

**Al-Mustaqbal university**  
**Engineering technical college**  
**Department of Building**  
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## **Computer principles**

***First class***

***Lecture No.1***

***Assist. Lecture***

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# Chapter One

## Introduction to Computer

### 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<sup>1</sup>.

### Functionalities of a computer

Any digital computer carries out five functions in gross terms:

- Takes data as input.
- Stores the data/instructions in its memory and use them when required.
- Processes the data and converts it into useful information.
- Generates the output
- Controls all the above four steps.

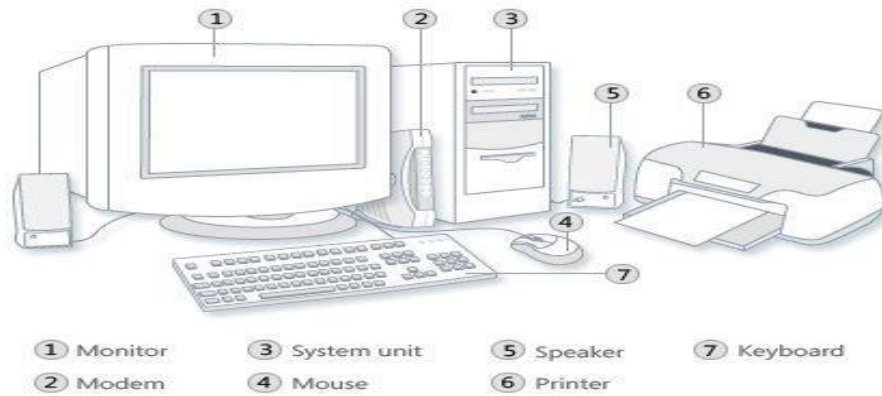


### Computer Components

Any kind of computers consists of **HARDWARE AND SOFTWARE**.

#### 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.<sup>3</sup>



## Input Devices

Input device is any peripheral (piece of computer hardware equipment to provide data and control signals to an information processing system such as a computer or other information appliance.

Input device Translate data from **form** that humans understand to one that the computer can work with. Most common are keyboard and mouse

Examples of Manual Input Devices			
Keyboard 	Numeric Keypad 	Pointing Device 	Remote Control 
Joystick 	Touch Screen 	Scanner 	Graphics Tablet 
Microphone 	Digital Camera 	Webcams 	Light Pens 

Example of Input Devices:-

1. Keyboard	2. Mouse (pointing device)	3. Microphone
4. Touch screen	5. Scanner	6. Webcam
7. Touchpads	8. MIDI keyboard	9. Cameras
10. Graphics Tablets	11. Electronic Whiteboard	12. Pen Input
13. Video Capture Hardware	14. Microphone	15. Trackballs
16. Barcode reader	17. Digital camera	18. Joystick

**Note:** The most common use keyboard is the QWERTY keyboard.  
 Generally standard Keyboard has 104 keys.

## **Central Processing Unit (CPU)**

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

The CPU is comprised of three main parts :

\* **Arithmetic Logic Unit (ALU):** Executes all arithmetic and logical operations. Arithmetic calculations like as addition, subtraction, multiplication and division. Logical operation like compare numbers, letters, or special characters

\* **Control Unit (CU):** controls and co-ordinates computer components.

1. Read the code for the next instruction to be executed.
2. Increment the program counter so it points to the next instruction.
3. Read whatever data the instruction requires from cells in memory.
4. Provide the necessary data to an ALU or register.
5. If the instruction requires an ALU or specialized hardware to complete, instruct the hardware to perform the requested operation.

\* **Registers:** Stores the data that is to be executed next, "very fast storage area".

