Certificate Course in
COMPUTER ON OFFICE AUTOMATION

COURSE MATERIAL

(This is only an illustration book)

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NOTE

This Course Material is part of reading material for the Certificate Course in Computer on Office Automation and in no way it constitutes the entirety of the Syllabus required for the Examination.

Contents

UNIT – 1

BASICS OF COMPUTER

1.1 Introduction to Computer

1.1.1 Definition

A computer is a device that accepts information (in the form of digitalized data) and manipulates it for some result based on a program, software, or sequence of instructions on how the data is to be processed.

1.1.2 History & Generation of Computer

First Generation

- The period 1940 to 1956, roughly considered as the First Generation of Computer.
- The first generation computers were developed by using vacuum tube or thermionic valve machine.
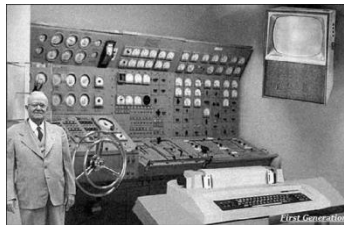
- The input of this system was based on punched cards and paper tape; however, the output was displayed on printouts.
- The first generation computers worked on binary-coded concept (i.e., language of 0-1). **Examples:** ENIAC, EDVAC, etc.

Second Generation

- The period 1956 to 1963 is roughly considered as the period of Second Generation of Computers.
- The second generation computers were developed by using transistor technology.

- In comparison to the first generation, the size of second generation was smaller.
- In comparison to computers of the first generation, the computing time taken by the computers of the second generation was lesser.

Third Generation

- The period 1963 to 1971 is roughly considered as the period of Third Generation of computers.

- The third generation computers were developed by using the Integrated Circuit (IC) technology
- In comparison to the computers of the second generation, the size of the computers of the third generation was smaller.
- In comparison to the computers of the second generation, the computing time taken by the computers of the third generation was lesser.

Third Generation

- The third generation computer consumed less power and also generated less heat.
- The maintenance cost of the computers in the third generation was also low.
- The computer system of the computers of the third generation was easier for commercial use.

Fourth Generation

- The period 1972 to 2010 is roughly considered as the fourth generation of computers.
- The fourth generation computers were developed by using microprocessor technology.

Fourth Generation

- By coming to fourth generation, computer became very small in size, it became portable.
- The machine of fourth generation started generating very low amount of heat.
- It is much faster and accuracy became more reliable.
- The production cost reduced to very low in comparison to the previous generation.
- It became available for the common people as well.

Fifth Generation

- The period 2010 to till date and beyond, roughly considered as the period of fifth generation of computers.
- By the time, the computer generation was being categorized on the basis of hardware only, but the fifth generation technology also included software.

Fifth Generation

- The computers of the fifth generation had high capability and large memory capacity.
- Working with computers of this generation was fast and multiple tasks could be performed simultaneously.
- Some of the popular advanced technologies of the fifth generation include Artificial intelligence, Quantum computation, Nanotechnology, Parallel processing, etc.

1.1.3 Applications of Computer
- Home
- Medical Field
- Entertainment
- Industry
- Education
- Government
- Banking
- Business

Home

Computers are used at homes for several purposes like online bill payment, watching movies or shows at home, home tutoring, social media access, playing games, internet access, etc. They provide communication through electronic mail. They help to avail work from home facility for corporate employees. Computers help the student community to avail online educational support.

Medical Field

Computers are used in hospitals to maintain a database of patients' history, diagnosis, X-rays, live monitoring of patients, etc. Surgeons nowadays use robotic surgical devices to perform delicate operations, and conduct surgeries remotely. Virtual reality technologies are also used for training purposes. It also helps to monitor the fetus inside the mother's womb.

Entertainment

Computers help to watch movies online, play games online; act as a virtual entertainer in playing games, listening to music, etc. MIDI instruments greatly help people in the entertainment industry in recording music with artificial instruments. Videos can be fed

from computers to full screen televisions. Photo editors are available with fabulous features.

Industry

Computers are used to perform several tasks in industries like managing inventory, designing purpose, creating virtual sample products, interior designing, video conferencing, etc. Online marketing has seen a great revolution in its ability to sell various products to inaccessible corners like interior or rural areas. Stock markets have seen phenomenal participation from different levels of people through the use of computers.

Education

Computers are used in education sector through online classes, online examinations, referring e-books, online tutoring, etc. They help in increased use of audio-visual aids in the education field.

Government

In government sectors, computers are used in data processing, maintaining a database of citizens and supporting a paperless environment. The country's defense organizations have greatly benefitted from computers in their use for missile development, satellites, rocket launches, etc.

Banking

In the banking sector, computers are used to store details of customers and conduct transactions, such as withdrawal and deposit of money through ATMs. Banks have reduced manual errors and expenses to a great extent through extensive use of computers.

Business

Nowadays, computers are totally integrated into business. The main objective of business is transaction processing, which involves transactions with suppliers, employees or customers. Computers can make these transactions easy and accurate. People can analyze investments, sales, expenses, markets and other aspects of business using computers.

Training

Many organizations use computer-based training to train their employees, to save money and improve performance. Video conferencing through computers allows saving of time and travelling costs by being able to connect people in various locations.

Arts

Computers are extensively used in dance, photography, arts and culture. The fluid movement of dance can be shown live via animation. Photos can be digitized using computers.

