الكلية التقنية الهندسية/ الحويجة
قسم هندسة تقنيات البناء والانشاءات

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Computer Principles

Computer Principles

1- Introduction to Computer.
2- Computer Components
3- Operating System and Graphical User Interface GUI
4- Word Processing.
5- Spread Sheet.
6- Presentation Software.
7- Introduction to Internet and Web Browsers.
8- Communications and Emails.
9- Computer Troubleshooting

1- Introduction to Computer.

What is a Computer?

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

An example of computer system is a calculator.

1- Introduction to Computer.

Functionalities of a computer

Any digital computer carries out five functions in total:

1- Takes data as input.

2-Stores the data/instructions in its memory and use them when required.

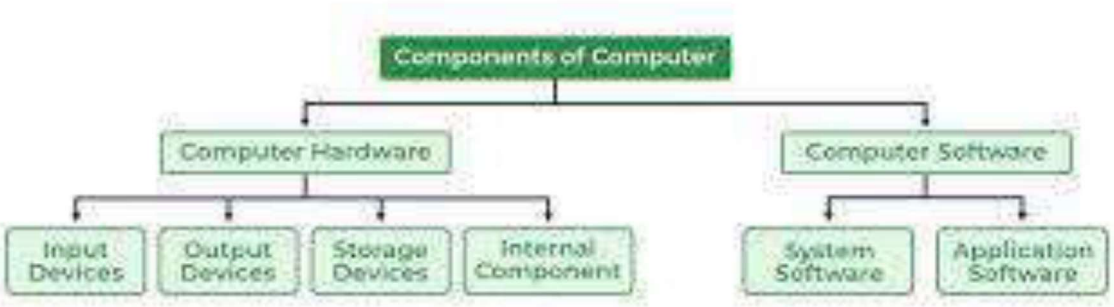
3- Processes the data and converts it into useful information.

4- Generates the output.

5- Controls all the above four steps. .

Computer Components

Any kind of computers consists of Hardware And Software.



Computer Components

Any kind of computers consists of Hardware And Software.

1-Hardware:

Computer hardware is the collection of physical elements that constitutes a computer system. Computer hardware refers to the physical parts or components of a computer **such as** the monitor, mouse, keyboard, computer data storage, hard drive disk (HDD), system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical objects that can be touched.

Computer Components

Any kind of computers consists of Hardware And Software.

1-Hardware:

A- Input Devices:

Input device is any peripheral (piece of computer hardware), Most common are keyboard ,mouse that input data to the computer system.

Examples of Manual Input Devices

Keyboard ,Numeric Keypad, Pointing Device ,Remote Control

Joystick ,Touch Screen ,Scanner ,Graphics Tablet,

Microphone ,Digital Camera ,

Webcams ,Light Pens .



Computer Components

Any kind of computers consists of Hardware And Software.

1-Hardware:

B -Central Processing Unit (CPU): -

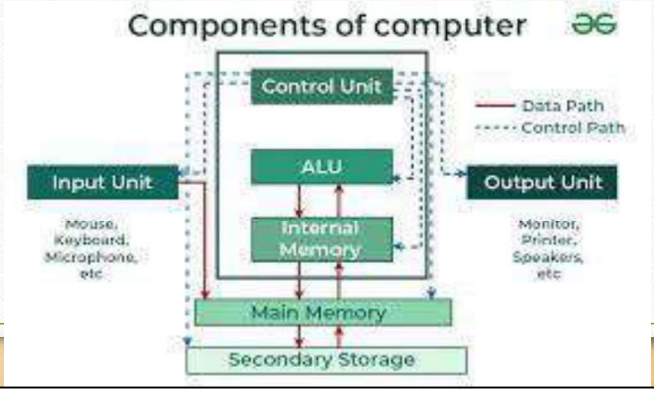
A CPU is brain of a computer. It is responsible for all functions and processes. the CPU is the most important element of a computer system.

Primary Memory:

1-RAM:

2. ROM

Secondary Memory:



Primary Memory:-

1-RAM: Random Access Memory (RAM) the memory of the computer system responsible for storing data on a temporary basis, so that it can be accessed by the processor when needed. It is volatile in nature, which means that data will be erased once supply to the storage device is turned off

2. ROM (Read Only Memory): ROM is a permanent form of storage. ROM stays active regardless of whether power supply to it is turned on or off. ROM devices do not allow data stored on them to be modified.

Secondary Memory: -

It's the storage of the computer that Stores data and programs permanently: it is retained after the power is turned off; it has many types like Hard Disk Drive (HDD).

Computer Components

Any kind of computers consists of Hardware And Software.

1-Hardware:

C- Output Device: A piece of equipment/hardware which gives out the result of the entered input, once it is processed.

An output device is any piece of computer hardware equipment used to show the results of data processing carried out by a computer.

Electronic screen, GPS. ,Headphones, Monitor, Optical mark reader, Printer..