## **Primary Memory: -**

1. **RAM:** Random Access Memory (RAM) is a memory scheme within the computer system responsible for storing data on a temporary basis, so that it can be promptly accessed by the processor as and 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: -**

Stores data and programs permanently: its retained after the power is turned off

1. **Hard drive (HD):** A hard disk is part of a unit, often called a "disk drive," "hard drive," or "hard disk drive," that store and provides relatively quick access to large amounts of data on an electromagnetically charged surface or set of surfaces.
2. **Optical Disk:** an optical disc drive (ODD) is a disk drive that uses laser light as part of the process of reading or writing data to or from optical discs. Compact discs, DVDs, and Blu-ray discs are common types of optical media which can be read and recorded by such drives. Optical drive is the generic name; drives are usually described as "**CD**" "**DVD**", or "**Bluray**", followed by "**drive**", "**writer**", etc. There are three main types of optical media: CD, DVD, and Blu-ray disc. CDs can store up to 700 megabytes (MB) of data and DVDs can store upto 8.4 GB of data. Blu-ray discs, which are the newest type of optical media, can store up to 50 GB of data. This storage capacity is a clear advantage over the floppy disk storage media

(a magnetic media), which only has a capacity of 1.44 MB.

### 3. Flash Disk

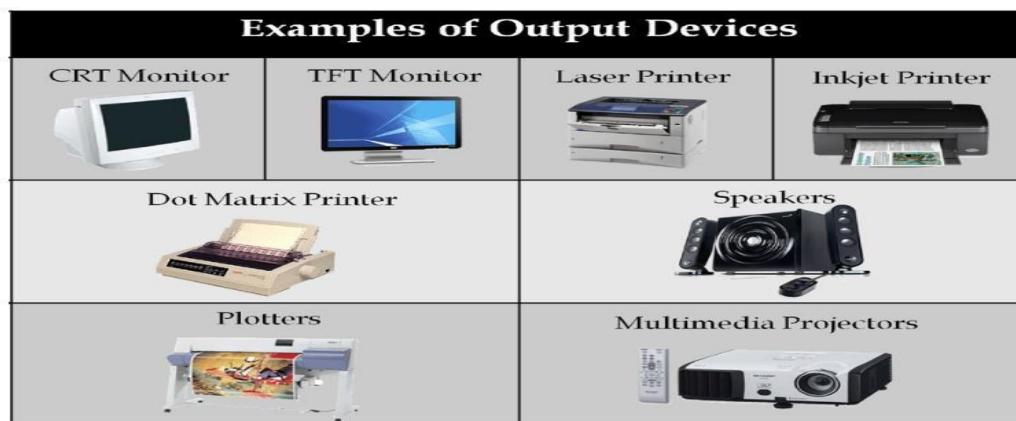
A storage module made of flash memory chips. A Flash disks have no mechanical platters or accessarms, but the term "disk" is used because the data are accessed as if they were on a hard drive. The disk storage structure is emulated.

Comparison between Main memory (RAM) and Secondary Memory (Hard disk)

<b>RAM</b>	<b>Hard Disk (Hard Drive)</b>
Memory	Storage
Smaller amount (typically 500 MB-6 GB)	Much larger amount (typically 80GB to 1000 GB)
Temporary storage of files and programs	Permanent storage of files and programs
A little like your real desktop - has only your current work on it (which could be ruined by a spill of Coke or coffee!)	Like a file cabinet - has long-term storage of work (it's safe from spills!)
Contents disappear when you turn off power to the computer and when the computer crashes	Contents remain when you turn off the power to the computer (they don't disappear unless you purposely delete them), and when the computer crashes
Consists of chips (microprocessors)	Consists of hard disks (platters)
When you want to use a program, a temporary copy is put into RAM and that's the copy you use	Holds the original copy of the program permanently

### Output devices

An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) which converts the electronically generated information into human-readable form.



### Example on Output Devices:

1. Monitor	2. LCD Projection Panels
3. Printers (all types)	4. Computer Output Microfilm (COM)
5. Plotters	6. Speaker(s)
7. Projector	

## Software

Software is a generic term for organized collections of computer data and instructions, often broken into two major categories: system software that provides the basic non-task-specific functions of the computer, and application software which is used by users to accomplish specific tasks.

### *Software Types*

- A. System software** is responsible for controlling, integrating, and managing the individual hardware components of a computer system so that other software and the users of the system see it as a functional unit without having to be concerned with the low-level details such as transferring data from memory to disk, or rendering text onto a display.
- B. Application software** is used to accomplish specific tasks other than just running the computer system. Application software may consist of a single program, such as an image viewer; a small collection of programs (often called a software package) that work closely together to accomplish a task, such as a spreadsheet or text processing system; a larger collection (often called a software suite) of related but independent programs and packages that have a common user interface or shared data format, such as Microsoft Office, which consists of closely integrated word processor, spreadsheet, database, etc.

