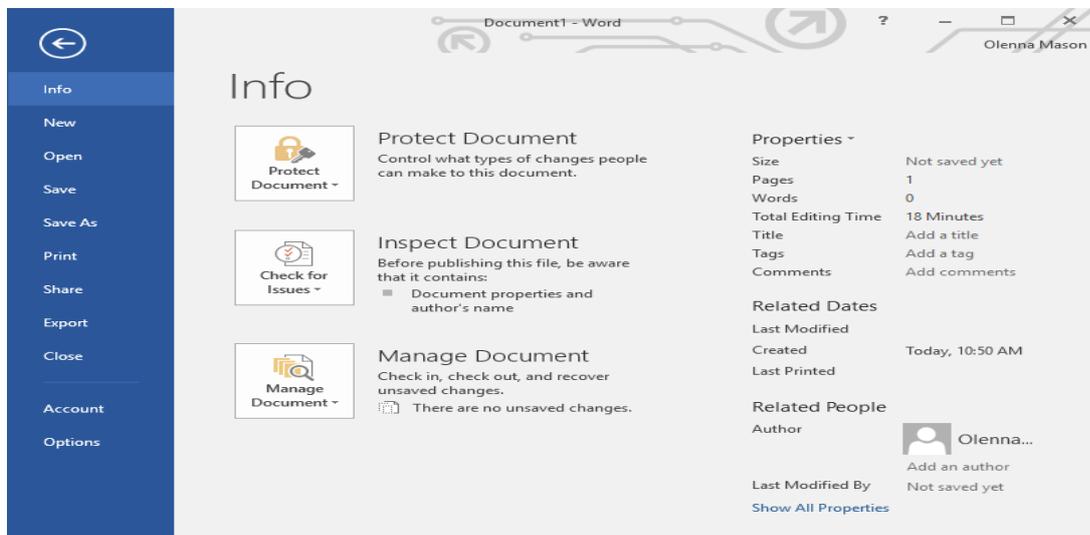


Backstage view

Backstage view gives you various options for saving, opening a file, printing, and sharing your document. To access Backstage view, click the File tab on the Ribbon.



Click the buttons in the interactive below to learn more about using Backstage view.



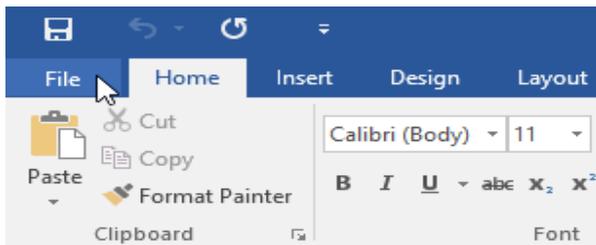
Word: Creating and Opening Documents

Word files are called documents. Whenever you start a new project in Word, you'll need to create a new document, which can either be blank or from a template. You'll also need to know how to open an existing document.

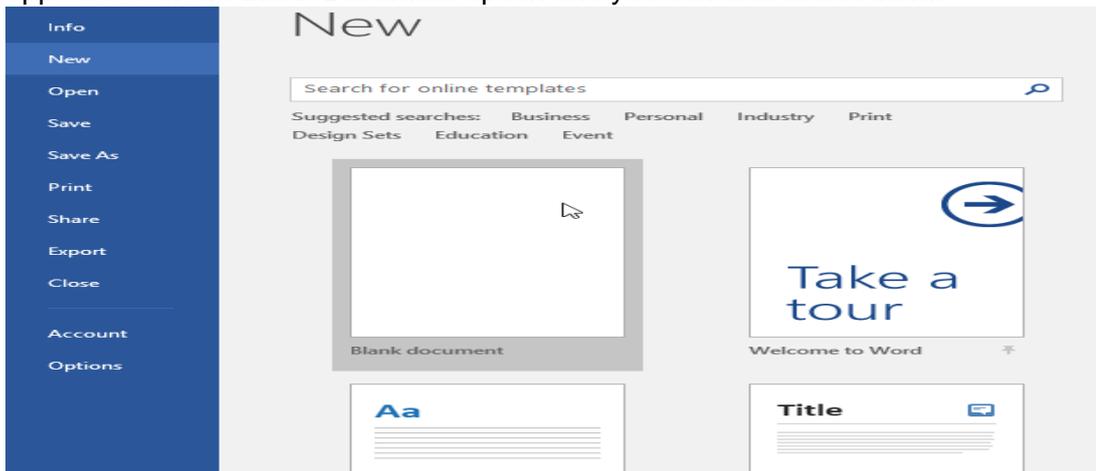
To create a new blank document, carry out the following steps:

When beginning a new project in Word, you'll often want to start with a new blank document.

