FUNDAMENTALS OF COMPUTERS

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What is a Computer ?

- A **computer** is an electronic device that manipulates information, or data.

- It has the ability to **store**, **retrieve**, and **process** data. You may already know that you can use a computer to **type documents**, **send email**, **play games**, and **browse the Web**.

- You can also use it to edit or create **spreadsheets**, **presentations**, and even **videos**.

Difference between hardware & Software

| Hardware	Software
Hardware is further divided into four main categories: • Input Devices • Output Devices • Secondary Storage Devices • Internal Components	Software is further divided into two main categories: • Application Software • System Software
Developed using electronic and other materials	Developed writing using instructions using a programming language
When damaged, it can be replaced with a new component	When damaged it can be installed once more using a backup copy
Hardware is physical in nature and hence one can touch and see hardware	The software cannot be physically touched but still can be used and seen
Hardware cannot be infected by Viruses	The software can be infected by Viruses
Hardware will physically wear out over time	Software does not wear out but it can be affected by bugs and glitches
An example of Hardware is hard drives, monitors, CPU, scanners, printers etc.	An example of software is Windows 10, Adobe Photoshop, Google Chrome etc.

Application of Computer system

- **Scientific, Engineering and Research Work :** They are used in areas which require lot of experiments, mathematical calculations weather forecasting, and complex mathematical and engineering applications.

- **Business:** Record keeping, budgets, reports, inventory, payroll, invoicing, accounts are all the areas of business and industry.

- **Medicine:** Computerized systems are now in widespread use in monitoring patient data like , pulse rate, blood pressure etc. resulting in faster and accurate diagnosis.

- **Information:** This is the age of information. Television, Satellite communication, Internet, networks are all based on computers.

- **Education:** The use of computers in education is increasing day by day.

- **Games and Entertainment**

Advantages & Disadvantages of Computer system

s.no	Advantages	Disadvantages
1.	*Speed*	*Unemployment*
2.	*Accuracy*	*Health issues*
3.	*Multitasking*	*Virus and hacking attacks*
4.	*Storage*	*Online Cyber Crimes*
5.	*Data security*	*High cost*
6.	*Automation*	*Distractions/disruptions*
7.	*Reduced cost*	*Increases waste and impacts the environment*
8.	*Reliability*	
9.	*Communications*	
10.	*Reduce work loads*	

