

Types of Computers According to Functionality

Computers are classified according to their functionality into three main types:

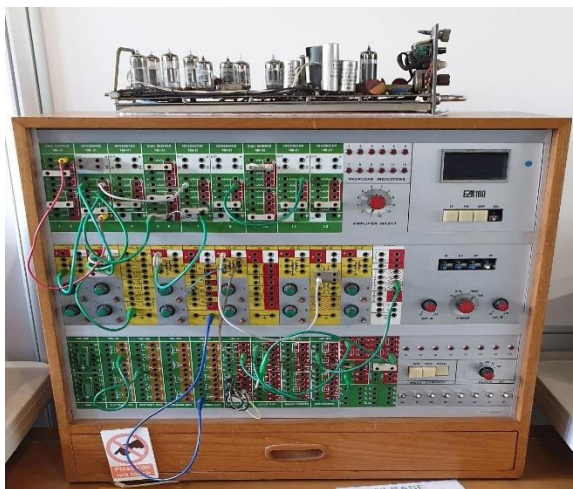
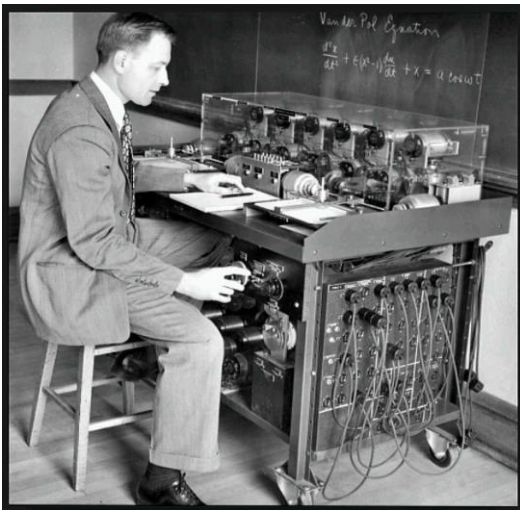
1. Analog Computers
2. Digital Computers
3. Hybrid Computers

Each type processes data differently and is used for different purposes.

Definition: An analog computer is a computer that works with continuous data, such as temperature, speed, pressure, and voltage.

It measures physical quantities and represents them through continuously changing signals.

1. Analog Computer



Characteristics:	Examples	Uses:
1. Works with continuous data. 2. Measures physical quantities. 3. Provides results that may be approximate. 4. Commonly used in scientific and industrial applications.	1. Thermometer-based measurement systems 2. Speedometers in vehicles 3. Analog flight instruments 4. Analog process-control systems	1. Measuring temperature and pressure. 2. Monitoring the speed of vehicles. 3. Controlling industrial machinery. 4. Studying physical processes.

Example in daily life: An analog speedometer shows a vehicle's speed using a moving needle on a dial.

Advantages:

- Useful for measuring continuous physical quantities.
- Can provide quick results in specialized applications.
- Useful for real-time monitoring and simulation.

Disadvantages:

- Results may be less precise than those of digital computers.
- Difficult to store and reproduce results accurately.
- Less flexible for general-purpose computing.

2. Digital Computer

Definition: A digital computer is a computer that processes data in the form of discrete values, usually represented by binary digits (0 and 1).

It performs arithmetic and logical operations to process information and produce results.



Characteristics:	Examples	Uses:
1. Works with discrete data. 2. Uses binary digits (0 and 1). 3. Produces accurate and reliable results when given correct data and instructions. 4. Can store large amounts of information. 5. Performs calculations and processes information at high speed.	1. Desktop computers 2. Laptop computers 3. Smartphones 4. Digital calculators 5. Servers	6. Education and online learning. 7. Banking and business. 8. Communication and entertainment. 9. Data processing and record keeping. 10. Scientific calculations

Example in daily life: A laptop processes documents, performs calculations, stores files, and connects to the internet using digital data.