- 1) Select the FILE tab to access backstage view.



- 2) Select New, then click the Blank Document. Several other beautiful templates will appear below the Blank Document option and you can also select them.

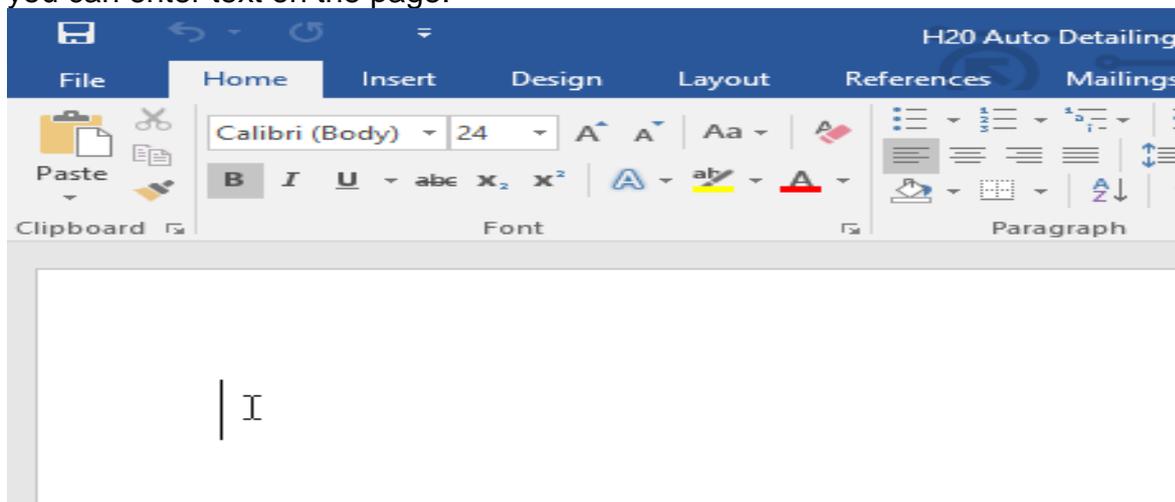


- 3) A new blank document will appear.

Text Basics

Now, you will learn the basics of typing, editing, and organizing text. Basic tasks include the ability to add, delete, and move text in your document, as well as how to cut, copy, and paste.

The insertion point is the blinking vertical line in your document. It indicates where you can enter text on the page.



Before you can move or format text, you'll need to select it. To do this, click and drag your mouse over the text, then release the mouse. A highlighted box will appear over

the selected text. The text has been selected. Then if you click on the right click of the mouse, some options will appear before you.



Copying and Moving Text

Word allows you to copy text that's already in your document and paste it in other places, which can save you a lot of time and effort. If you want to move text around in your document, you can cut and paste or drag and drop.

To copy and move text:

- 1) Select the text that you want to copy.
- 2) Press Ctrl+C to copy the text.
- 3) Place the insertion point where you want the text to be placed now.
- 4) Press Ctrl+V to place the text in your desired point.

Undo and Redo

Let's say you're working on a document and have accidentally deleted some text. Fortunately, you won't have to retype everything you just deleted! Word allows you to undo your most recent action when you make a mistake like this.

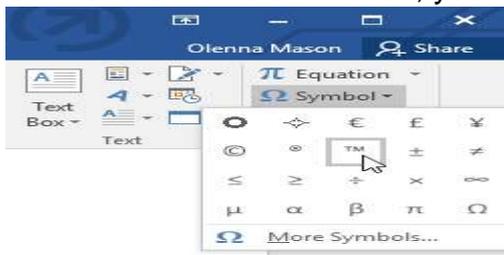
To do this, press Ctrl+Z on your keyboard. You can continue using this command to undo multiple changes in a row.

By contrast, the Redo command allows you to reverse the last undo. You can also access this command by pressing Ctrl+Y on your keyboard.