Science and Engineering

Computers with high performance are used to stimulate dynamic process in Science and Engineering. Supercomputers have numerous applications in area of Research and Development (R&D). Topographic images can be created through computers. Scientists use computers to plot and analyze data to have a better understanding of earthquakes.

1.1.4 Advantages of Computer
- Stores huge amount of data
- Accuracy
- Increases your productivity.
- Internet connection.
- Organizes the information.
- Keeps everyone connected.
- Helps to automate.
- Help physically challenged.

1.1.5 Terms related to Computer

1.1.5.1 Hardware
These computer science terms connect to the physical components of a computer. Hardware represents the most tactile aspects of computer science and the materials computers are made of.

1. CPU
CPU stands for the Central Processing Unit. It is the processing chip that serves as the "brains" of a device that interprets (or processes) the digital instructions provided by applications.

2. Bit
Bit is an abbreviation for "binary digit," the smallest piece of information used by a computer. Each bit is either a 1 or a 0, which are the binary digits that make up computer language. Bits are literally the foundation upon which computer science is built. In modern computing, information is stored and processed at a scale that is orders of magnitude larger than individual bits. See the conversion rate below to better contextualize the size of a bit:

- 1 Byte = 8 bits
- 1 Kilobyte = 1,024 bytes
- 1 Megabyte = 1,024 kilobytes
- 1 Gigabyte = 1,024 megabytes

3. RAM
Random Access Memory (RAM) is the hardware component used to store data that is actively being used by a processor. When needed, information flows to RAM storage from long-term secondary storage—typically a hard drive.

4. Secondary storage

Secondary storage refers to the long-term data storage options found in a device. This includes hard disk drives (HDD) and solid-state drives (SSD). When you save a file to your computer, it is sent to secondary storage.

5. ROM

ROM stands for Read-Only Memory. This is memory that can only be read from and is not electronically modifiable after being manufactured. Computers use ROM to store critical foundational information like start-up processes and software instructions.

6. Input/Output Devices (I/O Devices)

I/O devices refer to anything people use to input information to the computer or to take information out (output). For example, a keyboard and mouse are input devices. A printer is an output device.

1.1.5.2 Software

The physical components of devices are only the tip of the iceberg. Much of the computer science field focuses on software applications and their development.

7. Algorithm

At a basic level, algorithms are simply specific procedures used to solve computational problems. As computing power and data capabilities have grown more sophisticated, so have the algorithms and the problems they intend to solve. For example, a shipping company may turn to an algorithm to help determine the optimal route for delivery drivers.

8. API (Application Programming Interface)

An API is a software go-between that brings information from one application to another. It allows applications to communicate with one another while preserving some security measures for each end point. For example, an API can be used to securely transfer data stored by your web browser to a mobile app.

9. Boolean

A function in programming with binary choices, like "Yes or No" and "True or False." This serves as a basic building block of programming logic.

10. Bug

A bug is a programming error that causes unexpected glitches or problems for a program's end user. Debugging is the process of identifying, documenting and fixing the issues caused by bugs.

11. Camel Case

Camel case refers to the practice of capitalizing the first letter of each compound word in a programming variable to improve readability. For example, "StretchLength" and "FixedHeight."

12. Code

Code refers to the string of commands or directions used by different programming languages in order to create, edit or manage computer programs or applications. Code is used by computers to determine which action should be taken, define parameters and more.

13. Compiling

The process of taking code that's written in a high-level language (like C++) by human developers and translating it into machine-readable code.

14. Conditional statements

Conditional statements, another fundamental piece of programming instructions, set the terms for when a program moves forward. This is often expressed in an "If, then" format. If all conditions expressed are met and true, only then will the computer move on to do the next step.

15. Integrated Development Environment (IDE)

An integrated development environment is a software tool where developers can write code and run their programs. Many provide useful features like syntax highlighting, debugging tools, version control and more.

16. Latency

Latency is the measure of time between entering an input and the returned output. The higher the latency, the longer it takes. This is an important factor for web applications and interfaces where a noticeable delay may impact user satisfaction.

17. Scripts

Similar in a way to the scripts used by Hollywood stars, a script in programming terms is a line by line set of instructions for a computer program to follow. These are often used for automation or for generating dynamic page content.

18. Structured data

This refers to data or information that's been organized and "cleaned" in order to make it easier to search, manipulate and interface well with software applications. Structured data often is used for categories like names, addresses and credit card information but can be used for any quantifiable data category.

19. Syntax

Syntax refers to the rules that dictate the structure of a language. Programming languages, like all languages, need structure for the reader—whether a computer or a human—to make sense of the information. While some elements of syntax may carry over from language to language, most programming languages have unique and specific syntax rules that must be followed.

1.1.5.3 Technical Industry

Computer science today is about so much more than a computer and what it can do—it's a massive area of study that intersects the industry of technology in countless ways. Here

are some of the industry terms you'll want to ensure you know.

20. Agile development

Agile development is a project management process for producing and releasing software (or other projects) that calls for quick cycles that repeat, improving as they go. This typically breaks projects down into smaller increments. This can be helpful in software development where the individual components of a software application may need to be adjusted or revised in order to accommodate unexpected issues or changes downstream.

21. Big data

Big data is a quick way to refer to the massive amounts of data collected by organizations on a day-to-day basis. Data at this scale can be tapped into for a variety of purposes like trend analyses, forecasting, process automation and more.