Common Output Devices of Computer

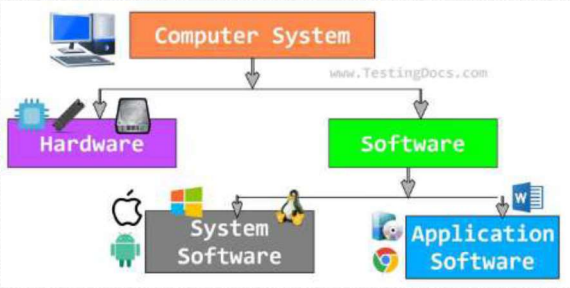
Computer Components

Any kind of computers consists of Hardware And Software.

2-Software

Software: is a generic term for organized collections of computer data and instructions, it has two types,

A- System Software
like Microsoft Windows
B- Application Software
like Adobe Photoshop.



Computers classification

Computers can be generally classified by size and power as follows, though there is Considerable overlap:

1- Personal computer: A small, single-user computer based on a microprocessor.



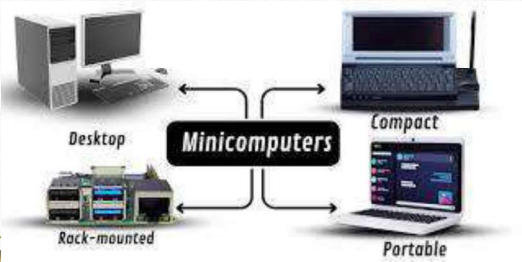
2-Workstation: A powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and a higher-quality monitor.



Computers classification

Computers can be generally classified by size and power as follows, though there is Considerable overlap:

3- Minicomputer: A multi-user computer capable of supporting from 10 to hundreds of users simultaneously.



Computers classification

Computers can be generally classified by size and power as follows, though there is Considerable overlap:

4- Mainframe: A powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously.



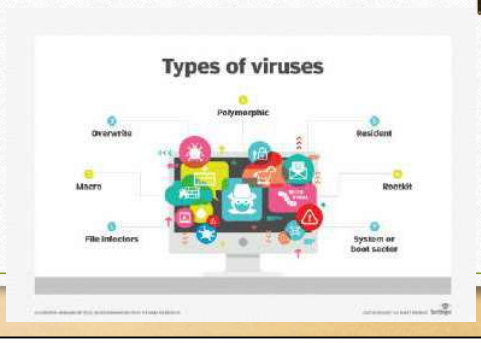
5- Supercomputer: An extremely fast computer that can perform hundreds of millions of instructions per second. .



Computer Viruses

Viruses: A virus is a small piece of software that attach itself to a real program and aim to harm to the computer system. For example, a virus might attach itself to a program such as a spreadsheet program. Each time the spreadsheet program runs, the virus runs too, and it has the chance to reproduce (by attaching to other programs).





Computer Viruses

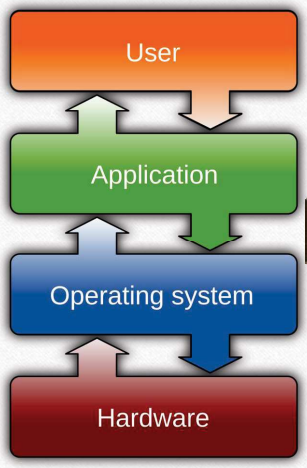
What are some tips to avoid viruses and lessen their impact?

- ❑ Install anti-virus software and Update it and use it regularly.
- ❑ Make sure you back up your data.



Operating System (OS):

The operating system is a program that installed on a computer to manage the hardware and the software components.



The three most common operating systems for personal computers are :
Microsoft Windows, Apple Mac OS X, and Linux.

Graphical User Interface (GUI):

Modern operating systems use a graphical user interface, or GUI (pronounced gooey).
A GUI lets you use your mouse to click icons, buttons, and menus.
Before GUIs, computers had a command-line interface, which meant users had to type every single command to the computer and the computer would only display text.

graphical user interface (GUI), a computer program that enables a person to communicate with a computer through the use of symbols, visual metaphors, and pointing devices







Windows 10 :



Windows 10 is a personal computer operating system produced by Microsoft. It is the successor to Windows 8.1 and was released in 2015.

An operating system allows your computer to manage software and perform essential tasks. It is also having a Graphical User Interface (GUI) that allows you to visually interact with your computer's functions in a logical, fun, and easy way.



The first screen appears after you turn on the power of computer is the welcome screen followed by a password screen if there is one.

The Desktop is the main Windows 10 screen.

It is the work area where dialog boxes, windows, icons, and menus appear, the Windows 10 desktop contains item. can use to do your job. For instance, from your desktop, you can perform file-management tasks and run software applications. You can customize the appearance of the desktop to suit your preferences.