### Comparison Application Software and System Software

	System Software	Application Software
	Computer software, or just software is a general term primarily used for digitally stored data such as computer programs and other kinds of information read and written by computers. App comes under computer software though it has a wide scope now.	Application software, also known as an application or an "app", is computer software designed to help the user to perform specific tasks.
Example:	1) Microsoft Windows 2) Linux 3) Unix 4) Mac OSX 5) DOS	1) Opera (Web Browser) 2) Microsoft Word (Word Processing) 3) Microsoft Excel (Spreadsheet software) 4) MySQL (Database Software) 5) Microsoft PowerPoint (Presentation Software) 6) Adobe Photoshop (Graphics Software)
Interaction:	Generally, users do not interact with system software as it works in the background.	Users always interact with application software while doing different activities.
Dependency:	System software can run independently of the application software.	Application software cannot run without the presence of the system software.

## **Computers classification\*\*\***

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

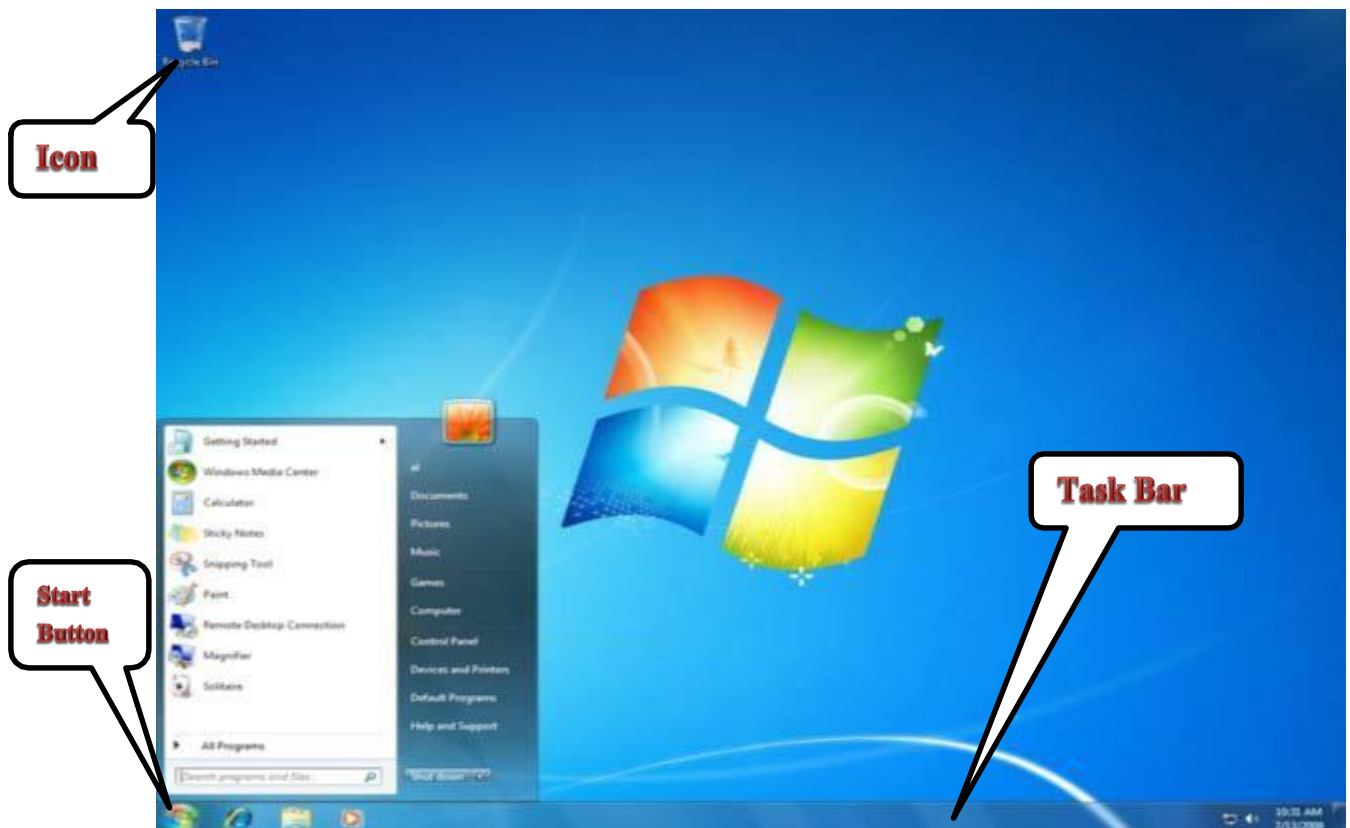
- **Personal computer:** A small, single-user computer based on a microprocessor. In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.
- **workstation:** A powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and a higher-quality monitor.
- **minicomputer:** A multi-user computer capable of supporting from 10 to hundreds of users simultaneously.
- **mainframe:** A powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously.
- **supercomputer:** An extremely fast computer that can perform hundreds of millions of instructions per second.