Components of computer system
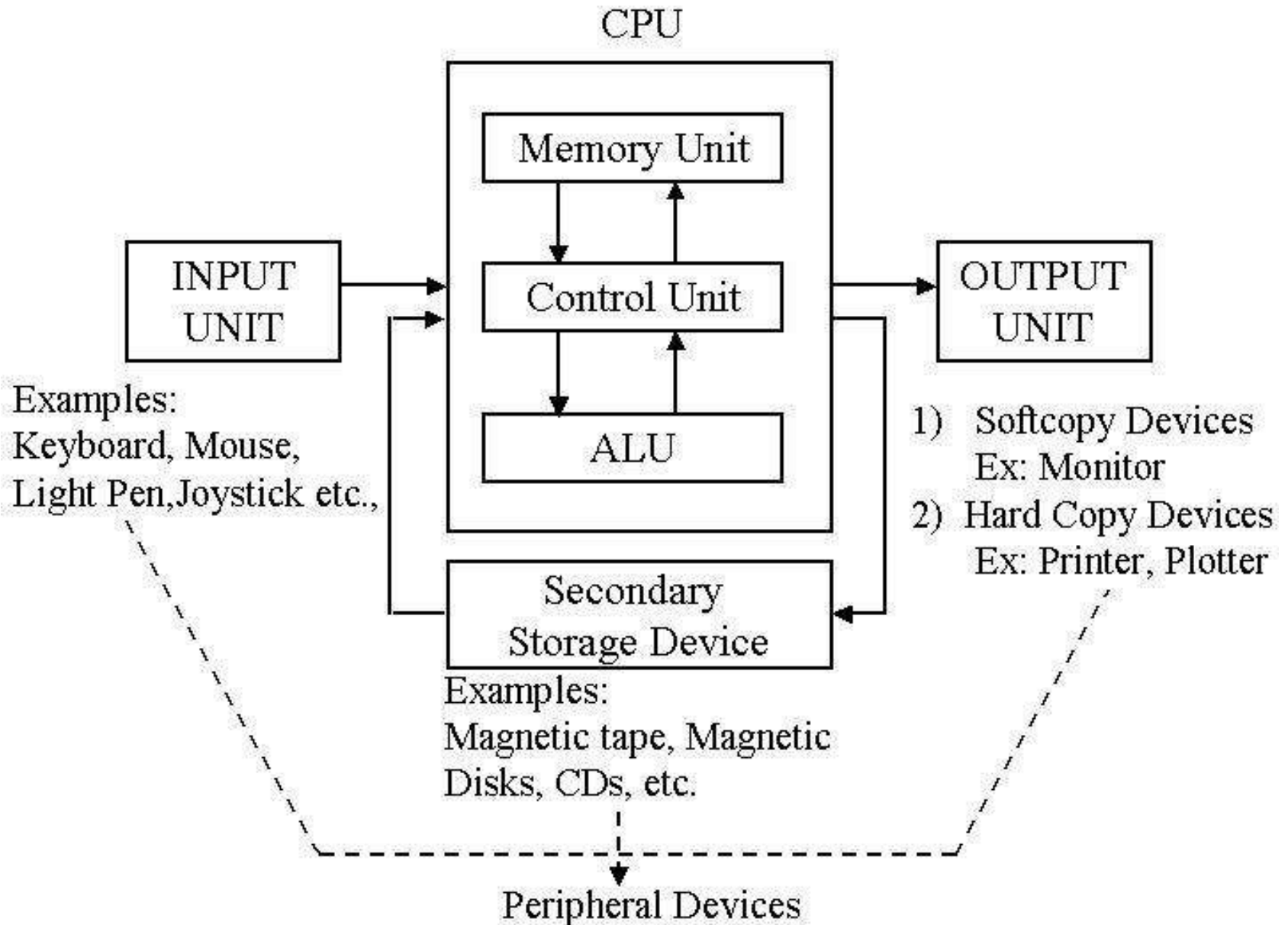
Control Processing Unit

- CPU is an electronics circuit used in a computer that fetches the input instructions or