Advantages:

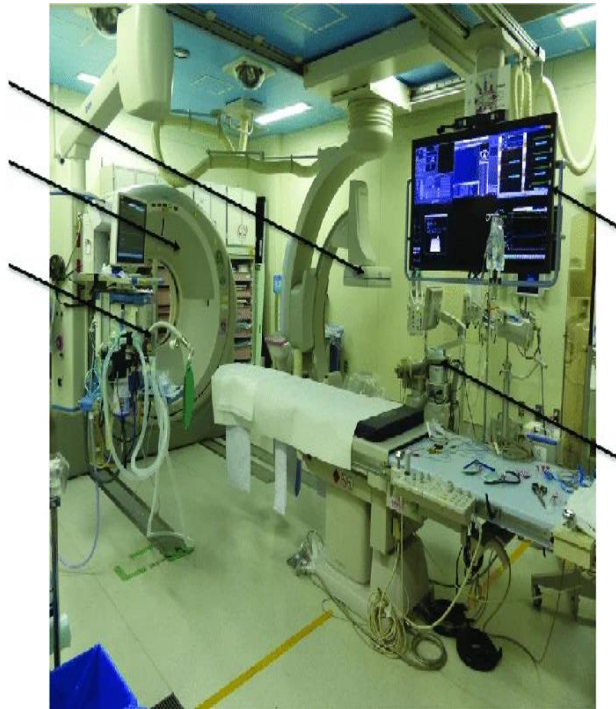
- High accuracy when properly programmed.
- Can store large amounts of data.
- Fast processing speed.
- Easy to program for different tasks.
- Suitable for many different applications.

Disadvantages:

- Requires electrical power.
- Hardware and software can be expensive.
- Data processing depends on programmed instructions.

3. Hybrid Computer

Definition: A hybrid computer combines the features of analog and digital computers. It can measure continuous physical data and use digital processing to analyze, store, or display the results.



Characteristics:	Examples	Uses:
1. Combines analog and digital technologies. 2. Measures continuous physical quantities. 3. Processes and presents data digitally. 4. Is useful when real-time measurement and accurate data processing are required.	1. Patient-monitoring systems in hospitals. 2. Industrial process-control systems. 3. Certain aircraft monitoring and control systems. 4. Specialized scientific measurement systems.	1. Monitoring a patient's heartbeat, blood pressure, and oxygen level. 2. Controlling industrial processes. 3. Monitoring and controlling physical systems. 4. Collecting and analyzing scientific measurements.

Example in daily life: A hospital patient-monitoring system receives signals from sensors, processes the measurements, and displays readings such as heart rate and oxygen saturation on a digital screen.

Advantages:

- Combines continuous measurement with digital processing.
- Useful for real-time monitoring.
- Can provide accurate measurements and rapid analysis when properly designed.

Disadvantages:

- Can be expensive to design and maintain.
- Requires specialized hardware and software.
- More complex than many ordinary digital systems.

Feature	Analog Computer	Digital Computer	Hybrid Computer
Data type	Continuous	Discrete	Both continuous and discrete
Working principle	Measures physical quantities	Processes binary data	Combines analog measurement and digital processing
Results	Often approximate	Usually precise, depending on input and system	Depends on measurement and processing accuracy
Examples	Analog speedometer	Laptop, desktop	Patient-monitoring system
Main use	Measurement	Calculation and data processing	Measurement and digital analysis

Conclusion

Computers according to functionality are divided into three main types: analog, digital, and hybrid computers. Analog computers handle continuous physical quantities, digital computers process discrete data, and hybrid computers combine the features of both. These computers are used in different fields according to their requirements.

Types of Computers According to Size

Computers are classified according to their size, processing power, storage capacity, and number of users they can support. Traditionally, computers are divided into **four main types according to size**:

1. Supercomputers
2. Mainframe computers
3. Minicomputers
4. Microcomputers

1. Supercomputer

Definition: A supercomputer is one of the largest and most powerful types of computers. It can perform an enormous number of calculations in a very short time.



Characteristics:	Examples:	Uses:
1. Has extremely high processing speed. 2. Can process huge amounts of data. 3. Requires specialized cooling and a large amount of electrical power. 4. Is expensive to build and maintain. 5. Is used for complex scientific and mathematical calculations.	1. Frontier — used for scientific research and simulations. 2. Fugaku — used for scientific and computational research. 3. Summit — used for scientific research and data analysis.	1. Weather forecasting 2. Climate research 3. Space exploration 4. Nuclear and physics simulations 5. Medical and scientific research

Example in daily life: Meteorologists use supercomputer simulations to help predict storms, rainfall, and other weather conditions.