## **Characteristics of Computer**

Speed, accuracy, diligence, storage capability and versatility are some of the key characteristics of a computer.

## ***Introduction to the Desktop***

The desktop is the main screen area that you see after you turn on your computer and log on to Windows. Like the top of an actual desk, it serves as a surface for your work.



1.  **Documents**: Is the default storage folder for your files that you create. When you save or open a file, Microsoft Windows initially opens the MY DOCUMENTS dialog box.
2.  **Computer**: Displays information about your computer, such as the contents of your computer drives and which printers you have installed. It also allows you to find, view and organize files.
3.  **The Recycle Bin** : This is where you place files you no longer need. Any file you delete from your hard drive will be placed first in the RECYCLE BIN.
4.  **Internet Explorer** : With INTERNET EXPLORER and an Internet connection, you can search for and view information on the World Wide Web. You can search the Internet for people, businesses, and information about subjects that interest you, download music, copy graphics, stay in touch with or meet new friends, and a host of other activities.
5.  **Microsoft Excel**: is a spread sheet application which allows users to enter text and numbers into rows and columns. This data can be manipulated and



analyzed by using formulas and functions and reporting and charting can be done on the results,



6. **Microsoft PowerPoint:** is a presentation program. It turns text, numbers and graphics into a presentation which can be shown to an audience in a slideshow, or printed off as handouts.



7. **Microsoft Word :** is a word processing application used for creating documents such as reports, letters, business plans, and more.

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## ICONS

### 1. Understanding Icons

- ☒ **Object icons:** Such as *My Computer*, *Recycle Bin*, and *Internet Explorer*.

These icons allow you to open files and programs on your computer.

- ☒ **Shortcut icons** allow you to open an application quickly. These icons appear on your desktop and with little arrow in the left corner. Desktop shortcuts are links to files and programs. You can add or delete shortcuts without affecting the programs on your computer.

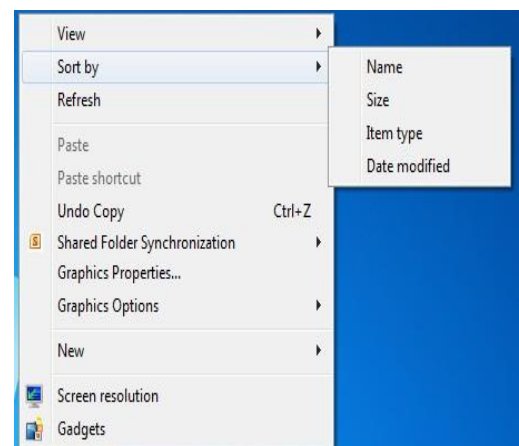


### 2. To open a program using an icon:

- Place your mouse over the icon.
- Text appears identifying its name or contents.
- Then, double-click the icon.

