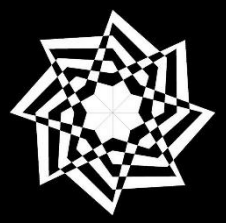


# Unit – 1

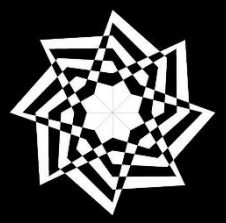
## Introduction to Computer System

Telegram User – @sdbhosale  
Whatsapp – 9503103805  
{Sachin Laxmi Dinesh Bhosale}



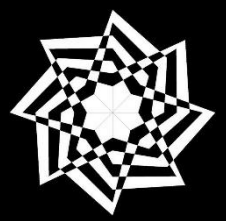
# Introduction

- noun
  - the action of bringing in something new; using something or taking something to a place for the first time.
  - एखादी नवीन गोष्ट आणण्याची कृती, एखादी गोष्ट वापरण्याची किंवा एखाद्या ठिकाणी प्रथमच आणण्याची कृती, नव्याने प्रचारात आणणे.



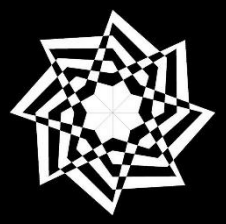
to

- preposition , adverb
  - in the direction of; as far as.
  - -च्या दिशेने, -कडे, -ला; जाईल तितका.



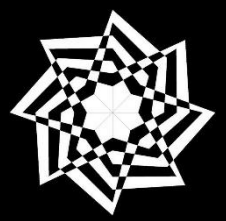
# Computer

- noun
  - an electronic machine that can store, find and arrange information, calculate amounts and control other machines.
  - इतर यंत्रांवर नियंत्रण ठेवणे, रकमा मोजणे, माहिती साठवणे, शोधणे आणि संगतवार लावणे इत्यादी गोष्टी करू शकणारे विद्युत्परमाणूवर चालणारे एक यंत्र; संगणक, संगणित्र, परिकलक.
  - Computer is defined as an electronic device which takes input from the user, processes it and gives the output as per user's requirements.



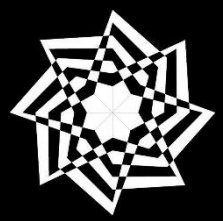
# System

- noun
  - a set of ideas or rules for organizing something; a particular way of doing something.
  - एखादी गोष्ट करण्यासाठी रचण्यासाठी वगैरे असलेली नियमावली; एखादी गोष्ट करण्याचा विशिष्ट मार्ग; सुरचित पद्धती, व्यवस्था.



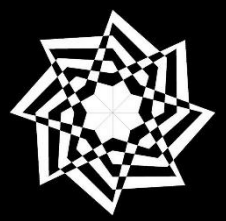
# Basics of Computer System

- A computer system is a machine that can store, process, and display information.
- It has hardware (physical parts) like CPU, monitor, keyboard, and mouse.
- It also has software (programs) that tell the computer what to do.
- The CPU is called the brain of the computer because it does all the processing.
- Computers are used in offices, schools, homes, and industries for various tasks.



# Generations of Computers

- The First Generation (1940-1956) used vacuum tubes and was very large and slow.
- The Second Generation (1956-1963) used transistors, which made computers smaller and faster.
- The Third Generation (1964-1971) used integrated circuits (ICs) for better performance.
- The Fourth Generation (1971-Present) uses microprocessors and is widely used today.
- The Fifth Generation (Present & Future) focuses on AI, robotics, and advanced computing.

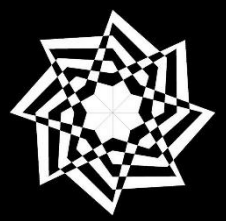


# Features of First Generation Computers

- They used vacuum tubes for processing and circuitry.
- They were very large in size and occupied entire rooms.
- These computers produced a lot of heat and often broke down.
- They were very slow and had low storage capacity.
- Programming was done using machine language (0s and 1s).



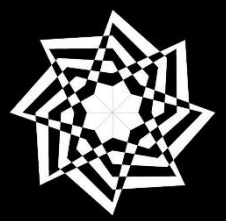




# Features of Second Generation Computers

- They used transistors instead of vacuum tubes, making them smaller and faster.
- These computers generated less heat and were more reliable.
- They supported programming in assembly language.
- Power consumption was lower compared to first generation.
- They were used in scientific and business applications.

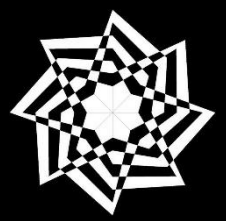




# Features of Third Generation Computers

- They used Integrated Circuits (ICs), which made them faster and more efficient.
- The size of computers became smaller and more compact.
- They supported high-level programming languages like COBOL and FORTRAN.
- These computers were more reliable and produced less heat.
- They were used for commercial and scientific purposes in many fields.

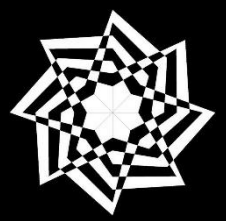




# Features of Fourth Generation Computers

- They use microprocessors, which combine all processing functions on a single chip.
- These computers are very fast, small, and affordable.
- They support graphical user interfaces (GUIs) and multimedia.
- They can connect to the internet and support networking.
- Fourth generation computers are used in homes, schools, offices, and industries.

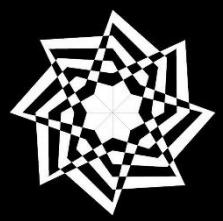




# Features of Fifth Generation Computers

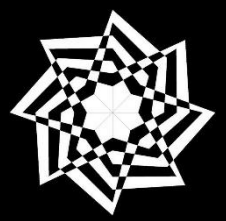
- They use Artificial Intelligence (AI) to think and learn like humans.
- These computers can understand natural language and voice commands.
- They are designed for high-speed processing and problem-solving.
- Fifth generation computers include robots, smart assistants, and intelligent systems.
- They support advanced technologies like machine learning, cloud computing, and quantum computing.





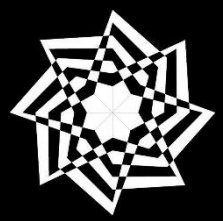
# Characteristics of a Computer

- **1. Speed** : A computer can perform millions of instructions in just a few seconds.
- **2. Accuracy** : It gives highly accurate results if the input and instructions are correct.
- **3. Automation** : Once programmed, a computer works automatically without human help.



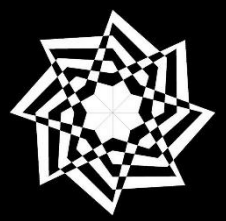
# Characteristics of a Computer

- **4. Storage :** It can store a large amount of data and retrieve it quickly when needed.
- **5. Versatility :** A computer can perform different types of tasks like calculations, writing, drawing, and more.
- **6. Diligence :** Unlike humans, computers do not get tired or bored and can work for long hours.
- **7. Multitasking :** It can handle multiple tasks at the same time without losing speed or accuracy.

