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Computer Fundamentals

&

Office Tools

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Syllabus

UNIT - I

Basics of Computers :Definition of a Computer - Characteristics and Applications of Computers - Block Diagram of a Digital Computer - Classification of Computers based on size and working -Central Processing Unit-I/O Devices.

Unit – II

Primary, Auxiliary and Cache Memory -Memory Devices. Software, Hardware, Firmware and People ware-Definition and Types of Operating System - Functions of an Operating System - MS-DOS - MS Windows - Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar-Control Panel.

Unit – III   MS-Word

Features of MS-Word - MS-Word Window Components -Creating, Editing, Formatting and Printing of Documents - Headers and Footers -Insert/Draw Tables, Table Auto format- Page Borders and Shading - Inserting Symbols, Shapes, WordArt, Page Numbers, Equations-Spelling and Grammar-Thesaurus - Mail Merge

Unit - IV   MS-PowerPoint

Features of PowerPoint-Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation-Adding Clip Art/Pictures-Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object-Slide Transition -Custom Animation

Unit - V   MS-Excel

Overview of Excel features-Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells -Inserting Rows/ Columns-Changing column widths and row heights, auto format, changing font sizes, colors, shading.

References:

1. ReemaThareja, Fundamentals of Computers, Oxford University Press, India
2. V.Raja Raman, Fundamentals of Computers, Prentice Hall of India.
3. John Walkenbach, HerbTyson, Michael R.Groh and Faithe Wempen, Microsoft Office 2010 Bible Wiley Publishers

SECTION – A

Answer ALL questions   5 x 10 = 50

1.

(a)   What are the uses of Computers? Explain the different parts of a Computer with its block diagram.

(or)

(b)   Explain various Input and Output devices

2.

(a)   Write about various Secondary storage devices

(or)

(b)   What is an Operating System? What are its functions? Briefly explain Windows operating system.

3.

(a)   Explain various ways of Text formatting in MS-Word

(or)

(b)   Explain how to create tables in MS-Word.

4.

(a)   Explain how to create a Power Point presentation.

(or)

(b)   Explain how to add objects into a Power Point Presentation

5.

(a)   What are the features of MS-Excel? Explain how to use formulas in MS-Excel.

(or)

(b)   Explain various ways of formatting work sheets in Excel.

Computer Fundamentals

Computer: It is an electronic device, which takes input from the user in the form of data and instructions. Then it processes the input as per the user's instructions and generates some output that is displayed before the user and also we can take the printout with the help of printer.

Characteristics of Computers:
The human race developed computers so that it could perform intricate operations, such as calculation and data processing, or simply for entertainment. Today, much of the world's Infrastructure runs on computers and it has profoundly changed our lives, mostly for the better.

Speed: The computers process at an extensively fast rate, at millions of instructions per second. In few seconds, a computer can perform such a huge task that a normal human being may take days or even years to complete. The speed of computer is calculated in MHz (Megahertz), that is, one million instructions per second. At present, a powerful computer can perform billions of operations in just one second.

Accuracy: Besides the efficiency, the computers are also very accurate. The level of accuracy depends on the instructions and the type of machines being used. Since the computer is capable of doing only what it is instructed to do, faulty instructions for data processing may lead to faulty results. This is known as GIGO (Garbage In Garbage Out).

Diligence: Computer, being a machine, does not suffer from the human traits of tiredness and lack of concentration. If four million of calculations have to be performed, then the computer will perform the last four-millionth calculation with the same accuracy and speed as the first calculation.

Reliability: Generally, reliability is the measurement of the performance of a computer, which is measured against some predetermined standard for operation without any failure.

Storage Capability: Computers can store large amounts of data and can recall the required information almost instantaneously. The main memory of the computer is relatively small it can hold only a certain amount of information, therefore, the data is stored on secondary storage device such as magnetic tapes or disks.

Versatility: Computers are quite versatile in nature. It can perform multiple tasks simultaneously with equal ease. For Example, at one moment it can be used to draft a letter, another moment it can be used to draft a letter, another moment it can be used to play music and in between, one can print a document as well.

Resource Sharing: Computers today have the capability to connect with each other. This has made the costly resources like capability to connect with each other. This has made the sharing of costly resources like printers possible. Apart from device sharing, data and information can also be shared among group of computers.

Limitations of Computers:

- A computer can only perform what it is programmed to do.

- The computer needs well-defined instructions to perform any operation. Hence, computers are unable to give any conclusion without going through intermediate steps.

- A computer's user is limited in areas where qualitative considerations are important. For instance, it can make plans based on situations and information but it cannot foresee whether they will succeed or not.
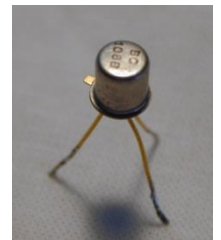
Generation of Computers:

Characteristics of First Generation Computers (1940-56) Vacuum Tubes

➢ These Computers are based on vacuum tube technology.
➢ These were the fastest computing devices of their times (computation time was in milliseconds).
➢ These computers were very large, and required a lot of space for installation.
➢ Since thousands of vacuum tubes were used, they generated a large amount of heat. Therefore, air-conditioning was essential.
➢ These were non-portable and very slow equipments.
➢ They lacked in versatility and speed.
➢ They were very expensive to operate and used a large amount of electricity.
➢ These machines were unreliable and prone to frequent hardware failures. Hence, constant maintenance was required.
➢ Since machine language was used, these computers were difficult in program and use.
➢ Each individual component had to be assembled manually. Hence, commercial appeal of these computers were poor.
➢ Examples: ENIAC, EDVAC and UNIVAC.

Characteristics of Second Generation Computers (1956-63) Transistors

➢ These Machines were based on transistors technology.
➢ These were smaller as compared to the first generation computers.
➢ The computational time of these computers was reduced to microseconds from milliseconds.
➢ These were more reliable and less prone to hardware failure. Hence, such computers required less frequent maintenance.
➢ These were more portable and generated less amount of heat.
➢ Assembly Language was used to program computers. Hence, programming became more time efficient and less cumbersome.
➢ Second generation computers still required air conditioning.
➢ Manual assembly of individual components into a functioning unit was still required.
➢ Examples: PDP-8, IBM 1401 and IBM 7090.

Characteristics of Third Generation Computers (1964-1970's) Integrated Circuits

➢ These computers are based on Integrated circuit (IC) technology.
➢ They were able to reduce computational time from microseconds to nanoseconds.
➢ They were easily portable and more reliable than the second generation.
➢ These devices consumed less power and generated less heat. In some cases, air conditioning was still required.
➢ The size of these computers was smaller as compared to previous computers.
➢ Since hardware rarely failed, the maintenance cost was quite low.
➢ Extensive use of high-level languages became possible.
➢ Manual assembling of individual components was not required, so it reduced the large requirement of labour and cost. However, highly sophisticated technologies were required for the manufacture of IC chips.
➢ Commercial production became easier and cheaper.
➢ Examples: NCR 395 and B6500.
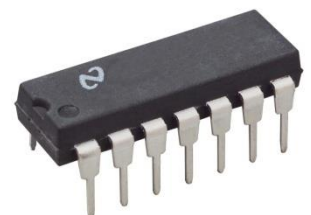
Characteristics of Fourth Generation Computers (1970-Till Date) Microprocessors

- Fourth-generation computers are microprocessor-based systems.
- These computers are very small.
- These are the cheapest among all the other generations.
- They are portable and quite reliable.
- These machines generate negligible amount of heat, hence they do not require air conditioning.
- Hardware failure is negligible so minimum maintenance is required.
- The production cost is very low.
- GUI and pointing devices enable users to learn to use the computer quickly.
- Interconnection of computers leads to better communication and resource sharing.
- Examples: APPLE II, Altair 8800, and CRAY-1.
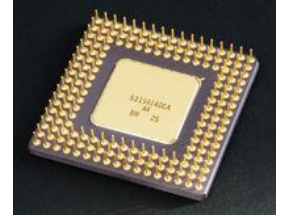
Characteristics of Fifth Generation Computers (Present and Beyond) Artificial Intelligence

- Fifth generation computers will use *Super Large Scale Integrated (SLSI)* chips, which will result in the production of microprocessor having millions of electronic components on a single chip.
- To store instructions and information require a great amount of storage capacity.
- Mega chips may enable the computer to approximate the memory capacity of the human mind.
- A computer using parallel processing accesses several instructions at once and works on them at the same time through use of multiple central processing units.
- Artificial Intelligence a series of related technologies the tries to simulate and reproduce human behaviour, including thinking, speaking and reasoning.
- Artificial Intelligence comprises a group of related technologies of Expert Systems (ES), natural language processing (NLP), Speech recognition, Vision recognition and robotics.

Classification of Computers:

Computers for Individual Usages:

1. Desktop Computers
- The most common type of computer.
- Sits on the desk or floor.
- Performs a variety of tasks.
- A small, single-user computer based on a microprocessor.
- It is also known as Personal Computer (PC).

2. Workstations
- Specialized computer
- A Workstation is a high-end microcomputer designed for technical or scientific applications. Intended primarily to be used by one person at a time.
- They are commonly connected to a Local area network and run multi-user operating systems.
- The term workstation has also been used to refer to a mainframe computer or a PC connected to a network.
- Popular among scientists, engineers, and animators.

3. Notebook computers
- Small portable computers
- They are also called *laptop computers*
- Typically as powerful as a desktop
- You can carry in your hand as you move from one place to another.
- These computers do not need any external power supply, as a rechargeable battery is completely self-contained in them.
- These computers are expensive as compared to desktop computers.
- Modern laptops weigh 3 to 12 pounds (1.4 to 5.4 kg); older laptops were usually heavier.

4. Tablet computers
- Newest development in portable computers.
- Input is through a pen.
- Offer all the functionality of a notebook PCs.
- Run specialized versions of standard programs.
- The ability to use in environments not conducive to a keyboard and mouse such as lying in bed, low lighting when a lighted screen is the input source, standing or with one hand.
- Higher cost — convertible tablet PCs can cost significantly more than their non-tablet counterparts although this premium has been predicted to fall
- Input speed — handwriting can be significantly slower than peak typing speeds which can be as high as 50-150 WPM.
- Screen damage risk - Tablet PCs are handled more than conventional laptops yet built on the same frames and since their screens also serve as input devices (like PDAs).
- Lighter weight, lower power models can be functioned.

5. Handheld computers
- Very small computers
- Popular type is : Personal Digital Assistants (PDA)
- Taking note or contact management.
- Connects with a computer to exchange data.
- Input is through a pen.
- PDAs and handheld devices are commonly allowed in the classroom for digital note taking. Students can spell-check, modify, and amend their class notes or e-notes. Some educators distribute course material through the use of the internet connectivity or infrared file sharing functions of the PDA.

6. Smart phones
- A **Smartphone** is a mobile phone offering advanced capabilities, often with PC-like functionality (PC-mobile handset convergence)
- Include many features: Web, e-mail access or special hardware (digital camera, music players, …)
- Hybrid of cell phone and PDA
- Examples: Apple iphone, Nokia N95, Nokia N97, Nokia E72, BlackBerry etc.,

Computers for Organizations

1. Network servers
- Centralized computer
- Usually a powerful PC with special software and equipment.
- All other computers connect
- Provides access to network resources
-

2. Mainframes
- Used in large organizations
- Handle thousands of users
- Users access through a terminal : dump and intelligent
- Insurance companies, bank, and airline's Web site.

3. Minicomputers
- Power between mainframe and desktop.
- Called *midrange* computers.
- Handle hundreds of users.
- Used in smaller organizations.
- Users access through a terminal.

4. Supercomputers
- The most powerful computers made
- Handle large and complex calculations
- Process trillions of operations per second
- Can house thousands of processors.
- Found in university, research organizations, forecasting weather...

The latest machine in the series is the **PARAM Padma**. Others include **PARAM 10000** and **PARAM 9000/SS**. The PARAM 10000 was India's first TFLOPS computer. The major applications of PARAM 10000 are in long-range weather forecasting, remote sensing, drug design and molecular modelling. PARAMs in the future may well be used for India's space programme. Plans to use it for oil and gas exploration are also on the line. The PARAM is used in almost all major scientific research institutes in India. It has also been exported to countries like Russia, Ukraine, Belarus and South Korea.

Applications of Computers:

Science: Scientists have been using computer to develop theories, to analyse, ad test the data. They can be used to generate detailed studies of how earthquakes affect buildings or pollution affects weather pattern. Satellite-based applications have not been possible without the use of computers. It would also not be possible to get the information of our solar system and the cosmos without computers.

Education: Computers have also revolutionised the whole process of education. Currently, the classrooms, libraries, and museums are utilising computers to make the education much more interesting. Unlike recorded television shows, Computer Aided Education (CAE) and Computer Based Training (CBT) packages are making learning much more interactive.

Medicine and Health Care: Now, doctors are using computers right from diagnosing the illness to monitoring a patient's status during complex surgery. By using automated imaging techniques,

doctors are able to look inside a person's body and can study each organ in detail (such as CT scans or MRI scans), which was not possible few years ago. Cochler implant, a special kind of hearing aid that makes it possible for deaf people to hear.

Engineering/Architecture/Manufacturing: The architects and engineers are extensively using computers in designing and drawings. Computers can create objects that can be viewed from all the three dimensions. By using techniques like virtual reality, architects can explore houses that have been designed but not built. The manufacturing factories are using computerised robotic arms in order to perform hazardous jobs. Computer Aided Manufacturing (CAM) can be used in designing the product, ordering the parts, and planning production. Thus, computers help in co-ordinating the entire manufacturing processes.

Entertainment: Computers are used to control the images and sounds. The Special effects, which mesmerise the audience, would not have been possible without the computers. In addition, computerised animation and colourful graphics have modernised the film industry.

Communication: E-mail or Electronic Mail is one of the communication media in which computer is used. Through e-mail, messages and reports are passed from one person to one or more persons with the aid of computer and telephone line. The advantage of this service is that while transferring the messages it saves time, avoids wastage of paper, and so on. Moreover, the person who is receiving the messages can read the messages whenever he is free and can save it, reply it, forward it or delete it from the computers.

Business Application: There are various concerns for which computers are used such as in business forecasting, to prepare pay bills and personal records, in banking operations and data storage, in the various types of Life Insurance Business, and as an aid to management. Businesses are also using the networking of computers, where a number of computers are connected together to share the data and the information. Use of e-mail and Internet has changed the ways of business.

Publishing: In DTP with the help of computer and a laser printer one can perform the publishing job all by oneself. Many of the tasks requiring long manual hours such as making table of contents and index can be automatically done by the application of computers and DTP software.

Banking: People can use the ATM (Automated Teller Machine) services 24 hours of the day in order to deposit and withdraw cash. When the different branches of the bank are connected through the computer networks, then the inter branch transaction such as cheque and draft can be done by the computers without any delay.

BLOCK DIAGRAM OF COMPUTER

A computer can process data, pictures, sound and graphics. They can solve highly complicated problems quickly and accurately.

Input Unit: Computers need to receive data and instruction in order to solve any problem. Therefore we need to input the data and instructions into the computers. The input unit consists of one or more input devices. Keyboard and mouse are the most commonly used input devices. All the input devices perform the following functions.
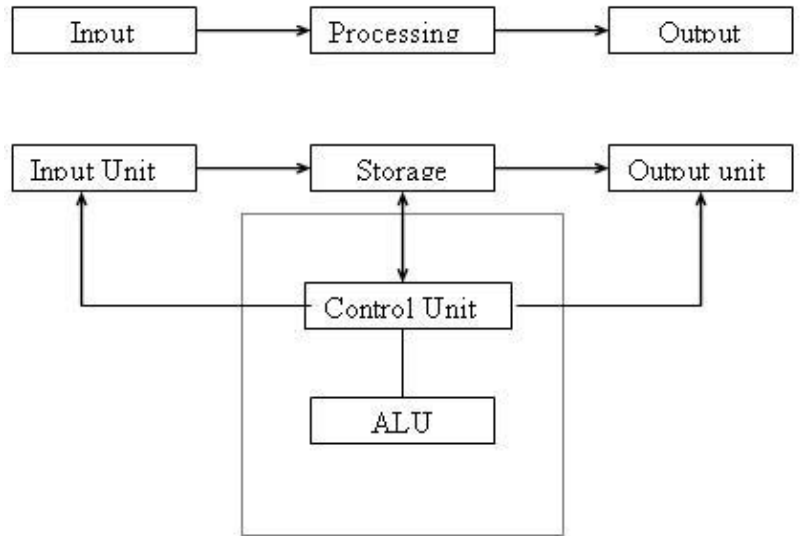
- ❖ Accept the data and instructions from the outside world.
- ❖ Convert it to a form that the computer can understand.
- ❖ Supply the converted data to the computer system for further processing.

Storage Unit: The storage unit of the computer holds data and instructions that are entered through the input unit, before they are processed. It preserves the intermediate and final results before these are sent to the output devices. It also saves the data for the later use. The various storage devices of a computer system are divided into two categories.

a. **Primary Storage:** Stores and provides very fast. This memory is generally used to hold the program being currently executed in the computer, the data being received from the input unit, the intermediate and final results of the program. The primary memory is temporary in nature. The data is lost, when the computer is switched off. In order to store the data permanently, the data has to be transferred to the secondary memory. Therefore most computers have limited primary storage capacity. Ex : RAM

b. **Secondary Storage:** Secondary storage is used like an archive. It stores several programs, documents, data bases etc. The programs that you run on the computer are first transferred to the primary memory before it is actually run. Whenever the results are saved, again they get stored in the secondary memory. The secondary memory is slower and cheaper than the primary memory. Some of the commonly used secondary memory devices are Hard disk, CD, DVD etc.,

Control Unit: It controls all other units in the computer. The control unit instructs the input unit, where to store the data after receiving it from the user. It controls the flow of data and instructions from the storage unit to ALU. It also controls the flow of results from the ALU to the storage unit. The control unit is generally referred as the central nervous system of the computer that control and synchronizes it's working.

Arithmetic Logical Unit: All calculations are performed in the Arithmetic Logic Unit (ALU) of the computer. It also does comparison and takes decision. The ALU can perform basic operations such as addition, subtraction, multiplication, division, etc., and does logic operations viz., >, <, =, 'etc. Whenever calculations are required, the control unit transfers the data from storage unit to ALU once the computations are done, the results are transferred to the storage unit by the control unit and then it is send to the output unit for displaying results.

Central Processing Unit: The control unit and ALU of the computer are together known as the Central Processing Unit (CPU). The CPU is like brain performs the following functions:

- ✓ It performs all calculations.
- ✓ It takes all decisions.
- ✓ It controls all units of the computer.

The heart of the computer, this is the component that actually executes the information. A central processing unit (CPU) is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions. The computer industry has used the term "central processing unit" at least since the early 1960s. Traditionally, the term "CPU" refers to a processor, more specifically to its processing unit and control unit (CU), distinguishing these core elements of a computer from external components such as main memory and I/O circuitry.

The central processing unit (CPU) of a computer is a piece of hardware that carries out the instructions of a computer program. It performs the basic arithmetical, logical, and input/output operations of a computer system. The CPU is like the brains of the computer - every instruction, no matter how simple, has to go through the CPU. So let's say you press the letter 'k' on your keyboard and it appears on the screen - the CPU of your computer is what makes this possible. The CPU is sometimes also referred to as the central processor unit, or processor for short. So when you are looking at the specifications of a computer at your local electronics store, it typically refers to the CPU as the processor.

When we start to look at the various components of a CPU and how they function, remember that this is all about speed. When we use a computer, we want the instructions to be carried out very fast. As the instructions become more complicated (for example, creating a 3D animation or editing a video file), we demand more from the CPU. Thus, the technological advances we have seen in processor technology have largely been driven by the need for speed.

Output Unit: The output unit of a computer provides the information and results of a computation to outside world. Printers, Visual Display Unit (VDU) or Monitors are the commonly used output devices.
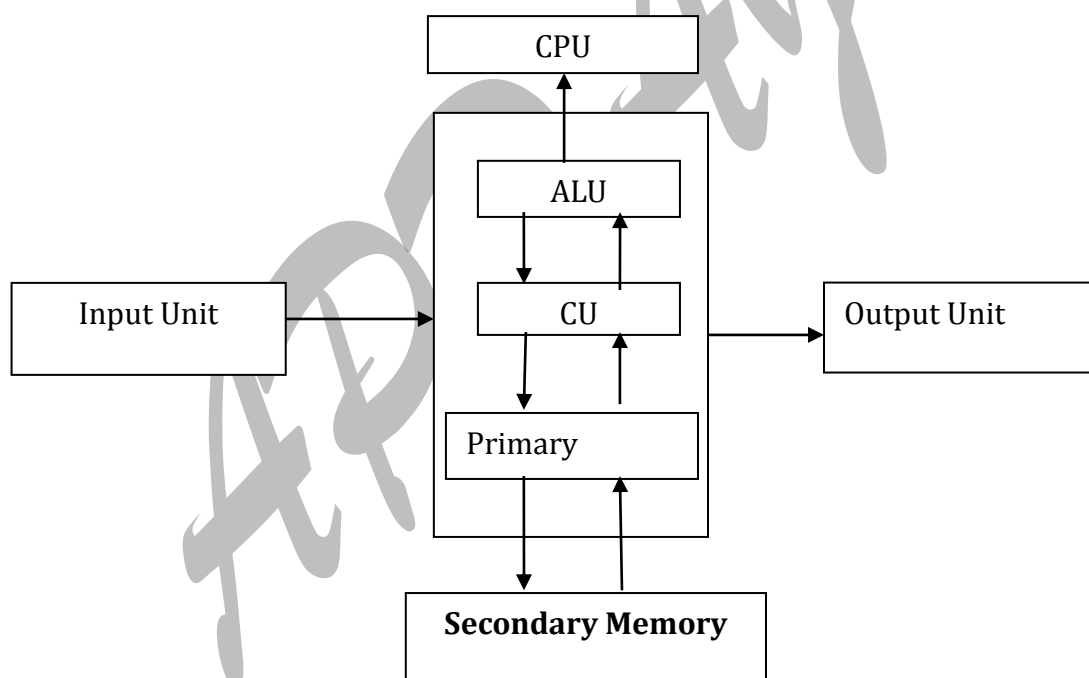
Keyboard: In computing, a keyboard is an input device, partially modelled after the typewriter keyboard, which uses an arrangement of buttons or keys, to act as mechanical levers or electronic switches. A keyboard typically has characters engraved or printed on the keys and each press of a key

typically corresponds to a single written symbol. However, to produce some symbols requires pressing and holding several keys simultaneously or in sequence. While most keyboard keys produce letters, numbers or signs (characters), other keys or simultaneous key presses can produce actions or computer commands. They are different types of keyboards i.e., **Normal, Multimedia and wireless** Keyboards. The keyboard consists of the following major categories of keys:

❖ *Letter keys:* These are the 26 letters of English alphabet arranged as in a typewriter.

❖ *Digit keys:* There are two sets of digit keys; one on the second row from the top of the keyboard just as in a typewriter, and the other is a numeric key pad at the bottom right which allows quick entry of numbers with the fingers of one hand.