commands from the memory unit, performs arithmetic and logic operations and stores this processed data back to memory.
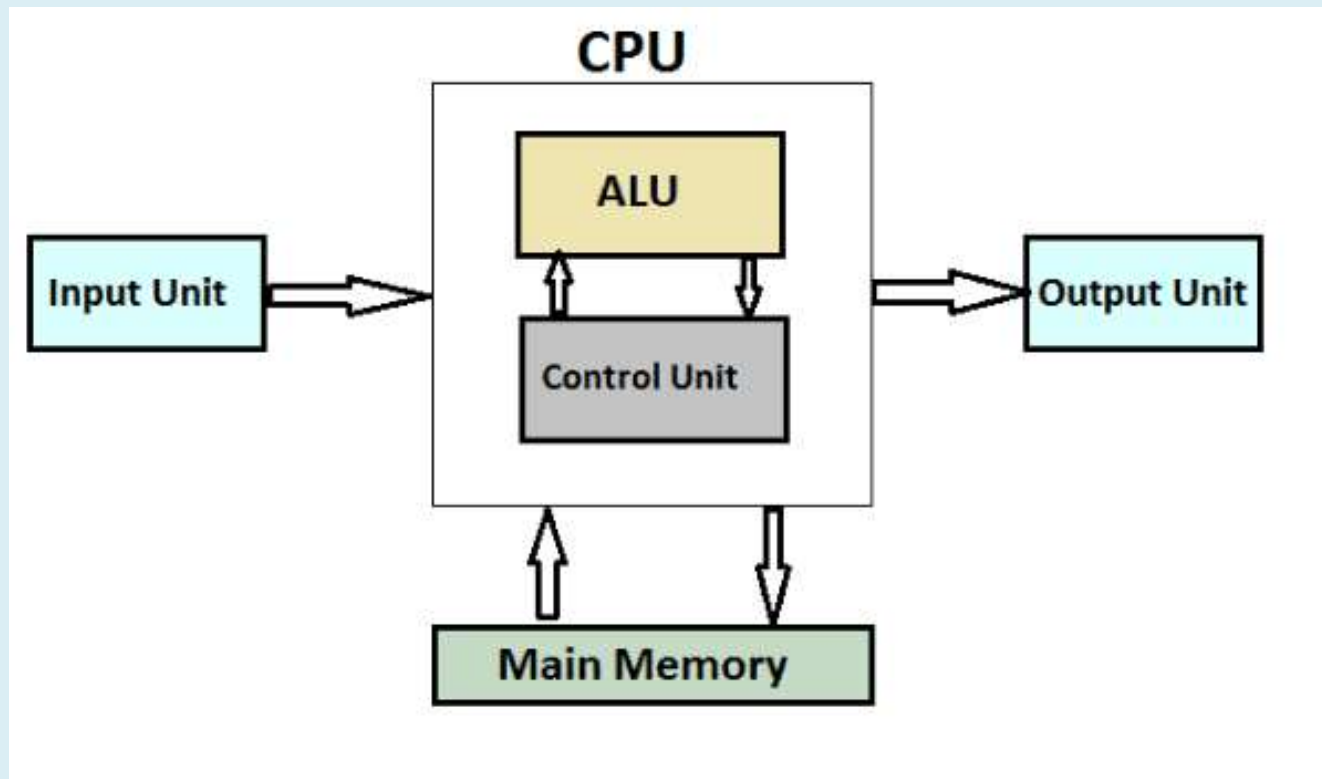
Arithmetic Logic Unit, ALU