2. Mainframe Computer

Definition: A mainframe computer is a large, powerful computer designed to process huge amounts of data and support many users or transactions simultaneously.

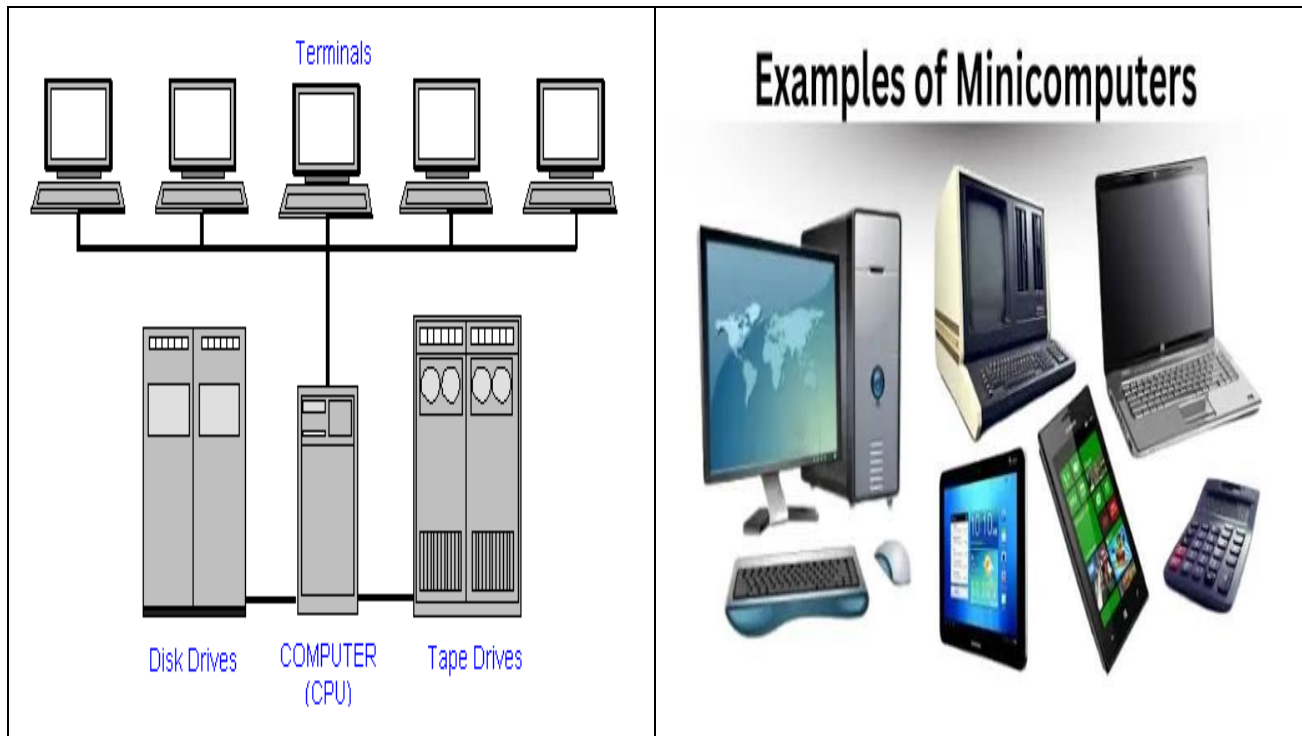


Characteristics:	Examples:	Uses:
1. Supports many users at the same time. 2. Provides high reliability and security. 3. Handles large volumes of transactions. 4. Has substantial memory and storage capacity. 5. Is commonly used by large organizations.	1. IBM z16 2. IBM z17	1. Banking systems 2. Airline reservation systems 3. Government databases 4. Insurance companies 5. Large business transaction processing

Example in daily life: When thousands of customers withdraw money from ATMs, a bank's mainframe system may process and manage the associated transactions.