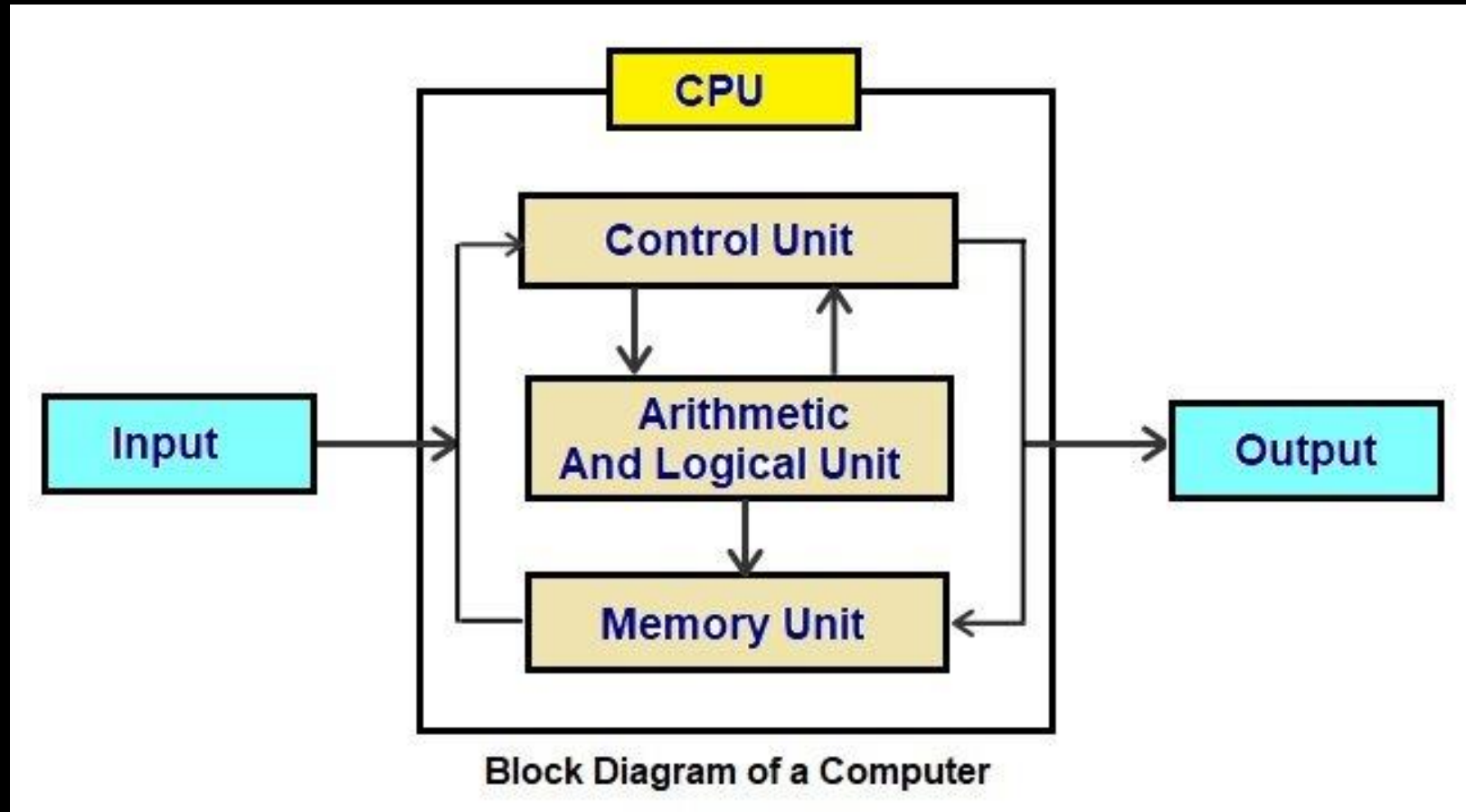


# Limitations of a Computer

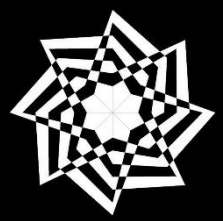
- Lacks Intelligence :A computer cannot think or make decisions on its own.
- No Feelings or Emotions : It cannot understand human emotions or behave like a human.
- Depends on Instructions : It works only when given proper commands and programs.
- Cannot Learn by Itself : Unlike humans, it cannot learn from experience (unless AI is used).
- No Common Sense : A computer cannot apply common sense to solve problems.



# Block Diagram of Computer

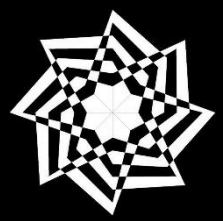






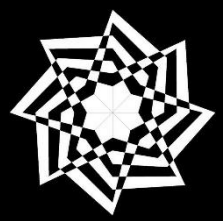
# 1. Input Device/Unit

- The Devices that are used to enter data and instructions into the computer are called as Input Devices.
- Function: Takes data and instructions from the user.
- Examples: Keyboard, Mouse, Scanner, Microphone.
- Explanation: The input unit sends the data to the computer for processing.



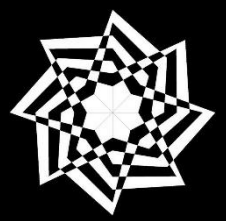
## 2. Central Processing Unit (CPU)

- The Component of computer system that controls the input and output devices with storage devices to interpret and execute instructions.
- The CPU is the brain of the computer. It processes the data and controls all operations.
- It has two main parts:
- a) Arithmetic and Logic Unit (ALU)
  - Performs mathematical operations (addition, subtraction, division, multiplication and remainder) and logical operations (comparison, decision-making).
- b) Control Unit (CU)
  - Controls and coordinates all parts of the computer.
  - It tells the input/output devices, memory, and ALU what to do and when.



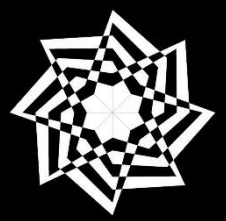
### 3. Memory / Storage Unit

- Stores data and instructions temporarily or permanently.
- Volatile Memory : Volatile memory loses its data when power is turned off (e.g., RAM).
- Non-Volatile Memory : Non-volatile memory keeps data even after the power is off (e.g., ROM, Hard Disk, SSD, Pen Drive).
- OR
  - Primary Memory (RAM) – Fast, temporary storage.
  - Secondary Memory (ROM, HDD, SSD, USB) – Permanent storage.



## 4. Output Unit

- The devices that are used to display the results or output after processing are called as output devices.
- Function: Displays the result of processing.
- Examples: Monitor, Printer, Speaker.
- Explanation: The processed data (output) is shown to the user through output devices.

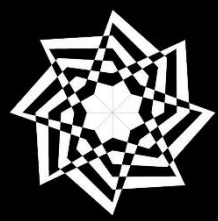


# Hardware

- The physical components of a computer system that can be seen and touched are called as Hardware.

# Software

- Software is collection or group of programs.
- Program is collection or group of instructions to perform specific tasks.



# TYPES OF COMPUTER HARDWARE



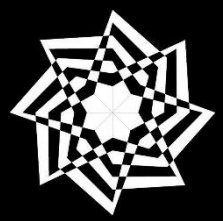
## External Hardware

- Keyboard
- Mouse
- Microphone
- Joystick
- Scanner
- Monitor
- printer
- Speaker
- projector

## Internal Hardware

- CPU/Microprocessor
- Motherboard
- RAM
- Sound card
- Modem
- Graphics card
- NIC- Network Interface Card

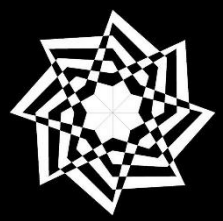




# External Hardware Components of a Computer

- 1. Monitor : It displays the visual output from the computer.
- 2. Keyboard : Used to type text and give commands to the computer.
- 3. Mouse : A pointing device used to move the cursor and select items on the screen.
- 4. Printer : It prints documents or images from the computer onto paper.



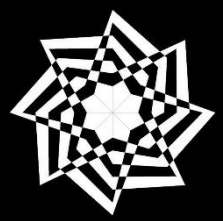


# External Hardware Components of a Computer

- 5. Scanner : Used to convert physical documents or images into digital form.
- 6. Speakers : They output sound from the computer.
- 7. Webcam : A camera that captures live video or photos, often used in video calls.
- 8. External Hard Drive / USB Drive : Used for extra data storage or transferring files between computers.



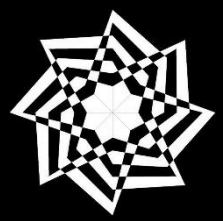




# External Hardware Components of a Computer

- 9. Projector : A projector displays the computer screen onto a large surface, like a wall or screen, for group viewing.
- 10. Joystick : A joystick is an input device used to control movement in games and simulations.
- 11. Microphone : A microphone is used to input sound or voice into the computer.
- 12. Light Pen : A light pen is a pointing input device that allows users to draw or select items directly on a screen.

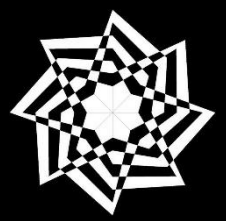




# External Hardware Components of a Computer

- 13. MICR (Magnetic Ink Character Recognition) : MICR is a technology used to read printed characters on cheques using magnetic ink.
- 14. OCR (Optical Character Recognition) : OCR is a technology that converts printed or handwritten text into digital editable text.
- 15. **Barcode Reader** : A barcode reader is a device that **scans and reads information stored in barcodes**.
- 16. **OMR (Optical Mark Recognition)** : OMR is a technology used to **read marks made on paper, such as answers in multiple-choice exams**.
- 17. Digitizer : A digitizer is an input device that converts hand-drawn images or graphics into digital form on a computer.

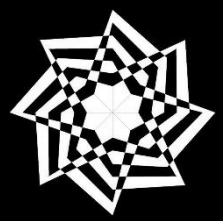




# External Hardware Components of a Computer

- 18. Plotter : A plotter is an output device used to print large drawings or graphics with high precision, such as maps and engineering designs.

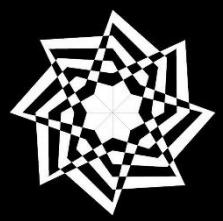




# Computer Monitors - Types

- CRT Monitor (Cathode Ray Tube) – Old, bulky monitors that use electron beams to display images.
- LCD Monitor (Liquid Crystal Display) – Slim, energy-efficient monitors with clear picture quality.
- LED Monitor (Light Emitting Diode) – Advanced version of LCD with better brightness and less power use.