❖ *Special character keys:* These are characters such as <, >, ?, /, {, }, [,], (,), ., ", \, !, @. #, $, %, ^, &, *, -, +. =. _• Most of these are printed when the shift key in the keyboard is pressed down and the key on which it is written is pressed. For example, when shift key and the key with digit 2 in the second row from top are pressed together, @ is printed.

❖ *Non printable control keys:* These are used for backspacing; going to next line, tabulation, moving cursor up or down, insert, delete characters etc. There is also a space bar at the bottom for leaving a space.

❖ *Function keys:* These are labelled Fl, F2, upto F12 and when pressed will invoke programs stored in the computer. The functions of some of the non-printable control keys are listed below:

❖ *Backspace key:* This key backs the cursor to the previous character and deletes the current character. If it is pressed 3 times, the 3 previous characters are deleted.

❖ **Enter key:** At the end of a line of typing, this key is pressed to go to the next line.

❖ **Arrow keys:** Moves the cursor up, down, back or forward.

❖ *Tab key:* Moves the cursor to the next tab stop.
❖ *Shift key:* When key pressed and a letter key is pressed, the upper case (i.e., capital) letter is printed. When a digit key, for example 5, on top line is pressed the character above the digit, namely % is printed. This indicator light is to remind the user of the locked/unlocked status of caps key.

MOUSE: It is a pointing device that functions by detecting two-dimensional motion relative to its supporting surface. Physically, a mouse consists of an object held under one of the user's hands, with one or more buttons. There are different types of mice. Three button mouse, Scroll Mouse and Cordless Mouse. In these also there are different types of Connectors same as keyboard.
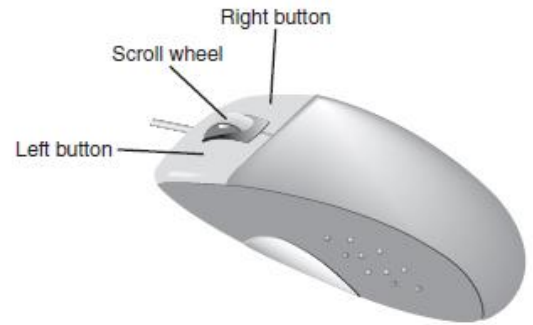
Other Input Devices:

Magnetic Ink Character Recognition (MICR): It is a character recognition technology used primarily by the banking industry to facilitate the processing of cheque and makes up the routing number and account number at the bottom of a cheque. The technology allows computers to read information off printed documents. Unlike barcodes or similar technologies, however, MICR codes can be easily read by humans.

The use of magnetic printing allows the characters to be read reliably even if they have been overprinted or obscured by other marks, such as cancellation stamps and signature. The error rate for the magnetic scanning of a typical check is smaller than with optical character recognition systems. For well printed MICR documents, the "can't read" rate is usually less than 1% while the substitution rate (misread rate) is in the order of 1 per 100,000 characters. MICR is standardized by ISO 1004:1995.

Optical mark recognition: Optical Mark Recognition (also called Optical Mark Reading and OMR) is the process of capturing human-marked data from document forms such as surveys and tests.

Many traditional OMR (Optical Mark Recognition) devices work with a dedicated scanner device that shines a beam of light onto the form paper. The contrasting reflectivity at predetermined positions on a page is then used to detect the marked areas because they reflect less light than the blank areas of the paper.

OMR is generally distinguished from optical character recognition (OCR) by the fact that a complicated pattern recognition engine is not required. That is, the marks are constructed in such a way that there is little chance of not reading the marks correctly. This does require the image to have high contrast and an easily-recognizable or irrelevant shape.

One of the most familiar applications of optical mark recognition is the use of HB pencil bubble optical answer sheets in multiple choice question examinations. Students mark their answers, or other personal information, by darkening circles marked on a pre-printed sheet. Afterwards the sheet is automatically graded by a scanning machine.

Optical character recognition: It is usually abbreviated to OCR, is the mechanical or electronic conversion of scanned images of handwritten, typewritten or printed text into machine-encoded text. It is widely used as a form of data entry from some sort of original paper data source, whether documents, sales receipts, mail, or any number of printed records.

It is crucial to the computerization of printed texts so that they can be electronically searched, stored more compactly, displayed on-line, and used in machine processes such as machine translation, text-to-speech and text mining. OCR is a field of research in pattern recognition, artificial intelligence and computer vision.

Early versions needed to be programmed with images of each character, and worked on one font at a time. "Intelligent" systems with a high degree of recognition accuracy for most fonts are now common. Some systems are capable of reproducing formatted output that closely approximates the original scanned page including images, columns and other non-textual components.

Barcode Reader (or barcode scanner): It is an electronic device for reading printed barcodes. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain decoder circuitry analysing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

Scanner: Scanner is a kind of input devices. They are capable of entering data or text or pictures directly into the computer. The main advantage of direct entry information is that users do not have to type the information. This provides faster and more accurate data entry.

Web Camera: A webcam is a video capture device connected to a computer or computer network, often using a USB port .The most popular use is for video telephony, permitting a computer to act as a videophone or video conferencing station. This can be used in messenger programs such as Windows Live Messenger, Skype and Yahoo messenger services. Other popular uses, which include the recording of video files or even still-images, are accessible via numerous software programs, applications and devices. Webcams are known for low manufacturing costs and flexibility, making them the lowest cost form of video telephony. A low resolution video camera used to provide visual input that can be easily transferred over the internet.

Output Devices:

PRINTER: A device that prints images (numbers, alphabets, graphs etc.) on paper is called Printer. After creating a document on the computer, you can send it to the printer for printing its hard-copy which is generally called a printout. The speed of a printer is rated either by pages per minute (ppm) or by characters per second (cps). You can take printout in full colours or in black colour only.

1. **Dot Matrix Printer:** A dot matrix printer or impact matrix printer is a type of computer printer with a print head that runs back and forth, or in an up and down motion, on the page and prints by impact, striking an ink-soaked cloth ribbon against the paper, much like a typewriter. Unlike a typewriter or daisy wheel printer, letters are drawn out of a dot matrix, and thus, varied fonts and arbitrary graphics can be produced. Because the printing involves mechanical pressure, these printers can create carbon copies and carbonless copies.

2. **Inkjet Printer:** This type of printer sprays ink on a sheet of paper. Inkjet printers produce high-quality text and graphics. An inkjet printer can print 4 to 6 pages in one minute. Due to its low price it is popular in homes. In these printers we will use cartridges. In this type we can print colour and black & white also.

3. **Laser Printer:** This type of printer uses fine powder ink called toner. Laser printers use the same technology as photocopy machines. They produce high quality text and graphics printouts. The laser printer also quite popular in corporate world and printing houses. Laser printers also available in black & white and colour.

4. **Plotter:** It is a computer printer for printing vector graphics. In the past, plotters were used in applications such as computer-aided design, though they have generally been replaced with wide-format conventional printers. It is now commonplace to refer to such wide-format printers as "plotters," even though they technically are not.

Monitors: A monitor or display (also called screen or visual display unit) is an electronic visual display for computers. The monitor comprises the display device, circuitry, and an enclosure. The display device in modern monitors is typically a thin film transistor liquid crystal display (TFT-LCD) thin panel, while older monitors use a cathode ray tube about as deep as the screen size.

CRT (Cathode Ray Tube): A VDU or CRT monitor is very similar to a television and its size is measured in diagonal length of the screen. Monitors are available in 12", 14", 15", 17", 19" and even in 21" size. It shows text or picture in colour or black and white, depending on the type. Colour monitors are more costly than black and white monitors. Whenever you type on the keyboard, you can see it on the monitor.

TFT-LCD (Liquid Crystal Display): LCD monitor is the flat panel type of monitor found on notebook PCs. TFT-LCD (Thin Film Transistor – Liquid Crystal Display) is a variant of LCD which uses TFT technology to improve image quality. TFT LCD is one type of matrix LCD. It is used in televisions, flat panel displays, projectors etc. LCD Monitors are available in 15", 17", 19", 21" and 23" size.

Organic light-emitting diode (OLED)

Organic light-emitting diode (OLED) monitors provide higher contrast and better viewing angles than LCDs, and are predicted to replace them. Lower cost in the future. Light weight & flexible plastic substrates. Wider viewing angles & improved brightness. Better power efficiency and Response time.

Speakers: deliver sound. Computer speakers, or multimedia speakers are external speakers, commonly equipped with a low power internal amplifier. The standard audio connection is a 3.5mm (1/8 inch) stereo jack plug often colour-coded lime green (following the PC 99 Standard) for computer sound cards. A few use an RCA connector for input.

Projectors: A projector or image projector is an optical device that projects an image (or moving images) onto a surface, commonly a projection screen.

Most projectors create an image by shining a light through a small transparent lens, but some newer types of projectors can project the image directly, by using lasers. A virtual retinal display, or retinal projector, is a projector that projects an image directly on the retina instead of using an external projection screen.

The most common type of projector used today is called a video projector. Video projectors are digital replacements for earlier types of projectors such as slide projectors and overhead projectors. These earlier types of projectors were mostly replaced with digital video projectors throughout the 1990s and early 2000s (decade), but old analog projectors are still used at some places. The newest types of projectors are handheld projectors that use lasers or LEDs to project images. Their projections are hard to see if there is too much ambient light. Movie theatre's used a type of projector called a movie projector, nowadays mostly replaced with digital cinema video projectors.

Modem: These used to access data via telephone line (dial-up connection) used to access BBS and Internet. A modem (modulator-demodulator) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. They are different types of modems. There are explained below

1. **Internal modems:** Internal computer modems are used with Dial-Up Internet connection through a couple of RJ-11 connection. Internal computer modems are usually 56K modems which mean that the modem is able to receive 56 Kbits/s (56 kilobits or 56000 bits per second) of data. This kind of data transmission is called downstream transmission, came from a provider and transmitted over telephone lines. Commonly it is the standard bandwidth with telephones lines.
2. **External modems**: It is the second term we have to consider from different types of computer modem. An *External* modem can be used to the same purpose and in the same conditions as internal computer modem. However external modem is a small box that uses other kind of interfaces to be connected to the computer.
3. **USB modem:** The same small box, on the other hand, can be an USB modem which normally uses USB port usually placed on the back or in front of the computer. Some Internet Service Providers supports wireless internet services. The wireless modems are used for this service. These modems work similar to traditional wired modems except its structure.

4. **Cable modem**: The cable modem uses a coaxial cable television lines to provide a greater bandwidth than the dial-up computer modem. An extremely fast access to the Web is providing by the cable modem with downstream transmission up to 38 Mbits/s and an upstream transmission up to 1 Mbits/s.

5. **DSL modem: DSL (Digital Subscriber Line)** modem is exclusively used for connections from a telephone switching office to the user. This technology, available and frequently usable, split up into two main categories:

6. **ADSL** or **Asymmetric Digital Subscriber Line:** It is used in North America and supports from 1.5 Mbits/s up to 9 Mbits/s of downstream transmission rate and up to 3 Mbits/s of upstream transmission rate.

Hardware: Hardware consists of interconnected devices that you can use to control the computer's operation. The hardware in a desktop computer is modular, making it easy for someone with intermediate knowledge of a computer to modify one. Desktop computers are more affordable than notebook computers. Main Components of a PC are Motherboard, Processor, RAM, Hard Disk Drive, FDD, HDD, CD Drive, DVD Drive, SMPS, Cabinet,

Software: Set of instructions given to the computer, software tells the computer what to do.

Firmware: Firmware is a type of software that provides control, monitoring and data manipulation of engineered products and systems. Typical examples of devices containing firmware are embedded systems (such as traffic lights, consumer appliances, and digital watches), computers, computer peripherals, mobile phones, and digital cameras. The firmware contained in these devices provides the low-level control program for the device.

People Ware: People Ware refers to the role people play in technology and the development of hardware or software. It can include various aspects of the process such as human interaction, programming, productivity, teamwork, and other factors.

Memories

Primary and Secondary memory: Storage is an important activity in the computers. Whatever the data, information Images and pictures would be saved by the user for future reference, Amazing storage devices are available in the field of computers. Computer memory can be categorized into Primary Memory & Secondary Memory

Primary memory: Primary memory is the memory that can be directly accessed by the CPU which constantly interacts with it, retrieves data stored there in, goes through instructions and execute them as per the requirement. All the information, data and application are loaded there in uniform manner. Earlier William tubes, delay lines or rotating magnetic drums were used as primary storage which was later replaced by magnetic core memory. Silicon chip technology revolutionized the electronic memory and paved the way for Random Access Memory (RAM): RAM is volatile (temporary) but fast form of memory. Apart from the main large capacity Random, Access Memory (RAM), there are two sub-layers of the primary memory processor registers within the processor, which are one of the fastest forms of data storage, contain a word of data (usually 32 or 64 bits). The CPU instructs and helps the Arithmetic and logic unit to perform a number of calculations on this data.

Processor cache, which is meant for enhancing the performance of the computer, links the fast registers to the slower main memory. Cache memory loads the duplicated information that is used most actively. It is much faster than the main memory but relatively can store limited data. It is also much slower but much larger than the processor registers. Cache setup is further split into different levels with smallest and fastest primary cache and relatively larger but slower secondary cache.

RAM (Random Access Memory): The most familiar form of system memory, Random Access Memory (RAM) derives its name from the fact that any of its memory cells can be accessed directly if you are aware of the row and column that intersect at that cell. The columns are referred to as bit lines while the rows are referred to as word lines. The intersection of a word line and bit line is the address of the memory cell onto a silicon wafer. In case of Serial Access Memory (SAM), the opposite of RAM, the data is stored as a series of memory cells and can be accessed sequentially. Whereas data stored in RAM can be accessed in any order. Some common types of RAM are as follows:

SRAM: Used primarily to create CPU's speed-sensitive cache, Static Random Access Memory (SRAM) uses multiple transistors for each memory cell. It does not have a capacitor in each cell. Each bit of memory is held by a flip-flop memory which takes four to six transistors besides some wiring. SRAM is not required to be refreshed which makes it significantly fast. As compared to DRAM, SRAM has more parts and therefore it consumes a lot more space on a chip. With less memory available per chip, the SRAM becomes costlier.

DRAM: Dynamic Random Access Memory needs to be refreshed consistently and contains memory cells with a paired transistor. In order to activate the transistor at each bit in the column, DRAM sends a charge through the appropriate column (CAS). The level of charge is determined by the sense-amplifier while reading. If the level of charge exceeds fifty percent, it is read as a 1 whereas if the charge is below fifty percent it is read as a 0. For dynamic memory to work, Either the CPU or the memory controller recharges all the capacitors before they are discharged to zero.

To ensure this the memory is read and written back which if referred to as refresh operation. DRAM is required to be refreshed dynamically all the time otherwise it will lose the information. This refreshing operation consumes a lot of time and causes the memory to slow down.

SDRAM: Synchronous dynamic random access memory enhances the system's performance by utilizing the burst mode concept. With maximum transfer rate to L2 cache of 528 mbps, SDRAM stays on the row that contains the requested bit and moves quickly through the columns to read each bit as it moves on.

DDR SDRAM: Double Data Rate Synchronous Dynamic Random Access Memory is somewhat similar to SDRAM but has higher bandwidth It has a maximum transfer rate to L2cache of about 1064 mbps.

ROM (Read only Memory): Read Only Memory (ROM) is an integrated circuit programmed with data that holds instructions for starting up the computer. Data stored in ROM is non-volatile and data is not lost when powered off. These data cannot be changed or a special operation is needed to be performed to change it. ROM chips also comprise of columns and rows but it is different from RAM in terms of intersection of these. These chips use diodes instead of transistors to connect the lines if the value is 1 whereas if the value is 0 the lines are not connected. A ROM chip cannot be reprogrammed or rewritten therefore when the chip is created it requires the programming of perfect and complete information. ROM chips are cost effective and use very little power. Some common types of ROM are as follows

PROM: Programmable Read Only Memory (PROM) is a type of ROM. These chips are non-volatile and cannot be purged to store something else once it has been used. Blank PROM chips can be coded with the help of a tool known as a programmer. Similar to ROM, PROM chips also have a grid of rows and columns but here fuses connect the intersections. A charge towards the columns passes through the fuse in a cell to a grounded row and indicates a value of 1. Initially PROM chips are all 1 s for all cells have a fuse. In order to change the value of a cell to 0, a programmer is used to send the current to the cell. The connection between the column and the row snaps as the higher voltages while passing through burns out the fuse.

EPROM: Erasable Programmable Read Only Memory can be erased with the help of ultraviolet light arid rewritten many times. These chips are configured by the EPROM programmer, providing the voltage at the specified levels.

EEPROM: Electrically Erasable Programmable Read Only Memory chips are riot required to remove, to be erased or rewritten. These chips do not require to be erased altogether and specific portion of it can be easily altered. Additional dedicated equipment is also not required to change the content the EEPROM chips. These chips are erased and rewritten with the help of electric charge.

Secondary Memory : Secondary memory is not directly accessible to the CPU. Input/output channels are used to access this non-volatile memory. This memory does not lose the data when the system is powered off. The most familiar form of secondary memory that is widely used is Hard Disk. Some examples of secondary memory are USB sticks, floppy drives and Zip drives. Secondary memory devices include magnetic disks like hard drives and floppy disks; optical disks such as CDs and CD ROMs; and magnetic tapes, which were the first forms of secondary memory.

Magnetic tapes

A magnetically coated strip of plastic on which data can be encoded. Tapes for computers are similar to tapes used to store music. Storing data on tapes is considerably cheaper than storing data on disks, tapes also have large storage capacities, ranging from a few hundred kilobytes to several gigabytes. Accessing data on tapes, however, is much slower than accessing data on disks. Tapes are sequential-access media, which means that to get to a particular point on the tape, the tape must go through all' the preceding points. In contrast, disks are random-access media because a disk drive can access any point at random without passing through intervening points.

Because tapes are so slow, they are generally used only for long-term storage and backup. Data to be used regularly is almost always kept on a disk. Tapes are also used for transporting large amounts of data. Tapes come in a variety of sizes and formats. Tapes are sometimes called streamers or streaming tapes.

Hard disk: A magnetic disk on which you can store computer data. The term hard is used to distinguish it from a soft, or floppy, disk. Hard disks hold more data and are faster than floppy disks. A hard disk, for example, can store anywhere from 10 to more than 100 gigabytes, whereas most floppies have a maximum storage capacity of 1.4 megabytes.

A single hard disk usually consists of several platters. Each platter requires two read/write heads, one for each side. All the read/write heads are attached to a single access arm so that they cannot move independently. Each platter has the same number of tracks, and a track location that cuts across all

platters is called a cylinder. For example, a typical 84 megabyte hard disk for a PC might have two platters (four sides) and 1,053 cylinders.

Hard disk provides convenient storage for large amounts accessible of data. Location where all information can be stored even when power is off. There are two types of HDD's. They are External and Internal Hard disks. Internal hard Disk Drives had two types one is IDE and other one is SATA. External Hard drives are connected with usb and Power cables. The max. Capacity now Available is 1 TB and 2 TB.

Floppy disks: A soft magnetic disk. It is called floppy because it flops if you wave it (at least, the SVS-inch variety does). Unlike most hard disks, floppy disks (often called floppies or diskettes) are portable, because you can remove them from a disk drive. Disk drives for floppy disks are called floppy drives. Floppy disks are slower to access than hard disks and less storage capacity, but they are much less expensive. And most importantly, they are portable.

Optical disks: A storage medium from which data is read and to which it is written by lasers. Optical disks can store much more data—up to 6 gigabytes (6 billion bytes)—than most portable magnetic media, such as floppies. The types of optical storage media are Compact Disc (CD). Compact Disk is used for secondary storage. It can read and write the data. The capacity of CD-ROM is 194 Mb – 900 Mb. CD Released in 1982, the CD (compact disc) revolutionized the music industry by offering digital sound to home consumers in replacement of analog formats. The CD was eventually transitioned from a music source to a form of storage for data. In 1990, the CD-R was introduced and allowed for the creation of optical disc's at home with a personal computer. The average CD allows for up to 700 MB of data storage. Digital bits are stored as pits on the reflective material in the disc. A red wavelength laser detects these pits and converts them to a digital signal.

Digital Versatile/Video Disc (DVD): DVD Released in the late 1990's, DVD's offered a widely accepted digital movie format. Allowing 4.7 GB for a single-layer disc and up to 8.5 GB for a dual-layer disc, DVD was an excellent choice for personal backups of data on a DVD-R or movie media. DVD is not only used for data and video. DVD-Audio discs are uncompressed studio master recordings that offer much higher bit-rate than a standard CD. DVD's used a red wavelength laser, much like CD's. The capacity of DVD-ROM is 4.7 GB – 17.08 GB.

4.7 GB (single-sided, single-layer)
8.5 GB (single-sided, double-layer)
9.4 GB (double-sided, single-layer)
17.08 GB (double-sided, double-layer – rare)

High Definition DVD: HD-DVD was released by Toshiba as a competing format to Sony's Blu-ray disc. HD-DVD offered enough storage space for full-length, high-definition movies on a single disc. HD-DVD discs were capable of holding 15 GB per layer with a maximum of two layers. Toshiba had planned on eventually releasing three-layer discs; however, with shifts of movie production studios, supports for HD-DVD dwindled until Toshiba announced it would no longer continue the format. HD-DVD drives use a blue wavelength laser that is able to read smaller pits on the optical media.

Blu-ray: Blu-ray is the newest high-definition optical format. Developed by Sony, Blu-ray discs offer 25 GB per layer with upto two layers per disc. Blu-ray discs have a protective coating that reduces the number of scratches and makes the disc durable. Like HD-DVD, Blu-ray offers a full-length, high-definition movie on one disc. Blu-ray recordable, or BD-R, drives are becoming more common in home

computers. The BD-R drives allow for up to 50 GB of storage on one disc. Blu-ray drives use the same type of laser as HD-DVD drives to allow for greater storage on the optical disc.

USB flash drive: A USB flash drive (Pen Drive) consists of flash memory data storage device integrated with a USB (Universal Serial Bus) 1.1 or 2.0 interface. USB flash drives are typically removable and rewritable, much smaller than a floppy disk, and most weigh less than 30 g. Storage capacities in 2009 can be as large as 256 GB with steady improvements in size and price per capacity. USB flash drives are often used for the same purposes as floppy disks were. They are smaller, faster, have thousands of times more capacity, and are more durable and reliable because of their lack of moving parts.

Flash Memory:

A variant of EEPROM is called a flash memory. Flash memories are random access memories. They use one transistor switch per memory cell and come in capacities ranging from 32 KB to 1 GB. They are non-volatile, i.e., they do not require power to preserve the data stored in them. The read time of flash memories is tens of nanoseconds whereas the write time is several microseconds. They are compact and come in various shapes such as pen drives, USB drives and flat disks. The major advantages of flash memory are:

- ✓ They are random access
- ✓ They are non-volatile
- ✓ They are slow write-fast read memories. Data stored in them can be over-written
- ✓ Their price/byte is rapidly reducing.