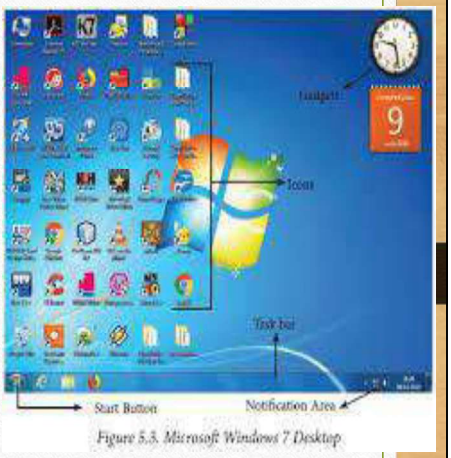
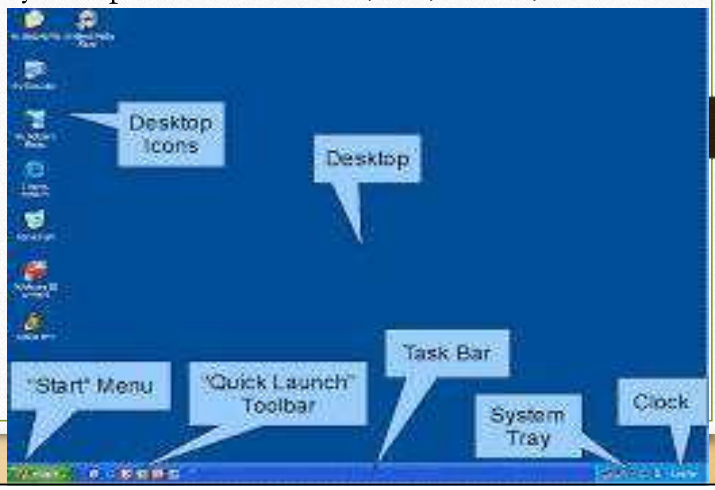


Figure 5.3. Microsoft Windows 7 Desktop

The Desktop Components

The desktop for Windows 10 consists of two main components.

1. Desktop that contains many components like icons, file, folder, shortcut. Etc.)
2. Task Bar



Desktop Components

Icons: An icon is a graphic image, a small picture or object that represents a file, program, web page, or command. Icons help you execute commands, open programs, or documents quickly. To execute a command by using an icon, click or double-click on the icon. It is also useful to quickly recognize an object in a browser list. For example, all documents using the same extension have the same icon.

Desktop Icons

The Desktop is where you'll find **icons (small pictures)** for many of your most **frequently used programs**. You'll most likely see icons for Computer, Documents, Recycle Bin, and Internet Explorer.

1. **Computer -** Allows you to see what drives are attached to your computer (for example, your local hard disk drive, your CD/DVD drives, any networked shared drives, and external drives, such as a USB flash drive). You can also view the files that are located on these drives.

Desktop Icons

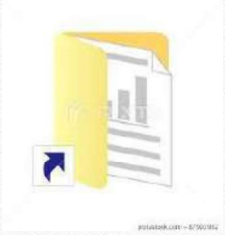
2- Documents - Supplies a 'catch-all' place for your personal files. Within here you can see your files, any shared files from other computer users and any music or pictures you may have stored. The Documents folder will sometimes be identified by your name instead of the word Documents.

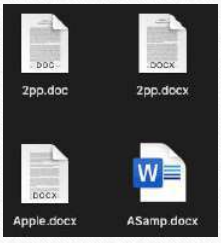
3- Recycle Bin - Stores any files you delete until you empty it.

4- Edge Browser - (in older windows' versions it was called internet explorer) is a web browser developed by Microsoft. It was first released for Windows 10 and Xbox One in 2015, then for Android and iOS in 2017.

We can classify icons as the following: Folder Icons, File Icons, Shortcut







All the data on your hard drive consists of files and folders. The basic difference between the two is that files store data, while folders store files and other folders.

. The folders, often referred to as directories, are used to organize files on your computer. The folders themselves take up virtually no space on the hard drive.

Files, on the other hand, is a collection of data. stored in one unit, identified by a filename. And filename period file extension can range from a few bytes to several gigabytes. They can be documents, programs, libraries, and other compilations of data.

File name consists of two parts, name, and extension.

Myfile.ext

file name period file extension

Examples:

Word	. docx
Excels	.xlsx
PowerPoint	. Ppt
AutoCAD	. dwg

A shortcut is a link that points to a program on the computer. Shortcuts allow users to create links to their programs in any folder, Start bar,

Taskbar, Desktop, or other locations

on their computer.

A shortcut in Windows is commonly identified

by a small arrow in the bottom corner of the icon.





What are the differences between a file, a folder, and a shortcut?

Icon **Operations**

Sort by

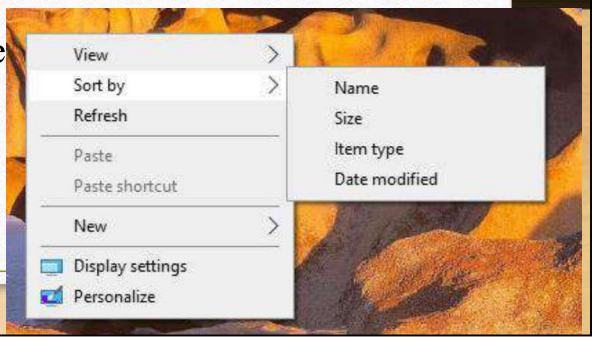
• Arrange Icons on the Desktop

To change the arrangement of icons on the desktop do the following

1 - Right Click the desktop

2- Click Sort by

3- Select one of the 4 options to arrange



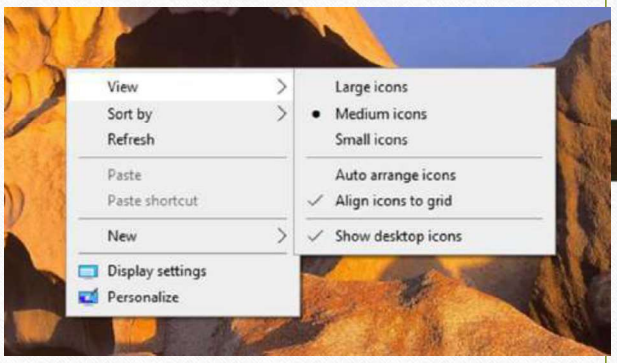
. View

Change Icon size

1- Right Click the desktop

2- Click View

3- Show the required size.