22. Cloud storage

Cloud storage is an alternative to storing data on a computer's physical storage. Information stored "on the cloud" is kept on remote servers that can be accessed anywhere via the Internet.

23. Cyber security

Cyber security is the process of protecting data from unauthorized users or hackers. It also represents a huge sector of the tech industry as more and more companies race to stay ahead of cyber criminals and security threats.

1.1.6 Characteristics of Computer

The characteristics of the computer system are as follows
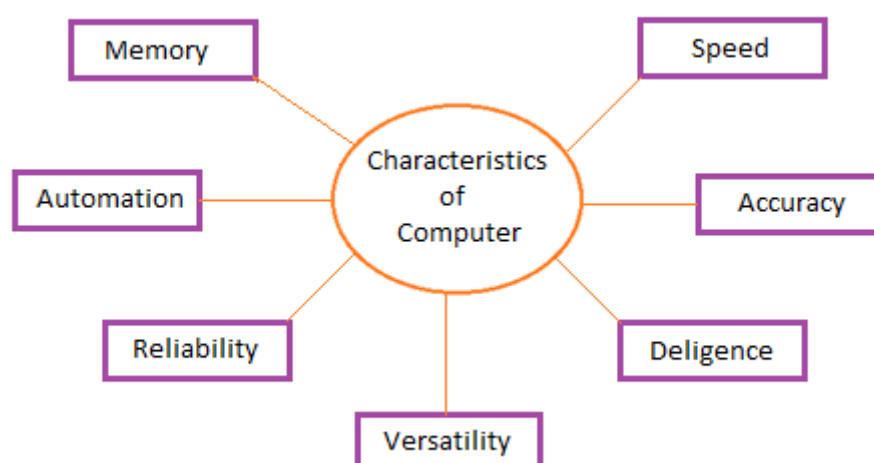
Speed

A computer works with much higher speed and accuracy compared to humans while performing mathematical calculations. Computers can process millions (1,000,000) of

instructions per second. The time taken by computers for their operations is microseconds and nanoseconds.

Storage

A computer has built-in memory called primary memory where it stores data. Secondary storage are removable devices such as CDs, pen drives, etc., which are also used to store data.

Diligence

A computer can perform millions of tasks or calculations with the same consistency and accuracy. It doesn't feel any fatigue or lack of concentration. Its memory also makes it superior to that of human beings.

Versatility

Versatility refers to the capability of a computer to perform different kinds of works with same accuracy and efficiency.

Hardware is further divided into four main categories: Input Devices Output Devices Secondary Storage Devices Internal Components	Software is further divided into two main categories: Application Software System Software
Developed using electronic and other materials	Developed writing using instructions using a programming language
When damaged, it can be replaced with a new component	When damaged it can be installed once more using a backup copy
Hardware is physical in nature and hence one can touch and see hardware	The software cannot be physically touched but still can be used and seen
Hardware cannot be infected by Viruses	The software can be infected by Viruses
Hardware will physically wear out over time	Software does not wear out but it can be affected by bugs and glitches
An example of Hardware is hard drives, monitors, CPU, scanners, printers etc.	An example of software is Windows 10, Adobe Photoshop, Google Chrome etc.

1.1.7 Block diagram and Working Principle of Computer

Block Diagram of a Computer
ArtOfTesting
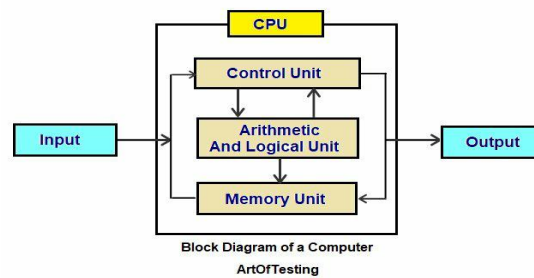
Input

All the data received by the computer goes through the input unit. The input unit comprises different devices. Like a mouse, keyboard, scanner, etc. In other words, each of these devices acts as a mediator between the users and the computer. The data that is to be processed is put through the input unit. The computer accepts the raw data in binary form. It then processes the data, and produces the desired output. The 3 major functions of the input unit are

- Take the data to be processed by the user.
- Convert the given data into machine-readable form.
- And then, transmit the converted data into the main memory of the computer. The sole purpose is to connect the user and the computer. In addition, this creates easy communication between them.

CPU – Central Processing Unit

Central Processing Unit or the CPU, is the brain of the computer. It works the same way a human brain works. As the brain controls all human activities, the CPU too controls all tasks. Moreover, the CPU conducts all the arithmetical and logical operations in the computer. Now the CPU comprises of two units, namely – ALU (Arithmetic Logic Unit) and CU (Control Unit). Both of these units work in sync. The CPU processes the data as a whole.

ALU – Arithmetic Logic Unit

The Arithmetic Logic Unit is made of two terms, arithmetic and logic. There are two major functions that this unit performs.

1. Data inserted through the input unit into the primary memory. Performs the basic arithmetical operation on it. Like addition, subtraction, multiplication, and division. It performs all sorts of calculations required on the data. Then sends back data to the storage.
2. The unit is also responsible for performing logical operations like, AND, OR, Equal to, Less than, etc. In addition to this it conducts merging, sorting, and selection of the given data.

CU – Control Unit

The control unit as the name suggests is the controller of all the activities/tasks and operations. All this is performed inside the computer. The memory unit sends a set of instructions to the control unit. Then the control unit in turn converts those instructions. After that these instructions are converted to control signals. These control signals help in prioritizing and scheduling the activities. Thus, the control unit coordinates the tasks inside the computer in sync with the input and output units.