It is thus expected that they will become a popular removable, portable memory for data.

Cache Memory: Pronounced as Cash (like the money). Cache is a high-speed access area that can be either a reserved section of main memory or a storage device. The two main cache types are memory cache and disk cache. Memory cache is a portion on memory of high-speed static RAM (SRAM) and is effective because most programs access the same data or instructions over-and-over. By keeping as much of this information as possible in SRAM, the computer avoids accessing the slower DRAM. Most computers today come with L3 cache or L2 cache, while older computers included only L1 cache.

Like memory caching, disk caching is used to access commonly accessed data. However, instead of using high-speed SRAM, a disk cache uses conventional main memory. The most recently accessed data from a disk is stored in a memory buffer. When a program needs to access data from the disk, it first checks the disk cache to see if the data is there. Disk caching can dramatically improve the performance of applications because accessing a byte of data in RAM can be thousands of times faster than accessing a byte on a hard drive.

Another cache is known as "Internet browser cache" also known as "Temporary Internet Files" in Internet Explorer. Internet cache is used to help improve how fast data is opened while browsing the Internet. In most cases, each time a web page is opened, it is sent to your browser's temporary cache on your hard drive. If that page is accessed again and has not been modified, the browser will open the page from your cache instead of downloading the page again. This saves users a lot of time, especially if that the user is using a modem, and can also help save the web page owner on bandwidth.

Anyone concerned about their privacy or who wants to hide pages they've visited on the computer will often clear their Internet cache (history).

Operating System: It is a type of software that controls and coordinates the operation of the various types of devices in a computer system. The two objectives of an operating system are controlling the computer's hardware and providing and interface between the user and machine.

An **operating system** (**OS**) is an interface between hardware and user which is responsible for the management and coordination of activities and the sharing of the resources of a computer that acts as a host for computing applications run on the machine.

Types of Operating System: The operating system has evolved immensely form its primitive days to the present digital era. From batch processing systems to the latest embedded systems, the different types of operating system can be classified into SIX broad categories.

1. **Batch Processing Operating System:** This type of operating system was one of the first to evolve. Batch processing operating system allowed only one program to run at a time. The operating system is responsible for scheduling the jobs according to priority and the resources required. Batch processing operating systems are good at churning through large numbers of repetitive jobs on large computers. For example, this operating system would be best suited for a company wishing to automate their payrolls. A list of employees will be entered, their monthly salaries will be calculated, and corresponding pay slips would be printed. Batch processing is useful for this purpose since these procedures are repeated for every employee each month.

2. **Time-Sharing or Multi-User Operating System:** This system is used in computer networks which allow different users to access the same data and application programs on the same network. The multi-user operating system builds a user database account, which defines the right that users have on a particular resource of the system.

3. **Multi-Tasking Operating System:** In this system, more than one process (task) can be executed concurrently. The processor is switched rapidly between the processes. Hence, a user may run more than one process at a time. It is quite common that a user on his computer can have a word processor open and running, an audio CD player playing at the same time. This type of operating system allows a user to switch between the applications and even transfer data between them. For example, it allows a user to copy a picture from an Internet opened in the browser application, and paste it into image editing application.

4. **Real-Time Operating System (RTOS):** This system is designed to respond to an event within a predetermined time. This kind of operating is primarily used in process control, telecommunications, and so on. As the real-time operating systems respond quickly, they are often used in applications such as air flight or railway reservation booking.

5. **Multi-Processor Operating System:** This system can incorporate more than one processor dedicated to running processes. This technique of using more than one processor is often called parallel processing.

6. **Embedded Operating System:** It refers to the operating system that is self-contained in the device and resident in ROM. Since embedded systems are usually not general purpose systems, these operating systems are lighter or les resource intensive as compared to general purpose OS. Most of these operating systems also offer real-time operating system qualities. Typical systems that use embedded operating systems are household appliances, car management systems, traffic control systems, and energy management systems.

Functions of Operating System: The main functions of a modern operating system are as follows:

1. **Process Management:** As a Process manger, the operating system handles the creation and deletion of processes, suspension and resumption of processes, and scheduling and synchronization of processes.

2. **Memory Management:** As a memory manger, the operating system handles allocation and deallocation of memory space as required by various programs.

3. **File Management:** The operating system is responsible for creation and deletion of files and directories. It also takes care of other file-related activities such as organizing, storing, retrieving, naming, and protecting the files.

4. **Device Management:** Operating system provides input/output subsequent between process and device driver. It handles the device caches, buffers, and interrupts. Operating system also detects device failures and notifies the same to the user.

5. **Security Management:** The Operating system protects system resources and information against destruction and unauthorized use.

6. **User Interface:** Operating system provides the interface between the user and the hardware. The user interface is the layer that actually interacts with the computer operator. The interface consists of a set of commands or menus through which a user communicates with a program.

7. Microsoft Windows.

User interface: Operating System organizes applications so that users can easily access them, use them, and store application data. When an application is opened, the operating system lets the application provide the majority of the user interface. Common interfaces provided by different operating systems can be categorized as Command Line user Interface (CLI) and Graphical User Interface (GUI).

1. **Command Line user Interface (CLI):** In early days of computing, operating systems provided the user with the facility of entering commands via an interactive terminal. Those were the only means of communication between a program and its user, based solely on textual input and output. Commands were used to initiate programs, applications, and so on. A user had to learn many commands for proper operation of the system. Ex: Ms-DOS

2. **Graphical User Interface (GUI):** A program interface that takes advantage of the computer's graphics capabilities to make the program easier to use. Well-designed graphical user interfaces can free the user from learning complex command languages. Graphical user interfaces, such as
   - **Icons**: Small pictures that represent commands, files, or windows. By moving the pointer to the icon and pressing a mouse button, you can execute a command or convert the icon into a window. You can also move the icons around the display screen as if they were real objects on your desk.

   - **Desktop**: The area on the display screen where icons are grouped is often referred to as the desktop because the icons are intended to represent real objects on a real desktop.

- **Windows:** You can divide the screen into different areas. In each window, you can run a different program or display a different file. You can move windows around the display screen, and change their shape and size at will.

- **Menus**: Most graphical user interfaces let you execute commands by selecting a choice from a menu.
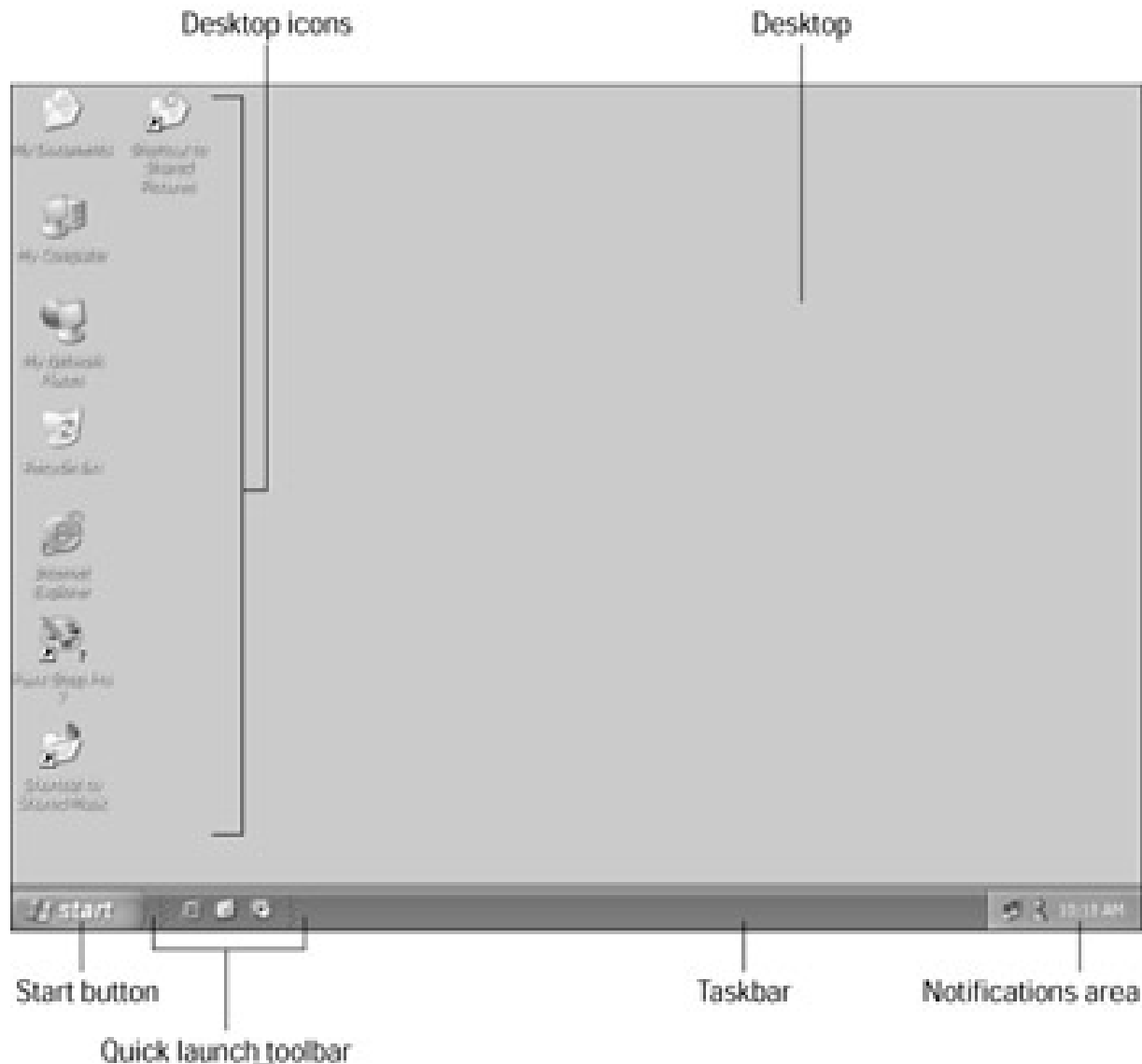
Desktop: Desktop is the first screen visible after logging in Windows XP operating system. The Desktop is a full screen display where all Windows activity takes place. It is part of a graphical user interface, where icons, menus and dialog boxes on the screen represent programs, files and options on your Computer.

Start Button: The Start menu provides a way to open most of the software applications that are installed on the computer. The Start Menu has been customized to provide quick access methods to all the programs.

Quick launch Toolbar: the Taskbar also displays its own set of toolbars; the most frequently used is the quick launch toolbar. The Quick launch bar is a customizable toolbar that displays Single Click links to programs and commands. By default, the Quick launch Toolbar displays links to Internet Explorer, Media Player, and Show Desktop.

If this Toolbar is not visible, then follow the steps given below:

1. Click on **Start** Button, go to **Settings** and select **Taskbar and start menu** tab
2. In the **Taskbar & Start Menu** Dialog Box Choose **Taskbar** tab and Select **Show Quick Launch,** and click **OK**.

Notification Area: The Notification area (also known as system tray in older versions of Windows Operating System) is located on the right hand side. This includes time and date, volume control and Antivirus programs (if any) etc., will be displayed.

Taskbar: It is used as a link to easily open and close programs. It also allows you to switch between the open application programs and files.

My Computer: Displays documents and files. It also provides access to hard drives and removable drives of the computer (both local and network).

My Network Places: Enables you to communicate with network resources on the network for file sharing purpose.

My Documents: It is used to store documents. It also contains data files, which can be easily organised.

My Pictures: It is used to store picture files. Which can be easily organised Images.

Recycle Bin: It is a temporary storage area used for storing deleted file and recover files accidentally deleted from hard drive or Floppy Drive.

Internet Explorer: Provides access to Internet.

Shut Down: This item has several options such as Shut Down and Restart Computer or Stand by the Computer.

Log off: close all programs and log on as a different user.

Run: Start's a program by typing in the program's name and path. There is a browse button to search for the program to be opened, in case, path is not known.

Help and Support: Gives access to the help feature for the Windows XP environment.

Printers and Faxes: Access to your printers and faxes folder, allows you to add and configure Printer/faxes.

Search: Searches for the different types of files in various locations.

Settings: Provides quick access to the Control Panel, Printer options and taskbar properties.

My Recent Documents: Reopens one of the last 15 files you have opened by clicking on its name.

All Programs: Provides access to a list of available programs and submenus of related programs.

Recycle Bin: The Recycle bin is a temporary storage area where you can move any files or folders that you no longer need. Recycle bin contains files deleted from hard drive only. Files or folders stored on a Floppy Disk or network drive are not sent to the recycle bin when deleted. Instead, they are permanently deleted.
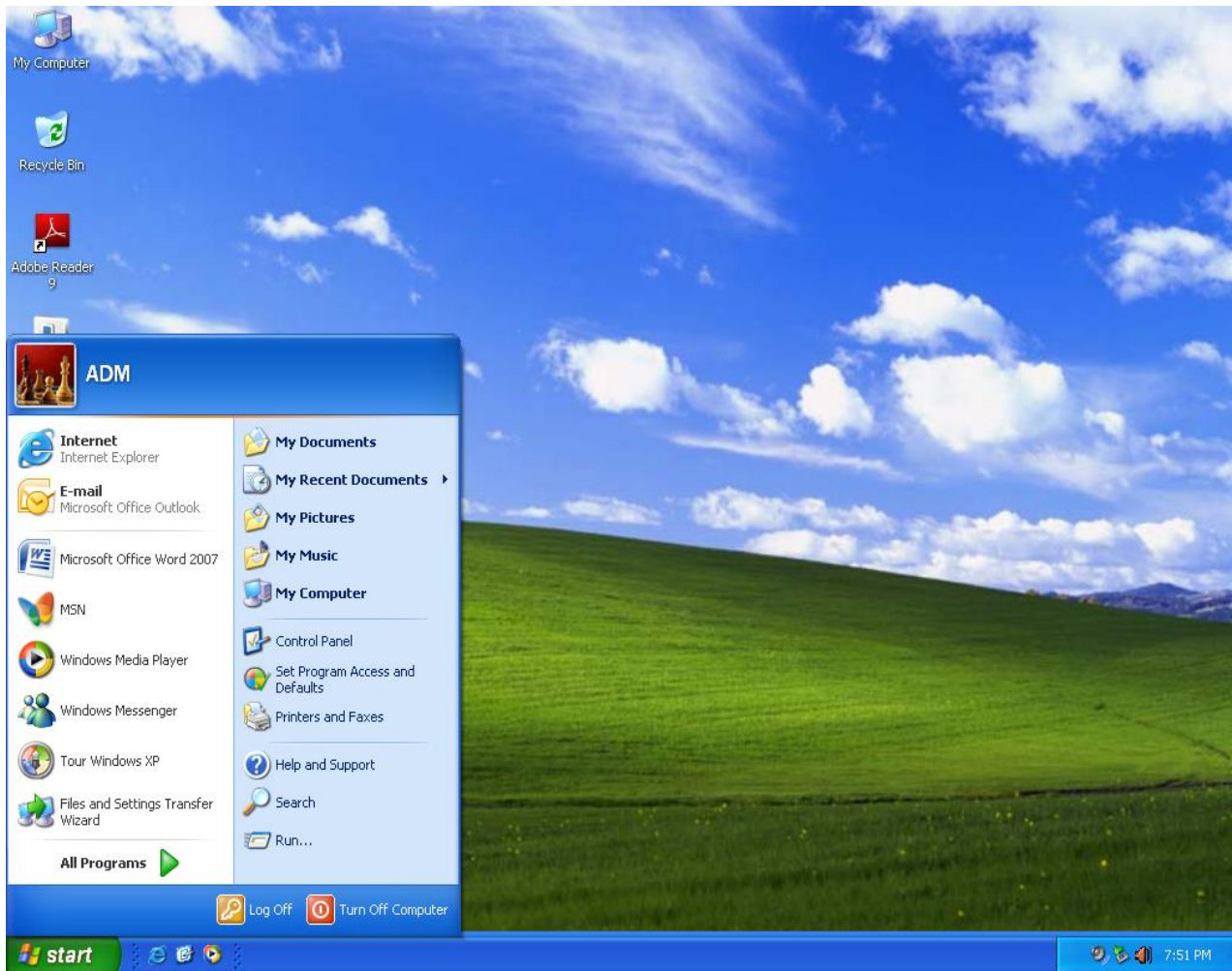
Control Panel: The Control Panel is a part of the Microsoft Windows graphical user interface which allows users to view and manipulate basic system settings and controls via applets, such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options. Additional applets can be provided by third party software.

The Control Panel has been an inherent part of the Microsoft Windows operating system since Windows 2.0, with many of the current applets being added in later versions. Beginning with Windows 95, the Control Panel is implemented as a special folder, i.e. the folder does not physically exist, but only contains shortcuts to various applets such as Add or Remove Programs and Internet Options. Physically, these applets are stored as .cpl files. For example, the Add or Remove Programs applet is stored under the name appwiz.cpl in the SYSTEM32 folder.

In recent versions of Windows, the Control Panel has two views, Classic View and Category View, and it is possible to switch between these through an option that appears on either the left side or top of the window.

Many of the individual Control Panel applets can be accessed in other ways. For instance, Display Properties can be accessed by right-clicking on an empty area of the desktop and choosing Properties.

The classic view consists of shortcuts to the various control panel applets, usually without any description (other than the name). The categories are seen if the user use "Details" view.

The category view consists of categories, which when clicked on display the control panel applets related to the category. In Windows Vista, the category used applets below the name of the category.

The Control Panel can be accessed quickly by typing control in the Run dialog box (⊞ Win+R).

On Windows 10, Control Panel is partially deprecated in favor of Settings app, which was originally introduced on Windows 8 as "PC Settings" to provide a touchscreen-optimized settings area using its Metro-style app platform. Some functions, particularly the ability to add and remove user accounts, were moved exclusively to this app on Windows 8 and cannot be performed from Control Panel

MS-WORD

Features of MS-Word:

Microsoft Word offers a variety of useful features.

- Spell check is a basic feature provided within the program that allows users to check proper spelling within their documents.
- Grammar checking is a popular feature that allows users to check punctuation, sentence structure and other basic grammar issues.
- Microsoft Word allows users to alter the appearance of text easily by changing its color, font style and size.
- The document is easily saved as a file on a computer or other media device and retrieved whenever needed for editing, sharing or printing.
- Cut and paste features included in Microsoft Word allow users to copy text or images from various sources and paste them directly into Word documents.
- Users are able to create and format custom tables and graphs, as well.
- Several templates are incorporated into the program that offer the ability to create customized resumes, letterheads, address labels and many other useful documents.
- The program offers the ability to handle HTML coding, so it can even be used to create or edit web pages.
- WYSIWYG (What You See Is What You Get): With WYSIWYG, a document appears on the display screen exactly as it will look when printed.
- Mail Merge is a feature supported by many word processors that enables you to do mass mailings or mailing campaigns.

Starting MS-WORD Program or Opening MS-Word Program:

- Click on the Start Button.
- Select Programs Menu or All Programs in the Start menu.
- In the Programs Menu or All Programs menu, select Microsoft Office Click on it.
- In this Microsoft office click on Microsoft Office Word 2007.
- Microsoft Office Word 2007 Window will open

MS-Word Window Components or Parts of Word 2007 Window:

Office Button – Click the Office Button to find a drop down menu containing options, such as: open, save, and print. Also shows previously opened files, which you may choose to "pin" them to make them "permanent" choices.

Title Bar – Shows name of program and open document. Also contains minimize, maximize and close buttons.

Quick Access Toolbar – This customizable toolbar allows you to add frequently used commands. Click on the down arrow at the end of the toolbar to add/remove command buttons – or - right-click on any command button and choose Add to Quick Access Toolbar.

Ribbon – The Ribbon is the strip of buttons and icons located above the work area in Word 2007. The Ribbon replaces the menus and toolbars found in earlier versions of Word. Each ribbon contains groups of command buttons with common purpose. Each ribbon contains 7 tabs.

Close Button – It will closes Microsoft Word Window.

Rulers – Gives you an idea of where you are on the page

Document Window – This is what you are typing/that will print out i.e. WYSIWYG
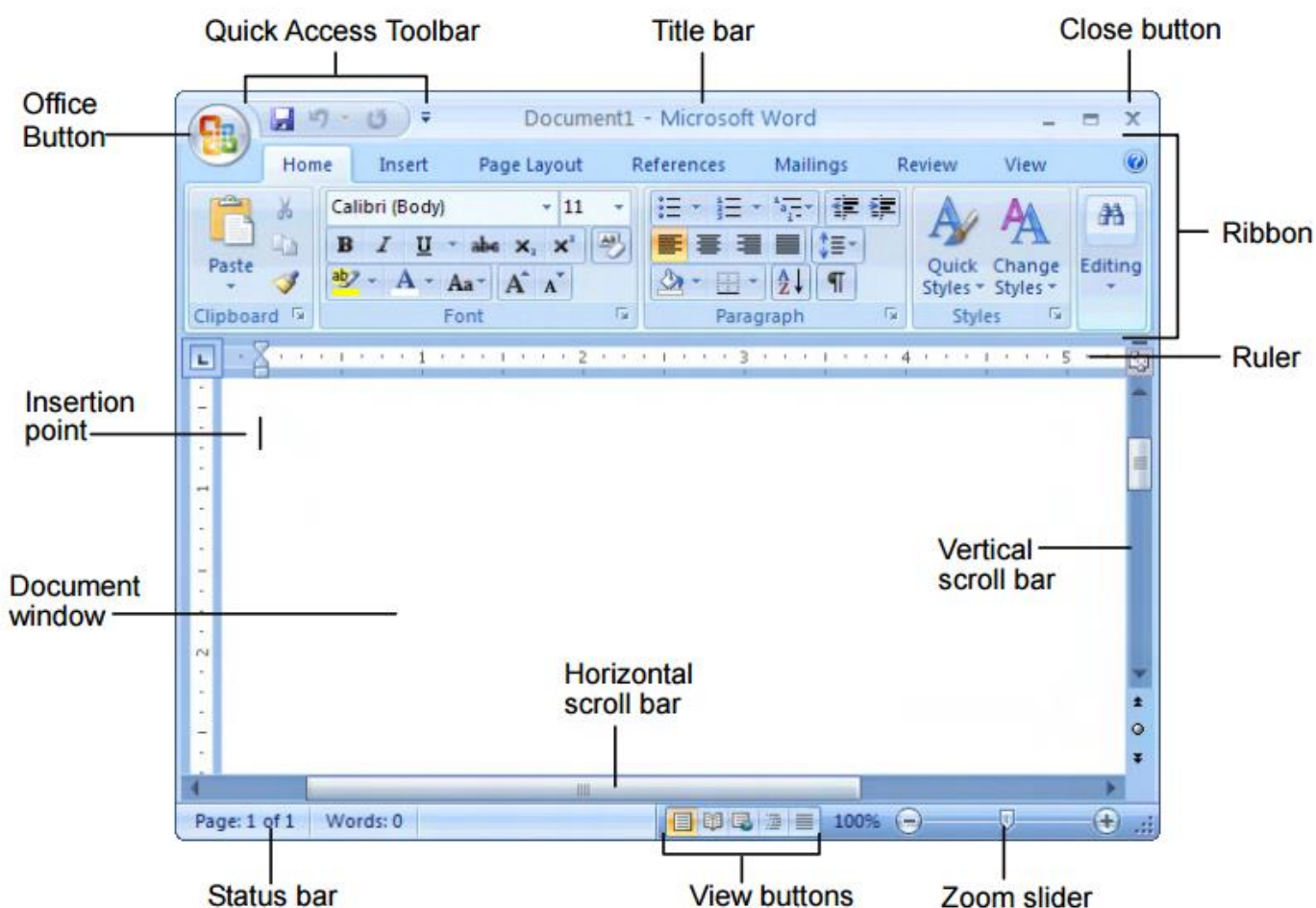
Scroll Bars – Allows you to view entire workbook by moving it up, down (vertical scroll bar), left or right (horizontal scroll bar).