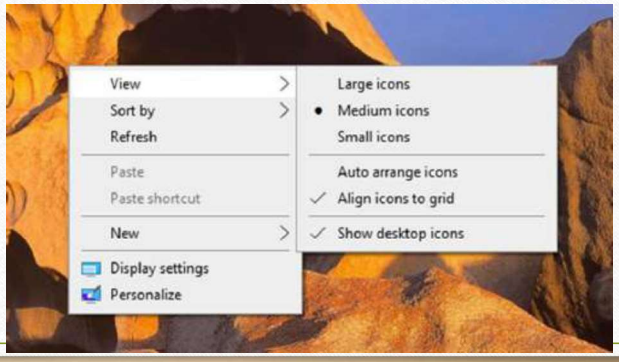
Auto Arrange Icon

1 - Right Click the desktop

2- Click View

3- Check to see if Auto Arrange has a check mark

4- If it does uncheck it



Start Menu Parts

The Start menu for Windows 10 consists of many Parts to show.

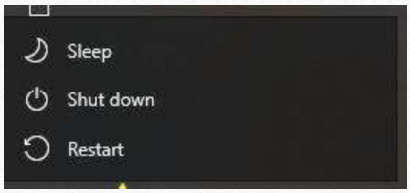


Use the Start menu to do these common activities:

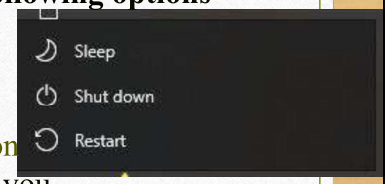
1. Start programs.
2. Open commonly used folders
3. Search for files, folders, and programs.
4. Adjust computer settings.
5. Get help with the Windows operating system.
6. Turn off the computer.
7. Log off from Windows or switch to a different user account.

Shutting Down the computer

The simplest and most basic method of closing Windows 10 is by using the Start Menu, which is the default option in the latest Microsoft operating system. To do this, first open the Start menu by clicking or tapping the Windows button on the bottom left corner of the screen. Then, click or tap the Power button. From the options that appear choose Restart to reboot the device or Shut down to shut it down completely.



Available **options appear in a pop-up box. Some or all the following options** appear:



1-Shut Down: closes any apps that are currently running.

2-Sleep: This option reduces the computer's power consumption without exiting Windows 10 or closing apps. As a result, when you wake the computer by moving the mouse or touching the screen or the keyboard, everything is exactly as you left it.

3-Restart: Temporarily shuts down Windows 10 and turns it on again. Use Restart when Windows 10 asks you to or when Windows 10 is misbehaving.

What are the differences between Shut Down, Sleep, and Restart?

Working with Windows

Whenever you open a program, file, or folder, it appears on your screen in a box or frame called a window (that's where the Windows operating system gets its name). Because windows are everywhere in Windows, it's important to understand how to move them, change their size, or just make them go away.

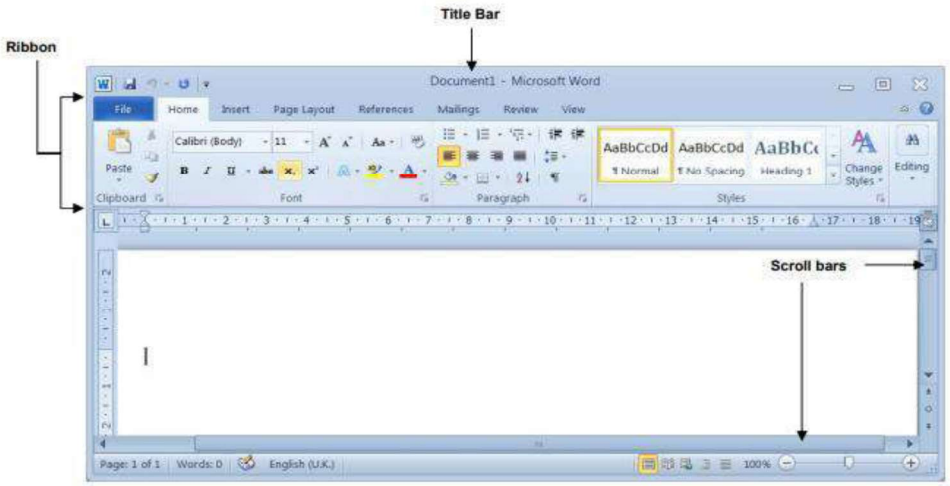
Although the contents of every window are different, all windows share some things in common. For one thing, windows always appear on the desktop - the main work area of your screen.