Memory Unit

All the data that has to be processed or has been processed is stored in the memory unit. The memory unit acts as a hub of all the data. It transmits it to the required part of the computer whenever necessary. The memory unit works in sync with the CPU. This helps in faster accessing and processing of the data. Thus, making tasks easier and faster.

There are two types of computer memory

1. **Primary memory** – This type of memory cannot store a vast amount of data. Therefore, it is only used to store recent data. The data stored in this is temporary. It can get erased once the power is switched off. Therefore, is also called temporary memory or the main memory.

   RAM stands for Random Access Memory. It is an example of primary memory. This memory is directly accessible by the CPU. It is used for reading and writing purposes. For data to be processed, it has to be first transferred to the RAM and then to the CPU.

2. **Secondary memory** – As explained above, the primary memory stores temporary data. Thus it cannot be accessed in the future. For permanent storage purposes, secondary memory is used. It is also called the permanent memory or the auxiliary memory. The hard disk is an example of secondary memory. Even in a power failure data does not get erased easily.

Output

There is nothing to be amazed by what the output unit is used for. All the information sent to the computer once processed is received by the user through the output unit. Devices like printers, monitors, projector, etc. all come under the output unit.

The output unit displays the data either in the form of a soft copy or hard copy. The printer is for the hard copy. The monitor is for the display. The output unit accepts the data in binary form from the computer. It then converts it into a readable form for the user.

1.1.8 Types of computer

1.1.8.1 Classification of Computers on the basis of working

Analog computers

Analog computers are used to process analog data. Analog data is of continuous nature and which is not discrete or separate. Such type of data includes temperature. pressure, speed weight, voltage, depth etc. These quantities are continuous and having an infinite variety of values.

It measures continuous changes in some physical quantity e.g. The Speedometer of a car measures speed, the change of temperature is measured by a Thermometer, the weight is measured by Weights machine. These computers are ideal in situations where data can be accepted directly from measuring instrument without having to convert it into numbers or codes.
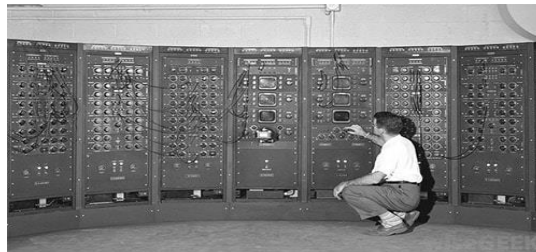
Analog computers are the first computers being developed and provided the basis for the development of the modern digital computers. Analog computers are widely used for certain specialized engineering and scientific applications, for calculation and measurement of analog quantities. They are frequently used to control process such as those found in oil refinery where flow and temperature measurements are important. They are used for example in paper making and in the chemical industry. Analog computers do not require any storage capability because they measure and compare quantities in a single operation. Output froth an analog computer is generally in the form of readings on a series of the dial (Speedometer of a car) or a graph on strip chart.

Digital Computers

A Digital Computer, as its name implies, works with digits to represent numerals, letters or other special symbols. Digital Computers operate on inputs which are ON-OFF type and its output is also in the form of ON-OFF signal. Normally, an ON is represented by a 1 and an OFF is represented by a 0. So we can say that digital computers process information

which is based on the presence or absence of an electrical charge or we prefer to say a binary 1 or 0.

A digital computer can be used to process numeric as well as non-numeric data. It can perform arithmetic operations like addition, subtraction, multiplication and division and also logical operations. Most of the computers available today are digital computers. The most common examples of digital computers are accounting machines and calculators.

Hybrid Computers

A hybrid is a combination of digital and analog computers. It combines the best features of both types of computers, i.e. It has the speed of analog computer and the memory and accuracy of digital computer. Hybrid computers are used mainly in specialized applications where both kinds of data need to be processed. Therefore. they help the user, to process both continuous and discrete data. For example a petrol pump contains a processor that converts fuel flow measurements into quantity and price values. In hospital Intensive Care Unit (ICU), an analog device is used which measures patient's blood pressure and temperature etc. which are then converted and displayed in the form of digits. Hybrid computers for example are used for scientific calculations, in defense and radar systems.

1.1.8.2 Classification of Computers on the basis of Size
- Supercomputers
- Mainframe computers
- Minicomputers
- Personal computers (PCs) or microcomputers

Supercomputers

Supercomputer – a powerful computer that can process large amounts of data and do a great amount of computation very quickly.

Supercomputers are used for areas related to:
- Science
- Engineering
- Education
- Defence
- Aerospace

Supercomputers are useful for applications involving very large databases or that require a great amount of computation. A supercomputer is a computer that performs at or near the highest operational rate for computers.

Traditionally, supercomputers have been used for scientific and engineering applications that must handle massive databases, do a great amount of computation or both. Advances like multicore processors and general-purpose graphics processing units have enabled powerful machines that could be called *desktop supercomputers* or *GPU supercomputers*.

By definition, a supercomputer is exceptional in terms of performance. At any time, there are a few well-publicized supercomputers that operate at extremely high speeds relative to all other computers. The term *supercomputer* is sometimes applied to far slower -- but still impressively fast -- computers.