Status Bar – This row can be customized by right-clicking and selecting desired options. Desired options may include page number/number of total page, word count, insert/overtype mode, caps lock, and zoom slide.

View buttons – These four buttons allow you to change the way you view your document on the screen. From left to right they are: print layout, full screen reading, web layout and draft. These can be added/removed by right clicking anywhere on the status bar and checking/unchecking View buttons.

Zoom Slider – Allows you to increase/decrease the amount of the document you see on the screen.

Create a new blank document:

- Click the Microsoft Office button.
- Select New. The New Document dialog box appears.
- Select Blank document under the Blank and recent section. It will be highlighted by default.
- New Document
- Click Create. A new blank document appears in the Word window.
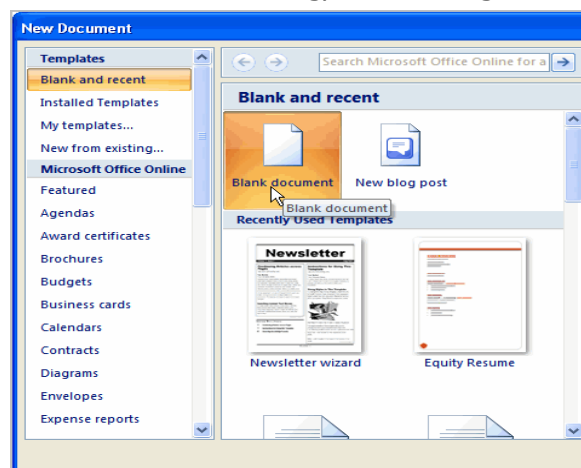
Formatting text in Word 2007 Document

To format font size:

1. Select the text you want to modify.
2. Left-click the drop-down arrow next to the font size box on the Home tab. The font size drop-down menu appears.
3. Move your cursor over the various font sizes. A live preview of the font size will appear in the document.
4. Left-click the font size you want to use. The font size will change in the document.

To format font style:

1. Select the text you want to modify.
2. Left-click the drop-down arrow next to the font style box on the Home tab. The font style drop-down menu appears.
3. Move your cursor over the various font styles. A live preview of the font will appear in the document.
4. Left-click the font style you want to use. The font style will change in the document.

To format font color:

- Select the text you want to modify.
- Left-click the drop-down arrow next to the font color box on the Home tab. The font color menu appears.
- Move your cursor over the various font colors. A live preview of the color will appear in the document.
- Left-click the font color you want to use. The font color will change in the document.
- Your color choices aren't limited to the drop-down menu that appears. Select More Colors at the bottom of the list to access the Colors dialog box. Choose the color you want, then click OK.

To use the bold, italic, and underline commands:

- Select the text you want to modify.
- Click the bold, italic, or underline command in the Font group on the Home tab.

To change the text case:

- Select the text you want to modify.
- Click the Change Case command in the Font group on the Home tab.
- Select one of the case options from the list.

To change text alignment:

- Select the text you want to modify.
- Select one of the four alignment options from the Paragraph group on the Home tab.
  1. *Align Text Left:* Aligns all of the selected text to the left margin
  2. *Center:* Aligns text an equal distance from the left and right margins
  3. *Align Text Right:* Aligns all of the selected text to the right margin
  4. *Justify:* Aligns text equally to the right and left margins; used in many books, newsletters, and newspapers

Printing Word 2007 Document

To preview the document before printing:

- Click the Microsoft Office button.
- Select Print → Print Preview. The document opens in Print Preview format.

Print Preview

- Click Print to print the document or Close Print Preview to exit the preview format and make changes to the document.
- In Print Preview format, you can perform many tasks, including:
- Modifying margins
- Changing page orientation
- Changing page size
- Zooming in and out to view various parts of the document
- Viewing multiple pages
- Accessing Word Options to change several Word settings

To print:

- Click the Microsoft Office button.
- Select Print → Print. The Print dialog box appears.
- Select the pages you want to print→either all pages or a range of pages.
- Select the number of copies.
- Check the Collate box if you are printing multiple copies of a multi-page document.
- Select a printer from the drop-down list.
- Print→Click OK.

To print via Quick Print:

- Click the Microsoft Office button.
- Select Print → Quick Print.

Note: The document automatically prints to the default printer.

Working with Text or Editing text in Word document

To insert text:

- Move your mouse to the location where you want text to appear in the document.
- Left-click the mouse. The insertion point appears.
- Type the text you want to appear.

To delete text:

- Place your cursor next to the text you want to delete.
- Press the Backspace key on your keyboard to delete text to the left of the cursor.
- Press the Delete key on your keyboard to delete text to the right of the cursor.

To select text:

- Place the insertion point next to the text you want to select.
- Left-click your mouse. While holding it down, drag your mouse over the text to select it.
- Release the mouse button. You have selected the text. A highlighted box will appear over the selected text.
- When you select text or images in Word, a hover toolbar with formatting options appears. This makes formatting commands easily accessible, which can save you time.

To copy and paste text:

- Select the text you want to copy.
- Click the Copy command on the Home tab.
- Place the insertion point where you want text to appear.
- Click the Paste command on the Home tab. The text will appear.
- Copy and Paste

To drag and drop text:

- Select the text you want to copy.
- Left-click your mouse, and drag the text to the location where you want it to appear. The cursor will have a text box underneath it to indicate that you are moving text.

Saving a Word 2007 Document

To use the Save As command:

- Click the Microsoft Office button.
- Select Save As →Word Document. The Save As dialog box appears.
- Select the location where you want to save the document using the drop-down menu.
- Enter a name for the document.
- Click the Save button.

To use the Save command:

- Click the Microsoft Office button.
- Select Save from the menu.

Note: Using the Save command saves the document in its current location using the same file name. If you are saving for the first time and select Save, the Save As dialog box will appear.

Headers and footers: The header is a section of the document that appears in the top margin, while the footer is a section of the document that appears in the bottom margin. Headers and footers generally contain information such as page number, date, and document name.

To insert a header or footer:

- Select the Insert tab.
- Click either the Header or Footer command. A menu appears with a list of built-in options you can use.
- Left-click one of the built-in options, and it will appear in the document.   *or*
- Left-click Blank to select it. Blank Header or Footer

To insert the date or time into a header or footer:

- With the header or footer section active, click the Date & Time command.
- Date and Time Command
- Select a date format in the dialog box that appears.
- Date and Time Dialog Box
- Click OK. The date and time now appear in the document.

Other header and footer options

- There are many other header and footer options you can use to design these sections of your document. From the Header and Footer Tools Design tab, you can see all of your design options.

Tables: A table is a grid of cells arranged in rows and columns. Tables can be customized and are useful for various tasks such as presenting text information and numerical data.

To insert a blank table:

- Place your insertion point in the document where you want the table to appear.
- Select the Insert tab.
- Click the Table command.
- Drag your mouse over the diagram squares to select the number of columns and rows in the table.
- Blank Table
- Left-click your mouse, and the table appears in the document.
- Enter text into the table.

<div align="center">or</div>

- Select the position in the document where your table will be placed by clicking the mouse.
- On the Insert tab, in the Tables group, click Table, and then click Insert Table.
- Under Table size, enter the number of columns and rows.
- Table will be created.
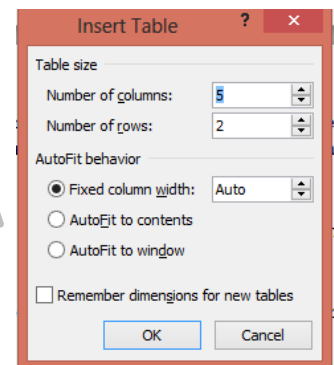
Inserting and modifying tables

To convert existing text to a table:

- Select the text you want to convert.
- Select the **Insert** tab.
- Click the **Table** command.
- Select **Convert Text to Table** from the menu. A dialog box appears.
- Choose one of the options in the **Separate text at:** section. This is how Word knows what text to put in each column.
- Click OK. The text appears in a table.
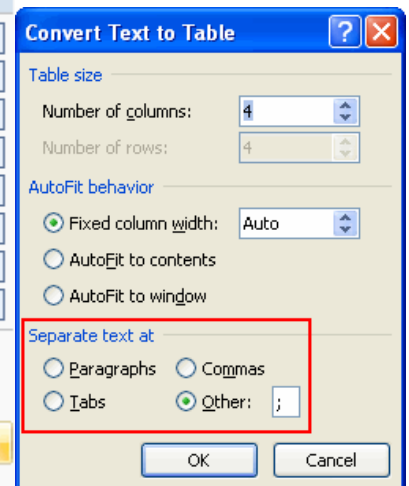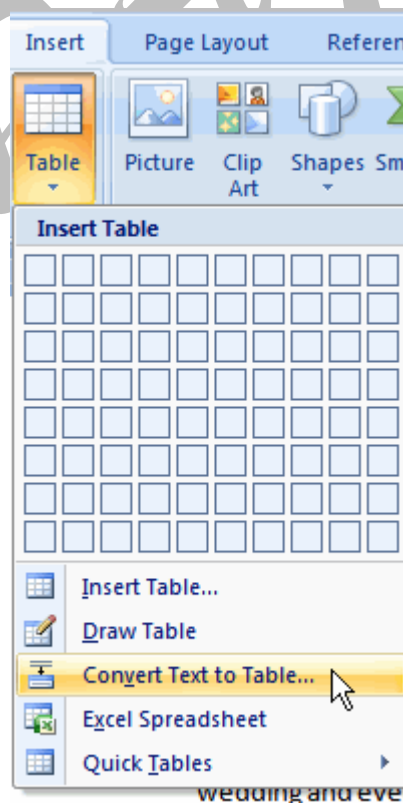
To add a row above an existing row:

- Place the insertion point in a row below the location where you want to add a row.

By Salesperson			
Current Salespeople & Monthly Ad Sales (Print, TV, Web)			*Insertion point is in FIRST row so we can add a new row ABOVE it.*
Jim M.	$10,252	$25,560	$13,745
Beth W.	$5,550	$13,470	$27,800
Luiz D.	$8, 547	$17,555	$8,907
Alice S.	$13,578	$6,789	$10,239

- Right-click the mouse. A menu appears.
- Select **Insert → Insert Rows Above**.

$25,560	$13,745
$13,470	$27,800
$17,555	$8,907
$6,789	$10,239

- Insert Columns to the Left
- Insert Columns to the Right
- Insert Rows Above
- Insert Rows Below
- Insert Cells...

Cut
Copy
Paste
Insert ►
Delete Cells...
Split Cells...
Borders and Shading...
Text Direction...
Cell Alignment ►
AutoFit ►
Table Properties...

ster in January 2008. All new clients are lo
1. New categories of business clients we s
usiness.

A new row appears **above** the insertion point.

By Salesperson	
Current Salespeople & Monthly Ad Sales (Print, TV, V	
Jim M.	$10,252
Beth W.	$5,550
Luiz D.	$8, 547
Alice S.	$13,578

You can also add rows below the insertion point. Follow the same steps, but select Insert Rows Below from the menu.

To add a column:

- Place the **insertion point** in a **column adjacent** to the location where you want the new column to appear.
- Right-click the mouse. A menu appears.
- Select **Insert → Insert Columns to the Left** or **Insert Columns to the Right**. A new column appears.

To delete a row or column:

- Select the row or column.
- Right-click your mouse, and a menu appears.
- Select **Delete Columns** or **Delete Rows**.

To apply a table style:

- Select the table. A **Table Tools Design** tab now appears on the Ribbon.
- Select the **Design** tab to access all of the **Table Styles** and **Options**.
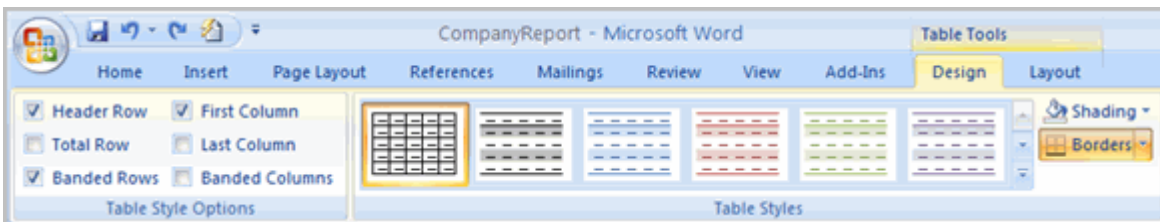
- Click through the various styles in the **Table Styles** section.
- Left-click a style to select it. The table style will appear in the document.
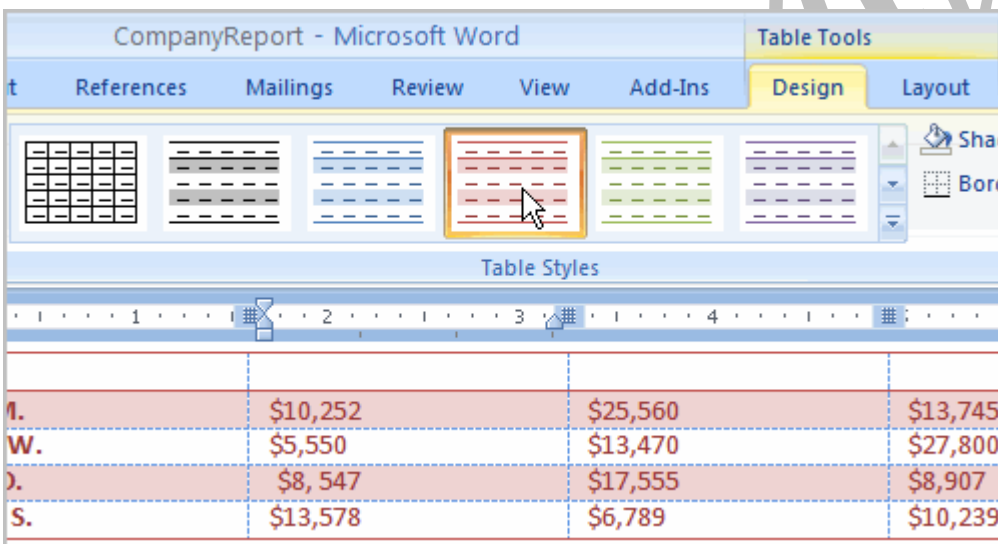
You can modify which table styles are displayed. In the **Table Styles Options**, you can select and deselect various table options. For example, you can select banded rows, and only tables with banded rows will appear in the Tables Styles section.

Page Borders in Word Documents:

How to create a page border in Microsoft Word

Microsoft Word gives you hundreds of page border options that allows you to surround a page with a clean or fancy border. Follow the steps below to insert a border in your Microsoft Word document.

- Open Microsoft Word.
- Click on the Page Layout tab.
- On the Page Layout tab, select Page Borders.
- On the Page Border tab in the Borders and Shading Window (shown below), select Box if you want a square border around your page.

▣ Select the Style of border you want on the page, which can be solid, dotted, or dashed. If you want to select artwork to use as the border, click the down arrow on Art. In the example below, we're using the hearts art as a border.

Tip: By default, the borders are applied to the whole document, which means every page has the same border. Clicking the down arrow on Apply to gives you the option to select the first page only, selected page, all pages but the first page, and other options.
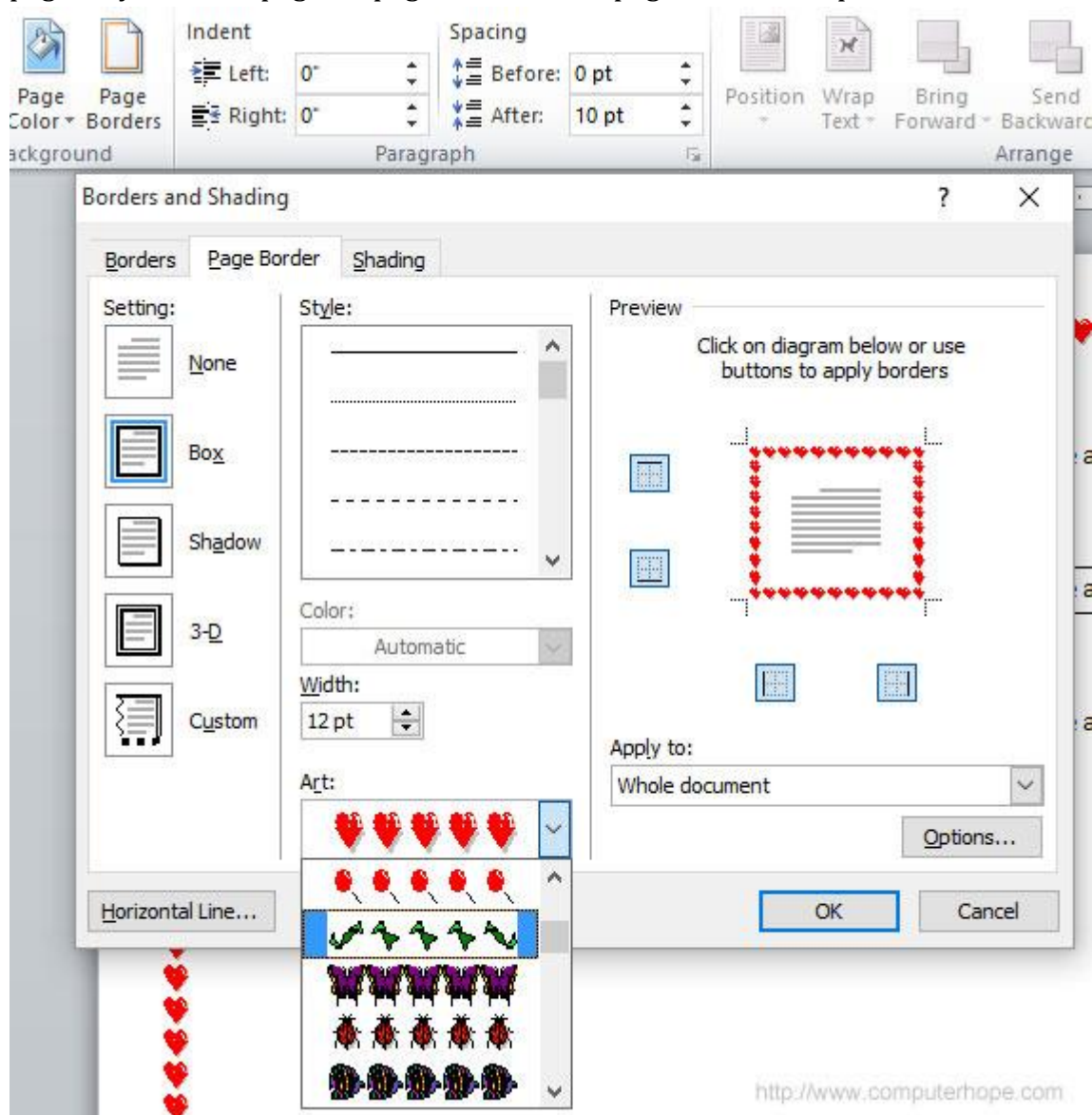
▣ Once you've selected all the border options you want to use in your document, click the Ok button to apply the border.

Insert symbols: Sometimes you need a character that's not on your keyboard, like a foreign currency symbol, a trademark (™), or a fraction like 1/3. For a few symbols, you can use the AutoCorrect feature to type them. For all other symbols, go to **Insert** > **Symbol**. AutoCorrect converts a series of keystrokes to symbols. Here are a few of the most commonly used ones.

Type   To insert

(c)   ©
(r)   ®
(tm)   ™
(e)   €
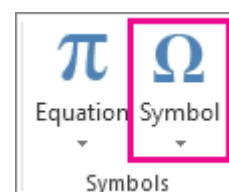
1. To insert other symbols, click **Insert** > **Symbol**.

   The **Symbol** gallery opens, which contains among other symbols, additional foreign currency symbols.
2. Select a symbol to insert it.
3. To see additional symbols, click **More Symbols** at the bottom of the gallery. The **Symbol** dialog box opens.
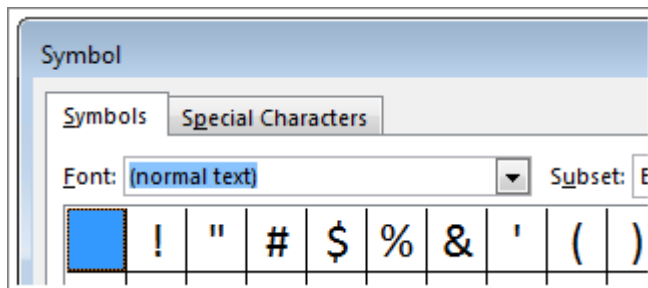
4. Scroll through the list of characters to see all the symbols available in your current font **(normal text)** in the **Font** box. Notice as you scroll that the label in the **Subset** drop-down list changes. If you want to skip directly to the not-equal-to sign, for example, select **Mathematical Operators** in the **Subset** list.
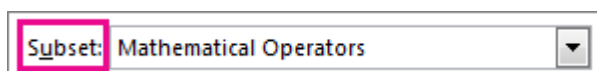
   Notes   If you do not see the **Subset** drop-down list, look in the lower right corner of the dialog box, and, in the **from** list, select **Unicode (hex)**.
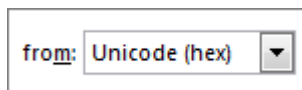
5. If you don't see what you want, select a different font in the **Font** box.
6. When you see a symbol you want, click **Insert** > **Close**. If you don't want to insert a symbol, click **Cancel**.

   Tip   For text that looks like pictures, switch to one of the Wingding fonts in the **Font** box.

Working with Shapes
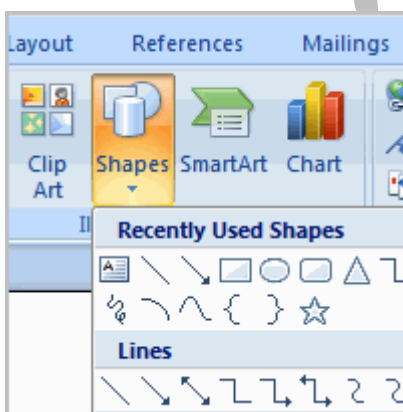
You can add a **variety of shapes** to your document, including arrows, callouts, squares, stars, and flow chart symbols. Want to offset your name and address from the rest of your resume? Use a line. Need to show the progress of a document through your office? Use a flow chart. While you may not need shapes in every document you create, they can add **visual appeal and clarity** to many documents.