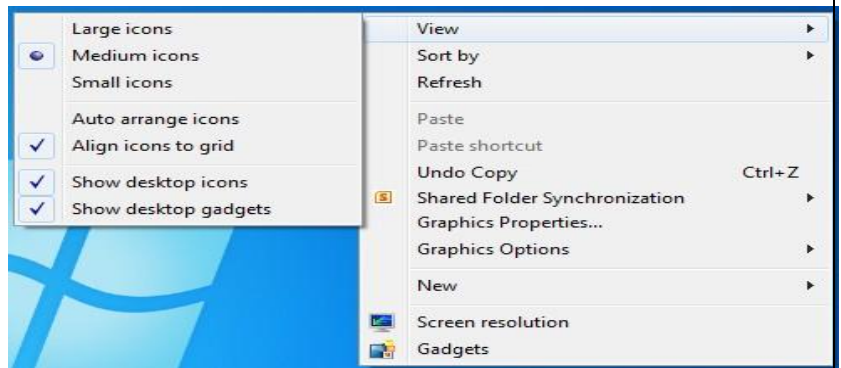
### 3. Arrange Desk top Icons

To arrange icons on desktop **click Right mouse button** on an empty space on desktop, menu appear choose **Sort by**.



#### 4. Change Desk top Icons View

To change your icons  
View **click Right mouse**  
**button** on an empty space on  
desktop, menu appears  
choose icon size.



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### Opening an Application

There are many ways to open an application the most common ways are:

1. By clicking on the START button, going to the PROGRAMS menu and locating the application in the list that appears.

2. By double clicking with the mouse on a shortcut icon on the desktop if one has been created.



3. Some applications may be located on the taskbar as a quick link (look at the lefthand side of the taskbar, just after the START button). These quick links only need to be clicked on once.



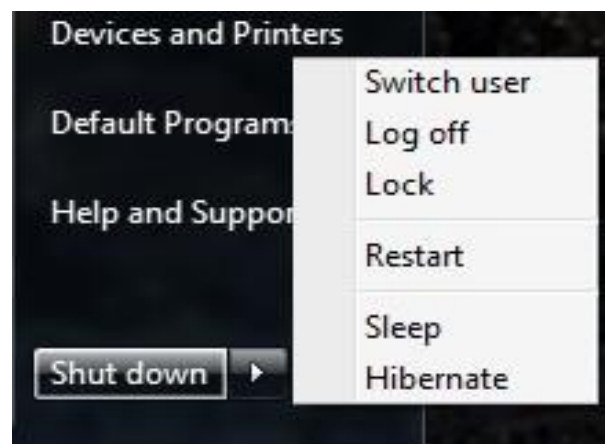
When you open an application it will open up in what is known as a WINDOW.

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### Log Off or Shut Down?

Once you have closed all open applications, you can either log off your computer or shutdown. It will depend on whether someone else will be using your computer when you've finished as to which action you choose.

**1. Log Off** means that you log off as a User without turning the computer off. Someone else can then log on.



1. Click on the START button;
2. Select LOG OFF (click the arrow next to Shut down);
3. If you have any open programs then you will be asked to close them down or to let Windows, Force them to shut down. You will lose any un-saved information if you do this.

**2. Shut Down** means that you log off as a User and the computer is turned off at the same time. If you are leaving work for the day and no-one else will be using your computer, you will need to Shut Down your computer as this saves power.

1. Click on the START button
2. Select SHUT DOWN
3. You will then see the SHUT DOWN WINDOWS dialog box
4. If you have any open programs then you will be asked to close them down or to let Windows, Force them to shut down. You will lose any un-saved information if you do this.

### **3. Restart your computer**

1. Click on the START button
2. Select RESTART from the drop down menu
3. Your computer will log you off, turn itself off and turn itself on again so you can re-log on.

### **4. What is Sleep?**

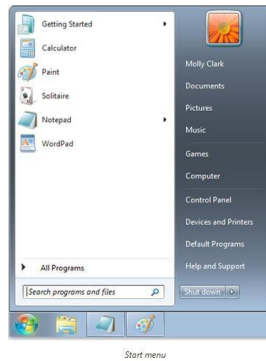
When your computer is in the Sleep mode, your computer consumes less electricity, but is ready for immediate use. However, if the computer loses electrical power while in the sleep mode, any information you have not saved will be lost.

## **Start Menu**

The Start menu is the main gateway to your computer's programs, folders, and settings.



It's called a menu because it provides a list of choices, just as a restaurant menu does.

And as "start" implies, it's often the place that you'll go to start or open things.



***Use the Start menu to do these common activities:***

- Start programs
- Open commonly used folders
- Search for files, folders, and programs
- Adjust computer settings
- Get help with the Windows operating system
- Turn off the computer
- Log off from Windows or switch to a different user account

To open the Start menu, click the Start button  in the lower-left corner of your screen. Or, press the Windows logo key  on your keyboard.