Inserting symbols:

To insert a symbol, carry out the following steps:

- 1) Place the insertion point on the part of the document where you want the symbol to appear.
- 2) Click the INSERT tab on the ribbon.
- 3) On the INSERT tab in ribbon, you will find your desired symbol.



- 4) If you can't find your expected symbol, then click on 'More Symbols' to find your symbol.

List Creation

Sometimes, you might need to insert list in your document. To insert a list:

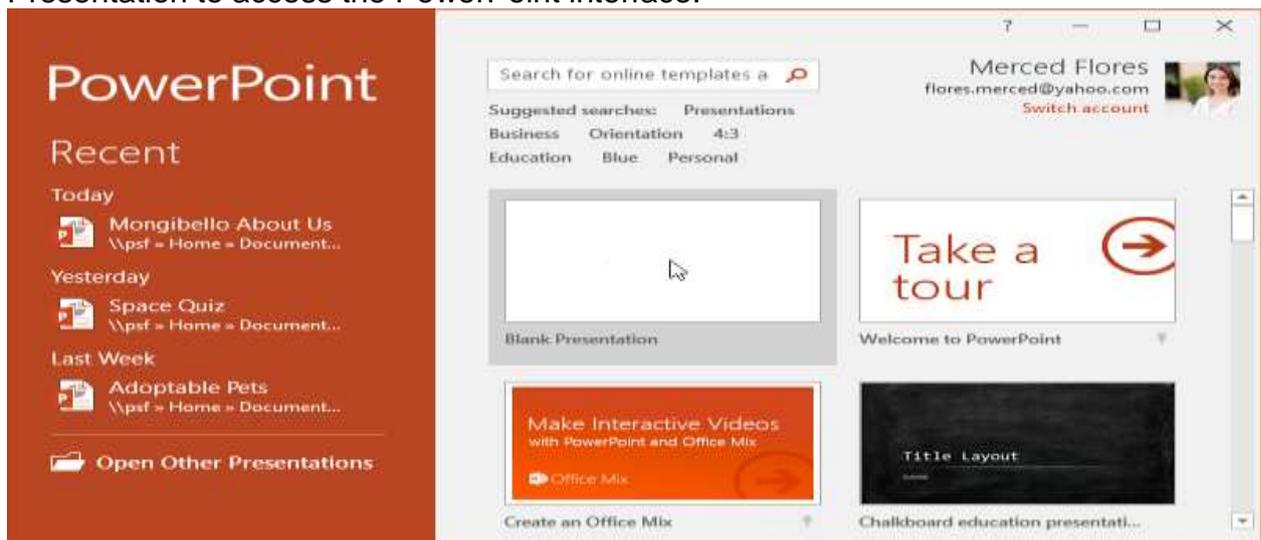
- 1) Select the text that you want to be in the list form.
- 2) Select the HOME tab on the ribbon.
- 3) Under the Paragraph group, the list options will appear.
- 4) Choose your favourable type of list.



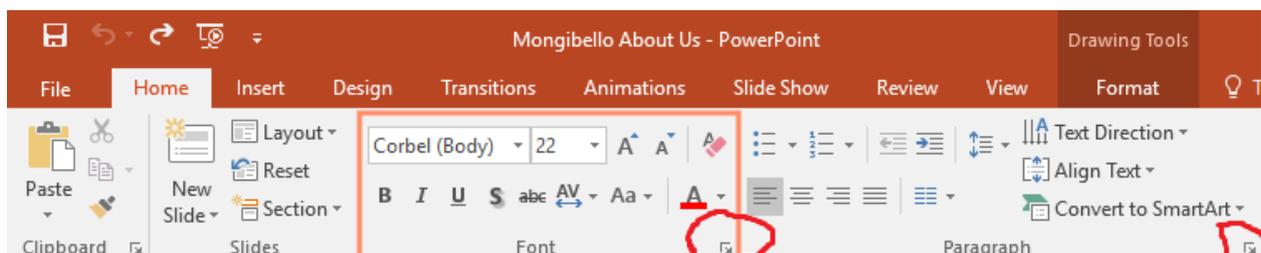
8.3 Microsoft PowerPoint

PowerPoint is a presentation program that allows you to create dynamic slide presentations. These presentations can include animation, narration, images, videos, and much more. The most common type of PowerPoint files is 'pptx' and 'ppt'. In this lesson, you'll learn your way around the PowerPoint environment.