# Computer Monitors - Types

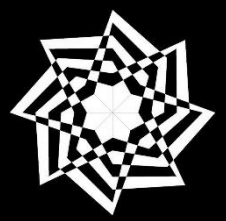
- OLED Monitor (Organic LED) – Offers rich colors and deeper blacks, used in high-end displays.
- Touchscreen Monitor – Allows users to interact directly with the screen using fingers or a stylus.





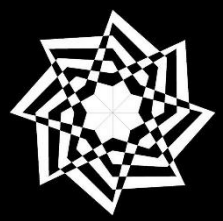
# Printers - types

- Impact Printers : Impact printers strike a ribbon to print characters on paper, like a typewriter.
- ◆ Examples:
  - Dot Matrix Printer
  - Line Printer
  - Daisy Wheel Printer
- ✓ Features:
  - Noisy but can print on multi-part (carbon) paper
  - Used in bills, invoices, and industrial use



# Printers - types

- Non-Impact Printers : Non-impact printers do not strike the paper; they use ink spray, laser, or heat.
- ◆ Examples:
  - Inkjet Printer
  - Laser Printer
  - Thermal Printer
- ✓ Features:
  - Quiet and faster
  - Can print in high quality and color

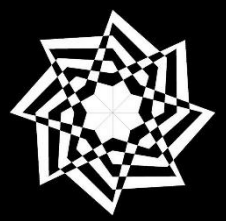


# Dot Matrix Printer

- A Dot Matrix Printer is an impact printer that prints by striking pins against an ink ribbon.
- It forms characters and images using tiny dots.
- It is noisy but can print multiple copies using carbon paper.
- Commonly used for bills, receipts, and industrial reports.
- Let me know if you want this in Marathi or with a diagram.



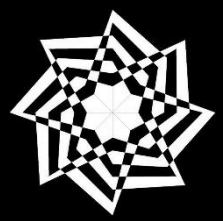




# Inkjet Printer

- An Inkjet Printer sprays tiny droplets of ink directly onto the paper.
- It is mostly used for color printing and photo printing.
- It produces high-quality prints at a low cost.
- Commonly used in homes, schools, and small offices.

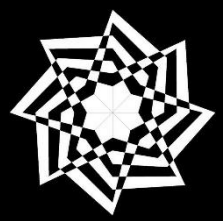




# Laser Printer

- A Laser Printer uses a laser beam and toner powder to print on paper.
- It is known for high-speed and high-quality printing.
- Mostly used for black and white document printing in offices.
- It is quiet, efficient, and cost-effective for large volume printing.

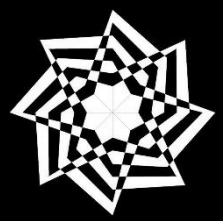




## CD (Compact Disc)

- A CD is a portable storage device used to store data, music, or videos.
- It can store up to 700 MB of data.
- Data is read using a laser beam in a CD drive.
- CDs are commonly used for software, songs, and backups.

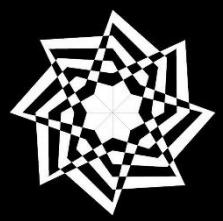




# DVD (Digital Versatile Disc)

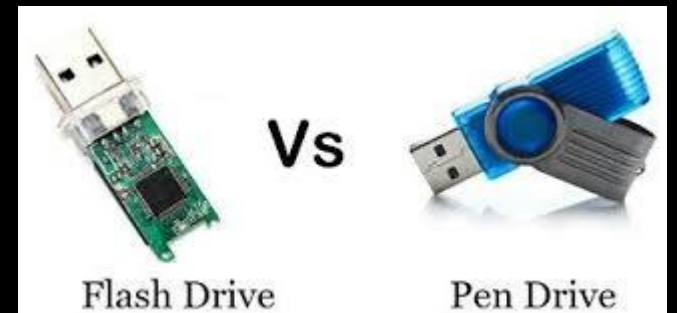
- A DVD is an optical storage device used to store videos, software, and large data files.
- It can store 4.7 GB or more, which is much more than a CD.
- DVDs are read using a DVD drive with a laser.
- Commonly used for movies, games, and backups.





## Pen Drive & Flash Drive:

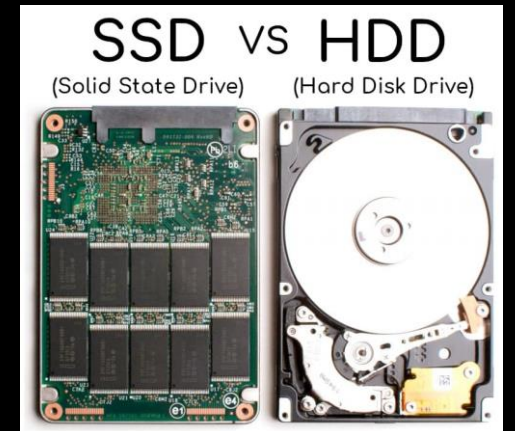
- A Pen Drive or Flash Drive is a portable USB storage device.
- It is used to store and transfer data like documents, photos, and videos.
- It is small, lightweight, and easy to carry.
- Available in various capacities, from 2 GB to 1 TB or more.
- A pen drive is a specific type of flash drive that connects through USB.
- All pen drives are flash drives, but not all flash drives are pen drives.
- Examples of Flash Drive : SSD, memory card, pen drive

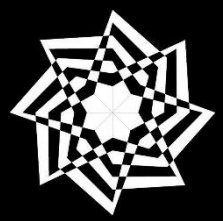




# Internal Hardware Components of a Computer

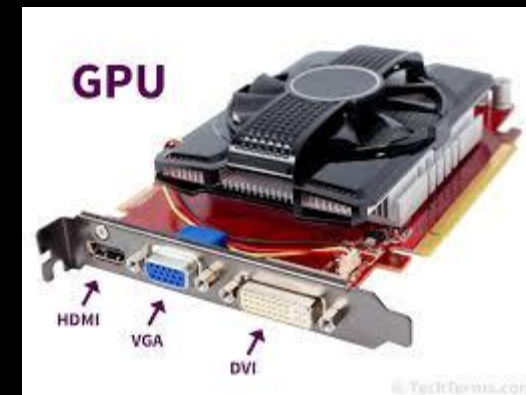
- 1. Central Processing Unit (CPU) : It is the brain of the computer that processes all instructions.
- 2. Motherboard : It is the main circuit board that connects all internal components.
- 3. Random Access Memory (RAM) : RAM is the temporary memory used to store data while the computer is working.
- 4. Hard Disk Drive (HDD) / Solid State Drive (SSD) : These are storage devices used to save files, software, and the operating system.



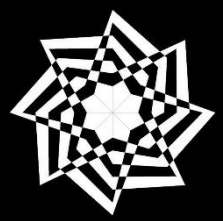


# Internal Hardware Components of a Computer

- 5. Power Supply Unit (PSU) : It converts electricity from a wall outlet into usable power for the computer.
- 6. Cooling Fan / Heat Sink : These components keep the computer cool by removing excess heat.
- 7. Graphics Processing Unit (GPU) : A GPU is used to handle images, videos, and gaming graphics.