Supercomputers are used for complex tasks, such as:
- Weather forecasting
- Climate research
- Scientific simulation
- Oil and gas exploration
- Quantum mechanics
- Cryptanalysis

Mainframe computers

Mainframe computer – a high-performance computer used for large information processing jobs.

Mainframe computers are primarily used in :
- Institutions
- Research
- Academics
- Health care
- Libraries

- Large businesses
- Financial institutions
- Stock brokerage firms
- Insurance agencies

Mainframe computers are useful for tasks related to:
- Census taking
- Industry and consumer statistics
- Enterprise resource planning
- Transaction processing
- e-business and e-commerce

Minicomputers

Minicomputer – a mid-range computer that is intermediate in size, power, speed, storage capacity, etc., between a mainframe and a microcomputer.

Minicomputers are used by small organizations.

"Minicomputer" is a term that is no longer used much. In recent years, minicomputers are often referred to as small or midsize servers (a server is a central computer that provides information to other computers).

Workstation

A high-performance computer system that is basically designed for a single user and has advanced graphics capabilities, large storage capacity, and a powerful central processing unit. A workstation is more capable than a personal computer (PC) but is less advanced than a server (which can manage a large network of peripheral PCs or workstations and handle immense data-processing and reporting tasks)

A desktop computer is a personal computing device designed to fit on top of a typical office desk.

It houses the physical hardware that makes a computer run and connects to input devices such as the monitor, keyboard and mouse users interact with. Desktop computers are commonly used in the enterprise, as well as in consumer use cases such as gaming. In the enterprise, they are important because they are the main means for many users to do their jobs.

Microcomputer

Microcomputer an electronic device with a microprocessor as its central processing unit (CPU). *Microcomputer* was formerly a commonly used term for personal computers, particularly any of a class of small digital computers whose CPU is contained on a single integrated semiconductor chip. Thus, a microcomputer uses a single microprocessor for its CPU, which performs all logic and arithmetic operations. The system also contains a number of associated semiconductor chips that serve as the main memory for storing program instructions and data and as interfaces for exchanging data of this sort with peripheral devices (e.g., keyboard, video display, and printer) and auxiliary storage units. The earliest microcomputers marketed in the mid-1970s contained a single chip on which all CPU, memory, and interface circuits were integrated.

As large-scale integration and then very-large-scale integration progressively increased the number of transistors that could be placed on one semiconductor chip, so the processing capacity of microcomputers using such single chips grew commensurately. During the 1980s microcomputers came to be used widely in other applications besides electronic game systems and other relatively simple computer-based recreations. Increasingly powerful microcomputers began to be used in personal computer systems and workstations, for instance. High-performance microcomputer systems began to be used widely in business, in engineering, in "smart" or intelligent machines employed in the factory and office, and in military electronics systems.

Desktop computer

A **desktop computer** is a personal computer designed for regular use at a single location on or near a desk due to its size and power requirements. The most common configuration has a case that houses the power supply, motherboard (a printed circuit

board with   a microprocessor as   the central   processing   unit, memory, bus, certain peripherals and   other   electronic   components), disk   storage (usually   one   or more hard disk drives, solid state drives, optical disc drives, and in early models a floppy disk drive); a keyboard and mouse for input; and a computer monitor, speakers, and, often, a printer for output. The case may be oriented horizontally or vertically and placed either underneath, beside, or on top of a desk.

Laptop Computer

A **laptop**, **laptop   computer**,   or **notebook   computer** is   a   small,   portable personal computer (PC) with a screen and alphanumeric keyboard. Laptops typically have a clam shell form factor with the screen mounted on the inside of the upper lid and the keyboard on the inside of the lower lid, although 2-in-1 PCs with a detachable keyboard are often marketed as laptops or as having a laptop mode.

Laptops are folded shut for transportation, and thus are suitable for mobile use. They are so named because they can be practically placed on a person's lap when being used. Today, laptops are used in a variety of settings, such as at work, in education, for playing games, web browsing, for personal multimedia, and for general home computer use.

Palmtop Computer

A **Palmtop PC** was an approximately pocket calculator-sized, battery-powered computer compatible with the IBM Personal Computer in a horizontal clamshell design with integrated keyboard and display. It could be used like a subnotebook, but was light enough to be comfortably used handheld as well. Most Palmtop PCs were small enough to be stored in a user's shirt or jacket pocket.

Palmtop PCs distinguish from   other palmtop computers by using a   mostly IBM-compatible PC architecture and BIOS as well as an Intel-compatible x86 processor. All such devices were DOS-based, with DOS stored in ROM. While many Palmtop PCs came with a number of PDA and office applications pre-installed in ROM, most of them could also run generic, off-the-shelf PC software with no or little modifications. Some could also run   other   operating   systems   such   as GEOS, Windows   1.0-3.0 (in Real   mode only), or MINIX 2.0.

1.1.8.3 Classification of Computers on the basis of Processor
XT, AT

The older 8-bit systems are very different, however. This gives us two basic system types, or classes, of hardware:

- 8-bit (PC/XT-class) systems
- 16/32/64-bit (AT-class) systems

In this verbiage, PC stands for personal computer; XT stands for an extended PC; and AT stands for an advanced-technology PC. The terms *PC*, *XT*, and *AT*, as they are used here, are taken from the original IBM systems of those names. The XT was a PC system that included a hard disk for storage in addition to the floppy drives found in the basic PC system. These systems had an 8-bit 8088 processor and an 8-bit Industry Standard Architecture (ISA) bus for system expansion. The *bus* is the name given to expansion slots in which additional plug-in circuit boards can be installed. The 8-bit designation comes from the fact that the ISA bus found in the PC/XT class systems can send and receive only 8 bits of data in a single cycle. The data in an 8-bit bus is sent along eight wires simultaneously, in parallel.