In this lesson, you will learn how to insert a shape and format it by changing its fill color, outline color, shape style, and shadow effects. Additionally, you will learn to apply 3D effects to shapes that have this option.

Using shapes

To insert a shape:

- Select the **Insert** tab.
- Click the **Shape** command.
- Left-click a shape from the menu. Your cursor is now a cross shape.
- Left-click your mouse and while holding it down, drag your mouse until the shape is the desired size.
- Release the mouse button.

To change shape style:

- Select the shape. A new **Format tab** appears with Drawing Tools.
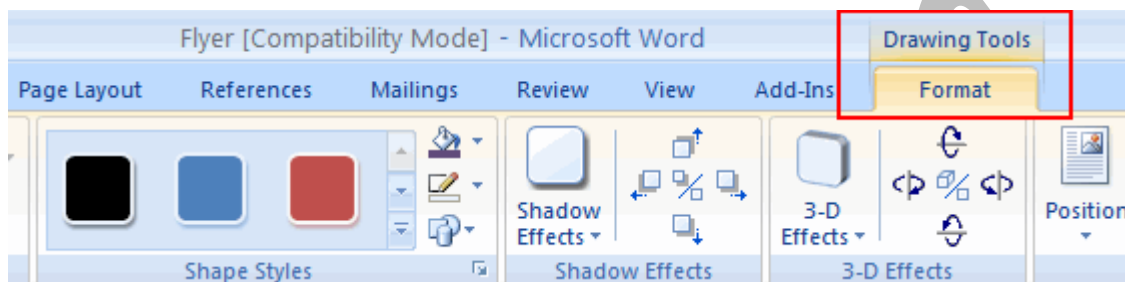
- Click the **More drop-down arrow** in the Shapes Style group to display more style options.
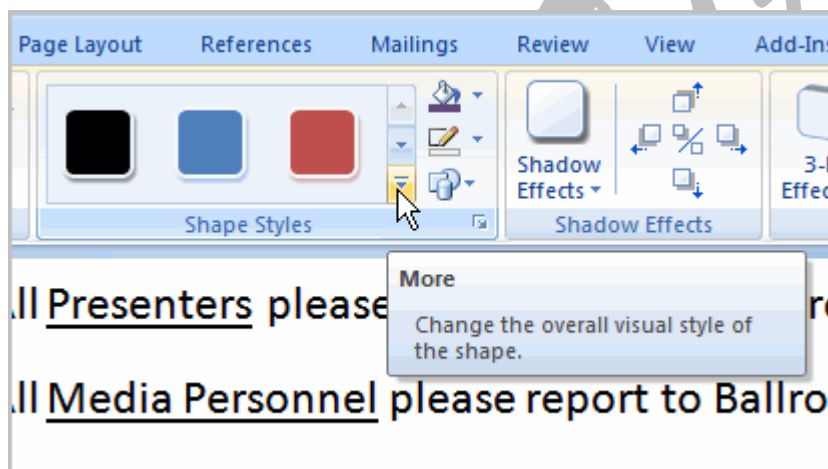
- Move your cursor over the styles, and Live Preview will preview the style in your document.
- Left-click a style to select it.

To change the shape fill color:

- Select the shape. A new **Format tab** appears with Drawing Tools.
- Click the **Shape Fill** command to display a drop-down list.
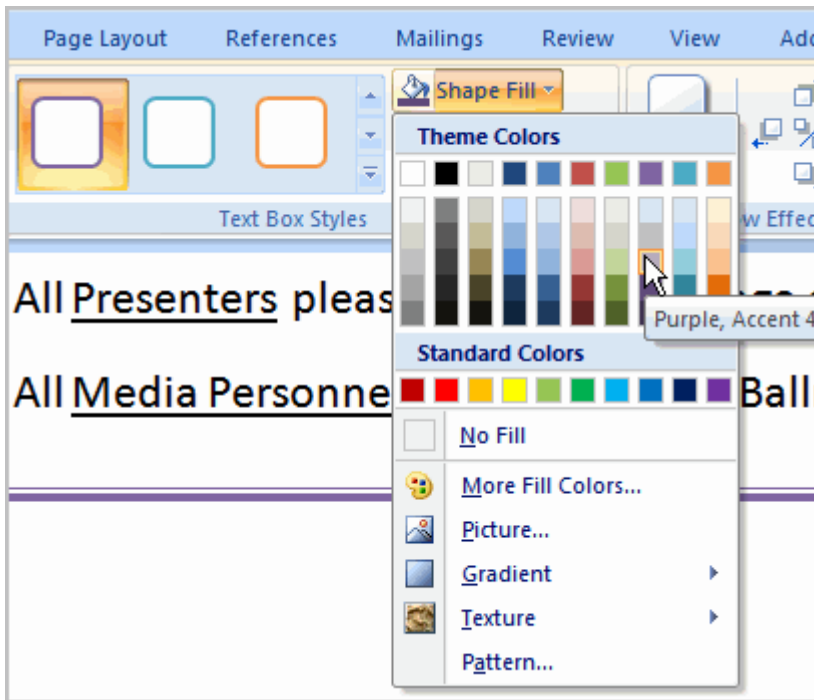
- Select a color from the list, choose No Fill, or choose one of the other options.

- Select a shape from the list.

Insert WordArt

WordArt is a quick way to make text stand out with special effects. You pick a WordArt style from the WordArt gallery, launched from the **Insert** tab, which you can then customize.

1. Click **Insert > WordArt**, and pick the WordArt style you want.
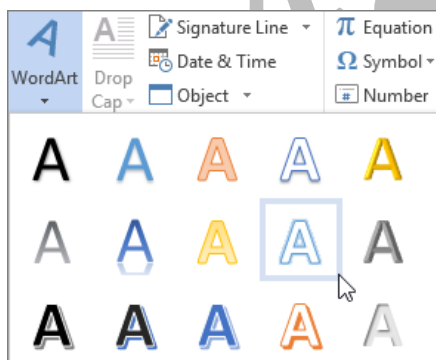
In the WordArt gallery, the letter A represents the different designs that are applied to all text you type.

Note   The WordArt icon is located in the **Text** group, and it may appear different depending on the program you're using and the size of your screen. Look for one of these icons:

2. The placeholder text "Your text here" appears, with the text highlighted. Enter your own text to replace the placeholder text.

Microsoft Word makes it easy to check that your document is spelt correctly and uses good grammar. You can either correct the spelling as you type, or run the Spelling and Grammar check at any time while producing your document.

Running the Spelling and Grammar Check

The Spelling and Grammar check looks at all the text in the document and suggests corrections to misspelt words, and allows the adding of words to the dictionary.

1. Click the Spelling and Grammar button in the Proofing group of the Review tab Or Press F7

   If Word discovers an error, the Spelling and Grammar dialogue box appears. The error appears in the text box at the top with suggestions below it.

   Take the required action by using the buttons on the right of the dialogue box as explained in the table below.

Ignore Once	Accepts the spelling or grammar used and moves onto the next error
Ignore All/Ignore Rule	Accepts the spelling or grammar used and ignores all future occurrences of it in the document
Next Sentence	Skips the grammar error and moves onto the next one
Add to Dictionary	Adds the word to the dictionary so that it is recognised in the future
Change	Changes the spelling of the word to the suggestion selected in the list
Change All	Changes all occurrences of the misspelling to the suggestion selected in the list

2. When the Spelling and Grammar check is complete, a dialogue box appears
3. Click Ok

Check Spelling and Grammar as you Type

Word 2007 checks for spelling and grammar errors whilst you type. Spelling errors are underlined in red and grammar errors are underlined in green.
This feature makes it easy to recognise errors and correct them on the move.

1. Right click on the error
2. A shortcut menu appears offering suggestions to the error
3. Select the required change. Word corrects the text and removes the red or green underline

Thesaurus in Word Document

A thesaurus is a dictionary of synonyms, words and phrases that mean the same thing as a particular word or phrase. Microsoft Word, and in more recent versions of Microsoft Office, other programs in the Office suite, come equipped with a thesaurus feature that enables you to look up both synonyms and antonyms (words and phrases that mean the opposite of a particular word or phrase). Using Word's thesaurus feature can help you add more variety to your writing and suggest words and phrases that your readers can better understand than the words you're uncertain of. Here's how to use Word's thesaurus feature.

- Access the Thesaurus In Word 2007 and 2010, select "Thesaurus" from the "Proofing" group on the "Review" menu ribbon.
- Select the word you want to find a synonym for. Press the "ALT" key and click on the word. A list of synonyms will appear in the "Research" task pane.
- Replace the selected word with the synonym or antonym of your choice. Point to the replacement word or phrase, click the down arrow to its right, and click "Insert" or "Copy" from the popup menu that appears.

Mail Merge: Mail Merge is a feature supported by many word processors that enables you to do mass mailings or mailing campaigns. Mail Merge is a useful tool that will allow you to easily produce multiple letters, labels, envelopes, and more using information stored in a list, database, or spread sheet. Mail Merge Wizard to create a data source and a form letter, and explore other wizard features. Additionally, you will learn how to use the Ribbon commands to access Mail Merge tools outside of the wizard.

1. **Select a document type:** Click the Mailings tab on the Ribbon, click the Start Mail Merge button in the Start Mail Merge group, and select the type of document you want to create.
2. **Connect the document to a data source:** In the Start Mail Merge group on the Mailings tab, click the Select Recipients button.
3. **Refine recipients:** In the Start Mail Merge group on the Mailings tab, click the Edit Recipient List button.
4. **Insert merge fields:** Position the insertion point where you want to insert the merge field(s) and use the commands found in the Write & Insert Fields group on the Mailings tab.
5. **Preview your letters:** In the Preview Results group on the Mailings tab, click the Preview Results button.
6. **Complete the merge:** In the Finish group on the Mailings tab, click the Finish & Merge button and select an option from the list.
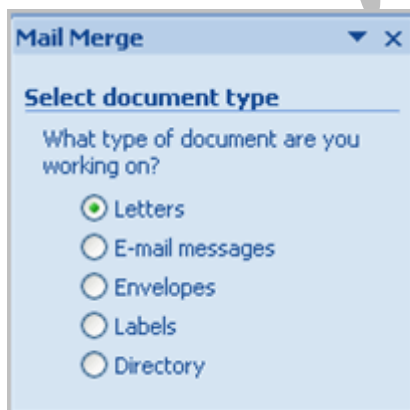
Mail Merge is a useful tool that will allow you to easily produce multiple letters, labels, envelopes, and more using information stored in a list, database, or spreadsheet.

To use Mail Merge:

- Select the **Mailings** on the Ribbon.
- Select the **Start Mail Merge** command.
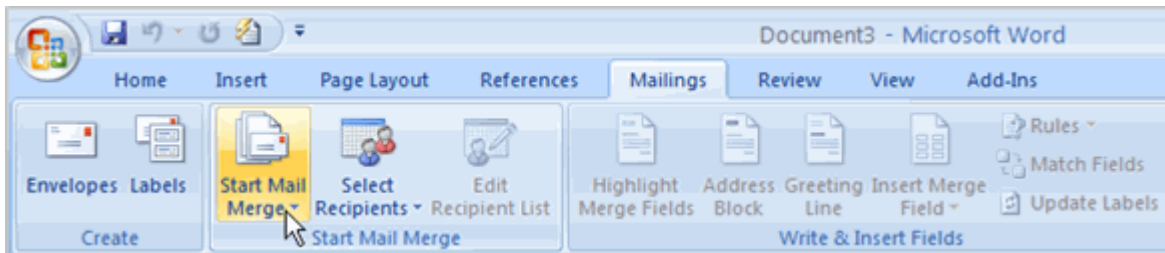
- Select **Step by Step Mail Merge Wizard**.

The Mail Merge task pane appears and will guide you through the **six main steps** to complete a merge. You will have several decisions to make during the process. The following is an example of how to create a form letter and merge the letter with a data list.

Steps 1-3

- Choose the type of document you want to create. In this example, select **Letters**.
- Click **Next: Starting document** to move to Step 2.
- Select **Use the current document**.
- Click **Next: Select recipients** to move to Step 3.
- Select the **Type a new list** button.
- Click **Create** to create a data source. The **New Address List** dialog box appears.

  - ➢ Click **Customize** in the dialog box. The Customize Address List dialog box appears.
  - ➢ Select any field you do not need, and click **Delete**.
  - ➢ Click **Yes** to confirm that you want to delete the field.
  - ➢ Continue to delete any unnecessary fields.
  - ➢ Click **Add**. The Add Field dialog box appears.
  - ➢ Enter the new field name.
  - ➢ Click OK.
  - ➢ Continue to add any fields necessary.
  - ➢ Click **OK** to close the Customize Address List dialog box.
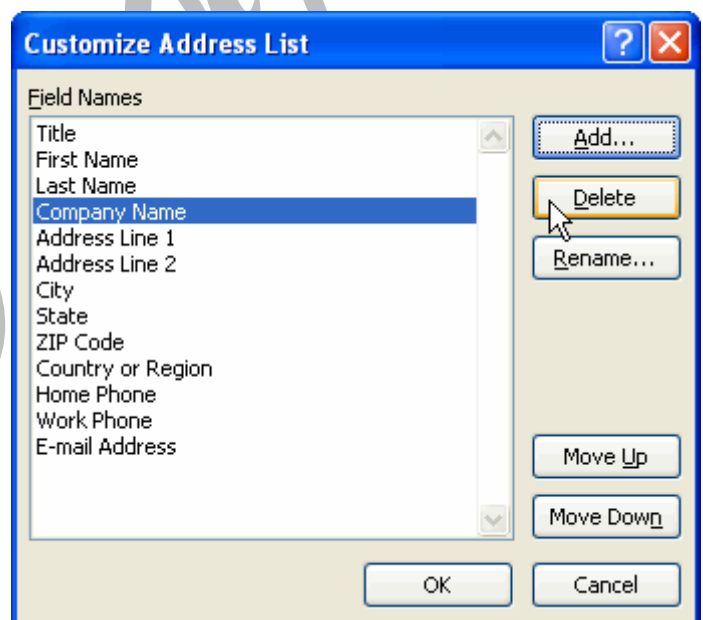
To customize the new address list:

- Enter the necessary data in the New Address List dialog box.
- Click **New Entry** to enter another record.
- Click **Close** when you have entered all of your data records.
- Enter the file name you want to save the data list as.
- Choose the location where you want to save the file.
- Click **Save**. The Mail Merge Recipients dialog box appears and displays all of the data records in the list.
- Confirm that the data list is correct, and click **OK**.
- Click **Next:Write your letter** to move to Step 4.

Steps 4-6

- Write a letter in the current Word document, or use an open existing document.

To insert recipient data from the list:

- Place the insertion point in the document where you want the information to appear.
- Select Address block, Greeting line, or Electronic postage from the task pane. A dialog box with options will appear based on your selection.

  OR

- Select More Items. The Insert Merge Field dialog box will appear.
- Select the field you want to insert in the document.
- Click **Insert**. Notice that a placeholder appears where information from the data record will eventually appear.
- Repeat these steps each time you need to enter information from your data record.
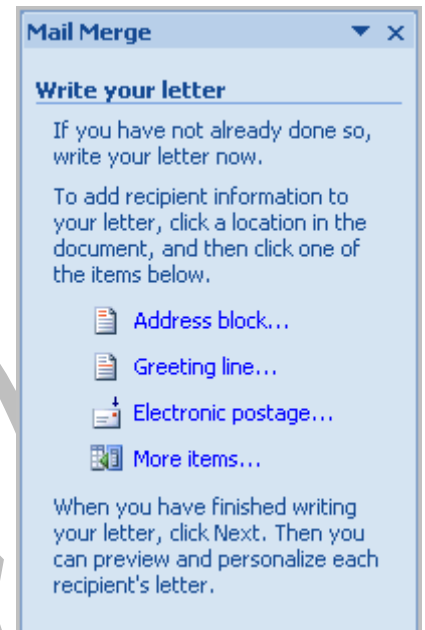
- Click **Next: Preview your letters** in the task pane once you have completed your letter.
- Preview the letters to make sure the information from the data record appears correctly in the letter.
- Click **Next: Complete the merge**.
- Click **Print** to print the letters.
- Click **All**.
- Click **OK** in the Merge to Printer dialog box.
- Click **OK** to send the letters to the printer.

The Mail Merge Wizard allows you to complete the merge process in a variety of ways. The **best** way to learn how to use the different functions in Mail Merge is to try to develop several of the different documents—letters, labels, and envelopes—using the different types of data sources.

Ms – Power Point

Features of PowerPoint:

1. Microsoft PowerPoint is a presentation program currently developed by Microsoft, for use on both Microsoft Windows and Apple Macintosh operating systems.
2. PowerPoint is useful for helping develop the slide-based presentation format and is currently one of the most commonly used slide-based presentation program.
3. **Design:** The design features of PowerPoint allow you to customize the appearance and format of the slides.
4. PowerPoint typically comes with a set of preloaded themes for you to choose from.
5. These can range from simple color changes to complete format layouts with accompanying font text. Themes can be applied through the whole presentation or a single slide.
6. Using the page setup allows you to optimize the presentation for the display size; for instance, you should use a larger screen ratio when displaying on a projector compared to a computer screen.
7. **Animation:** PowerPoint animation is divided between slide transitions and element animation.
8. Using slide transition adds an effect when switching slides during a slide show.
9. You can edit the transition effect and timing, as well as opt for an on-click or automatic transition between slides.
10. Element animation adds movement and sounds to the objects within the slide.
11. For example, if you're constructing a photo gallery as a slide show, you can choose which pictures enter the slide first, how they enter and add a sound as they enter.
12. **Presentation:** The presentation function of PowerPoint is largely designed to accommodate public speaking.
13. PowerPoint comes with a built-in notes function; when printing out presentation slides, you can add presenter notes beside each slide as accompanying content.
14. This is useful to clarify points in the slide without sacrificing the slide's readability. As of the 2007 version of PowerPoint, you can pre-record narration for a presentation.
15. PowerPoint also has a rehearsal function as well, allowing you or your team to practice your timing and monitor the length of your presentation.
16. **Integration:** PowerPoint is compatible with all other software in the Microsoft Office suite; you can export slides into Word documents or use Excel charts within your presentation.
17. In addition to image and audio support, PowerPoint 2007 also has video-integration functionality; you can embed videos within a presentation for easy playback without exiting the program.
18. You can also export presentation files to an online interface for multi-user remote editing and presentation practice.

Starting a PowerPoint Program

You can start your PowerPoint program in different ways.   One way is using Start button:

1. Click on the Start button.
2. In the menu that appears select All Programs→Microsoft Office→Microsoft Office PowerPoint 2007.   In few seconds you will see PowerPoint screen on the monitor
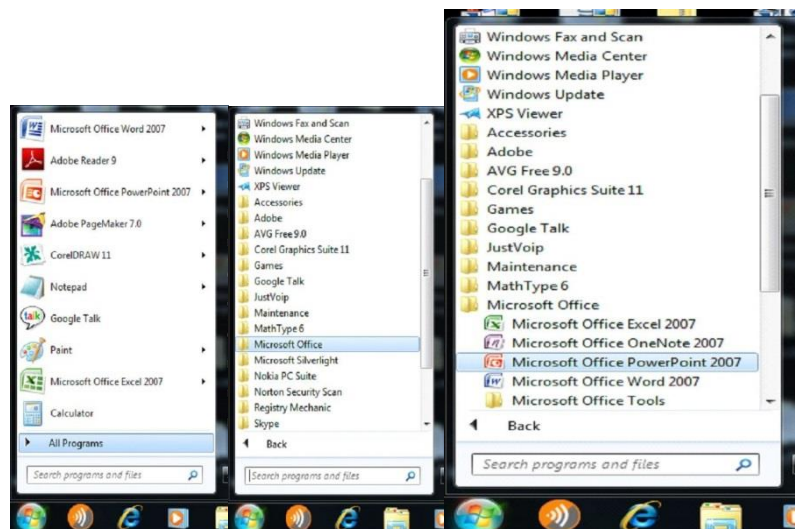
**Creating New Presentations or Blank Presentation:**

When you open PowerPoint from the Start menu or from an icon on your desktop, a new presentation with one slide appears by default. You can also create a new presentation while PowerPoint is already open.

- Click the Microsoft Office button, and choose New from the menu.
- The New Presentation dialog box will appear. Blank presentation is selected by default.
- Click Create, and a new presentation will open in the PowerPoint window.
- *Note: The default slide that appears when you create a new presentation is a Title Slide layout.*
- *A new blank presentation can also be created by pressing Ctrl + N*
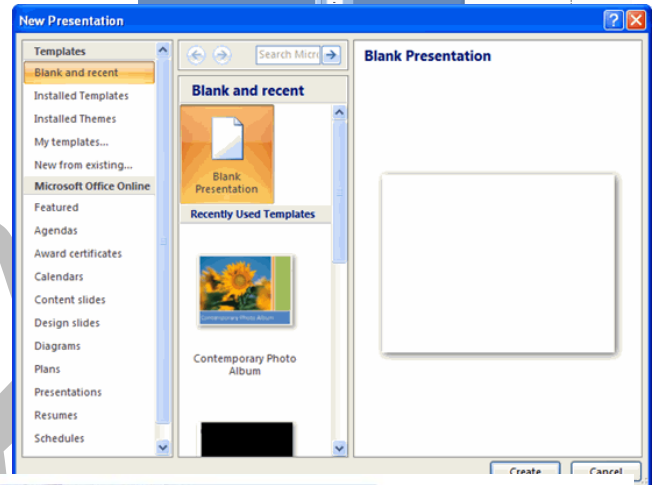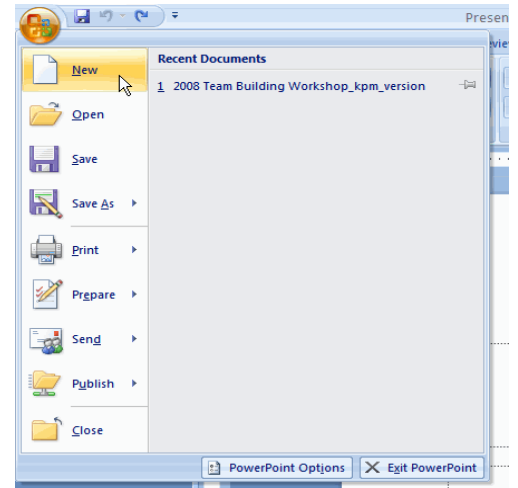
Creating a Presentation using a Template:

- Click the Microsoft Office Button Office button image , and then click New.
- In the New Presentation dialog box, do one of the following:
  a. Under Templates, click Blank and recent, Installed Templates, or Installed Themes, click the built-in template that you want, and then click Create.
  b. Under Templates, click New from existing, locate and then click the other presentation file that contains the template, and then click Create New.
  c. Under Templates, click My templates, select a custom template that you created, and then click OK.
  d. Under Microsoft Office Online, click a template category, select a template, and then click Download to download the template from Microsoft Office Online.
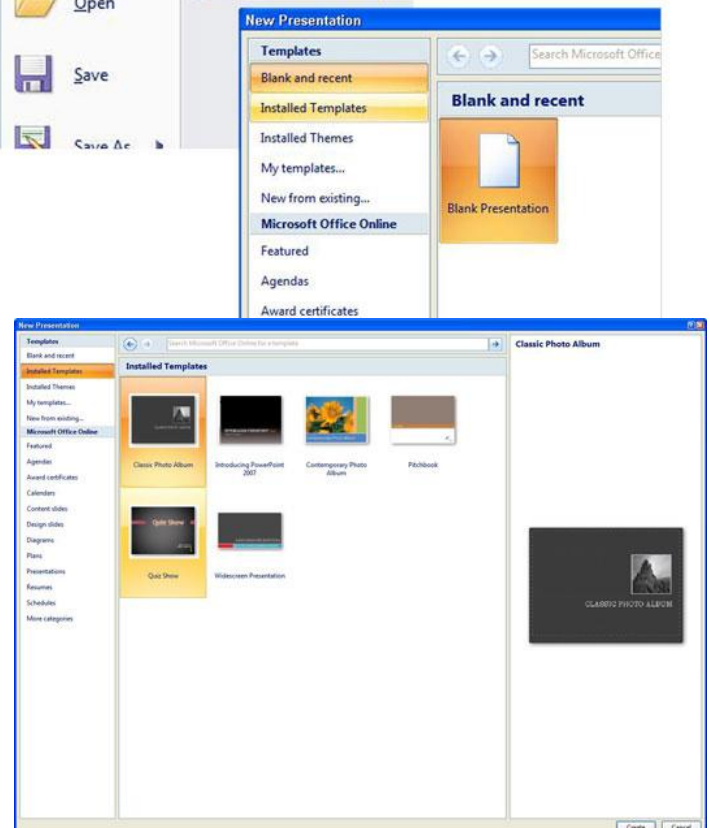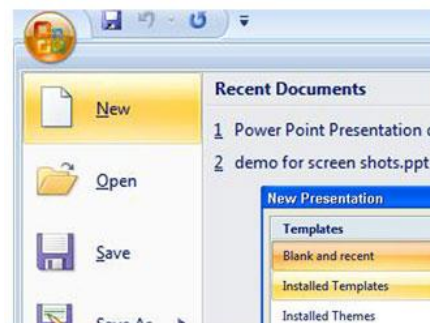
Inserting and Deleting Slides in a Presentation

- Home Tab >> Slides Group >> New Slide
- Click on the New Slide Tool. It adds a new slide in the default layout "Title and Content."