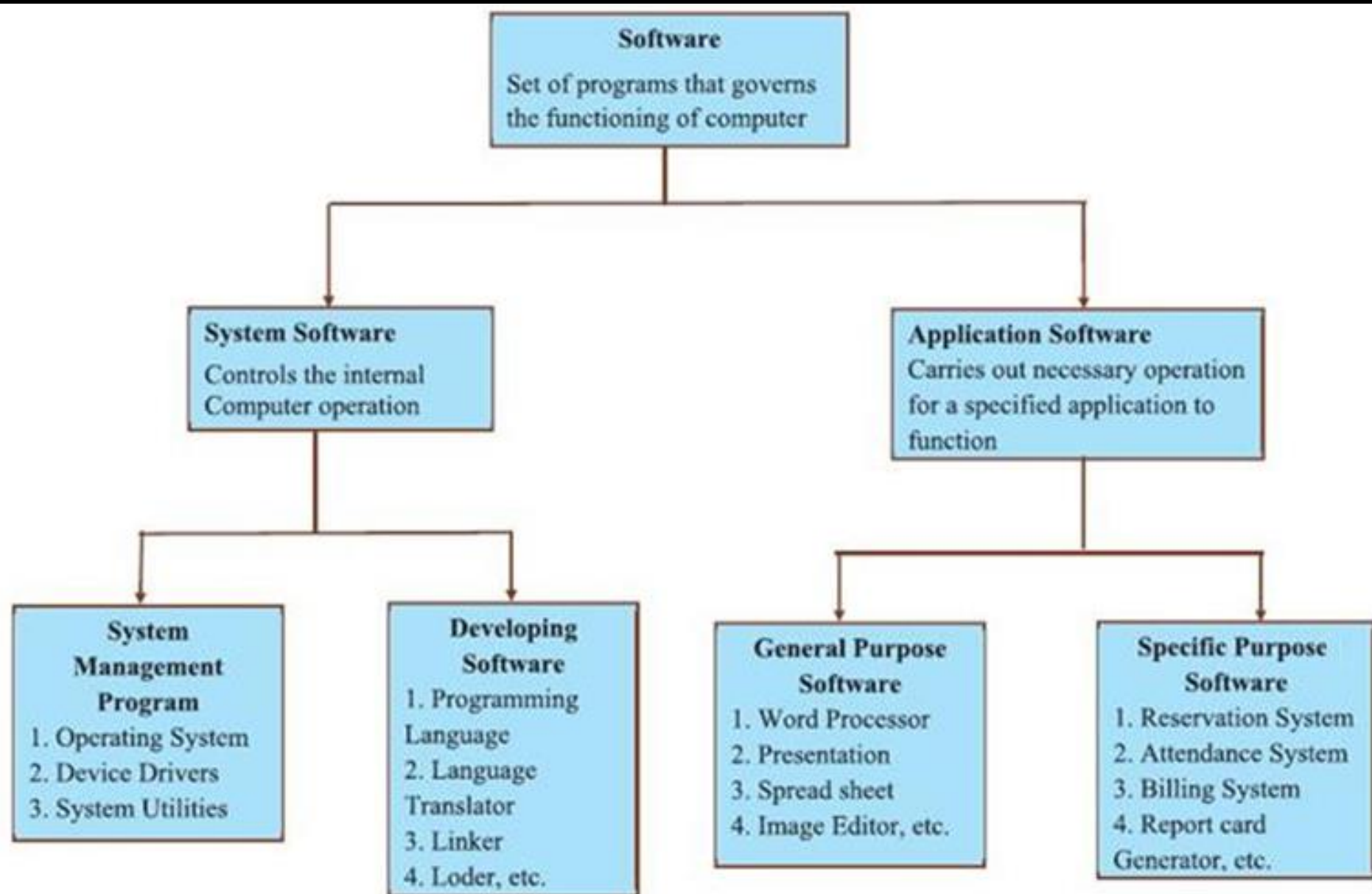
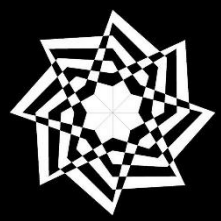


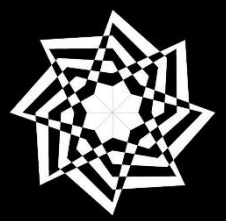
# Internal Hardware Components of a Computer

- 8. Sound Card : A sound card is an internal device that processes and outputs audio signals in a computer.
- 9. Modem : A modem is a device that connects a computer to the internet by converting digital signals to analog and vice versa.
- 10. Network Interface Card (NIC) : A Network Interface Card is a hardware component that enables a computer to connect to a wired or wireless network.



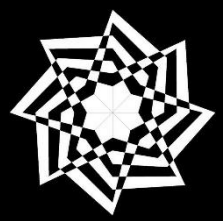






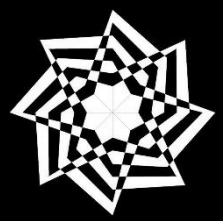
# System Software

- System Software is a type of software that controls and manages the hardware and basic operations of a computer.
- Key Features:
  - Acts as a bridge between hardware and user applications
  - Runs in the background to manage system resources
  - Required for the functioning of all application software
  - Includes operating systems, device drivers, and utility programs
- Examples:
  - Operating Systems – Windows, Linux, macOS
  - Device Drivers – Printer driver, display driver
  - Utility Software – Antivirus, disk cleanup tools
  - Firmware – BIOS, embedded software in devices



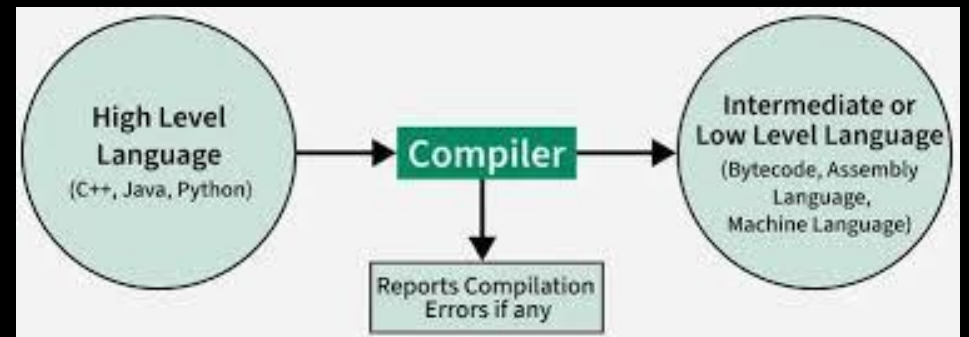
# Characteristics of System Software

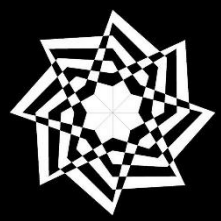
- Hardware Control - It manages and controls the working of computer hardware.
- Works in Background - Runs automatically in the background without user interaction.
- Fast and Efficient - Designed to be quick and efficient for smooth system performance.
- Essential for Running Computer - Without system software, the computer cannot function properly.
- Resource Management - Manages CPU, memory, files, and input/output devices.
- User Interface Provider - Provides a platform or interface (like Windows desktop) for users to work.
- Supports Application Software - It helps in the installation and execution of application programs.



# Compiler

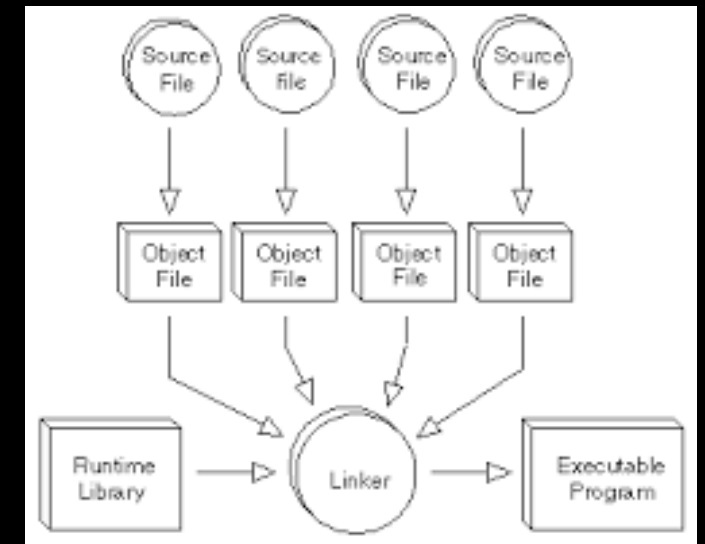
- A compiler is a type of language translator that converts an entire high-level programming code (like C, C++, or Java) into machine code (binary) before execution.
- Key Features of Compiler:
  - Translates full program at once from high-level to machine language.
  - Generates an executable file (.exe) that can be run later without the source code.
  - Faster execution after compilation.
  - Shows all errors after compiling, not line by line.
  - Used for languages like C, C++, Java, and Pascal.
- Examples of Compilers:
  - GCC – GNU Compiler Collection (for C/C++)
  - Turbo C++
  - javac – Java compiler
  - MSVC – Microsoft Visual C++ Compiler





# Linker

- A linker is a system software tool that combines multiple object files (compiled code) into a single executable file.
- Key Functions of a Linker:
  - Links various program modules (object files) together.
  - Connects function calls with their definitions across files.
  - Resolves addresses of variables and functions.
  - Produces a final .exe (executable) file for execution.
  - Works after compilation, as part of the program-building process.
- Example Tools:
  - GNU Linker (ld)
  - MS Linker (used in Visual Studio)
  - Part of most compiler suites (like GCC, Turbo C++)

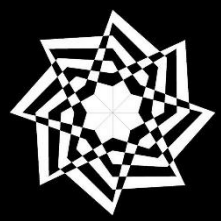




# Operating System (OS)

- An Operating System is system software that manages computer hardware and software resources.
- It provides a user-friendly interface to run programs and perform tasks.
- Examples :
  - Windows – e.g., Windows 10, Windows 11
  - Linux – e.g., Ubuntu, Fedora, Debian
  - macOS – e.g., macOS Ventura, macOS Monterey
  - Chrome OS – used in Chromebooks
  - Unix – used in servers and academic systems

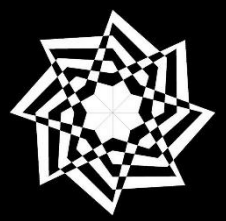




# Device Drivers



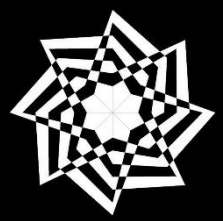
- Device drivers are special programs that help the operating system communicate with hardware devices.
- They ensure that printers, keyboards, and other devices work properly with the computer.
- Examples :
  - Printer Driver – Allows the computer to send print commands to the printer.
  - Display Driver (Graphics Driver) – Controls the display of images and video on the monitor.
  - Sound Driver – Enables audio input/output through speakers and microphones.
  - Keyboard Driver – Allows the computer to receive input from the keyboard.
  - Mouse Driver – Helps the system understand movements and clicks of the mouse.
  - Wi-Fi Driver – Enables wireless connectivity to internet networks.
  - USB Driver – Allows communication between the system and USB devices like pen drives.