In addition, most windows have the same basic parts.

1- Title bar. Displays the name of the document and program (or the folder name if you're working in a folder).

2- Minimize, Maximize, and Close buttons. These buttons hide the window, enlarge it to fill the whole screen, and close it, respectively (more details on these shortly).

Some windows (e.g. MS Word) have a set of toolbars placed on several tabs referred to as the ribbon.



3-Menu bar, Contains items that you can click to make choices in a program.

4- Scroll bar. Let's you scroll the contents of the window to see information that is currently out of view.

5- Borders and corners. You can drag these with your mouse pointer to change the size of the window.

Moving a window

1-To move a window, point to its title bar with the mouse pointer. Then drag the window to the location that you want. (Dragging means pointing to an item, holding down the mouse button, moving the item with the pointer, and then releasing the mouse button.)

Changing the size of a window

2- To make a window fill the entire screen, click its Maximize button or double-click the window's title bar.

3- To return a maximized window to its former size, click its Restore button of the Maximize button). Or double-click the window's title bar.

Using the taskbar

The taskbar provides a way to organize all your windows. Each window has a corresponding button on the taskbar. To switch to another window, just click its taskbar button. The window appears in front of all other windows, becoming the active window-the one you're currently working in.

Using **Alt +Tab,** You can switch to the previous window by pressing Alt**+Tab,** or cycle through all open windows and the desktop by holding down Alt and repeatedly pressing Tab, Release Alt

• Using Aero Flip 3D. Aero Flip 3D arranges your windows in a three-dimensional stack that you can quickly flip through. To use Flip 3D, Hold down the Windows logo key & and press Tab to open Flip 3D. Dialog boxes





Working with file and folder

1. **Selecting**

•Single object: To select a single object, click on it once.

•Multiple object: There are several ways to select Multiple files or folders

•To select a consecutive group of files or folders, click the first item, press, and hold Shift key, and then click the last item.

•To select Multiple files or folders that are near each other, drag the mouse pointer to create. selection around the outside of all the items that you want to include.

•To select non-consecutive files or folders, press and hold down the Ctrl key, and then click each item that you want to select.

To select all the files or folders in a window, on the toolbar, click Organize, and then click Select all. If you want to exclude one or more items from your selection, press and hold down the Ctrl key, and then click the items.

Notes: After selecting files or folders, you can perform many common tasks, such as copying, deleting, renaming, printing, and compressing. Simply right click the selected items, and then click the appropriate choice.

Working with file and folder

2.Rename.
Click the file or folder to select it
Click the organize button on the toolbar, and then click Rename
•With the name highlighted, type a new name, or click to position **the** insertion point, and then edit the name.
• Press Enter.
Notes:
• Right-*click* the file or folder *you* want to rename, click Rename, type a *name*, and then *press* Enter.
• You can also select **the** file, then **press F2,** *type* a name, and then press *Enter*.
Note: File names can be up to 255 characters. You can use spaces and underscores in names, but you can't use the following characters: * : <> | ?" \ or /. Remember the best way to keep your files organized is with a consistent naming convention.

2. Copying

When you copy an item, the original item remains in its original location- plus you have the new copy.

- Open the location that contains the file you want to copy.
- Right-click the file, and then click Copy.
- Open the location where you want to store the copy.
- Right-click an empty space within the location, and then click Paste.

The copy of the original file is now stored in the new location. ***Notes***:
• Another *way to* copy and paste files *is to* use the keyboard shortcuts ***Ctrl+C*** *(Copy)* and V *(Paste)*.
can also press and hold the *right*-mouse button and then drag the file to **the** new location. When you release the mouse button, click Copy here.

3. Moving (cut)

Moving a file (or folder) is different from copying it. Moving cuts, the item from its previous location and places it in a new location. Copying leaves the original item where it was and creates a copy of the item elsewhere. In other words when you copy something you end up with two of it. When you move something, you only have the one thing.

- Open the drive or folder containing the file or folder you want to move.
- Select the files or folders you want to move.
- Click the Organize button on the toolbar, and then click Cut.
- Display the destination folder where you want to move the files or folder.
- Click the Organize button on the toolbar, and then click Paste.

Copy or Move a File or Folder Using Drag and Drop

- Open the drive or folder containing the file or folder you want to copy or move.
- Select the files or folders you want to copy or move.
- In the Navigation pane, point to a folder list to display the expand and collapse arrows.
- Click the arrows to display the destination folder, and then click **the** destination folder.
- Right-click the selected files or folders, drag to the destination folder, and then click Copy Here or Move Here.

Notes:

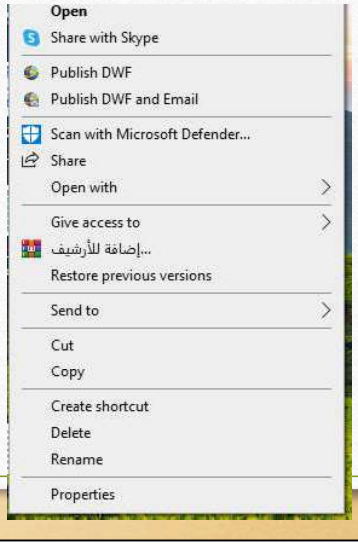
To move the selected items, drag them to the destination folder. To copy the items, hold down the Ctrl key while you drag.