<div align="center">or</div>

- Locate the slide you'd like to insert new side. And click Ctrl+M on keyboard

<div align="center">or</div>

- Right-click directly onto the slide you'd like to insert new Slide. Click "Insert Slide" from the drop-down that is displayed.
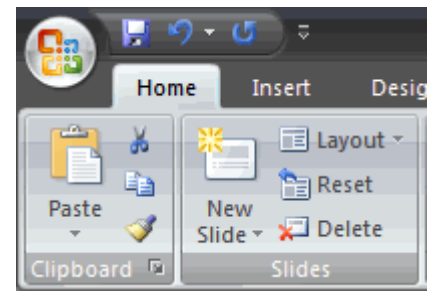
To delete a slide:

- Home Tab >> Slides Group >> Delete
- Select the slide you want to delete.
- Click the Delete command in the Slides group on the Home tab.

<div align="center">or</div>

- Locate the slide you'd like to delete. And click Delete Button on keyboard

<div align="center">or</div>

- Right-click directly onto the slide you'd like to delete. Click "Delete Slide" from the drop-down that is displayed.
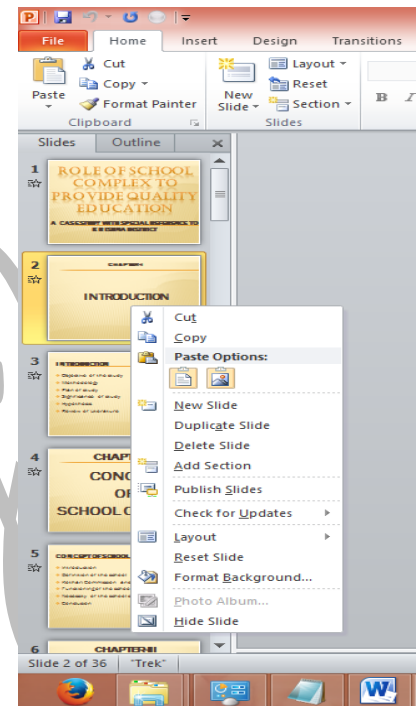
Adding clip art

You can add clip art to any slide by going to the Illustrations or Images Group in the Insert tab, then click the Clip Art button.

Try adding a fish image to your slide.

1. Go to the Illustrations or Images Group in the Insert tab, then click the Clip Art button.
2. The Clip Art window appears on the right side of your screen.
3. Type "fish" in the search box and click Go.
4. Clicking on an image will automatically add it to your slide.
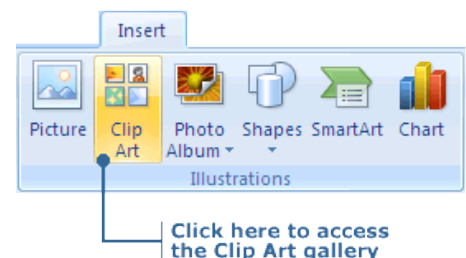
Note: Some built-in slide Layouts in PowerPoint already have placeholders for clip art. To insert clip art into one of these slides, simply click the placeholder and the clip art gallery will open

Adding Pictures:

You can add pictures to any slide by going to the Illustrations or Images Group in the Insert tab. Then click the picture button.

Try adding any image to your slide.

1. Go to the Illustrations or Images Group in the Insert tab, Then click the Picture button.
2. The Insert Picture dialog box window will appear on the screen.
3. Select picture file and click Insert.
4. Image will automatically add it to your slide.

To insert a sound file from your computer:

- ▣ Select the slide where you want to add sound.
- ▣ Select the Insert tab.
- ▣ Click the drop-down arrow on the Sound command in the Media Clips group.
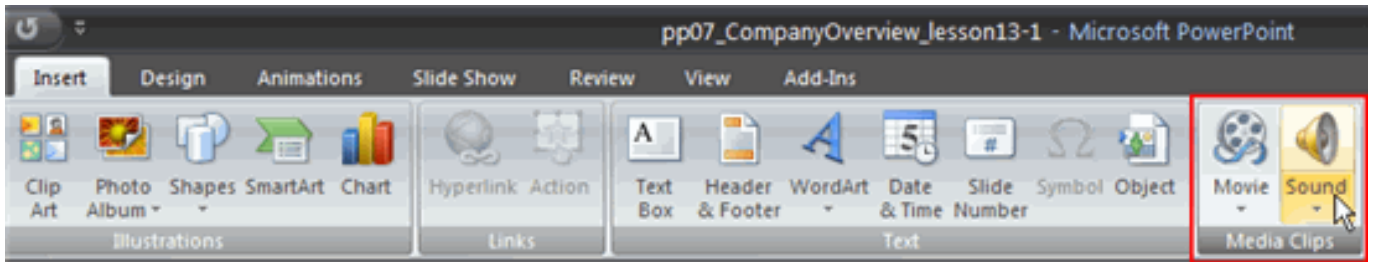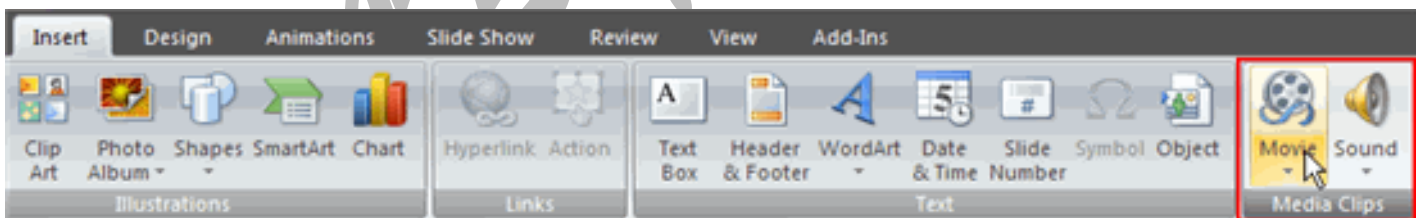

- ▣ Select Sound from File from the menu. The Insert Sound dialog box will appear.
- ▣ Locate the sound file on your computer.
- ▣ Select the file.
- ▣ Click OK. A sound icon and a dialog box will appear.
- ▣ Select Automatically or When Clicked. Automatically will start the sound automatically as soon as the slide appears in Slide Show view, while When Clicked will start the sound when you click.
- ▣ Click, drag, and release the button to move the sound icon to a different location on the slide.
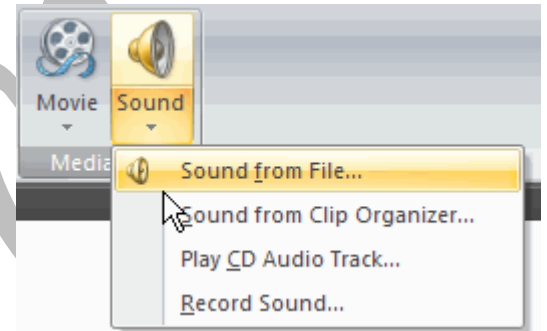
To insert a movie from a file on your computer:

- ▣ Select the slide where you want to insert the movie.
- ▣ Select the Insert tab.
- ▣ Click the drop-down arrow on the Movie command in the Media Clips group.

- ▣ Select Insert a Movie from File from the menu. The Insert Movie dialog box will appear.
- ▣ Locate the file you want to insert from your computer.
- ▣ Click the file name.
- ▣ Click OK. The movie will appear on the slide. The Movie Tools Options tab and Picture Tools Format tab appear on the Ribbon when the movie is inserted.
- ▣ Note: A dialog box will appear. Click Automatically or When Clicked. Automatically will start the movie automatically as soon as the slide appears in Slide Show view, while When Clicked will start the movie when you click.
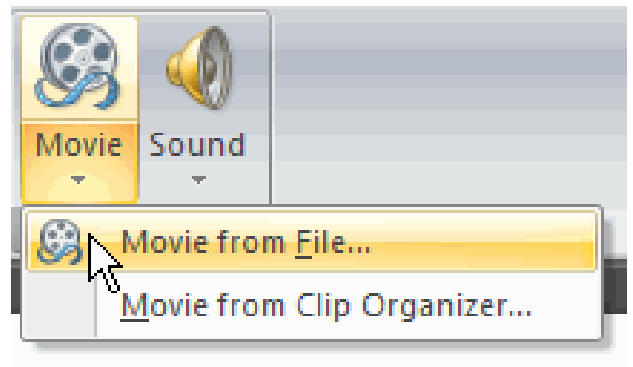
To insert a table using a placeholder command:

- Select the slide where you want to insert a table.
- Click the Insert Table command in the placeholder. The Insert Table dialog box will appear.
- Enter the number of table columns and rows in the dialog box.

To insert a chart:

- Select the Insert tab.
- Click the Insert Chart command. The Insert Chart dialog box appears.
- Click and drag the scroll bar to view the chart types, or click a label on the left of the dialog box to see a specific chart style.
- Click a chart to select it.
- Click OK. Excel will open. Usually, Excel will appear on one side of the screen, while PowerPoint appears on the other side of the screen.
- Note: If a slide layout has a content placeholder, click the Insert Chart command to insert a new chart.

To insert a shape:

- Select the Home tab.
- Click the Shapes command.
- Click a shape from the menu.
- Move your cursor toward the slide. It will appear as a cross shape.
- Click and hold down the mouse button, and drag the cursor until the shape is the desired size.
- Release the mouse button to insert the shape.

**Resize and scaling a picture, shape, text box, or WordArt**

- Resizing stretches or shrinks the dimensions of an object.
- *Important:* If you are unable to resize a WordArt text box using this procedure, see Resize WordArt text.
- Click the picture, shape, text box, or WordArt that you want to resize.
- NOTE: If you have trouble selecting the object because it is behind another object or objects, click the top object, and then press TAB until your object is selected.
- To increase or decrease the size in one or more directions, drag a sizing handle away from or toward the center, while doing one of the following:
- To keep the center of an object in the same place, press and hold CTRL while you drag the sizing handle.
- To maintain the object's proportions, press and hold SHIFT while you drag the sizing handle.
- To both maintain the object's proportions and keep its center in the same place, press and hold both CTRL and SHIFT while you drag the sizing handle.

**Transition effects in Power Point Presentation:**

Transition effects—or transitions as they are often called—are the movements you see when one slide changes to another in Slide Show view. Transition effects are different from animation effects. The term animation in PowerPoint refers to the movements of text and objects on the slide, while transitions refer to the movement of the slide as it changes to another slide.
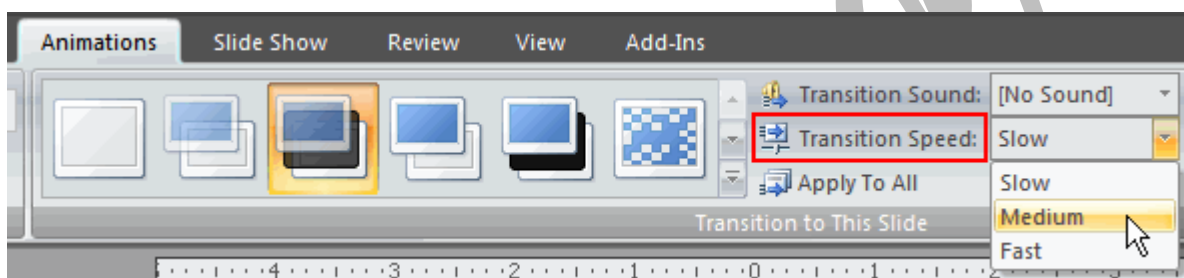
To apply a transition to one slide:

- ▣ Select the slide you want to modify.
- ▣ Select the Animations tab.
- ▣ Locate the Transition to This Slide group. By default, No Transition is applied to each slide.
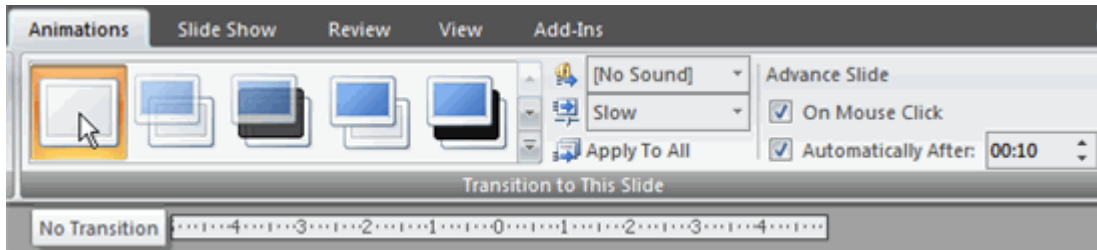
- ▣ Click the More drop-down arrow to display all available transition effects.
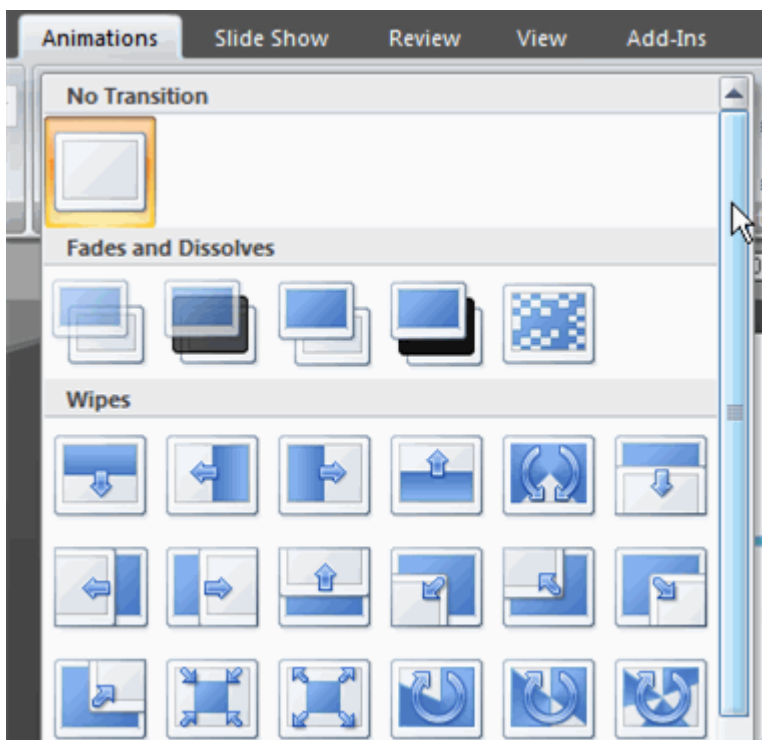
- ▣ Click a slide transition effect to apply it to the selected slide.

Note: Hover over a slide transition effect to see a live preview of the effect on the slide.

To apply a slide transition to all slides:

- ▣ Select the slide you want to modify.
- ▣ Select the Animations tab.
- ▣ Locate the Transition to This Slide group. By default, No Transition is applied to each slide.
- ▣ Click the More drop-down arrow to display all transition effects.
- ▣ Click a slide transition effect to apply it to the selected slide.

�“ Click "**Apply To All**" to apply the transition to all slides in the presentation.
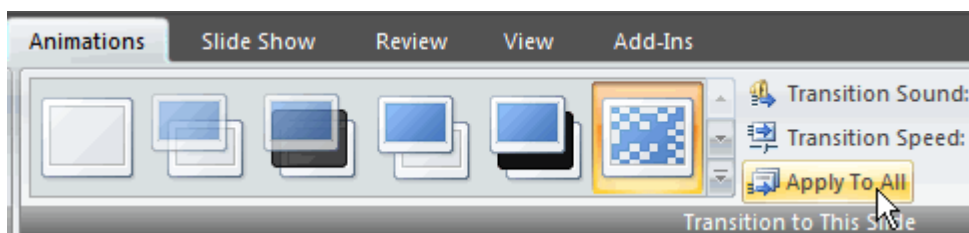
Modifying transitions

◻ To set slide transition speed:

◻ Apply a slide transition effect to a slide.

◻ Click the Transition Speed drop-down menu in the Transition to This Slide group on the Animations tab.

◻ Select a menu option to apply the transition speed to the selected slide.

◻ You can set the transition speed when you apply the transition effect, or you can return to the Animations tab and apply it later. If you want to apply the transition effect and transition speed to all slides, Click **"Apply to All".**

To set slide transition sound:

◻ Apply a slide transition effect to a slide.

◻ Click the Transition Sound drop-down menu in the Transition to This Slide group on the Animations tab.

◻ Select a sound to apply it to the selected slide.

◻ Click Apply To All if you want to apply the transition effect and transition sound to all slides.

To remove a slide transition effect:

◻ Select the slide you want to modify.

◻ Select the Animations tab.

◻ Click No Transition in the Transition to This Slide group.

◻ Repeat this process for each slide you want to modify.

OR

◻ Click "**Apply To All**" to remove the slide transition effect from each slide in the presentation.

To set timing for slides:

- View the slides in Slide Sorter view.
- Select a slide.
- Select the Animations tab.
- Locate the Advance Slide section of the Transition to This Slide group.
- Enter the time in the Automatically After field. Use the arrows or type the number.
- Select another slide and repeat the process until all desired slides have the timing set.
- If you want to apply the same transition effect and timing for each slide, set the transition effect timing for one slide and click Apply to All.
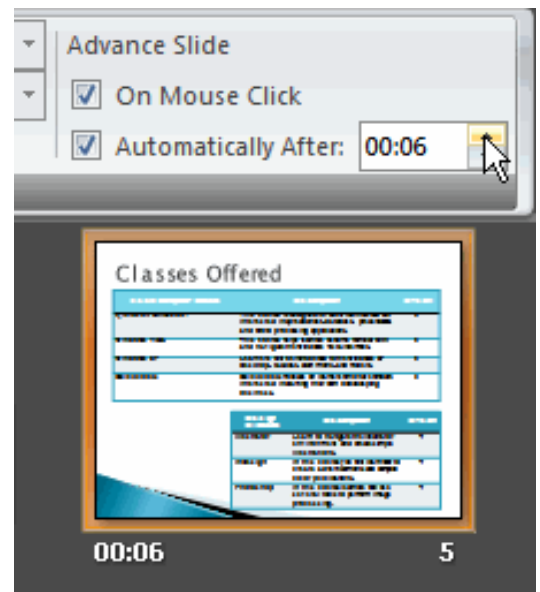
Animation in PowerPoint presentation:

We can animate text and objects such as clip art, shapes, and pictures on the slide. Animation—or movement—on the slide can be used to draw the audience's attention to specific content or to make the slide easier to read.