# Language Translators

- Language translators are programs that convert high-level programming code into machine language so that a computer can understand and execute it.
- Examples :
  - Compiler – Converts the entire high-level program into machine code at once (e.g., GCC for C/C++).
  - Interpreter – Translates and runs code line by line (e.g., Python Interpreter).
  - Assembler – Converts assembly language into machine code

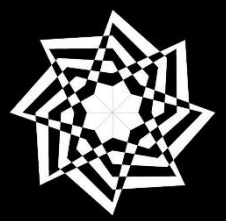




# Utility Software

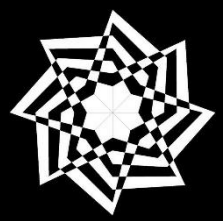
- Utility software helps in maintaining, analyzing, and optimizing the performance of a computer
- Examples :
  - Antivirus Software – Protects the computer from viruses and malware (e.g., Avast, Quick Heal).
  - Disk Clean up Tool – Removes unnecessary files to free up space.
  - File Compression Tool – Compresses files to reduce their size (e.g., WinRAR, 7-Zip).
  - Backup Software – Helps create copies of data for recovery (e.g., Acronis, EaseUS).
  - Defragmentation Tool – Organizes scattered data on the hard disk for faster access.





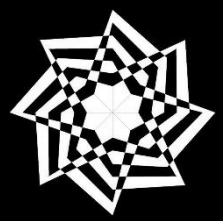
# Application Software

- Application software is designed to perform specific tasks for users, such as writing documents or editing photos.
- Examples include MS Word, Excel, PowerPoint, Tally, and Photoshop, Calculator, Paint, Image viewer, VLC Media Player, Music Player etc.



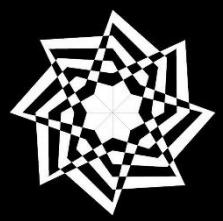
# BIOS (Basic Input/Output System) Software

- BIOS is a built-in system software stored on a ROM chip on the motherboard.
- It stands for Basic Input/Output System.
- BIOS is the first software that runs when you turn on your computer.
- It helps the computer start properly and checks if all hardware is working.
- Key Functions of BIOS:
  - Booting the Computer – BIOS performs the POST (Power-On Self-Test) and loads the operating system.
  - Hardware Control – It manages basic communication between the operating system and hardware (like keyboard, display, etc.).
  - Settings Management – Users can enter the BIOS Setup Utility to change system settings like boot order, time/date, etc.
  - Stored in ROM – BIOS is non-volatile, so it remains even when the computer is off.



# General Purpose Application Software

- General Purpose Application Software is designed to perform common, everyday tasks that users need regularly.
- Key Features:
  - Used by all types of users (students, office workers, home users).
  - Helps in writing, calculating, presenting, drawing, etc.
  - Not specific to any one profession or industry.
- Examples:
  - MS Word – For writing letters, reports, and documents.
  - MS Excel – For calculations, data analysis, and charts.
  - MS PowerPoint – For creating presentations.
  - Notepad / WordPad – For simple text editing.
  - Paint – For basic image drawing and editing.
  - Web Browsers – Like Chrome, Firefox for internet access.



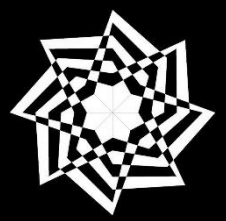
# Word Processing Software

- Word Processing Software is used to create, edit, format, and print text documents like letters, reports, and essays.
- Key Features:
  - Typing and editing text
  - Formatting (fonts, colors, alignment, bullets, etc.)
  - Spell check and grammar correction
  - Inserting images, tables, and charts
  - Saving and printing documents
- Examples: Microsoft Word, Google Docs, LibreOffice Writer, WordPad, WPS Writer



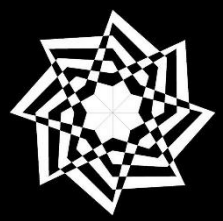
# Spreadsheet Software

- Spreadsheet software is used to organize, calculate, analyze, and visualize data in rows and columns (tables).
- Key Features:
  - Data entry in cells arranged as rows and columns
  - Mathematical formulas and functions (like SUM, AVERAGE)
  - Charts and graphs for data visualization
  - Sorting and filtering of data
  - Automatic calculations and data analysis
- Examples: Microsoft Excel, Google Sheets, LibreOffice Calc, WPS Spreadsheets, Apple Numbers



# Database Management System (DBMS) Software

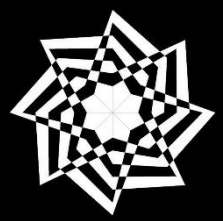
- DBMS software is used to store, manage, organize, and retrieve data efficiently in a structured way.
- Key Features:
  - Creates and manages databases
  - Allows adding, updating, deleting, and querying data
  - Ensures data security, backup, and recovery
  - Supports multiple users and access control
  - Handles large volumes of data systematically
- Examples: MySQL, Oracle Database, Microsoft SQL Server, MS Access, PostgreSQL



# Presentation Software

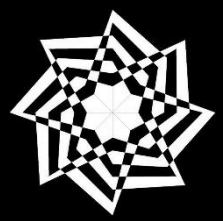
- Presentation software is used to create, display, and share slideshows that include text, images, audio, video, and animations.
- Key Features:
  - Create slides with text and visuals
  - Add animations and transitions
  - Insert charts, images, videos, and audio
  - Used for presenting ideas, reports, and projects
  - Allows live presentation or sharing as a file
- Examples: Microsoft PowerPoint, Google Slides, LibreOffice Impress, WPS Presentation, Canva (for slide designs)





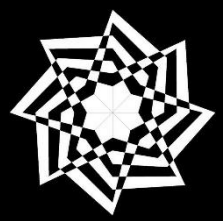
# Measuring Software

- Measuring software is used to measure, monitor, and analyze values such as length, weight, temperature, voltage, speed, or performance — depending on the application or field.
- Key Uses:
  - Helps in scientific experiments, engineering, manufacturing, and healthcare.
  - Can work with sensors or devices to collect and display measurements.
  - Provides real-time data, graphs, and reports.
- Examples:
  - NI LabVIEW – For scientific and engineering measurements
  - SpeedFan – For measuring PC temperature and fan speed
  - Vernier Logger Pro – For educational science experiments
  - Multimeter software – For digital voltage/current readings
  - CAD software with measurement tools – Like AutoCAD



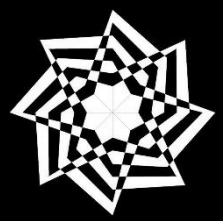
# Photo Editing Software

- Photo editing software is used to modify, enhance, or create images and photographs digitally.
- Key Features:
  - Crop, resize, and rotate images
  - Adjust brightness, contrast, and colors
  - Add filters, effects, and text
  - Remove backgrounds or objects
  - Supports layer editing and retouching
- Examples:
  - Adobe Photoshop – Professional photo editing
  - GIMP – Free and open-source image editor
  - Canva – Easy online design and editing tool
  - Pixlr – Online and mobile-friendly editor
  - Snapseed – Mobile photo editing app by Google



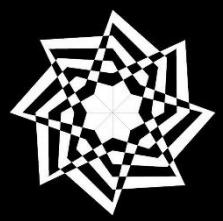
# Video Editing Software

- Video editing software is used to edit, cut, combine, and enhance video clips to create professional or personal videos.
- Key Features:
  - Cut, trim, and merge video clips
  - Add transitions, effects, and titles
  - Insert music, voiceover, and subtitles
  - Adjust brightness, contrast, and color grading
  - Export videos in different formats and resolutions
- Examples:
  - Adobe Premiere Pro – Professional video editing
  - Filmora – Beginner-friendly with powerful tools
  - DaVinci Resolve – Advanced color correction and editing
  - iMovie – Easy video editing for Mac/iOS users
  - KineMaster / CapCut – Mobile video editing apps