16-bit and greater systems are said to be AT-class, which indicates that they follow certain standards and that they follow the basic design first set forth in the original IBM AT system. AT is the designation IBM applied to systems that first included more advanced 16-bit (and later, 32- and 64-bit) processors and expansion slots. AT-class systems must have a processor that is compatible with Intel 286 or higher processors (including the 386, 486, Pentium, Pentium Pro, Pentium II, and Pentium III processors), and they must have a 16-bit or greater system bus. The system bus architecture is central to the AT system design, along with the basic memory architecture, interrupt request (IRQ), direct memory access (DMA), and I/O port address design. All AT-class systems are similar in the way these resources are allocated and how they function.

The first AT-class systems had a 16-bit version of the ISA bus, which is an extension of the original 8-bit ISA bus found in the PC/XT-class systems. Eventually, several expansion slot or bus designs were developed for AT-class systems, including the following:

- 16-bit ISA bus
- 16/32-bit Extended ISA bus
- 16/32-bit PS/2 Micro Channel Architecture (MCA) bus
- 16-bit PC-Card (PCMCIA) bus
- 32-bit Cardbus (PCMCIA) bus
- 32-bit VESA Local (VL) bus
- 32/64-bit Peripheral Component Interconnect bus
- 32-bit Accelerated Graphics Port

A system with any of these types of expansion slots is by definition an AT-class system, regardless of the actual Intel or Intel-compatible processor that is used. AT-type systems with 386 or higher processors have special capabilities not found in the first generation

of 286-based ATs. These distinct capabilities are in the areas of memory addressing, memory management, and possible 32- or 64-bit wide access to data. Most systems with 386DX or higher chips also have 32-bit bus architectures to take full advantage of the 32-bit data transfer capabilities of the processor.

Differences between PC/XT and AT Systems

System Attributes	(8-Bit) PC/XT Type	(16/32/64-Bit) AT Type
Supported processors	All x86 or x88	286 or higher
Processor modes	Real	Real/Protected/Virtual Real
Software supported	16-bit only	16- or 32-bit
Bus slot width	8-bit	16/32/64-bit
Slot type	ISA only	ISA, EISA, MCA, PC-Card, Cardbus, VL-Bus, PCI, and AGP
Hardware interrupts	8 (6 usable)	16 (11 usable)
DMA channels	4 (3 usable)	8 (7 usable)
Maximum RAM	1MB	16MB/4GB or more
Floppy controller speed	250Kbps	250/300/500/1,000 Kbps
Standard boot drive	360KB or 720KB	1.2MB/1.44MB/2.88MB
Keyboard interface	Unidirectional	Bidirectional
CMOS memory/clock	None standard	MC146818-compatible
Serial-port UART	8250B	16450/16550A or greater

Pentium:

Core i3 processors offer a great mix of price and performance. They aren't the best for heavy multi-tasking or more challenging tasks such as editing videos, but they offer a noticeable step up from Pentium processors without you having to spend too much more; you'll find them in laptops from about £350 and up.

Core i5 processors are a great choice if you want a computer that can perform lots of tasks at once, and perhaps even delve into photo and video editing work. They don't cost as much as i7 processors but they offer performance that isn't too far off. It's the specification we recommend to most people, and you can grab one in a laptop for about £500.

Core i7 is a step up from i5, with a bit of extra performance to make those tough tasks that bit quicker. You often pay a premium for this, and if you have no specific need for speed then you may well not need or want to pay the extra. Core i9 chips are reserved for specialist computers working on extremely challenging tasks, usually editing large videos. These would be overkill for most people, although if you do get the chance to use one you'll surely notice the scintillating speed.

1.2 Memory

1.2.1 Units, Representation

Memory unit is the amount of data that can be stored in the storage unit. This storage capacity is expressed in terms of Bytes.

The following table explains the main memory storage units

S.No.	Unit & Description
1	**Bit (Binary Digit)** -A binary digit is logical 0 and 1 representing a passive or an active state of a component in an electric circuit.
2	**Nibble** - A group of 4 bits is called nibble.
3	**Byte** - A group of 8 bits is called byte. A byte is the smallest unit, which can represent a data item or a character.

| S.No.	Unit	Description
1	Kilobyte (kB)	1 KB = 1024 Bytes
2	Megabyte (MB)	1 MB = 1024 kB
3	GigaByte (GB)	1 GB = 1024 MB

1.2.2 Types
Primary memory

Primary memory is computer memory that a processor or computer accesses first or directly. It allows a processor to access running execution applications and services that are temporarily stored in a specific memory location.

Primary storage (also known as main memory) is the component of the computer that holds data, programs and instructions that are currently in use.
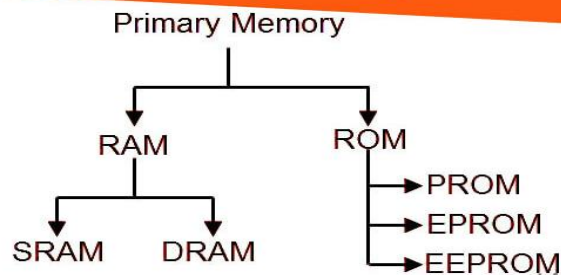
RAM > Random Access Memory

RAM (Random Access Memory), contains one or multiple memory modules that store data temporarily. It is also called volatile memory because data get erased when the computer is turned off. It holds data and instruction frequently during processing. When we are launching the software, then it is loaded into RAM.