Minicomputer

Definition: A minicomputer is a mid-sized computer that was traditionally more powerful than a personal computer but smaller than a mainframe. It was often used by departments and medium-sized organizations to support multiple users.



Characters tics	Examples:	Uses:
1. Medium processing capacity compared with traditional mainframes. 2. Supports multiple users. 3. Can perform several tasks simultaneously. 4. Generally smaller and less expensive than mainframes. 5. Was commonly used in laboratories, factories, and business departments.	1. PDP-11 2. VAX-11/780	1. Industrial process control 2. Laboratory research 3. Departmental data processing 4. Educational institutions 5. Business operations

Example in daily life: A traditional minicomputer could be used in a factory to monitor production equipment and manage data for several departments.

Note: Minicomputers are largely a historical category. Many of their roles are now performed by servers and other modern computer systems.

Microcomputer

Definition: A microcomputer is a small computer built around a microprocessor. It is generally designed for use by one person at a time, although it can also communicate with networks and shared systems.

 		
Characteristics	Example	Uses
• Small in size. • Usually less expensive than mainframes and supercomputers. • Easy to use and maintain. • Suitable for personal, educational, and business tasks. • Available in portable and non-portable forms.	1. Desktop computer 2. Laptop 3. Tablet 4. Smartphone 5. Single-board computer, such as the Raspberry Pi	1. Education and online learning 2. Office work 3. Internet browsing 4. Gaming and entertainment 5. Programming and communication

Example in daily life: A student uses a laptop to prepare assignments, attend online classes, create presentations, and browse educational websites.

Types of Microcomputers

1. Desktop computer



A computer designed to stay on a desk. It is commonly used in offices, schools, and homes.

2. Laptop computer



A portable computer with a built-in screen, keyboard, and battery.

3. Tablet computer



A portable computer operated mainly through a touchscreen.

4. Smartphone

A
and



handheld computing device used for communication, internet access, apps, many other tasks.

Comparison of Computers According to Size

Type	Relative size and power	Number of users	Example
Supercomputer	Extremely powerful	Many users or jobs	Frontier
Mainframe	Very powerful for large-scale transactions	Many users	IBM z16
Minicomputer	Medium-sized in the traditional classification	Multiple users	PDP-11
Microcomputer	Small, personal-use computer	Usually one user at a time	Laptop

Conclusion :- Computers according to size are traditionally classified into four types:

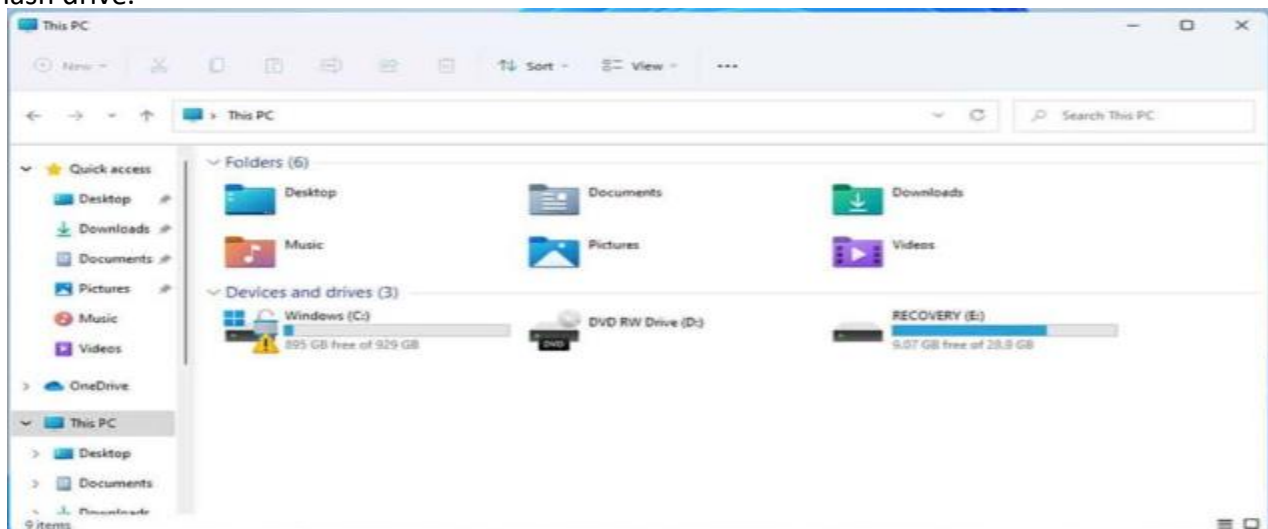
- **Supercomputer:** Used for complex scientific calculations.
- **Mainframe computer:** Used for large-scale data processing, such as banking.
- **Minicomputer:** Traditionally used by departments and medium-sized organizations.
- **Microcomputer:** Used by individuals for everyday tasks, such as studying and office work.