### *The Start menu is divided into three basic parts:*

- The large **left pane** shows a short list of programs on your computer. Your computer manufacturer can customize this list, so its exact appearance will vary. Clicking All Programs displays a complete list of programs.
- At the bottom of the left pane is the **search box**, which allows you look for programs and files on your computer by typing in search terms.
- The **right pane** provides access to commonly used folders, files, settings, and features. It's also where you go to log off from Windows or turn off your computer.

### *Opening programs from the Start menu*

One of the most common uses of the Start menu is opening programs installed on your computer. To open a program shown in the left pane of the Start menu, click it. The program opens and the Start menu closes. If you don't see the program you want, click All Programs at the bottom of the left pane. Instantly, the left pane displays a long list of programs in alphabetical order, followed by a list of folders.

Clicking one of the program [icons](#) launches the program, and the Start menu closes.

So what's inside the folders? More programs. Click Accessories, for example, and a list of programs that are stored in that folder appears. Click any program to open it. To get back to the programs you saw when you first opened the Start menu, click Back near the bottom of the menu.

If you're ever unsure what a program does, move the pointer over its icon or name.

A box appears

that often contains a description of the program. For example, pointing to Calculator displays this message: "Performs basic arithmetic tasks with an on-screen calculator."

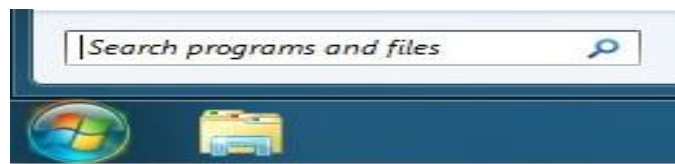
This feature works for items in the right pane of the Start menu, too.

You might notice that over time, the lists of programs in your Start menu change. This happens for two reasons. First, when you install new programs, they get added to the All Programs list. Second, the Start menu detects which programs you use the most, and places them in the left pane for quick access.

### **The search box**

The search box is one of the most convenient ways to find things on your computer.

The exact location of the items doesn't matter—the search box will scour your programs and all of the folders in your personal folder (which includes Documents, Pictures, Music, Desktop, and other common locations). It will also search your e-mail messages, saved instant messages, appointments, and contacts.



*The Start menu search box*

- The ***right pane of the Start menu*** contains links to parts of Windows that you're likely to use frequently. Here they are, from top to bottom:
  - ***Personal folder***. Opens your [personal folder](#), which is named for whoever is currently logged on to Windows. For example, if the current user is Molly Clark, the folder will be named Molly Clark. This folder, in turn, contains user-specific files, including the Documents, Music, Pictures, and Videos folders.
  - ***Documents***. Opens the Documents folder, where you can store and open text files, spreadsheets, presentations, and other kinds of documents.
  - ***Pictures***. Opens the Pictures folder, where you can store and view digital pictures and graphics files.
  - ***Music***. Opens the Music folder, where you can store and play music and other audio files.
  - ***Games***. Opens the Games folder, where you can access all of the games on your computer.
  - ***Computer***. Opens a window where you can access disk drives, cameras, printers, scanners, and other hardware connected to your computer.

- **Control Panel**. Opens Control Panel, where you can customize the appearance and functionality of your computer, install or uninstall programs, set up network connections, and manage useraccounts.
- **Devices and Printers**. Opens a window where you can view information about the printer, mouse, and other devices installed on your computer.
- **Default Programs**. Opens a window where you can choose which program you want Windows to use for activities such as web browsing.
- **Help and Support**. Opens Windows Help and Support, where you can browse and search Help topics about using Windows and your computer.

At the bottom of the right pane is the Shutdown button. Click the Shutdown button to turn off your computer. Clicking the arrow next to the Shutdown button displays a menu with additional options for switching users, logging off, restarting, or shutting down.

**You can make the following:**

- \* Pin and remove a program icon to and from the start menu.
- \* Move the start button.
- \* Add and clear recently opened files or programs to and from the start menu.
- \* Adjust the number of shortcuts for frequently used programs.
- \* Customize the right pane of the start menu.
- \* Search for programs from the start menu.
- \* Add the run commend to the start menu.