To apply a default animation effect:

- Select the text or object on the slide you want to animate.
- Select the Animations tab.
- Click the Animate drop-down menu in the Animations group to see the animation options for the selection. The options change based on the selected item.
- Move your cursor over each option to see a live preview of the animation on the slide.
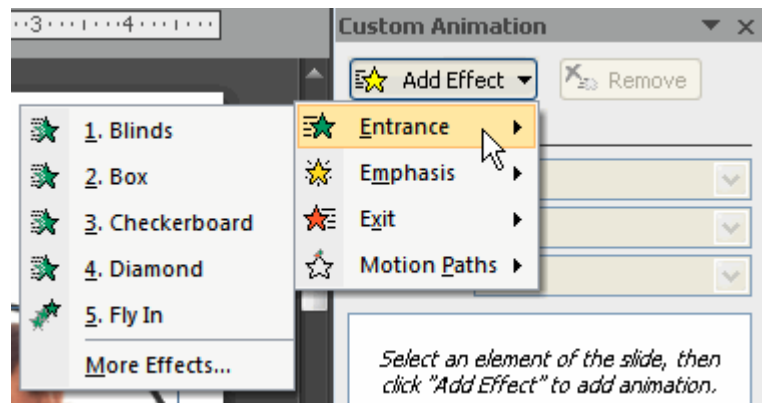- Click an option to select it.
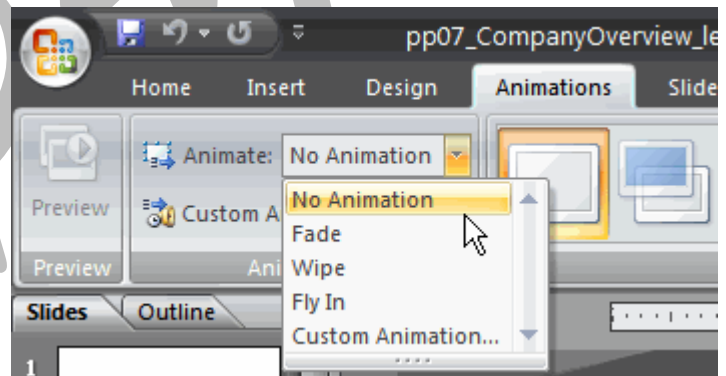
To apply a custom animation effect:

- Select the text or object on the slide you want to animate.
- Select the Animations tab.
- Click Custom Animation in the Animations group. The Custom Animation task pane will appear on the right.
- Click Add Effect in the task pane to add an animation effect to the selected text or object.
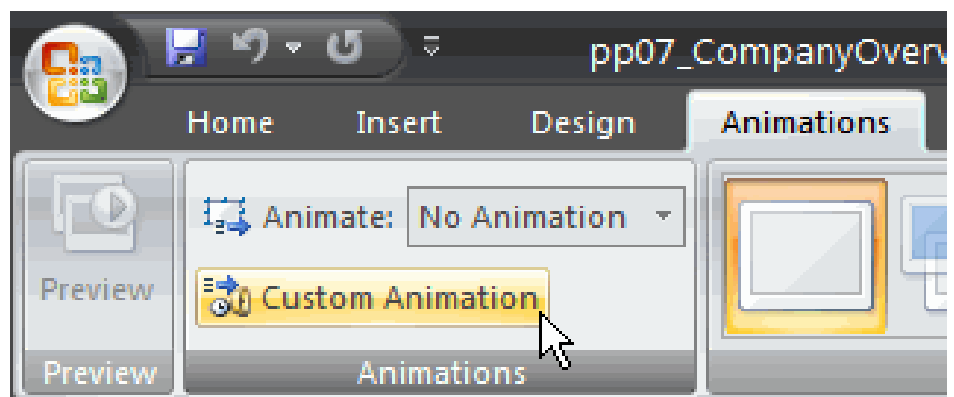
- Select Entrance, Emphasis, Exit, or Motion Path to display a submenu of animation effects for the category.
    - ✓ *Entrance:* Changes how the selected item appears on the page
    - ✓ *Emphasis:* Draws attention to the selected item while the slide is displayed
    - ✓ *Exit:* Changes the way the selected item disappears from the slide
   - ✓ *Motion Path:* Animates the selected item so it moves to a specific place on the screen
- Select an animation effect to apply it.
- The animation will display on the selected item on the slide and will appear listed in the Custom Animation task pane.
    1. A number label appears on the slide next to the animated object. A matching number label also appears next to the animation in the Custom Animation task pane list.
    2. Drop-down menus appear at the top of the Custom Animation task pane. You can define the animation effect in greater detail here.
    3. The star Play Animations icon appears beneath the slide on the Slides tab in the task pane on the left. It indicates that the slide has an animation effect.
- Select More Effects or More Motions Paths from the menu to see more animation effect options.
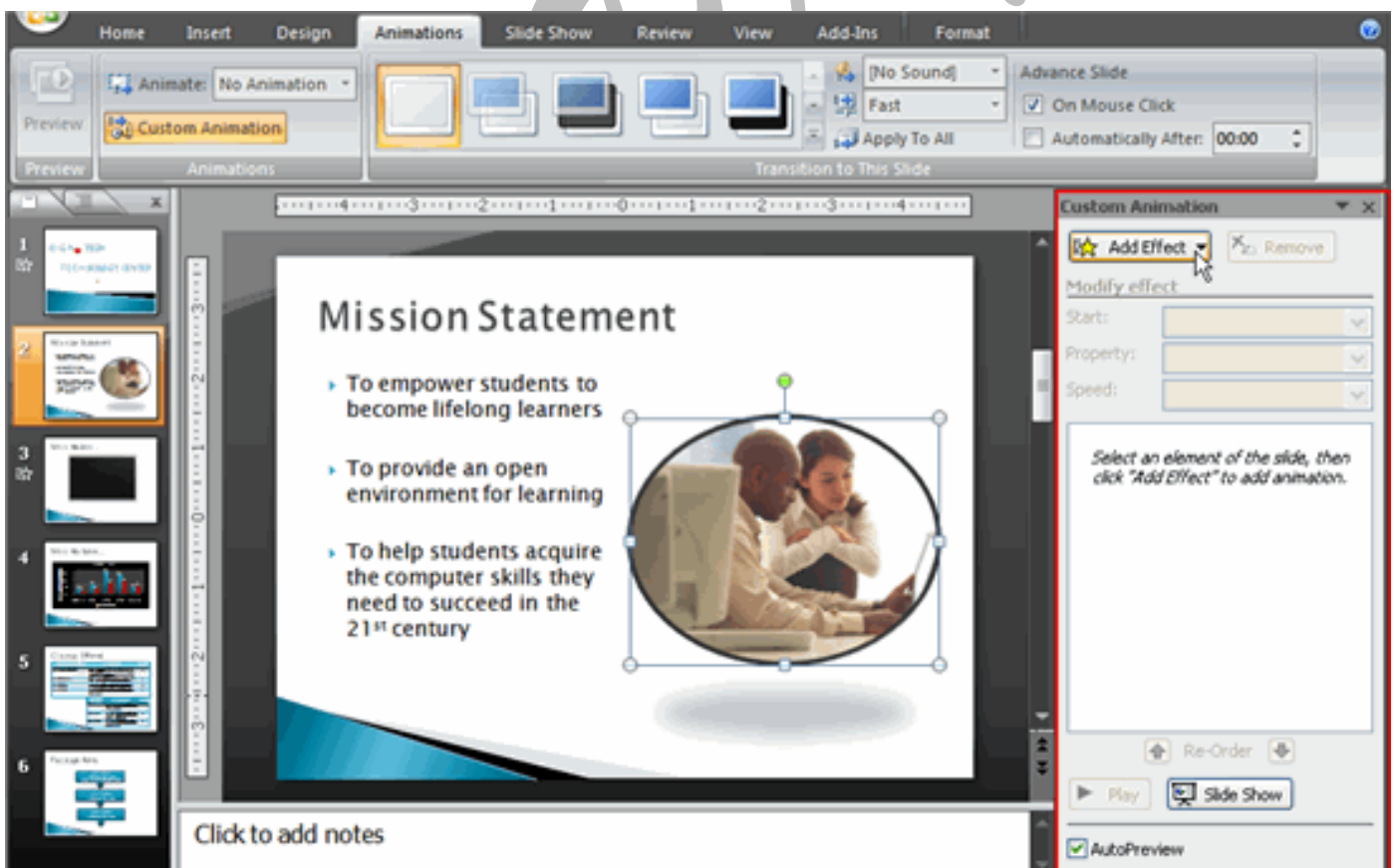
Working with animation effects

To modify a default or custom animation effect:

- After you apply an animation effect, drop-down menus will appear at the top of the Custom Animation task pane. The menus vary based on the animation effect.
- Select an option from a drop-down menu to change the default setting.
- Repeat until all menu options are at desired settings.

To preview an animation effect:

- Select the text or object you want to modify on the slide.
- Select the Animations tab.
- Click Custom Animation in the Animations group. The Custom Animation task pane will appear on the right.
- Select the animation in the Custom Animation task pane list.
- Click Play at the bottom of the task pane to see a preview of the animation in Normal view.

<div align="center">OR</div>

- Click Slide Show to see the animation in Slide Show view. Press the Esc key to return to Normal view.

Ms-Excel

Overview and Features of Excel:

1. Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS.
2. It features calculation, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications.
3. It has been a very widely applied spreadsheet for these platforms, especially since version 5 in 1993, and it has replaced Lotus 1-2-3 as the industry standard for spreadsheets.
4. Excel forms part of Microsoft Office.
5. This document introduces you to the Excel spreadsheet.
6. It outlines the general structure of spreadsheets, then tells you specifically how to use Excel 2007.
7. Files produced in Excel 2007 have the file extension ".xlsx", and the files themselves are very different from previous file formats. If you wish to use an old Excel spreadsheet in Excel 2007, Excel will switch to compatibility mode, to let you work on the old file with no problems. You can then save this file in Excel 97-2003 format, or you can save it in the new Excel 2007 format.
8. If you give a copy of a new Excel file to a colleague who is using an older version, they will not be able to read it initially.
9. However, their Excel will detect this new format, and will invite them to download and install a compatibility pack. Once they have done this they will be able to work on Excel 2007 files in their older version.
10. It is a spread sheet application in which we can add sheets as per our requirements. In a single sheet, it consists of rows and columns and cells, where every cell has different address.
11. Sum, product, subtraction, division and many mathematical, logical functions are available within it.
12. It is basically used for payroll, accounts, mathematical, and for other business purposes.
13. *Tables.* Tables are created with different fields (e.g. name, age, address, roll number, and so forth). You can add a table to fill these values.
14. *Hyperlink.* We can link one file to another file or page.
15. *Clip art.* We can add images and also audio and video clips.
16. *Charts.* With charts, we can clearly show a product(s) evaluation to a client. For example, you can display a chart showing which product is selling more or less by month, week, and so forth.
17. *Functions.* There are both mathematical functions (add, subtract, divide, multiply), and logical ones (average, sum, mod, product).
18. *Images and backgrounds.* You can incorporate images and backgrounds into each sheet.
19. *Macros.* Macros are used for recording events for future use.
20. *Database:* With the data feature, you can add any database from other sources to it.
21. *Sorting and filtering.* We can sort and/or filter our data so that anything redundant or repetitive can be removed more easily.
22. *Data validations.* This tool can help you consolidate your data.
23. *Grouping.* The grouping feature helps you both to group your data and ungroup it so that you have subtotals and so forth.
24. *Page layout.* Themes, colors, sheets, margins, size, backgrounds, breaks, print, titles, sheets height, width, scaling, grids, headings, views, bring to front of font or back alignment, and many more are available for you to lay out your page.

Starting Spreadsheet

1. Click on the Start button
2. In the menu click All Programs → Microsoft Office→ Microsoft Office Excel 2007.

Parts of Excel 2007 Window or Components of Excel 2007

Office Button – Click the Office Button to find a drop down menu containing options, such as: open, save, and print. Also shows previously opened files, which you may choose to "pin" them to make them "permanent" choices.

Quick Access Toolbar – This customizable toolbar allows you to add frequently used commands. Click on the down arrow at the end of the toolbar to add/remove command buttons – or - right-click on any command button and choose Add to Quick Access Toolbar.

Title Bar – Shows name of program and open book. Also contains minimize, maximize and close buttons.

Formula Bar – Located above the worksheet, this area displays the contents of the active cell. It can also be used for entering or editing data and formulas.

Close Button – It will closes Microsoft Excel Window.

Ribbon – The Ribbon is the strip of buttons and icons located above the work area in Excel 2007. The Ribbon replaces the menus and toolbars found in earlier versions of Excel. Each ribbon contains groups of command buttons with common purpose. Each ribbon contains 7 tabs.
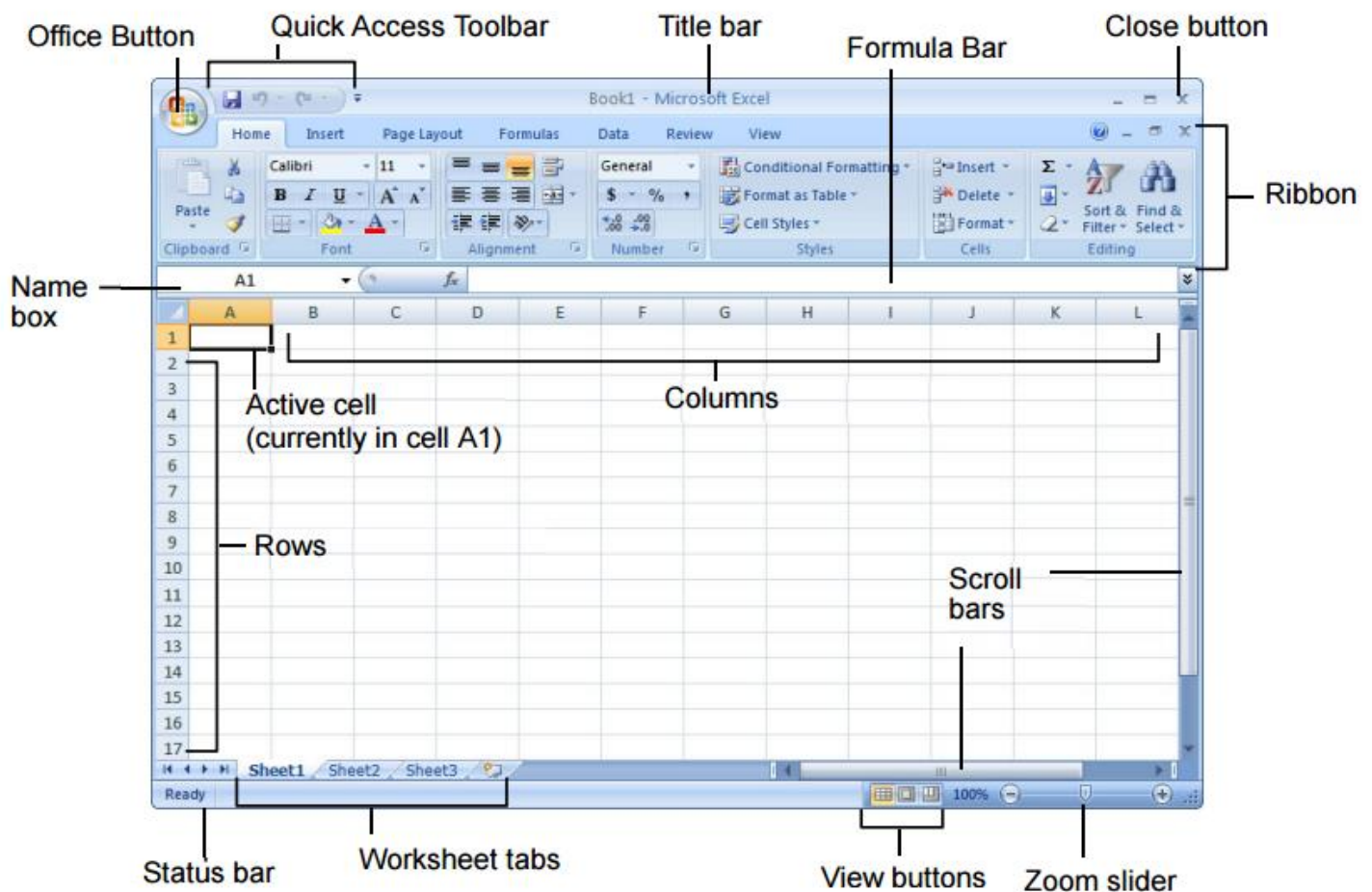
Name Box - This shows the address of the current selection or active cell.

Active Cell – In an Excel 2007 worksheet, the cell with the black outline. Data is always entered into the active cell.

Rows – In **Excel 2003** each spread sheet contains **65,536 rows**. In **Excel 2007** each spread sheet contains **1,048,576 rows**. Each row is named by a number.

Columns - In **Excel 2003** each Excel spread sheet contains **256 columns**. In **Excel 2007** each Excel spread sheet contains **16,384** columns. Each column is named by a letter or combination of letters. **i.e.XVD**

Scroll Bars – Allows you to view entire workbook by moving it up, down (vertical scroll bar), left or right (horizontal scroll bar).

Status Bar – Reports information about the worksheet and provides shortcuts for changing the view and the zoom.

Worksheet tabs - Navigation buttons allow you to move to another worksheet in an Excel workbook. They are used to display the first, previous, next, and last worksheets in the workbook. Sheet tabs separate a workbook into specific worksheets. A workbook defaults to three worksheets. A workbook must contain at least one worksheet. The worksheets are labelled Sheet1, Sheet2, and Sheet3.

View buttons – In Microsoft Excel, you have the option of changing the views to Normal, Page Layout, and Page Break Preview.

Zoom Slider – Use to zoom the Excel screen in or out by dragging the slider.

To create a new blank workbook:

When you first open Excel, the software opens to a new blank workbook.

- Left-click the **Microsoft Office button**.
- Select **New**. The New Workbook dialog box opens, and Blank Workbook is highlighted by default.
- Click **Create**.
- A new blank workbook appears in the window.
- Press Ctrl+N to create a new Blank Workbook
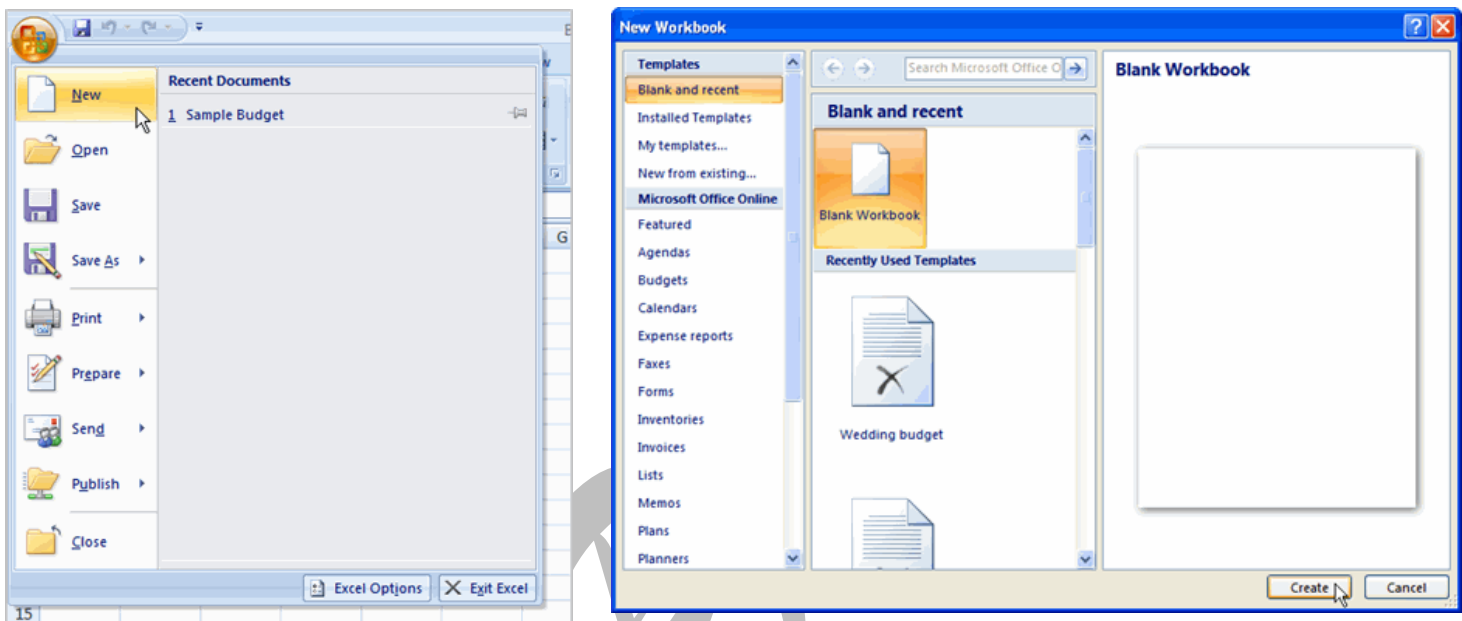
Creating New Workbook

A workbook is a collection of many worksheets. You can create a blank workbook or create a new workbook based on an existing workbook. By default, a workbook opens with three worksheets and it can contain a maximum of 255 worksheets.

For creating a new workbook:

1. Click on the MS Office button.
2. Click on New. (or press Ctrl + N Keys together)
3. In the new dialog box, click Blank workbook.
4. Click on **create** button.

Opening Workbook

To work on any worksheet in a workbook, first of all you have to open a workbook.

1. Click on the MS Office button.
2. Click on open. (or press Ctrl + O Keys together)
3. In the open dialog box, choose drive, folder name that contains the workbook.
4. Click on Open.

Saving a workbook

1. Click on MS Office button.
2. Click on Save As.
3. In Save As dialog box, specify the location where you want to save the file in the Save in box.
4. In the File name box, give the name of the file.
5. In the save as type box, give the type of the file.
6. Click save button.

Closing a Workbook

1. Click on MS Office button.
2. Choose Close
3. You can select Exit Excel command to exit from MS Excel.

Enter Data in a Cell.

a) Select the cell in which you want to enter the data.
b) Type some data and press Enter.

2. Editing and Delete Data from a Cell.

a) Select the cell of which you want to edit or delete the data.
b) Press Delete.

Note: If you only need to delete some characters, not the whole data of a cell Click on the cell and goto Formula Bar delete the text or edit it.

Selecting Cells:

If you click on a cell with the mouse you will see its name appear on the left hand side of the formula bar. As you click on different cells the name in the formula bar will change accordingly. Alternatively, you can select different cells in the worksheet using the arrow keys or the Enter and Backspace keys.

You can select a range of cells by clicking on a single cell at one corner of the range then, with the mouse button held down, drag the selection so that it extends over the other cells. To select an entire row of cells you can click on the row number, and you can select columns by clicking on the appropriate letter. Finally, you can select the entire worksheet by clicking on the grey box against the letter A and number 1.

Formatting Text:

A worksheet containing raw data is not very clear, but you can improve its appearance by applying different formats to some key cells. The most popular formats are available through tools in the Font and Alignment groups on the Home tab.

The button in the lower-right corner is very useful for headings. If you select a single cell, then extend the selection horizontally across adjacent cells you can then click on this button to centre the single cell contents across the selected range.

Finally, you can adjust the width of any column by positioning the cursor between two lettered column headings and dragging the column wider. To automatically adjust any column to accommodate its widest entry, simply double click the column label. Row heights can be adjusted in a similar way.