Practicals

What Is File Manager in Windows?

A File Manager is a program that helps you view, organize, find, copy, move, rename, and delete files and folders on your computer.

In Windows 10 and Windows 11, the file manager is called File Explorer. For example, you can use File Explorer to find a photo, open a document, organize your study materials, or copy files to a USB flash drive.



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How to Open File Explorer

Method 1: Using the taskbar

Click the yellow folder icon on the taskbar.

Method 2: Using the keyboard

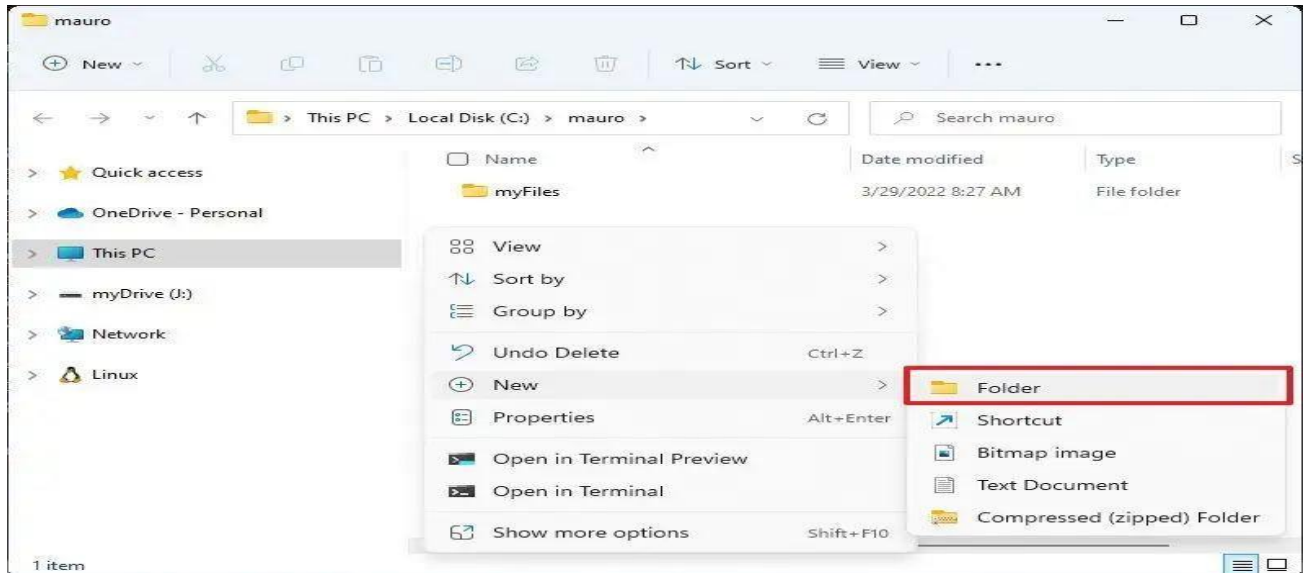
Press **Windows key + E** together. This is the quickest method.



The main parts of File Explorer are:

- **Navigation pane:** The left side, where you can access Home, Desktop, Downloads, Documents, and other locations.
- **Address bar:** Shows the location of the folder you are currently viewing.
- **Search box:** Helps you find files and folders.
- **Main area:** Displays the files and folders in the selected location.
- **Toolbar:** Contains commands such as New, Copy, Paste, Rename, Share, and Delete.
- **This PC:** Shows your computer's storage drives, such as Local Disk (C:).