# Graphic Manipulation Software

- Graphic manipulation software is used to create, edit, and modify images, illustrations, and digital graphics.
- Key Features:
  - Allows drawing, painting, and designing graphics
  - Supports image editing, layering, and resizing
  - Useful for creating logos, posters, advertisements, and digital art
  - Offers tools for color correction, masking, and effects
  - Often used by designers, artists, and photographers
- Examples:
  - Adobe Photoshop – Industry standard for image editing and design
  - CorelDRAW – Widely used for vector graphics and design
  - GIMP – Free and open-source image editor
  - Adobe Illustrator – Best for creating scalable vector artwork
  - Inkscape – Free vector graphic design tool



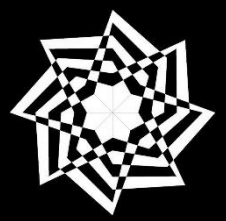
# Customized Application Software

- Customized Application Software is specially developed to meet the specific needs of a particular user, company, or organization.
- Key Features:
  - Tailored for a specific task or workflow
  - Not for general public use — made for internal or private use
  - Increases efficiency and accuracy in business operations
  - Can be modified or updated as per user requirements
- Examples:
  - Hospital Management System – For managing patients, staff, and records in a hospital
  - School ERP Software – For student records, fees, exams, and attendance
  - Billing Software for Shops – Custom software for generating bills and managing stock
  - Inventory Management System – For warehouses or retail stores
  - CRM Software – Designed for managing customer interactions in a specific company



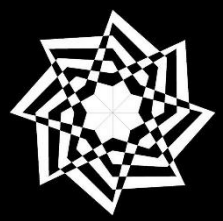
# Network Environments

- A network environment refers to the setup in which multiple computers, devices, and software systems are connected to share data, resources, and communication.
- Key Features:
  - It includes hardware (like routers, switches, computers) and software that enable networking.
  - Can be as small as a Local Area Network (LAN) or as large as the Internet.
  - Devices in a network environment can share files, printers, internet connection, and applications.
  - Used in homes, schools, offices, banks, and industries for communication and collaboration.



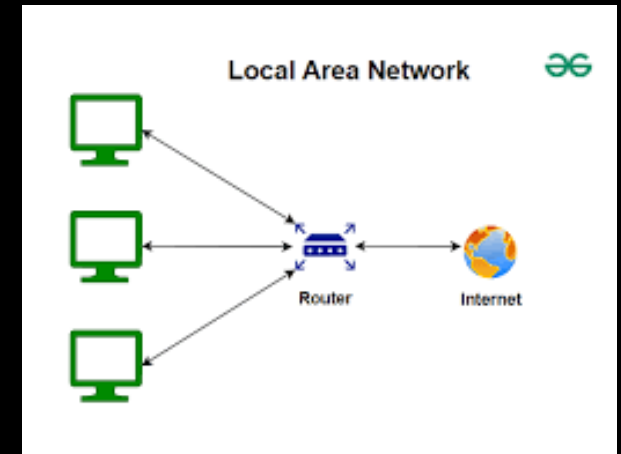
# Network Environments

- Types of Network Environments:
  - LAN (Local Area Network) – Small area like office or home.
  - WAN (Wide Area Network) – Covers large areas, like cities or countries (e.g., Internet).
  - MAN (Metropolitan Area Network) – Covers a city or campus.
  - Wireless Networks (Wi-Fi) – No physical cables; uses radio waves.

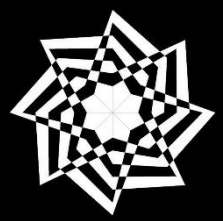


# LAN (Local Area Network)

- LAN stands for Local Area Network – a network that connects computers and devices within a small area, like a home, office, school, or building.
- Key Features of LAN:
  - Covers a small geographical area (typically within 1 building).
  - Enables fast and secure data sharing between connected devices.
  - Uses cables (Ethernet) or Wi-Fi for connections.
  - Requires network devices like switch, router, and network cables.
  - Commonly used for file sharing, printer access, and internet sharing.
- Examples:
  - Computers connected in a college lab
  - Devices connected to the same home Wi-Fi network

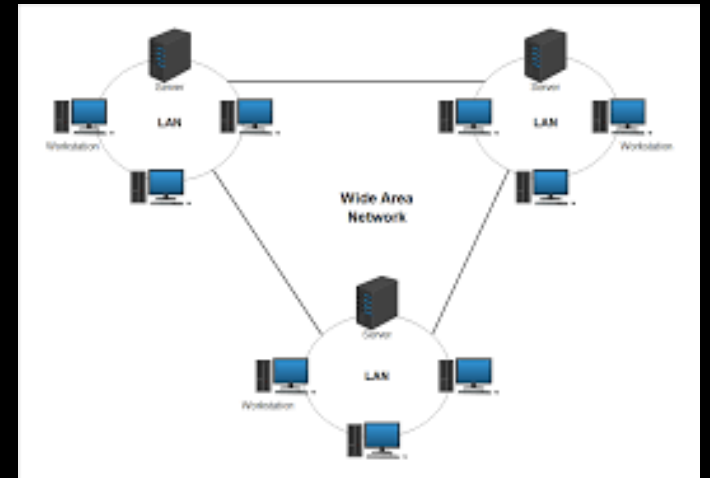


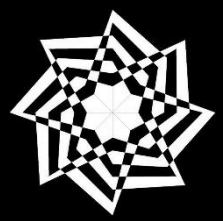




# WAN (Wide Area Network)

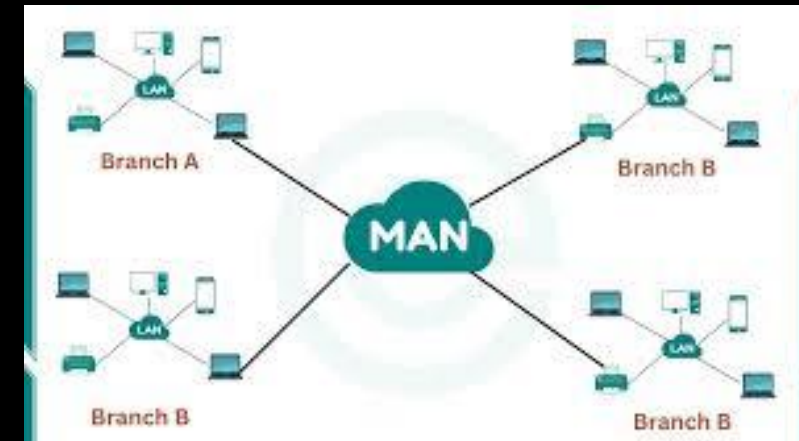
- WAN stands for Wide Area Network – a network that connects computers and devices over a large geographical area, such as cities, states, or countries.
- Key Features of WAN:
  - Covers a very large area, even globally.
  - Connects multiple LANs and MANs together.
  - Data travels over public networks like telephone lines, fiber optics, or satellites.
  - Generally slower and more expensive than LAN.
  - The Internet is the largest and most common example of a WAN.
- Examples:
  - Internet
  - A company's offices in different cities connected via private WAN

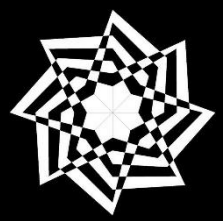




# MAN (Metropolitan Area Network)

- MAN stands for Metropolitan Area Network – a network that connects computers and devices across a city or large campus.
- Key Features of MAN:
  - Covers a larger area than LAN but smaller than WAN (like a city or town).
  - Often used to connect multiple LANs in schools, colleges, or government offices.
  - Uses high-speed cables or wireless connections like fiber optics.
  - Usually owned and maintained by an organization or city authority.
  - Useful for sharing resources and communication within a metro area.
- Examples:
  - University campus network spread across multiple buildings
  - Cable TV or city-wide internet services

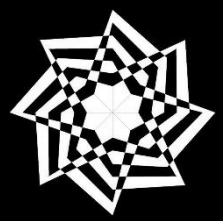




# PAN (Personal Area Network)

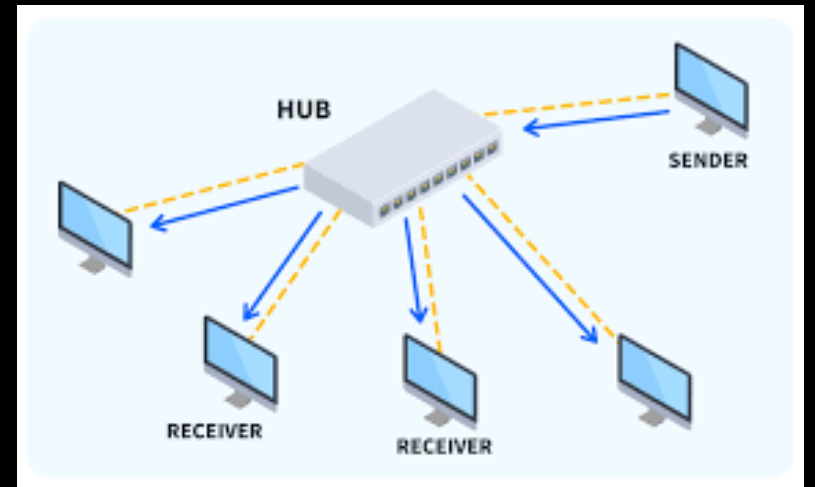
- PAN stands for Personal Area Network – a small network used to connect personal devices within a short range, typically around 10 meters.
- Key Features of PAN:
  - Connects devices like smartphones, laptops, tablets, and smartwatches.
  - Used for data transfer, file sharing, or internet tethering.
  - Can be wired (USB) or wireless (Bluetooth, Wi-Fi Direct).
  - Very easy to set up and used for individual or personal use only.
  - Has a limited range and is not suitable for larger networks.
- Examples:
  - Bluetooth connection between phone and wireless headphones
  - Wi-Fi hotspot from a mobile phone to laptop