Another way to copy and paste files is to use the keyboard shortcuts Ctrl+X (Cut) and Ctrl+V (Paste). Pay attention to pop-up messages that appear when dragging-you can use these to find out what will happen when you release the mouse button.

4. Create a Folder.

• Open the drive or folder where you want to create a folder. Click the New folder button on the toolbar.

With the New Folder name selected, type a new name.



5. Deleting

Select the file or folder.

Click the Organize button and select Delete from the pull-down menu. After you select delete a confirmation message appears.

• Notes:

• You can also delete a file or folder by press right click on the item and then click delete.

• Or press Del buttons on the keyboard.

• The easiest way to delete on the desktop by drag and drop it to recycle Bin.

• When you delete a file or folder from your hard disk, it's not deleted right away. Instead, it's stored in the Recycle Bin until the Recycle Bin is emptied.

• If you delete a file or folder from a network folder or from a USB flash drive, it might be permanently deleted rather than being stored in the Recycle Bin.

If a file can't be deleted, **it** might be in use by a program that's currently running. Try closing the program or restarting your computer to fix the problem.

Note: To permanently delete a file without first moving *it to* the Recycle *Bin*, select the *file*, and
then press *Shift* + Delete.

Permanently delete files from the Recycle Bin.

When you delete a file, *it's usually* moved *to* the Recycle Bin *so that you* can restore the file later *if* necessary.

To permanently remove files from your computer and reclaim any *hard disk* space they were using, you need to delete the files from the Recycle *Bin*. You can delete individual files from the Recycle *Bin* or empty the entire Recycle Bin at once.

1. Open the Recycle *Bin by* double-clicking the Recycle *Bin* on the desktop.
2. Do one of the following:

To permanently delete one file, *click it,* press Delete, and then click Yes.

NOTE

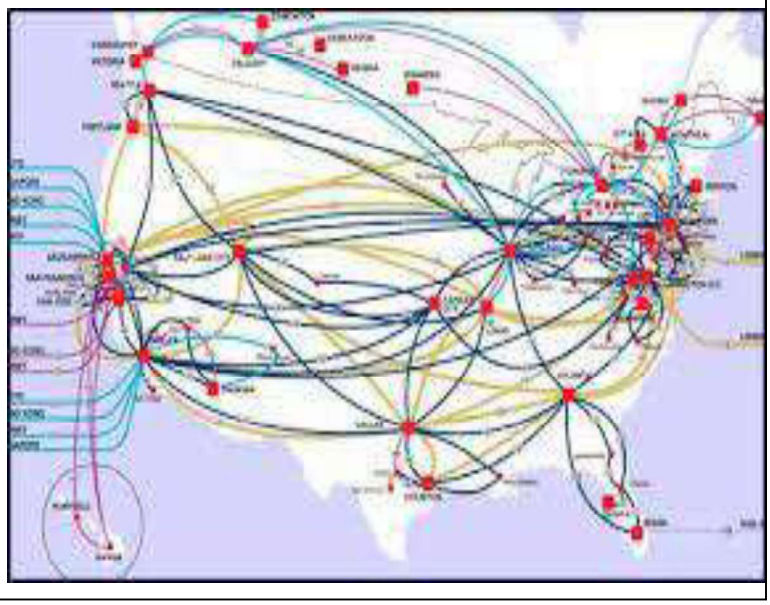
You can empty the Recycle Bin opening it by right-clicking the Recycle Bin and then clicking Empty Recycle *Bin. You* can *permanently* delete a file from your computer without sending it to the Recycle Bin by clicking the file and then pressing Shift + *Delete*. Restore item from recycle Bin

- Open the Recycle Bin by double-clicking the Recycle Bin *on* the desktop.

Do one of the following:

- To restore a file, click *it,* and then, on the toolbar, click Restore this item.
- To restore all the files, make sure that no files are selected, and then, *on* the toolbar, click Restore all *items.*

The Internet And Networks



Introduction to the World of the Internet and Networks

- **What is a Network?**

Imagine a group of people who want to exchange information and news with each other. The easiest way is for each person to talk to the other directly. But what if the number of people is large or they are in distant places? Here, the need arises for a means that connects them and facilitates the process of communication and data exchange. This means is the essence of a "network."

❖ **Network is a group of devices (such as computers, smartphones, printers, servers) connected to each other via communication media (such as cables, radio waves, satellites) for the purpose of exchanging data and resources.**

Basic Types of Networks:

1. **Local Area Network (LAN):** Connects devices in a limited geographical area such as a home, office, or school. Example: A network connecting employees' computers in a single company.
2. **Wide Area Network (WAN):** Connects local networks that are geographically separated. The **Internet** is the largest example of a wide area network, connecting millions of local networks around the world.
3. **Metropolitan Area Network (MAN):** Covers a geographical area larger than a LAN but smaller than a WAN, such as a network connecting the branches of a company in a single city.