3. Basic Operations in File Explorer

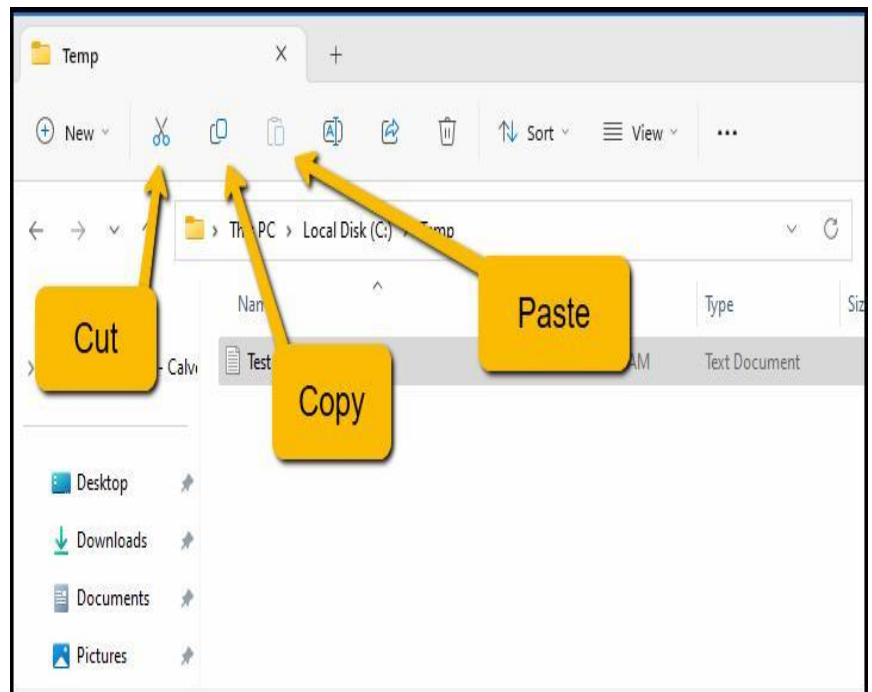


A. Create a folder

1. Open File Explorer.
2. Open Documents or Desktop.
3. Click **New** → **Folder**.
4. Type a name, such as My Work, and press Enter.

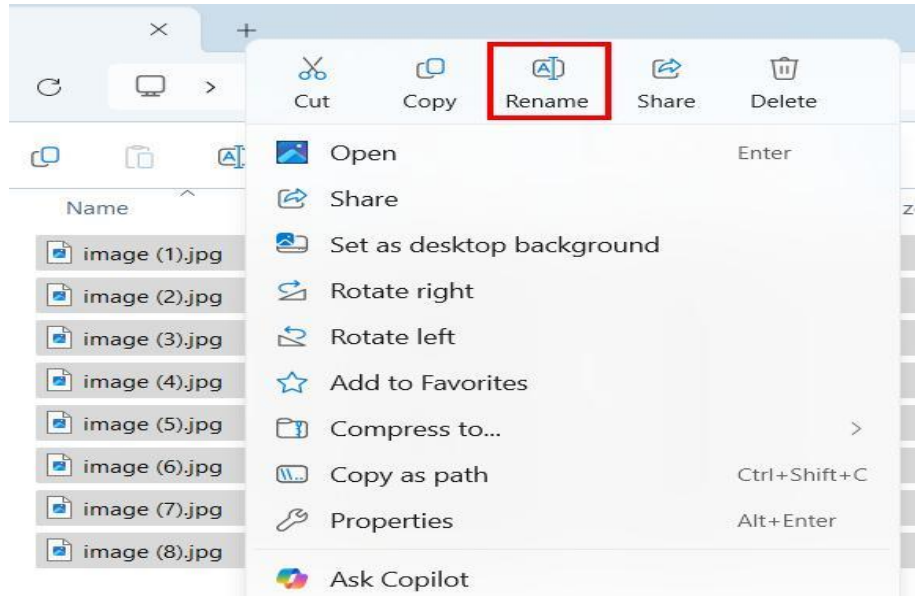
B. Copy and paste a file

1. Select a file.
2. Press **Ctrl + C** to copy it.
3. Open the destination folder.
4. Press **Ctrl + V** to paste a copy.