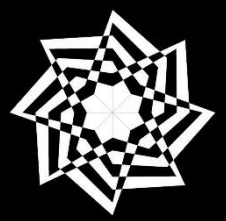




# Network Hub

- A network hub is a basic networking device that connects multiple computers or devices in a Local Area Network (LAN) and transmits data to all connected devices.
- Key Features of Network Hub:
  - Acts as a central connection point in a LAN.
  - Broadcasts data to all devices, whether they need it or not.
  - Works at the physical layer (Layer 1) of the OSI model.
  - It is simple and inexpensive, but not efficient.
  - Rarely used today – replaced by smarter devices like switches.
- Example:
  - In a small office, a hub might connect 4–5 computers to share data and internet.





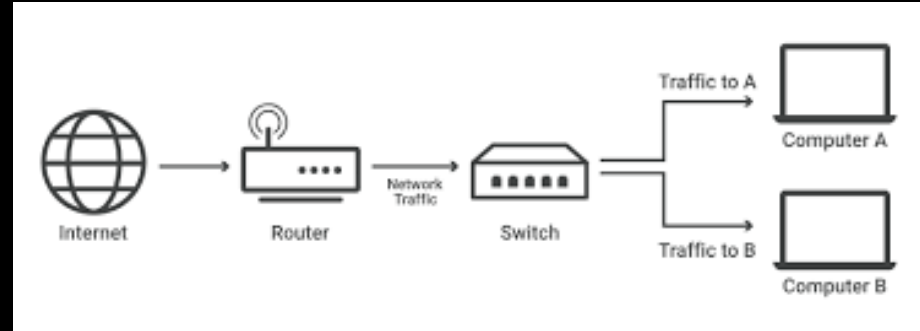
# Types of Network Hubs

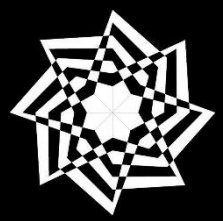
- Passive Hub – Simply connects devices and passes signals without any processing.
- Active Hub – Amplifies and regenerates signals before forwarding to devices.
- Intelligent Hub – Monitors network traffic and can manage data like a basic switch.



# Network Switch

- A network switch is a device that connects multiple devices in a LAN and forwards data only to the intended device, making communication faster and more efficient.
- Key Features of Network Switch:
  - Works at the Data Link Layer (Layer 2) of the OSI model.
  - Learns MAC addresses of connected devices to send data precisely.
  - Unlike a hub, it does not broadcast to all devices.
  - Improves network performance and reduces traffic.
  - Commonly used in homes, schools, offices, and data centers.

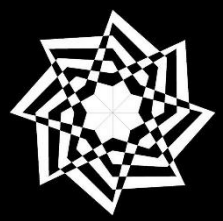




# Router

- A router is a networking device that connects multiple networks together and directs data between them, such as between a home network and the Internet.
- Key Features of Router:
  - Works at the Network Layer (Layer 3) of the OSI model.
  - Routes data between different networks, not just within one network.
  - Assigns IP addresses and manages network traffic.
  - Can be wired or wireless (Wi-Fi router).
  - Commonly used to connect devices to the internet in homes and offices.



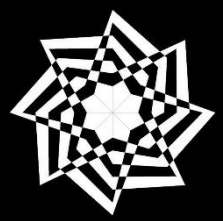


# Wi-Fi (Wireless Fidelity)

- Wi-Fi is a wireless networking technology that allows devices like smartphones, laptops, and tablets to connect to the internet or a local network without using cables.
- Key Features of Wi-Fi:
  - Uses radio waves to transmit data wirelessly.
  - Requires a Wi-Fi router or hotspot to create a wireless network.
  - Commonly used in homes, schools, offices, and public places.
  - Supports multiple devices at once with a limited range (usually 30–100 meters).



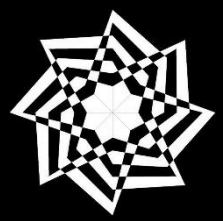




# Bluetooth

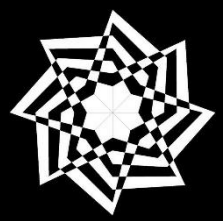
- Bluetooth is a short-range wireless technology that allows devices to communicate and exchange data over short distances (typically up to 10 meters).
- Key Features of Bluetooth:
  - Used to connect phones, headsets, speakers, laptops, smartwatches, etc.
  - Consumes low power and does not require internet.
  - Ideal for personal area networks (PAN).
  - Commonly used for file sharing, audio streaming, and input device connections (like wireless keyboard/mouse).





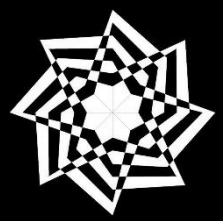
# Desktop View of Windows Operating System





# Desktop View of Windows Operating System

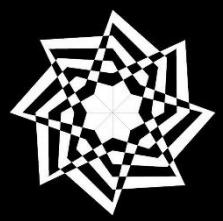
- The Desktop is the main screen you see after logging into the Windows Operating System. It acts like your digital workspace where you can access files, folders, and applications.
- Key Elements of the Windows Desktop (computer's **home screen**):
  - Desktop Background (Wallpaper): The image or color that appears in the background of your screen.
  - Icons: Small pictures on the desktop that represent files, folders, apps, or shortcuts (e.g., This PC, Recycle Bin).
  - Taskbar (Bottom Bar): Located at the bottom of the screen; shows open programs, time, Start Menu, and system tray.
  - Start Menu: Accessed by clicking the Windows icon, it provides access to all installed apps, settings, and shutdown options.
  - System Tray (Notification Area): On the right side of the taskbar; shows the clock, battery, volume, internet status, and background app icons.



# This Computer (also known as This PC in newer Windows versions)

- "This Computer" is a desktop icon in the Windows operating system that allows users to access and manage their computer's storage and connected devices.
- Key Features of "This Computer":
  - Shows all local drives (C:, D:), DVD drives, and connected USB devices.
  - Lets you access folders like Documents, Downloads, Pictures, Music, etc.
  - Provides options to check storage space, rename drives, or manage properties.
  - Useful for navigating files, copying/moving data, and accessing system details.
  - "This Computer" helps you explore everything stored on your computer — like a file manager.





# Recycle Bin

- The Recycle Bin is a special folder on the Windows desktop where deleted files and folders are temporarily stored.
- Key Features of Recycle Bin:
  - When you delete a file, it goes to the Recycle Bin instead of being permanently removed.
  - You can restore accidentally deleted files from it.
  - You can also permanently delete files by emptying the Recycle Bin.
  - Helps prevent accidental data loss by acting as a safety net.
  - The Recycle Bin holds deleted items until you decide to remove them forever or restore them.

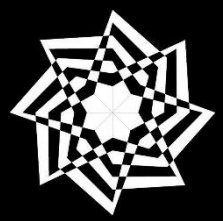


Recycle Bin



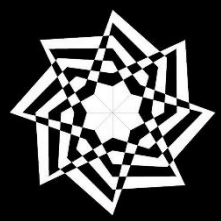
# Working with Files and Folders in Windows

- In Windows, files are documents or data (like photos, music, or Word files), and folders are containers that help organize those files.
- Common File and Folder Operations:
  - Create
  - Right-click → New → File/Folder
  - Used to store documents, images, or organize data.
- Rename
  - Right-click → Rename
  - Helps you give files/folders meaningful names.
- Move or Copy
  - Drag and drop or use Cut/Copy and Paste to move/copy to a different location.