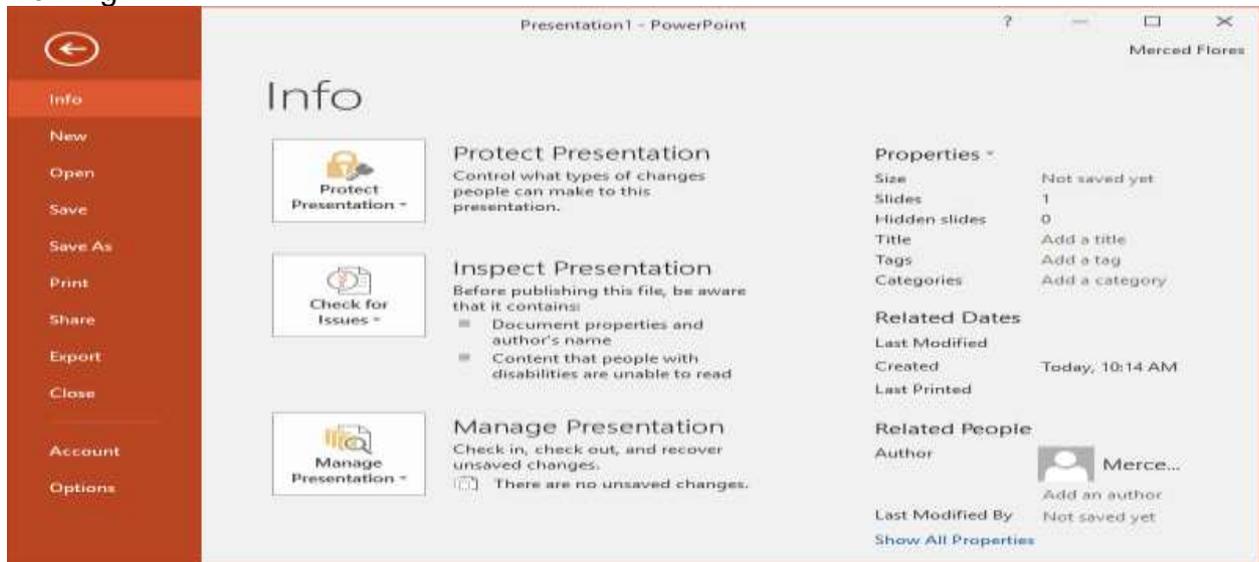
When you open PowerPoint for the first time, the Start Screen will appear. From here, you'll be able to create a new presentation, choose a template, and access your recently edited presentations. From the Start Screen, locate and select Blank Presentation to access the PowerPoint interface.



The Ribbon is the place where you will find all your required commands to make a PowerPoint presentation. PowerPoint uses a tabbed Ribbon system instead of traditional menus. The Ribbon contains multiple tabs, each with several groups of commands. For example, the Font group on the Home tab contains commands for formatting text in your document. Some groups also have a small arrow in the bottom-right corner that you can click for getting more options.



The Backstage View provides us with the options for saving, printing, opening and sharing our presentations. To access the Backstage view, click the File tab on the ribbon that is on the top left corner. The usual interface of the Backstage View is provided below. From the Backstage View, you can also get the basic information like the number of slides, size, author, related dates of the file on which you are working.



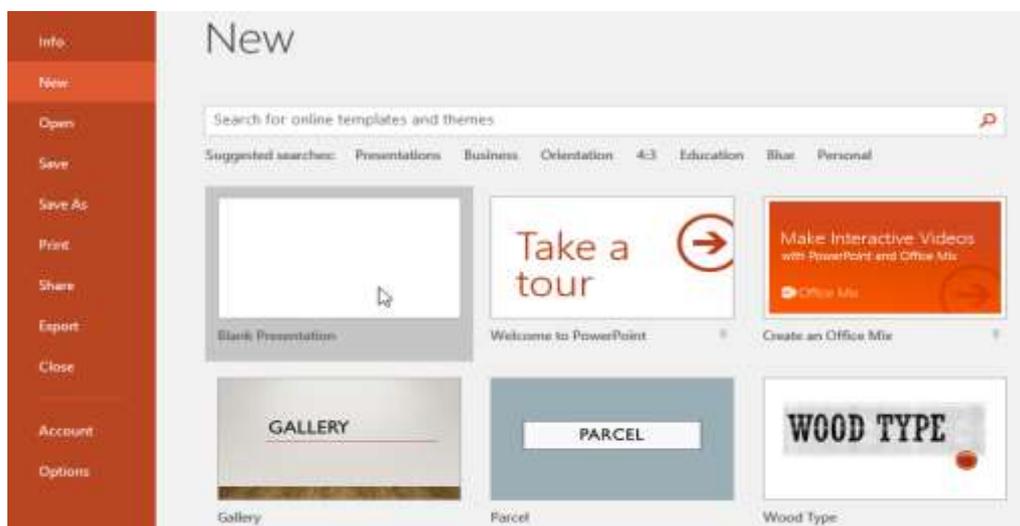
Whenever you start a new project in PowerPoint, you'll need to create a new presentation, which can either be blank or from a template.