Formatting Text Using Styles

Excel 2007 offers a more powerful way to quickly format text, using the tools in the Styles group on the Home tab. Select one or more cells, then from the Styles group, click the Cell Styles button.
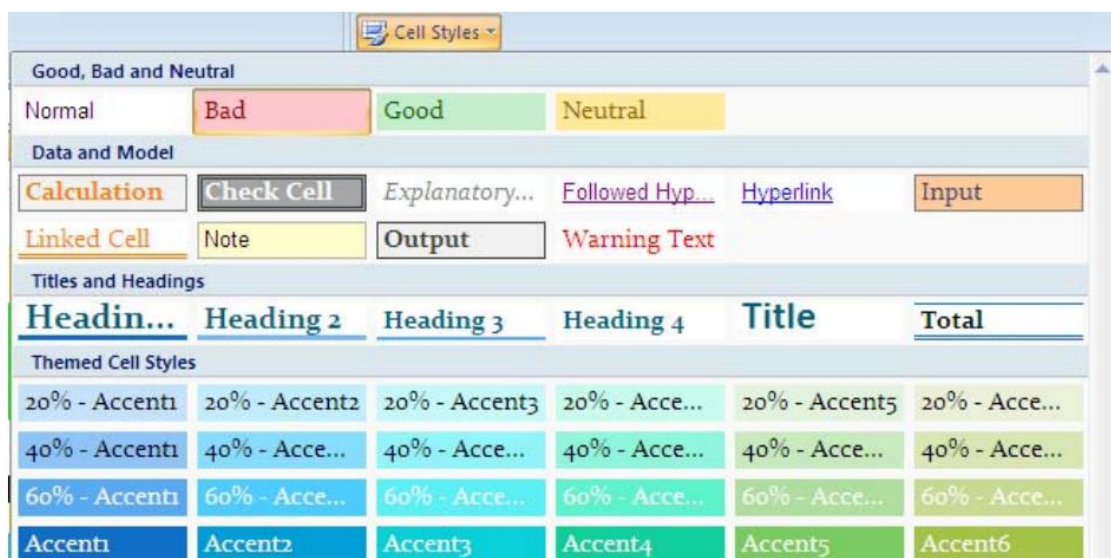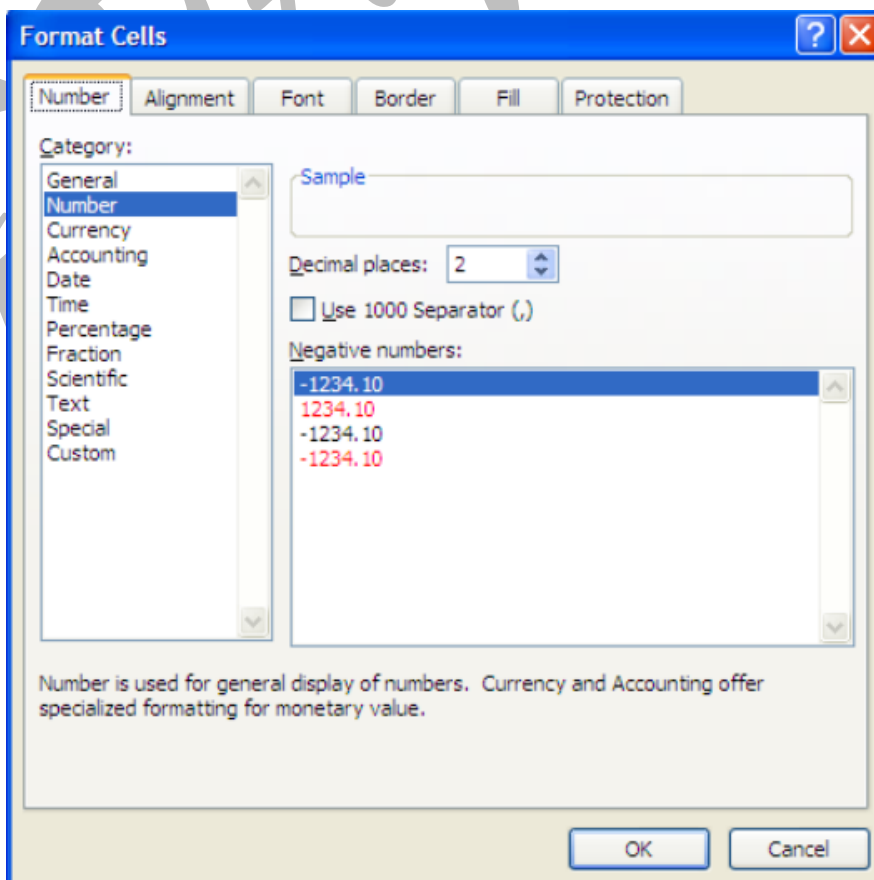

Formatting Numbers

To clarify your worksheet further you can specify the format in which selected numbers are displayed. To do this, select the cells containing the numbers in question, then from the Number group on the Home tab, click the drop down list.

Select any numbering style, or for more options, select the More Number Formats option. In the dialog box that appears, you will see a list of categories of numbers and for each category there will be a second list containing possible formats. You can then choose a format for your selected data.

In addition, there are buttons in the Number group which will quickly format numbers as currency, percentages, or fixed numbers of decimals.

Formatting Dates

If you choose the date format for numbers, you have a great deal of control over how your dates appear in the worksheet. If you select Date from the dialog box above you will be offered a choice of formats, but you can create your own format by clicking the Custom option. You can then build a date format using the letters d, m and y for date month and year as follows

dd	two digit day number	01, 02, ... 31
ddd	three letter day	Mon, Tue, ... Sun
dddd	full day name	Monday Tuesday, ... Sunday
mm	two digit month number	01, 02, ...12
mmm	three letter month name	Jan, Feb, ... Dec
mmmm	full month name	January, February, ... December
yy	two digit year	98, 99, 00, ...
yyyy	four digit year	1998, 1999, 2000, ...

Note: So the date format dddd dd-mmm-yy would give dates in the form:

Monday 27-Feb-17

Using AutoFilter:

The **AutoFilter** feature makes filtering, or temporarily hiding, data in a spread sheet very easy. This allows you to focus on specific spread sheet entries.

To Use AutoFilter:

- Select **Data** from the main menu.
- Select **Filter → AutoFilter**.
- Click the drop-down arrow next to the heading you would like to filter.

For example, if you would like to only view data from the **West Sales Region**, click the drop-down arrow next to **Sales Region**.

- Choose the data you would like to **display**.

In this example, you would choose **West**. All other data will be filtered, or hidden, and only the West Sales Region data is visible.

➢ Click the drop-down arrow again and select **All** to display all of your original data.

Functions in MS-Excel: Functions carry some specific work. It minimizes a large work. A function can be of two types that are

- **User Defined Function:** A user defined functions are defined by the user for their specific purpose, which is not available for other users.
- **System Defined Function:** System defined user are available to all user by default and they provide some general purpose functionalities. Following are some types of System Defined Functions and their examples

Types of System Defined functions: There are different types of functions used in Ms-Excel.

Mathematical functions:

Sum	Add all the numbers in the given range.	=SUM(A1:A10)
Product	Multiplies all the numbers in the given range.	=PRODUCT(A1,A2)
Mod	returns the remainder after a number divided by a divisor.	=MOD(NUMBER,DIVISOR)
Abs	Returns absolute value of a number. That is a number without sign.	=ABS(Number)
Fact	Returns the factorial of a given number.	=FACT(Number)
Sqrt	Returns the square root of a given number.	=SQRT(NUMBER)

Statistical functions:

Average	Its returns Average of its arguments.	=AVERAGE(A3:A7)
Max	It returns the maximum of the given numbers.	=MAX(A1:A6)
Min	It returns the minimum of the given numbers.	=MIN(A1:A6)
Count	Counts the number of cells.	=COUNT(A1:A6)

Text functions:

Concatenate	Joins several text strings into one text string	=Concatenate (text1, text2…) OR =Concatenate (A1, A2, A3, A4, A5) Then press enter.
Len	Returns the number of characters in a text string. Characters include spaces, commas and special characters etc.	=Len(text)
Upper	Converts text to Upper case	=Upper(text)
Lower	Convert text to Lower case.	=Lower(text)
Exact	Compares two text strings and returns True if they exactly the same, False otherwise.	=EXACT (text1, text2)
Rept	Repeats text a given number of times.	=Rept (text, number of times)
Left	Left returns the first character or characters in a text string, based on the number of characters.	=Left (text, number of characters)
Right	Right returns the last character or characters in a text string, based on the number of characters.	=Right (text, number of characters)
Mid	Returns a specific number of characters from a text string, starting at the position you specify, based on the number of characters you specify.	=Mid (text, start_num, number of characters)
Trim	Removes all UN used spaces from the text.	=Trim (text)

Date & Time functions:

Today	Returns the current date in the month-date-year format.	=Today() Type the above syntax in the cell and press enter.
Now	Returns the current date and time. In the format of month/date/year Hours: minutes	=Now()
Weekday	Returns the day of the week corresponding to a date. The day is given as an integer, ranging from 1(Sunday) to 7(Saturday), by default.	=Weekday(date)
Day	Returns the day of the date, represented by a serial number. The day is given as an integer ranging from 1-31.	=Day (Cell address)
Month	Returns the month of the date, represented by a serial number. The day is given as an integer ranging from 1(January)-12(December)	=Month (Cell address)
Year	Returns the year of the date, represented by a serial number. The day is given as an integer ranging from 1900-9999.	=Year(Cell address)

Logical functions:

And	Returns True if all its arguments are True, Returns false one or more argument is false.	=And(logical1,logical2,…)
Or	Returns True if any argument is True, Returns false if all arguments are false.	=or(logical1,logical2,…)
Not	Reverses the value of its argument	=Not(logical)
True	Returns the logical value True	=True()
False	Returns the logical value False	=False()
If	Returns one value if a condition evaluates true and another value if it evaluates false.	=If(logical, value if true, value if false) EX: =If(B4>30, 'Pass', 'Fail') it returns Pass if value of B4 is >30, otherwise it returns Fail.

FORMULA IN MS-EXCEL

In MS-Excel, formula option includes numbers, cell references, functions, operators and parentheses. A formula entry always begins with an equal (=) sign.

For example, the cell D3 and D4 contain respectively 78 and 22. In D5, enter the formula = D3-D4. After confirming the entry, the cell shows the result 56, while the formula bar will show the entered formula. If the contents of either or both of these cells are changed Excel automatically recalculates the result in cell D5. That is, if the contents of cell D3 are changed to 63, D5 will automatically display 63-22 = 41.

STEPS OF ENTERING FORMULA IN MS-EXCEL: We will write a simple formula in Excel to add the numbers 3 + 2.

STEP 1: ENTERING THE DATA

It's best if you first enter all of your data into the spread sheet before you begin creating formulas. This way you will know if there are any layout problems, and it is less likely that you will need to correct your formula later.

1. Type a 3 in cell Al and press the ENTER key on the keyboard.
2. Type a 2 in cell A2 and press the ENTER key on the keyboard.

STEP 2: ADD THE EQUAL (=) SIGN

When creating formulas in Microsoft Excel, you ALWAYS start by typing the equal sign. You type it in the cell where you want the answer to appear.

1. Click on cell C1 with your mouse pointer.
2. Type the equal sign in cell C1.

STEP 3: ADD CELL REFERENCES USING POINTING

After typing the equal sign in step 2, you have two choices for adding cell references to the spread sheet formula.

1. You can type them in or,
2. You can use an Excel feature called Pointing

Pointing allows you to click with your mouse on the cell containing your data to add its cell reference to the formula.

AFTER TYPING AN EQUAL SIGN IN CELL E3 IN STEP 2:

1. Click on cell Al with the mouse pointer to enter the cell reference into the formula
2. Type a plus (+) sign
3. Click on cell A2 with the mouse pointer to enter the cell reference into the formula
4. Press the ENTER key on the keyboard

The answer 5 should appear in cell E3.

Using operators in Formulas

Various types of operators can be included in Excel formulas. The following table shows the n a me and description of these operators.

Operators	Sign	Type of operation
Arithmetic	+	Addition
	-	Subtraction
	*	Multiplication
	/	Division
	%	Percentage
	^	Exponentiation
Comparison	<	Less than
	>	Greater than
	<=	Less than or equal to
	>=	Greater than or equal to
	<>	Not equal to
Text	& (ampersand)	Joins text within quotation marks. (concatenation)

Chart or Graph: Generally worksheet contains some data or in other words, it can be said that worksheet can be treated as a database. Such data can be presented in terms of pictures, which is known as "Chart or Graph". Charts can be insert in worksheet by 'INSERT>Chart menu'.

Charts are graphic representation of numerical data. A set of numeric data which is actually plotted, is called data series. Each value in the data series is a data point. Data series can be in rows (row wise) or column (column wise).

Types of Charts: Chart can be an 'Embedded chart' or 'Chart sheet'. An embedded chart is that chart which is drawn on the same worksheet where worksheet data exists. Chart sheet is a separate sheet containing chart in one sheet and data in another sheet. On the basis of appearance, there are many types of charts available. Some of the common types of charts are:

1. **Column Charts** Excellent when you need to compare categories. Good at showing changes over time, with time as the x-axis
2. **Bar Charts** Similar to column charts, but the bars extend horizontally instead of vertically. Avoid using a time-based scale as the category, studies show that this is generally confusing for people. Use a column chart instead when working with times or dates.
3. **Cylinder, Cone, And Pyramid Charts** These are just like column charts, but use cones, cylinders, or pyramids instead of rectangles. These are 3-D, so they should be used when you have three axes to plot against (i.e. sales made for each month for each salesman).
4. **Line Charts** Best show changes in a series over categories or time. Suggests that the data is continuous, so if you were to measure a point between two points, the line would be correct
5. **Pie Charts** Best for showing percentages of the whole. Use the Exploded Pie choice to emphasize a particular category.
6. **Scatter Charts** Used to show correlations between two sets of values, one on the x-axis and one on the y-axis. Generally not used with time, use a line chart instead.
7. **Area Charts** Best for when you want to show a change over time but emphasize the total of all the series combined. This is like the combination of a line chart and a pie chart.
8. **Doughnut Charts** Just like comparing multiple pie charts, you see how two (or more) series contributed to their wholes and a comparison of the amounts. Not often used in the US, so others may be confused by it.
9. **Radar Charts** Uses a separate axis for each category radiating out from the center. Not often used in the US, so others may not know how to read it.
10. **Surface Charts** These use three axes to show how three sets of data interact (like a scatterplot with three axes). Shown in 3-D with the data points shown as a flat sheet, almost like a bent piece of paper.
11. **Bubble Charts** Very similar to Scatter charts, but the size of the dot at each point reflects another dimension of the chart.
12. **Stock Charts** Used specifically for charting stock activity.

Creating a Chart or Graph

Step 1: If Excel is already open on your workstation open a new Excel workbook.

Step 2: Enter the data into the worksheet and highlight all the cells that will be included in the chart including headers.

Step 3: Click the Chart Wizard button on the standard toolbar to view the first Chart Wizard dialog box.

Step 4: Chart Type: Choose the Chart type and the Chart subtype if necessary. Then click 'Next'.

Step 5: Chart Source Data: Select the data range and click 'Next'.

Step 6: Chart Option: Enter the name of the chart and titles for the X- and Y- axes. Other options for the axes, grid lines, legend, data labels, and data table can be changed by clicking on the tabs. Press 'Next' to move to the next set of options.

Step 7: Chart Location: Click As new sheet if the chart should be placed on a new, blank worksheet or select As object in if the chart should be embedded in an existing sheet and select the worksheet from the drop-down menu.

Step 8: Click 'Finish' to create the chart.

Chart Wizard: The Chart Wizard brings through the process of creating a chart by displaying a series of dialog boxes. There are many types of charts. The two most widely used are the bar chart and the pie chart.

Procedure to use Chart Wizard:

1. Start Excel, and then open your workbook.
2. Select the cells that contain the data that you want to display in the chart.
3. On the Insert menu, click Chart to start the Chart Wizard.
4. In the Chart Wizard - Step 1 of 4 - Chart Type dialog box, specify the chart type that you want to use for your chart. To do this, do one of the following:
   - ➢ Click the Standard Types tab. To view a sample of how your data will look when you select o*ie of the standard chart types that Excel provides, click the chart type, click the chart subtype that you want to view, and then click Press and Hold to View Sample.
   - ➢ To select a chart type, click the chart type, click the chart subtype that you want, and then click Next.
   - ➢ Click the Custom Types tab. To select a built-in custom chart type, or to create your own chart type, click User-defined or Built-in. Select the chart type that you want, and then click Next.
5. In the Chart Wizard - Step 2 of 4 - Chart Source Data dialog box, you can specify the data range and how the series is displayed in your chart.
   If the preview chart appears the way that you want, click Next.
   If you want to change the data range or series for your chart, do any of the following, and then click Next.
   - ➢ On the Data Range tab, click the Data Range box, and then select the cells that you want on your worksheet.
   - ➢ Specify whether you want the series displayed in columns or rows.
   - ➢ On the Series tab, add and delete a series, or change the worksheet ranges used for the names and values for each series in your chart.
6. In the Chart Wizard - Step 3 of 4 - Chart Options dialog box, you can modify the appearance of your chart more when you select any of the chart option settings on the six tabs. As you change
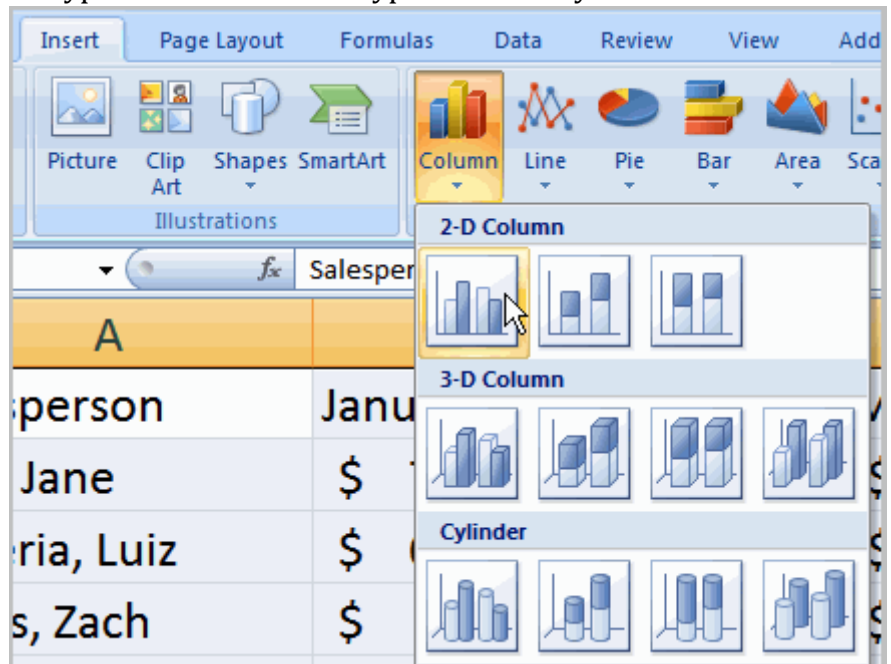
these settings, view the preview chart to make sure that your chart looks the way that you want.

When you finish selecting the chart options that you want, click Next.

➢ On the Titles tab, you can add or change the chart and axis titles.
➢ On the Axes tab, you can set the display options for the primary axes of your chart.
➢ On the Gridlines tab, you can display or hide gridlines.
➢ On the Data Labels tab, you can add data labels to your chart.
➢ On the Data Table tab, you can display or hide data tables.

7. In the Chart Wizard - Step 4 of 4 - Chart Location dialog box, select the location in which to place your chart by doing one of the following:

➢ Click As new sheet to display your chart as a new sheet.
➢ Click As object in to display your chart as an object in a sheet.

8. Click Finish.

Identifying the parts of a chart

Have you ever read something you didn't fully understand but when you saw a chart or graph, the concept became clear and understandable? Charts are a **visual representation** of data in a worksheet. Charts make it easy to see comparisons, patterns, and trends in the data.

Source data: The range of cells that make up a chart. The chart is updated automatically whenever the information in these cells changes.

Title: The title of the chart.

Legend: The chart key, which identifies what each color on the chart represents.

Axis: The vertical and horizontal parts of a chart. The vertical axis is often referred to as the Y axis, and the horizontal axis is referred to as the X axis.

Data series: The actual charted values, which are usually rows or columns of the source data.
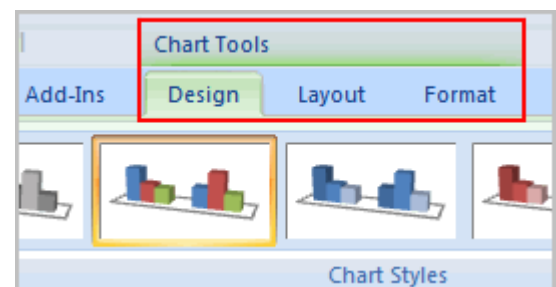
Value axis: The axis that represents the values or units of the source data.

Category axis: The axis identifying each data series.


Chart tools

Once you insert a chart, a new set of **Chart Tools**, arranged into three tabs, will appear above the Ribbon. These are only visible when the chart is selected.

To change the chart type:

➢ Select the **Design** tab.
➢ Click the **Change Chart Type** command. A dialog box appears.
➢ Select another **chart type**.
➢ Click OK.

The chart in the example compares each salesperson's monthly sales to his or her other months' sales; however, you can change what is being compared. Just click the **Switch Row/Column Data**
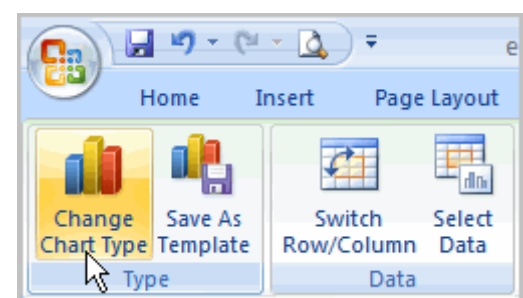
command, which will rotate the data displayed on the **x** and **y axes**. To return to the **original view**, click the Switch Row/Column command again.

To change chart layout:
➢ Select the **Design** tab.
➢ Locate the **Chart Layouts** group.
➢ Click the **More** arrow to view all of your layout options.
➢ Left-click a layout to select it.

If your new layout includes chart titles, axes, or legend labels, just insert your cursor into the text and begin typing to add your own text.

To change chart style:
➢ Select the **Design** tab.
➢ Locate the **Chart Style** group.
➢ Click the **More** arrow to view all of your style options.
➢ Left-click a style to select it.
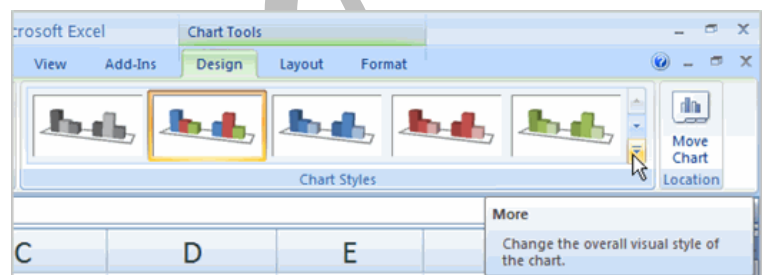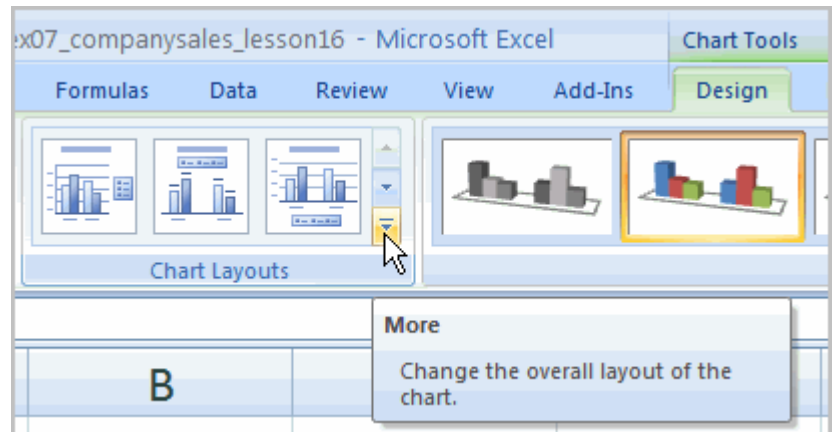
To move the chart to a different worksheet:

➢ Select the **Design** tab.
➢ Click the **Move Chart** command. A dialog box appears. The current location of the chart is selected.
➢ Select the desired location for the chart (i.e., choose an existing worksheet, or select New Sheet and name it).