The ALU is an internal electronic circuitry of a CPU that performs all the arithmetic and logical operations in a computer. The ALU receives three types of inputs.

- Control signal from CU (Control Unit)
- Data(operands) to be operated
- Status information from operations done previously.

Control Unit, CU

The Control Unit is an internal part of a CPU that co-ordinates the instructions and data flow between CPU and other components of the computer. It is the CU that directs the operations of a central processing unit by sending timing and control signals.

Various Input Devices

- The various input devices are:

1. **Punched cards -** data is first recorded into these cards using standard codes and then fed to the computer with a card punch machine. Though cheap, their major drawbacks are that they cannot be reused and require large storage space.

2. **Keyboard -** is the most commonly used device for on line data entry. It is very easy to use, inexpensive and allows on-line data editing.

3. **Mouse -**is a pointing device used along with a keyboard to control cursor movement, select data etc. Light pen, joystick and track ball are also similar devices used for cursor control.

4. **A digitizer -** This converts pictorial data into a digital form which can be directly entered and stored in a computer.

5. **A scanner** can directly enter text and images into computer memory using light source or magnetic ink recognition.

6. **A voice** recognition system converts the speech of the operator into electrical signals for data entry.

Printers (Output Devices)
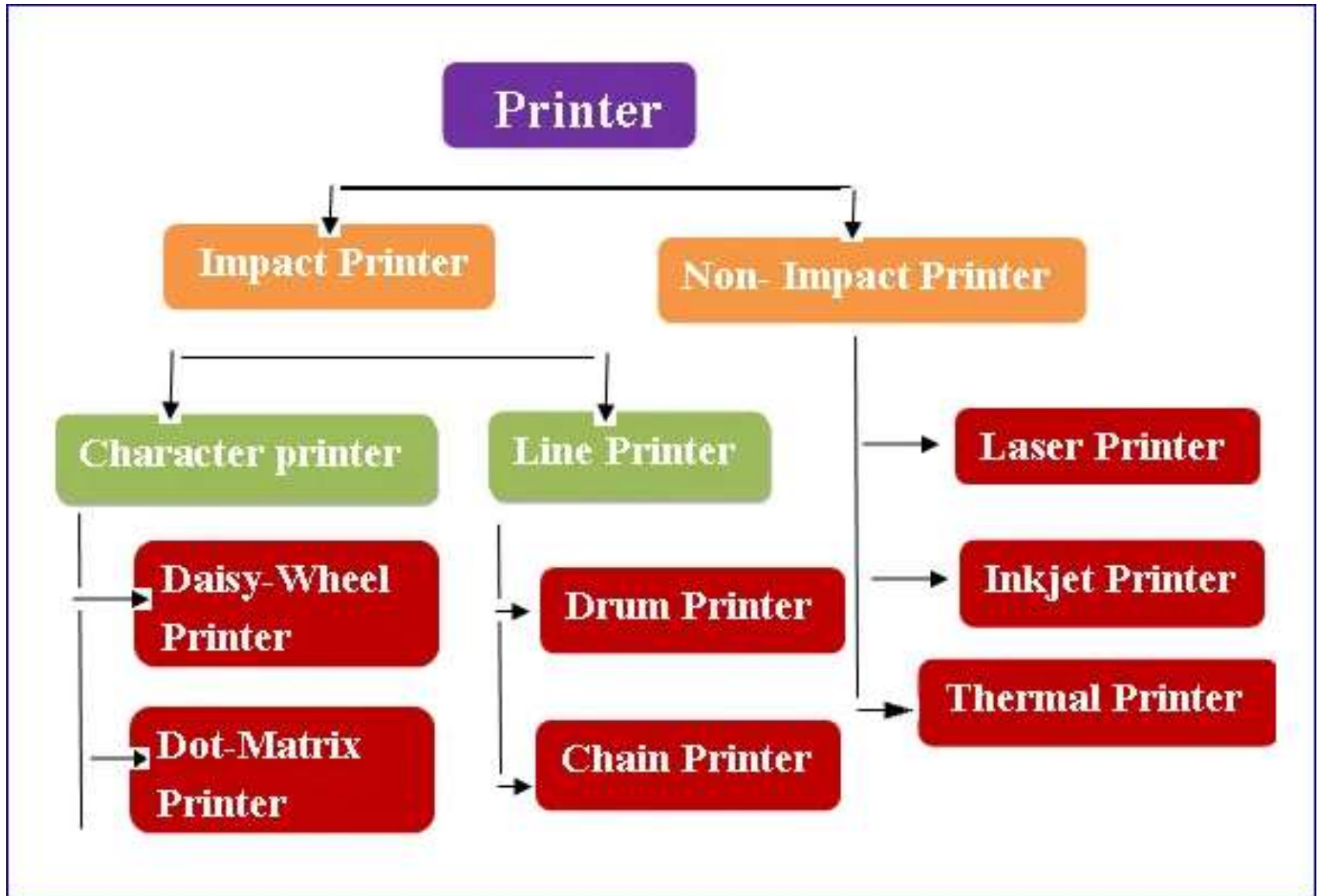
Non Impact Printer

- These printer uses ink and special electrical machines for producing outputs. Non – impact printers are all those printers whose printing heads do not touch paper. A non impact printer forms characters and image on a piece of paper without actually striking the paper.

Type of non Impact Printer

- Laser printer
- Inkjet printer
- Thermal printer

Laser Printers

- They print one page at a time thus laser printer is also referred as Page Printer. A laser printer uses electronics, lasers, xerography and other techniques, which is called electro photographic technique

Laser Printer

Advantages of Laser Printers

- Very high speed .
- Low noise level
- Low maintenance requirement.
- Very high quality output on ordinary paper.
- Good graphics quality (300 dpi to 1200 dpi) and excellent graphics capabilities.
- Supports many fonts and different character size.
- Color printing possible

Dis advantages of Laser Printers

- Very Expensive.
- Require periodic maintenance.

Ink Jet Printer

- It uses the dot matrix approach to print to print text and graphics. However the dots are formed by tiny droplets of ink. They print characters by spraying small drops of ink onto paper. For spraying drops nozzles are used.

Advantages of Inkjet Printers

- High quality text and graphics.
- Produces no noise

Dis advantages of Inkjet Printers

- Its speed is slow than other impact printer and no- impact printers.
- Its image quality is also lower than other printer [low dpi (dot per inch) , bout 180 dpi].
- Ink cartridge is costly.