What is the Internet?

The **Internet** is a "**network of networks**." Imagine a huge map connecting millions of small and large networks around the world.

It is a global system that enables the exchange of information and communications between connected devices using a unified set of protocols (communication rules).

Example:

When you browse a website from your device in Mosul, your device connects to a local network (which may be your home network or an internet cafe), and this network in turn connects to an Internet Service Provider (ISP) that connects you to the wider network of the Internet, to finally reach the server that hosts this website somewhere around the world.

Benefits of the Internet and Networks

The Internet and networks have numerous benefits that have changed the way we live and work.

1. **Communication:**
   - **Email:** A fast and efficient way to exchange messages and files with anyone in the world who has an email address.
   - **Instant Messaging Apps:** Such as WhatsApp, Telegram, Facebook Messenger, allow direct and instant text, voice, and video communication
   - **Video Calls:** Enable seeing and hearing the people you are talking to remotely.

Benefits of the Internet and Networks

2. Access to Information:

- **Search Engines:** Such as Google and Bing, provide access to a vast amount of information on almost any topic.
- **Digital Libraries and Online Encyclopedias:** Provide rich sources of knowledge in various fields.

3. Education and Learning:

- **Online Courses:** Platforms like Coursera and Udemy offer courses in various fields that can be studied from anywhere.
- **Open Educational Resources:** Free educational materials available to everyone.

Benefits of the Internet and Networks

4. Commerce and Business:

- **E-commerce:** Buying and selling products and services online
- **Digital Marketing:** Promoting products and services through online channels.

5. Entertainment:

- **Video and Music Streaming Services:** Such as YouTube, Netflix, and Spotify, provide access to millions of movies, series, and songs.
- **Online Games:** Allow playing with other people from all over the world.



Disadvantages of the Internet and Networks

Despite the great benefits, the use of the Internet and networks carries some disadvantages and challenges:

Disadvantages of the Internet and Networks

1. **Security and Privacy**:
   - **Security Threats**: Such as viruses, malware, and hacks that can cause data loss or theft. **Example:** Receiving an email containing a malicious link that leads to the theft of your personal information.
   - **Privacy Violation:** Collecting and sharing users' personal data without their consent or in unethical ways. **Example:** Websites tracking your online activities and using this information to display targeted advertisements.
   - **Scams and Fraud**: Attempts to obtain money or personal information illegally online. **Example:** Receiving a message asking you to transfer an amount of money under the pretext of winning a fake prize.

Disadvantages of the Internet and Networks

2. Misinformation and Fake News: The spread of inaccurate or fabricated information that can affect public opinion and cause confusion. **Example:** Reading a fake news story on social media that is widely circulated.



3.Addiction and Impact on Health:

- **Internet and Social Media Addiction:** Spending excessive time online can negatively affect mental health, social relationships, and productivity. **Example:** Feeling anxious or uncomfortable when unable to use your phone or the internet.
- **Physical Health Impact:** Lack of movement, vision problems, and neck and back pain resulting from excessive use of electronic devices.

Disadvantages of the Internet and Networks

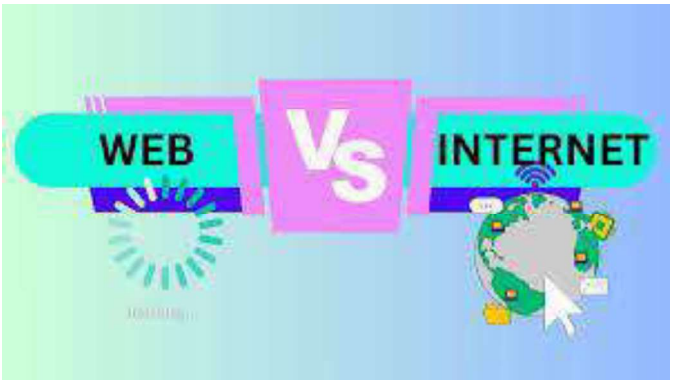
4. Cyberbullying: Using the internet and social media to harm or harass others. **Example:** Receiving threatening or insulting messages online.

5. Digital Divide: Inequality in access to the internet and technology among different groups and regions. **Example:** Difficulty for some rural communities to access a reliable internet network.



The Difference Between the Internet and the Web (World Wide Web)

The terms "Internet" and "Web" are often confused, but they are not the same thing. Here is the basic difference:



The Difference Between the Internet and the Web (World Wide Web)

Internet: Is the **infrastructure** that allows the exchange of data between connected devices. It is a vast global network of computers and networks connected to each other. Think of it as the roads and transportation means that allow the movement of information.

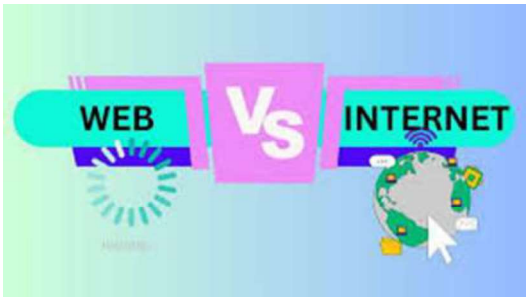
Web (World Wide Web - WWW): Is an **application** that runs on top of the Internet infrastructure. It is a system of interconnected documents (web pages) that can be accessed via the Internet using a web browser (**such as Google Chrome, Firefox, Safari**).