To create a new presentation:

1. Select the File tab to go to Backstage view.



2. Select New on the left side of the window. From here, you can choose a Blank Presentation. Rather than choosing a blank presentation, you can choose from thousands of beautiful templates for your presentation.



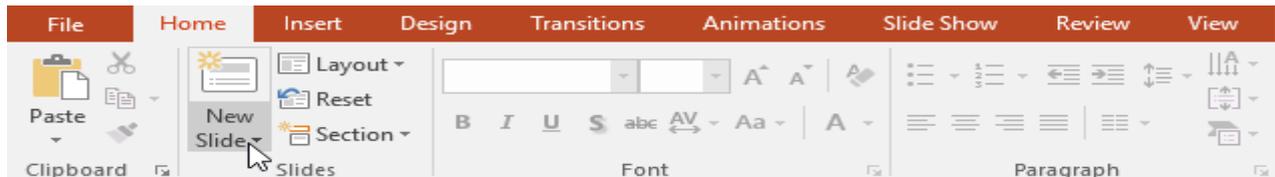
3. A new presentation will appear.

Every PowerPoint presentation is composed of a series of slides. To begin creating a slide show, you'll need to know the basics of working with slides. You'll need to feel comfortable with tasks like inserting a new slide, changing the layout of a slide, arranging existing slides, changing the slide view, and adding notes to a slide.

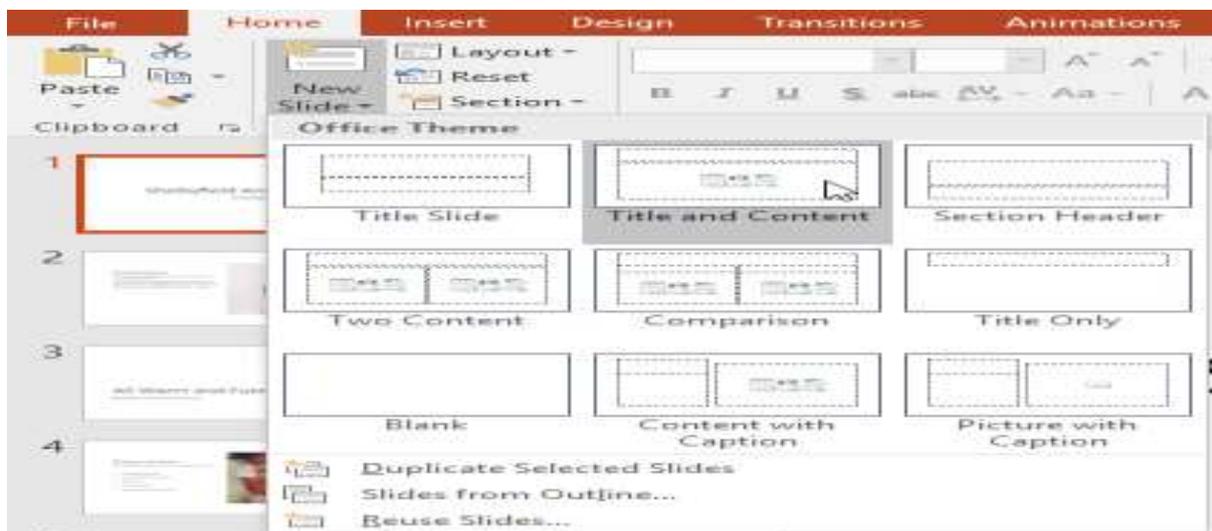
To insert a new slide:

Whenever you start a new presentation, it will contain one slide with the Title Slide layout. You can insert as many slides as you need from a variety of layouts.