Difference between RAM & ROM

Difference	RAM	ROM
Data retention	RAM is a volatile memory which could store the data as long as the power is supplied.	ROM is a non-volatile memory which could retain the data even when power is turned off.
Working type	Data stored in RAM can be retrieved and altered.	Data stored in ROM can only be read.
Use	Used to store the data that has to be currently processed by CPU temporarily.	It stores the instructions required during bootstrap of the computer.
Speed	It is a high-speed memory.	It is much slower than the RAM.
CPU Interaction	The CPU can access the data stored on it.	The CPU can not access the data stored on it unless the data is stored in RAM.
Size and Capacity	Large size with higher capacity.	Small size with less capacity.
Used as/in	CPU Cache, Primary memory.	Firmware, Micro-controllers
Accessibility	The data stored is easily accessible	The data stored is not as easily accessible as in RAM
Cost	Costlier	cheaper than RAM.

What is Booting Process

- Booting a computer refers to the process of powering on the computer and starting the operating system.

- The boot process loads the operating system into main memory or the random access memory (RAM) installed on your computer. Now let's learn a little more about the boot process.

Recycle Bin

- Recycle Bin is a place where deleted items are temporarily stored in Windows unless they are permanently deleted. It provides users the option to recover deleted files in Windows operating systems since Windows 95.

Screen Saver

- A screen saver or screensaver is a software program that becomes activated after the computer is inactive for a specified amount of time. Screensavers were originally designed to help prevent images or text from being burned into older monitors.

Some abbreviations Used in FC

- ALU   -   Arithmetic Logic Unit
- BIOS   -   Basic Input Output System
- CAD   -   Computer Aided Design
- EPROM   -   Erasable Programmable Read-Only Memory
- IP   -   Internet Protocol
- OCR   -   Optical Character Recognition
- OMR   -   Optical Mark Reader
- MICR   -   Magnetic ink character recognition
- DBMS   -   Database Management System
- FAX   -   Far Away Xerox
- FTP   -   File Transfer Protocols
- GIF   -   Graphics Interchange Format
- HTTP   -   Hyper Text Transfer Protocol
- HTML   -   Hyper Text Markup Language
- SIM   -   Subscriber Identification Module

Microsoft Powerpoint

- Microsoft PowerPoint is a powerful slide show presentation program. It is a standard component of the company's Microsoft Office suite software, and is bundled together with Word, Excel, and other office productivity tools.

- The program uses slides to convey information rich in multimedia. The term slide refers to the old slide projector, which this software effectively replaces.

What can you do with PowerPoint?

PowerPoint gives you the ability to share your presentation with others in real time on the web. You would supply the user with a link to the presentation. After selecting the link, the user(s) will be able to follow you and your presentation online.

1. Custom animation
2. Add photos, videos and sound effects
3. Save as a webpage
4. Print presentations as handouts
5. Embed YouTube videos