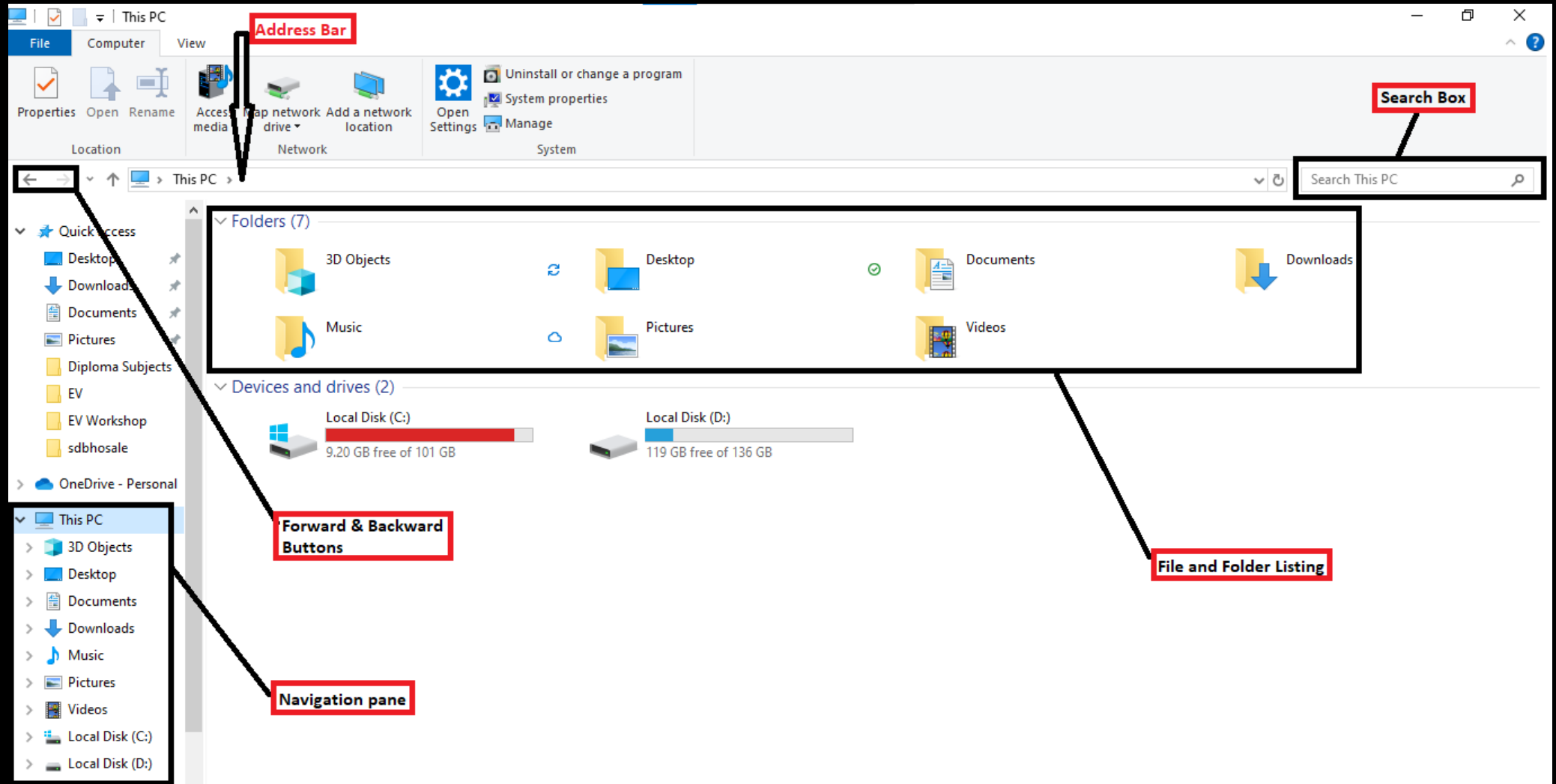


# Working with Files and Folders in Windows

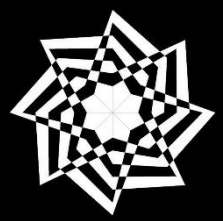
- Delete
  - Press Delete key or right-click → Delete
  - Goes to Recycle Bin unless permanently deleted.
- Search
  - Use the search bar to quickly find files or folders by name or type.
- Open
  - Double-click to open files/folders using the default program.
- Files are your work, and folders are where you keep your work organized. You can create, open, rename, move, copy, delete, and search them easily in Windows.



# This PC

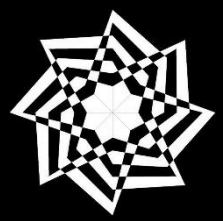






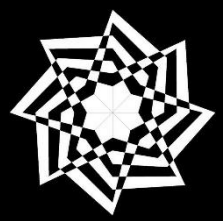
# Organizing Folder Data in Windows

- Organizing data in folders helps you keep your files neat, easy to find, and efficiently managed.
- **Keep your files in the right folders with clear names**, so you can find them easily when needed.
- Tips for Organizing Folder Data:
  - Create Folders and Subfolders : Group files by subject, project, or file type (e.g., "School Work > Maths", "Photos > 2025").
  - Use Meaningful Names : Name folders and files clearly (e.g., "Resume\_2025.docx" or "Sem5\_Project").
  - Sort and Group Files :
    - Use Windows options to sort by name, date, type, or size.
    - Group files (View → Group by → Type/Date/etc.).
  - Use Tags or Comments (if supported) : Add descriptions or labels to identify files quickly.
  - Regular Cleanup : Delete unwanted files and move useful ones to the correct folders.



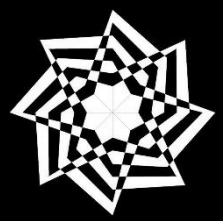
# Drive, Folder and File

- 1. Drive
  - A drive is a storage space on your computer where all your data is saved.
  - Examples: C: drive (system), D: drive (data), USB drive, DVD drive.
- 2. Folder : A folder is like a digital container used to organize files and keep related things together.
  - Example: Folder named "College Notes" can contain many subject files.
- 3. File : A file is a single unit of information like a document, image, song, or video.
  - Example: Assignment.docx, Photo.jpg, Song.mp3



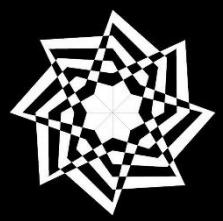
# Copy a File or Folder in Windows

- Copying a file or folder means creating a duplicate of it in another location without removing the original.
- Steps to Copy:
  - Select the file or folder you want to copy.
  - Right-click on it and choose "Copy" from the menu.
  - Go to the destination folder or drive where you want to place the copy.
  - Right-click there and choose "Paste".
- ✎ Shortcut Keys:
  - Ctrl + C → Copy
  - Ctrl + V → Paste



# Renaming Files and Folders in Windows

- Renaming means changing the name of a file or folder to something more meaningful or updated.
- Steps to Rename:
  - Right-click on the file or folder.
  - Click on “Rename” from the menu.
  - Type the new name.
  - Press Enter to save the new name.
- ✦ Shortcut Method:
  - Select the file/folder and press F2 → Type new name → Press Enter.



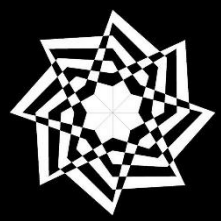
# Deleting Files and Folders in Windows

- Deleting means removing a file or folder from its location. It usually goes to the Recycle Bin unless permanently deleted.
- Steps to Delete:
  - Right-click on the file or folder.
  - Select "Delete" from the menu.
  - The item is moved to the Recycle Bin.
- ✎ Shortcut Key:
  - Select the file/folder and press Delete key on the keyboard.
- ⚠ To delete permanently:
  - Press Shift + Delete → Skips Recycle Bin (Be careful — can't undo easily!)



# Searching Files and Folders in Windows

- Searching helps you quickly find files or folders on your computer by name, type, or content.
- How to Search:
  - Click on the Search Bar : Located on the taskbar (bottom-left) or in File Explorer (top-right).
  - Type the file/folder name : Example: Resume.docx or Photos.
  - View results : Windows will show matching files, folders, or apps.
- ✦ Tips:
  - You can search by file type (e.g., \*.pdf, \*.jpg)
  - You can also search inside folders using the search box in File Explorer.
- Example:
  - To find a photo named Vacation.jpg, just type "Vacation" in the search bar.



# Creating a Shortcut of an Application on the Desktop (Windows)

- A shortcut is a quick link to open an application without searching for it each time.
- Steps to Create a Shortcut on Desktop:
  - Click Start Menu and find the app (e.g., Calculator, MS Word).
  - Right-click on the app → Choose "Open file location" (if available).
  - In the folder that opens, right-click the app icon → Click "Send to" → "Desktop (create shortcut)".
  - A shortcut icon will appear on your desktop screen.
- Alternative Way (Drag and Drop): Drag the app from Start Menu to the Desktop — it automatically creates a shortcut.
- Example: Creating a shortcut for MS Word on the desktop lets you open it with just one double-click.

--- The End ---