1. From the Home tab, click the bottom half of the New Slide command.



2. Choose the desired slide layout from the menu that appears.



3. The new slide will appear. Click any placeholder and begin typing to add text. You can also click an icon to add other types of content, like a picture or chart.



4. To change the layout of an existing slide, click the Layout command, then choose the desired layout.

PowerPoint presentations can contain as many slides as you need. The Slide Navigation pane on the left side of the screen makes it easy to organize your slides. From there, you can duplicate, rearrange, and delete slides in your presentation.



Duplicate slides: If you want to copy and paste a slide quickly, you can duplicate it. To duplicate slides, select the slide you want to duplicate, right-click the mouse, and choose Duplicate Slide from the menu that appears. You can also duplicate multiple slides at once by selecting them first.

Move slides: It's easy to change the order of your slides. Just click and drag the desired slide in the Slide Navigation pane to the desired position.



Delete slides: If you want to remove a slide from your presentation, you can delete it. Simply select the slide you want to delete, then press the Delete or Backspace key on your keyboard.

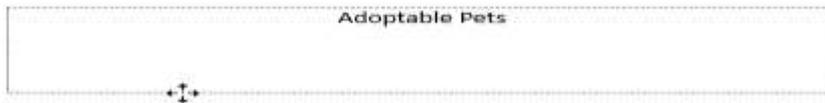
Adjusting Placeholders

- To select a placeholder: Hover the mouse over the edge of the placeholder and click (you may need to click the text in the placeholder first to see the border). A selected placeholder will have a solid line instead of a dotted line.



- To move a placeholder: Select the placeholder, then click and drag it to the desired location.

Shelbyfield Animal Rescue



- To resize a placeholder: Select the placeholder you want to resize. Sizing handles will appear. Click and drag the sizing handles until the placeholder is the desired size. You can use the corner sizing handles to change the placeholder's height and width at the same time.

Shelbyfield Animal Rescue



- To delete a placeholder: Select the placeholder you want to delete, then press the Delete or Backspace key on your keyboard.

8.4 Microsoft Excel

Excel is a spreadsheet program that allows you to store, organize, and analyze information. While you may think Excel is only used by certain people to process complicated data, anyone can learn how to take advantage of the program's powerful features. Whether you're keeping a budget, organizing a training log, or creating an invoice, Excel makes it easy to work with different types of data.

When you open Excel for the first time, the Excel Start Screen will appear. From here, you'll be able to create a new workbook, choose a template, and access your recently edited workbooks.

From the Excel Start Screen, locate and select Blank workbook to access the Excel interface.



Like the other Microsoft Office software's, Excel has a Ribbon where you can find the options that you can employ in your spreadsheet works. Excel also has the Backstage View from where you can save, print, open and share your workbooks.

Excel files are called workbooks. Whenever you start a new project in Excel, you'll need to create a new workbook. There are several ways to start working with a

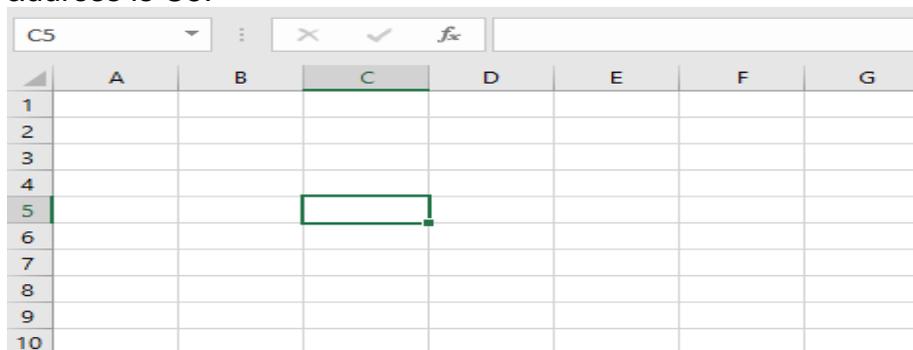
workbook in Excel. You can choose to create a new workbook—either with a blank workbook or a predesigned template—or open an existing workbook. To create a new blank workbook, go to the Backstage View from the File tab and from there, you will have the option to choose a new blank workbook or a predesigned template.