Saving a Presentation

1. On the **File** tab, select **Save**.
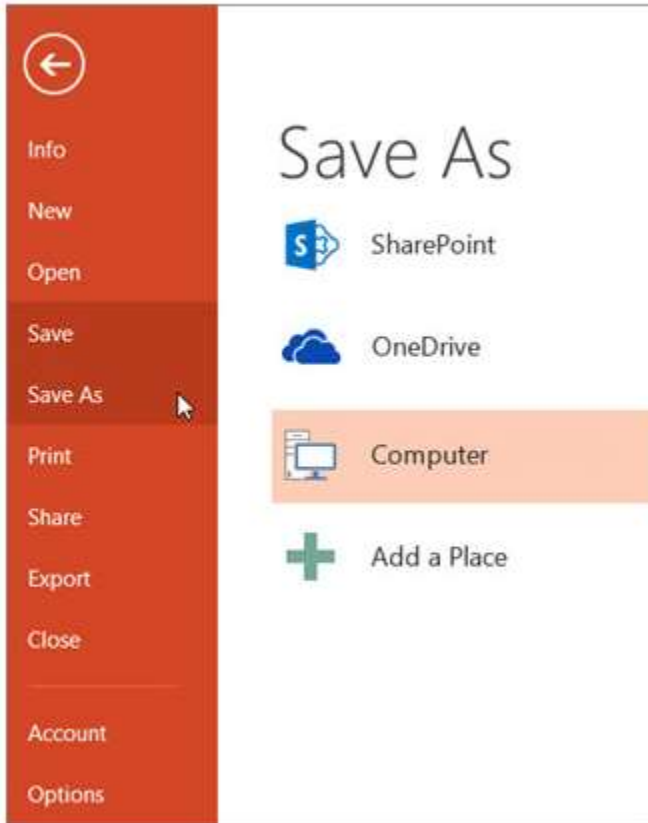
Difference between save and save As

The main difference between Save and Save As is that Save helps to update the lastly preserved file with the latest content while Save As helps to store a new file or to store an existing file to a new location with the same name or a different name

Microsoft Word

- Microsoft Word or MS Word is a popular word-processing program used mainly for **creating documents**, such as brochures, letters, learning activities, quizzes, tests, and students' homework assignments. It was first released in 1983 and is one of Microsoft Office suite's applications.

Basic Uses Of Ms Word Are:

1. Creating text documents.
2. Editing and Formatting the existing documents.
3. Making a text document interactive with different features and tools.
4. Graphical documents, comprising images.
5. Used by Authors and Researchers.
6. Detect grammatical errors in a text document.

Creating MS Word document

- Open Word. Or, if Word is already open, select File > New.

- In the Search for online templates box, enter a search word like letter, resume, or invoice. Or, select a category under the search box like Business, Personal, or Education.

- Click a template to see a preview. ...

- Select Create

Advantages of MS Word

Availability

- One of the advantages of using Microsoft Word is that it is available practically everywhere.

Integration With Office Programs

- Another benefit of using Microsoft Word is that it easily integrates with other Microsoft Office programs.

Instant Help

- While you are creating a document, Word also helps you make sure that it is the best it can be. When you misspell a word, Microsoft Word will immediately underline it.
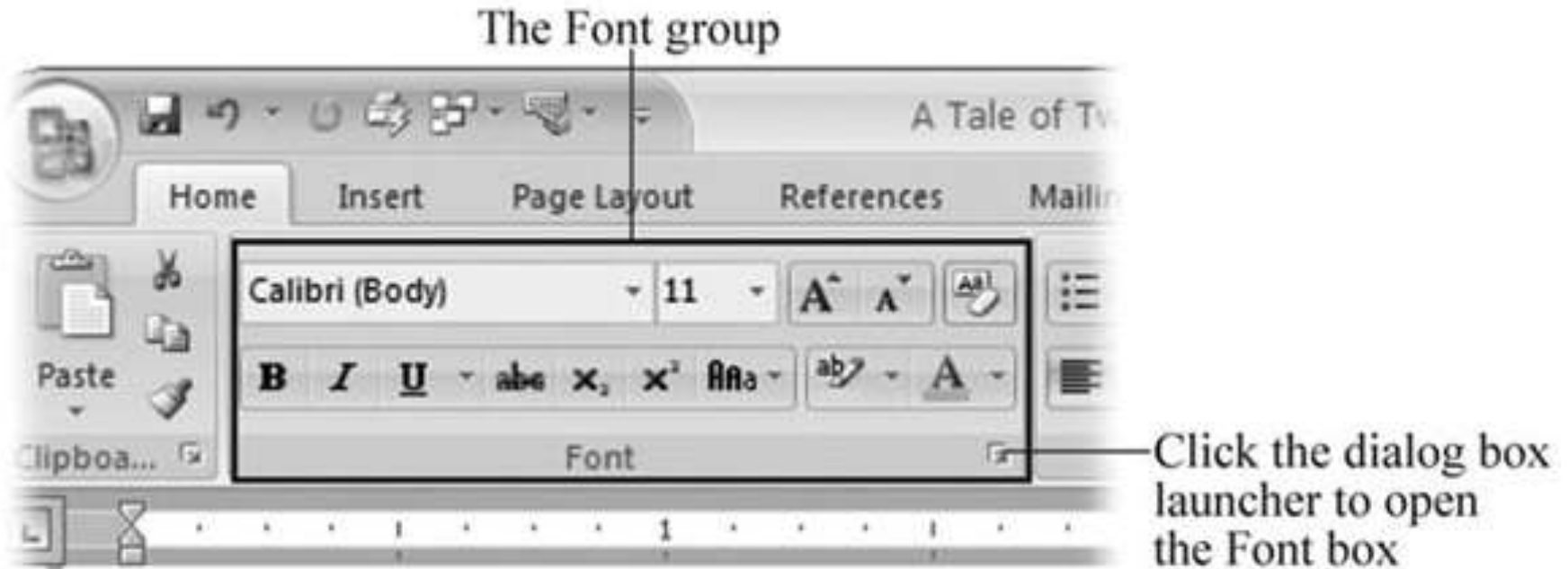
Navigation Pane