C. Rename a file

1. Select the file.
2. Press **F2**.
3. Type the new name.
4. Press Enter.

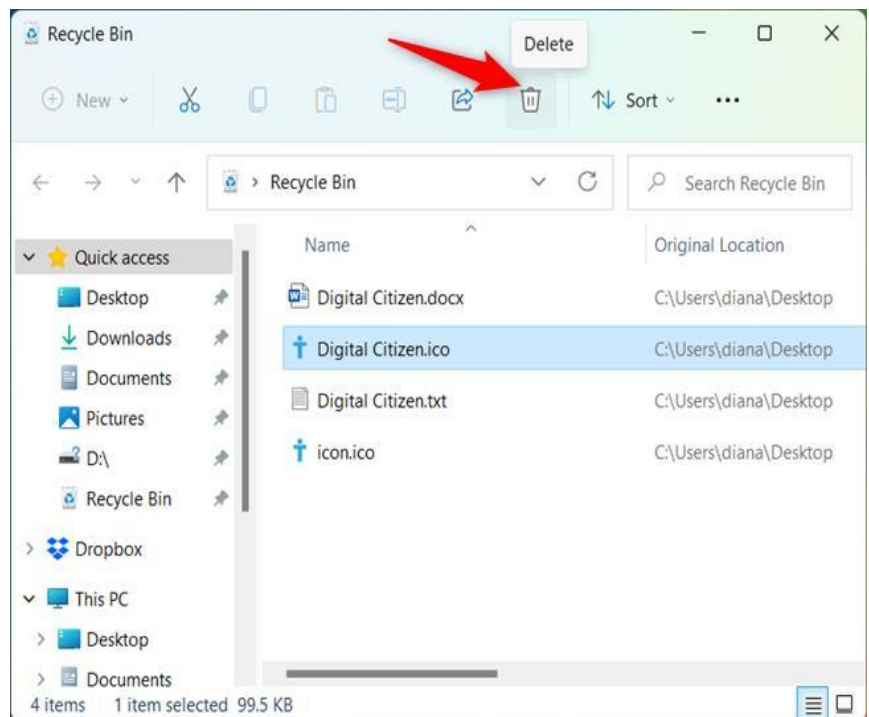
**D. Delete a file**

1. Select the file.
2. Press **Delete**.
3. Confirm if prompted.

Usually, the file moves to the Recycle Bin, where you may be able to restore it.

E. Search for a file

1. Open File Explorer.
2. Navigate to the folder or drive you want to search.
3. Type the file name in the search box at the top right.
4. Wait for the matching results.



4. Important Keyboard Shortcuts

Shortcut	Function
Win + E	Open File Explorer
Ctrl + C	Copy
Ctrl + X	Cut (prepare to move)
Ctrl + V	Paste
Ctrl + A	Select all
F2	Rename a selected file
Delete	Delete a selected item
Ctrl + Z	Undo the last action
Alt + Left Arrow	Go back to the previous location

Exercise

Theory Questions.

1. How many types of computers according to size.
2. Which types of computers commonly use in real life?
3. Difference between the data and information.
4. What is difference between the analog and digital computers?

Practical Questions.

1. How to create folder in windows operating system.
2. How to check file types in file explorer.

Objective and MCQs:

1. What is the file manager in Windows called
 - a) Task Manager
 - b) File Explorer
 - c) Control Panel
 - d) Disk manager
2. Which shortcut opens File Explorer?
 - a) CTRL+R
 - b) ALT + E
 - c) Window key + E
 - d) Ctrl+ V
3. What is a folder used for?
 - a) Organizing files
 - b) Turning off the computer
 - c) Connecting to the internet
4. Which shortcut key for use select all files?
 - a) Ctrl + V
 - b) Ctrl + C
 - c) Ctrl + A
 - d) Alt + A
5. Which shortcut key for use Undo?
 - a) Ctrl + P
 - b) Alt + U
 - c) Ctrl + U
 - d) Ctrl + Z