Cell Basics

When we work with Excel, we enter information or content into cells. Cells are the basic building blocks of worksheet.

Every worksheet is made up of thousands of rectangles, which are called cells. A cell is the intersection of a row and a column. To select a cell, you just need to click it.

Columns are identified by letters (A, B, C), while rows are identified by numbers (1, 2, 3). Each cell has its own name—or cell address—based on its column and row. In the example below, the selected cell intersects column C and row 5, so the cell address is C5.



Note that the cell address also appears in the Name box in the top-left corner, and that a cell's column and row headings are highlighted when the cell is selected.

You can also select multiple cells at the same time. A group of cells is known as a cell range. Rather than a single cell address, you will refer to a cell range using the cell addresses of the first and last cells in the cell range, separated by a colon. For example, a cell range that included cells A1, A2, A3, A4, and A5 would be written as A1:A5.

Any information you enter into a spreadsheet will be stored in a cell. Each cell can contain different types of content, including text, formatting, formulas, and functions.

One of the most powerful features in Excel is the ability to calculate numerical information using formulas. Just like a calculator, Excel can add, subtract, multiply, and divide. In this lesson, we'll show you how to use cell references to create simple formulas.

Mathematical operators: Excel uses standard operators for formulas, such as a plus sign for addition (+), a minus sign for subtraction (-), an asterisk for multiplication (*), a forward slash for division (/), and a caret (^) for exponents.

All formulas in Excel must begin with an equal's sign (=). This is because the cell contains, or is equal to, the formula and the value it calculates.

While you can create simple formulas in Excel manually (for example, =2+2 or =5*5), most of the time you will use cell addresses to create a formula. This is known as making a cell reference. Using cell references will ensure that your formulas are always accurate because you can change the value of referenced cells without having to rewrite the formula.

	A	B
1	10	
2	5	
3	=A1+A2	
4		

The formula in cell A3 refers to the value in cell A1 plus the value in cell A2

	A	B
1	10	
2	5	
3	15	
4		

The formula calculates and displays the answer to the equation A1 plus A2

	A	B
1	15	
2	5	
3	20	
4		

The formula automatically recalculates when the value of a referenced cell is changed

By combining a mathematical operator with cell references, you can create a variety of simple formulas in Excel. Formulas can also include a combination of cell references and numbers, as in the examples below:

=A1+A2	Adds cells A1 and A2
=C4-3	Subtracts 3 from cell C4
=E7/J4	Divides cell E7 by J4
=N10*1.05	Multiplies cell N10 by 1.05
=R5^2	Finds the square of cell R5

To edit a formula:

Sometimes you may want to modify an existing formula. In the example below, we've entered an incorrect cell address in our formula, so we'll need to correct it.

1. Select the cell containing the formula you want to edit. In our example, we'll select cell B3.

B3		=B1-C2	
	A	B	C
1	Budget Total	\$1,050.00	
2	Inventory Cost	\$315.23	
3	Total Remaining	\$1,050.00	
4			
5			

- Click the formula bar to edit the formula. You can also double-click the cell to view and edit the formula directly within the cell.

B3		=B1-C2		Formula Bar			
	A	B	C	D	E	F	
1	Budget Total	\$1,050.00					
2	Inventory Cost	\$315.23					
3	Total Remaining	\$1,050.00					
4							
5							
6							

To edit a formula, double-click the selected cell or click the formula bar

- A border will appear around any referenced cells. In our example, we'll change the second part of the formula to reference cell B2 instead of cell C2.

SUM		=B1-C2	
	A	B	C
1	Budget Total	\$1,050.00	
2	Inventory Cost	\$315.23	
3	Total Remaining	=B1-C2	
4			
5			

- When you're finished, press Enter on your keyboard or click the checkmark in the formula bar.

SUM		=B1-B2	
	A	B	C
1	Budget Total	\$1,050.00	
2	Inventory Cost	\$315.23	
3	Total Remaining	=B1-B2	
4			
5			

- The formula will be updated, and the new value will be displayed in the cell.

B3		=B1-B2	
	A	B	C
1	Budget Total	\$1,050.00	
2	Inventory Cost	\$315.23	
3	Total Remaining	\$734.77	
4			
5			

SESSION 8: DISCUSSION AND QUESTION ANSWER

Basic ICT usage will be discussed

- Summary of the module
- Way forward