- Microsoft Word offers an easy-to-use navigation pane at the top. This allows you to see visual representations of many of the functions that you might need.

Document Flexibility

- Word lets you create simple word-processing documents like letters and reports and make them as basic or as jazzed-up as you wish -- you can add color, use clip art, write in a variety of fonts and sizes, and use tables, borders and bullet formatting.

Editing Character in MS Word document

The Font group

Calibri (Body) 11 A A Aa

B I U abc x₂ x² AAa ab A

Font

Click the dialog box launcher to open the Font box

The sights he had seen there,

The mad joy over the prisone

against those who were cut t

Editing Paragraph in MS Word document
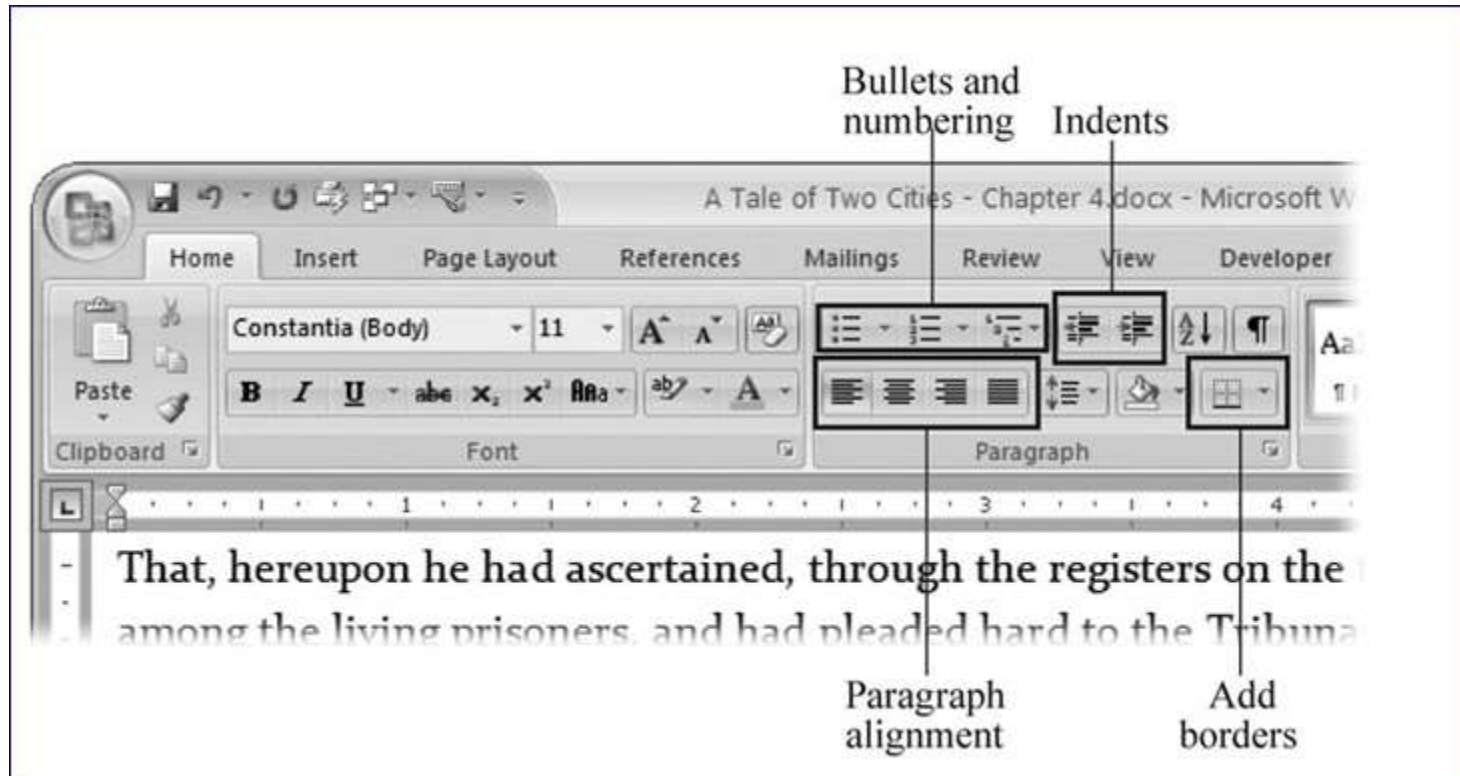
INTERNET