These documents are written in Hypertext Markup Language (HTML) and contain text, images, videos, and hyperlinks that navigate you between different pages. Think of it as the websites, buildings, and services located along the roads and transportation means provided by the Internet.

The Difference Between the Internet and the Web (World Wide Web)

In other words:

- **Internet:** Is the physical network, cables, and protocols that make communication possible.



- **Web:** Is the content (text, images, video, applications) that we see and interact with using internet browsers.

Web Browsers

A web browser is an application that enables you to access and view websites. It acts as the interface through which you interact with Internet content.

Main Functions:

- Displaying web pages: Converting code (HTML) into visible pages.
- Navigating between pages: Through hyperlinks.
- Managing tabs: To open multiple pages at the same time.
- Supporting multimedia: Displaying images, videos, and audio.
- Securing connections: Through protocols like HTTPS.
- Managing files: Uploading and downloading files to and from the Internet.
- Adding extra functions: Through extensions.

Web Browsers

Examples of Web Browsers:
Google Chrome: Characterized by speed, flexibility, and a variety of extensions.
Mozilla Firefox: Known for its focus on privacy and security.
Safari: Apple's browser, known for good performance on Apple devices.
Microsoft Edge: Microsoft's new browser, based on the same core as Chrome and characterized by integration with Microsoft services.



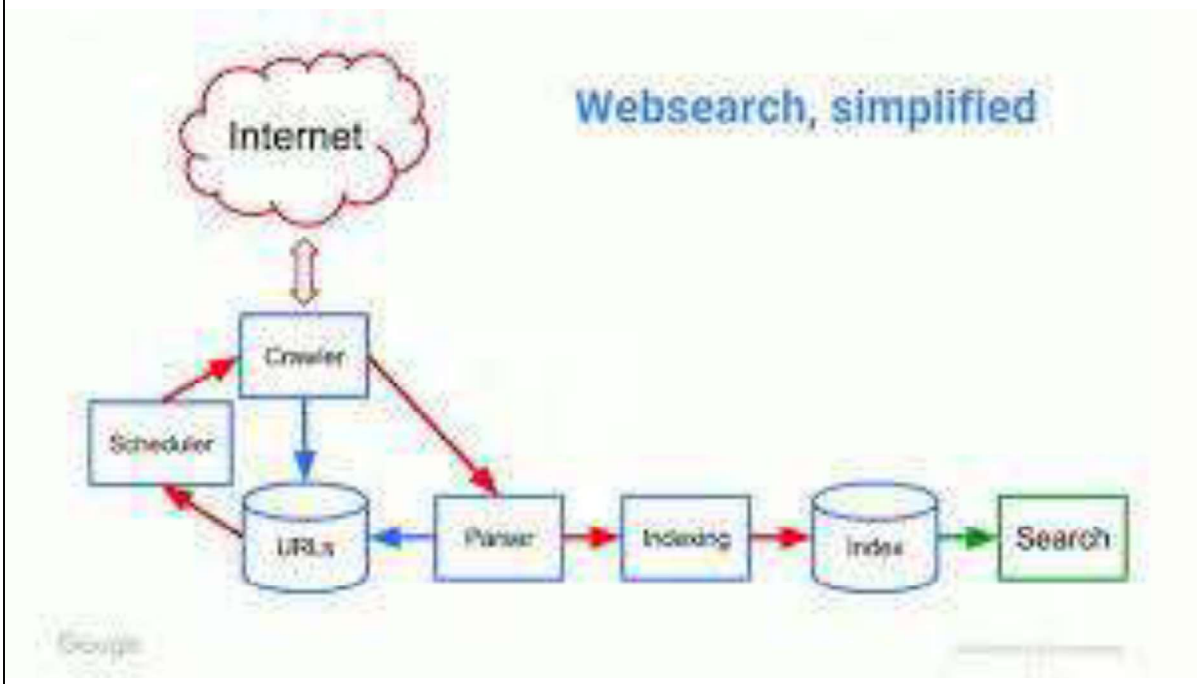




Search Engines

A search engine is a tool that helps you find the information you need on the Internet.

Instead of remembering the exact addresses of websites, you can use a search engine to type keywords related to the topic you are looking for, and the search engine will display a list of relevant pages.



Search Engines

How Search Engines Work:

1. Crawling: A program called a "crawler" browses web pages and collects information about them.
2. Indexing: The collected information is organized into a huge database.
3. Searching: When you enter a search query, the search engine searches the index for relevant pages and displays them to you.
4. Ranking: Search results are ranked based on several factors such as relevance to the keywords, page popularity, and content quality.

Search Engines



Examples of Search Engines:

1. Google: Considered the most famous and widely used around the world, and is characterized by the accuracy and speed of its results.
2. Bing: Microsoft's search engine, characterized by an attractive interface and diverse search features.



3. Yahoo: In addition to search, it offers other services such as news and email.