ROM > Read Only Memory

ROM is a primary memory. It stores some standard processing programs to operate the PC. Processers only read the content of ROM but cannot change the content.

PROM

It stands for **programmable read-only memory**. In this memory, data can be written only once and will remain there forever.

It can retain its content when the computer is turned off. PROM is manufactured in an empty state and then programmed later using PROM Programmer or burner.

EPROM

It stands for **Erasable programmable read-only memory**, In this memory can be erased by exposing it to ultraviolet light. Ultraviolet light clears its contents, marking it possible to reprogrammed memory.

EEPROM

It stands for **Electrically erasable programmable read-only memory**, Same as EPROM but it erases content by exposing it to electrical charge and then can be reprogrammed.

It retains its content when the power is turned off. It is like flash memory. However, It requires data to be written and erased one byte at a time. This makes it faster than flash memory.

Primary storage is located on the motherboard. As a result, data can be read from and written to primary storage extremely quickly. This gives the processor fast access to the data and instructions that the primary storage holds.

There are four types of primary storage:

- Read Only Memory (ROM)
- Random Access Memory (RAM)
- Flash memory
- Cache memory

The two main types of primary storage are ROM, which is non-volatile, and RAM, which is volatile. Non-volatile memory keeps its contents even when the computer is switched off. Volatile memory loses its contents when power is lost.

Primary storage is comparatively limited in size, especially when compared with secondary storage. In a modern personal computer, primary storage is often around 4 GB in size.

DDR

In computing, a computer bus operating with **double data rate** (**DDR**) transfers data on both the rising and falling edges of the clock signal.[1] This is also known as **double pumped**, **dual-pumped**, and **double transition**. The term **toggle mode** is used in the context of NAND flash memory.
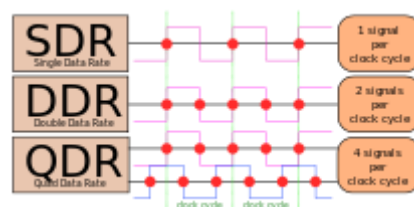
The Secondary storage media can be *fixed* or *removable*. Fixed Storage media is an internal storage medium like a hard disk that is fixed inside the computer. A storage medium that is portable and can be taken outside the computer is termed removable storage media.

Types of Secondary Device

Fixed Storage

Removable Storage
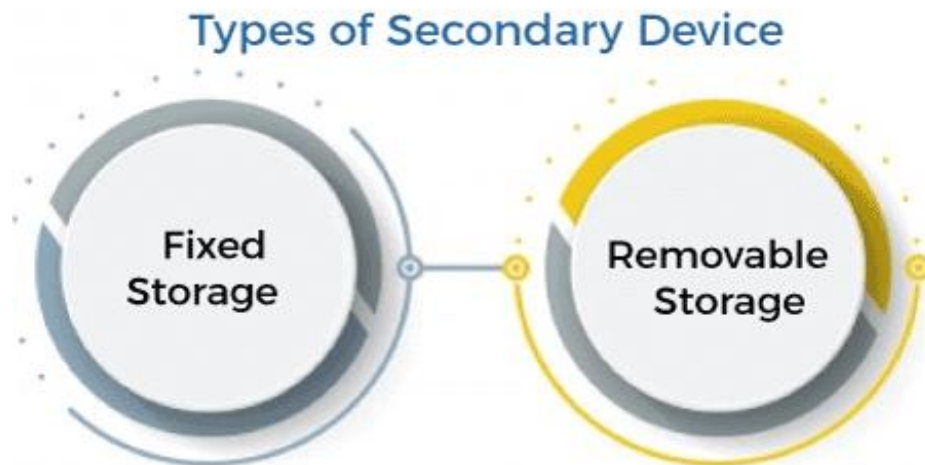
Fixed storage is an internal media device used by a computer system to store data. Usually, these are referred to as the fixed disk drives or Hard Drives.

Fixed storage devices are not fixed. These can be removed from the system for repairing work, maintenance purposes, and also for an upgrade, etc. But in general, this can not be done without a proper toolkit to open up the computer system to provide physical access, which needs to be done by an engineer.

Technically, almost all data, i.e. being processed on a computer system, is stored on some built-in fixed storage device. We have the following types of fixed storage:

- o Internal flash memory (rare)
- o SSD (solid-state disk) units
- o Hard disk drives (HDD)

Hard disk (HDD)

A hard disk is also known as a hard drive or fixed disk. It is said to be rigid magnetic disc that stores data. It is located within a drive unit. Hard disk is a non-volatile storage device that contains platters and magnetic disks rotating at high speeds. Non-volatile means the data retains when the computer shuts down.

It is installed internally in our computer systems. Hard disk is located within a drive unit on the computer's motherboard and comprises one or more platters packed in an air-sealed casing.

Its main components include a read/write actuator arm, head actuator, read/write head, spindle, and platter. A circuit board (also called as the interface board or disk controller) is present on the back of a hard drive. It lets the hard drive to communicate with the computer.