- The Internet is a vast network that connects computers all over the world. Through the Internet, people can share information and communicate from anywhere with an Internet connection.

- The Internet is a global network of billions of computers and other electronic devices. With the Internet, it's possible to access almost any information, communicate with anyone else in the world, and do much more.

- You can do all of this by connecting a computer to the Internet, which is also called going online. When someone says a computer is online, it's just another way of saying it's connected to the Internet.

Threat to security in internet

- Some hacker may break into your server and modify the files kept here
- Every day hundreds of viruses are created which can freely flow through Internet.
- Due to electronic commerce, the credit card credentials can be read by a professional hacker.
- This is a dangerous situation l Secret military and government data can be stolen.
- Many methods are available to implement security mechanisms:
- If you attach your local area network directly to the Internet through a router, you risk intrusion into your network from the Internet.
- Many routers now function as devices called firewalls, which allow you to restrict the information flowing through the firewall by type (for instance, only HTTP or FTP information), IP address of the computers, and many other factors.
- Firewalls are the best way to protect your network from intrusion via the Internet.
- Some ISPs provide a firewall service. They will automatically filter traffic to and from your network by type; if you desire.
- Always keep the latest version of any good virus scanning software e.g. Mcafee, Norton, dr. soloman, etc. Whenever you download any material from Internet, get it thoroughly scanned by the virus scanner software. It may contain a virus, which may effect your files or computer as a whole.

Protocols used on the internet

- **TCP/IP(Transmission Control Protocol/ Internet Protocol):** These are a set of standard rules that allows different types of computers to communicate with each other. The IP protocol ensures that each computer that is connected to the Internet is having a specific serial number called the IP address.

- **SMTP(Simple Mail Transfer Protocol):** These protocols are important for sending and distributing outgoing emails. This protocol uses the header of the mail to get the email id of the receiver and enters the mail into the queue of outgoing mails.

- **PPP(Point to Point Protocol):** It is a communication protocol that is used to create a direct connection between two communicating devices. This protocol defines the rules using which two devices will authenticate with each other and exchange information with each other.

Protocols used on the internet

- **FTP (File Transfer Protocol):** This protocol is used for transferring files from one system to the other. This works on a client-server model. When a machine requests for file transfer from another machine, the FTO sets up a connection between the two and authenticates each other using their ID and Password.

- **HTTP(HyperText Transfer Protocol):** This protocol is used to transfer hypertexts over the internet and it is defined by the www(world wide web) for information transfer. This protocol defines how the information needs to be formatted and transmitted. And, it also defines the various actions the web browsers should take in response to the calls made to access a particular web page.

- **HTTPS(HyperText Transfer Protocol Secure):** HTTPS is an extension of the Hypertext Transfer Protocol (HTTP). It is used for secure communication over a computer network with the SSL/TLS protocol for encryption and authentication.

Protocols used on the internet

- **TELNET** is a standard TCP/IP protocol used for virtual terminal service given by ISO. This enables one local machine to connect with another. The computer which is being connected is called a remote computer and which is connecting is called the local computer. TELNET operation lets us display anything being performed on the remote computer in the local computer. This operates on the client/server principle.