SSD

Solid-state drives (SSD) are a new generation of storage devices aimed at replacing traditional mechanical hard-disk drives (HDD). SSDs use flash-based memory rather than spinning disks, making them faster, more reliable and more energy-efficient.

This storage technology was previously reserved for enterprise organizations and the most high-end PCs. Technology improvements have made them more affordable so they are now more common in mainstream devices. They are on average more expensive than HDDs but they provide more value. SSDs are available with storage capacities ranging from 32 gigabytes up to 8 terabytes.

CD

A compact disc (CD) is a circular disc introduced by James Russell. It is 4.75 in diameter, which is a flat, round, portable storage medium used to record, store and playback audio, video, and other data. On **17 August 1982**, in *Germany*, the first CD was created at a Philips factory. Sony and Philips proposed the CD standard, and in **1993**, the technology was introduced to the U.S. It can store data up to 700 MB or 80 minutes of audio. It stores data as small notches and read with the help of laser from an optical drive, and the notches are converted into usable data by drives.

The first CDs were able to store only audio, which was replaced by audiotapes. Audio CDs have the ability to enable users to skip to different places on the disc. CDs can be used unlimited time without losing quality, while audio tapes can lose the quality if you use it around ten times. Because in the CDs, the laser that reads data does not put the pressure on the disc, while in a tape, the play heads drape slowly wear away the magnetic strip on the tape.

What is the use of a CD on the computer?

CDs are used to store data, which can be executed in the future. Thus, you can load software programs in the compact disc that can be moved onto the computer. Even, Windows files are also stored in the CD, which can be installed onto the computer. Furthermore, the stored files on the compact disc can be transferred to other computers, through which you can make a backup of all files.

History of CD (Compact Disc)

The two companies Sony and Philips announced to developed the CD (Compact Disc) with developing prototypes separately in the late **1970s.**

DVD

DVD is short for digital versatile disc or digital video disc. It is a type of optical media used for storing optical data. Although it has the same size as a CD, its storage capacity is much more than a CD. So, it is widely used for storing and viewing movies and to

distribute software programs as they are too large to fit on a CD. DVD was co-developed by Sony, Panasonic, Philips, and Toshiba in 1995.

Types of DVDs:

DVDs can be divided into three main categories which are as follows:

DVD-ROM (Read-Only): These types of DVDs come with media already recorded on them, such as movie dvds. As the name suggests, data on these discs cannot be erased or added, so these discs are known as a read-only or non-writable DVD.

DVD-R (Writable): It allows you to record or write information to the DVD. However, you can write information only once as it becomes a read-only DVD once it is full.

DVD-RW (Rewritable or Erasable): This type of discs can be erased, written, or recorded multiple times.

Blu-Ray DVD

A Blu-ray disk is a type of high capacity optical disk medium, which is used to store a huge amount of data and to record and playback high definition video. Blu-ray was designed to supersede the DVD. While a CD is able to store 700 MB of data and a DVD is able to store 4.7 GB of data, a single Blu-ray disk is able to store up to 25 GB of data. The dual-layer Blu-ray disks can hold 50 GB of data. That amount of storage is equivalent to 4 hours of HDTV. There is also a double-sided dual-layer DVD, which is commonly used and able to store 17 GB of data.

Blu-ray disk uses the blue lasers, which help them to hold more information as compared to other optical media. The laser is actually known as 'blue-violet', but the developer rolls off the tongue to make 'Blue-violet-ray' a little earlier as 'Blu-ray'. The CDs and DVDs use the red laser, and their wavelength (650 nm) is greater than the blue-violet laser (405nm). With the help of a small wavelength, the laser can focus on a small area. In Blu-ray disks, we can use the same size, which is used by CD or DVD and store a large amount of data on a disk. Blu-ray is able to provide very high resolution as compared to the DVD. On the basis of standard definition, a DVD can provide a definition of 720x480 pixels. In contrast, the Blu-ray high definition contains 1920X1080 pixel resolution.

Pen drive

Pen drive is a compact secondary storage device. It is also known as a USB flash drive, thumb drive or a jump drive. It connects to a computer via a USB port. It is commonly used to store and transfer data between computers. For example, you can write a report using a computer and then copy or transfer it in the pen drive. Later, you can connect this pen drive to a computer to see or edit your report. You can also store your important documents and pictures, music, videos in the pen drive and keep it at a safe place.

Pen drive does not have movable parts; it comprises an integrated circuit memory chip that stores the data. This chip is housed inside a plastic or aluminium casing. The data storage capacity of the pen drive generally ranges from 2 GB to 128 GB. Furthermore, it is a plug and play device as you don't need additional drives, software, or hardware to use it.

Magnetic Tape

Reading and writing techniques in the tape system is the same as the disk system. In this, the medium is **flexible polyester** tape coated with a **magnetizable material.** The tape's data can be structured as a number of parallel tracks that will be run lengthwise. In this form, the recording of data can be called a **parallel recording.** Instead of the parallel recording, most of the modern system uses serial recording. The **serial recording** uses the sequence of bits along with each track to lay of the data. It is done with the help of a magnetic disk. In the serial recoding, the disk contains the physical record on the tape, which can be described as the data which are read and write in the contiguous blocks.

The gaps are used to separate the blocks on the tape, which can also be known as **inter-record gaps.** With the disk, we format the tape so that we can assist in locating physical records. When the data are being recorded in the techniques of serial tape, we record the first set of bits along with the whole tape's length. When we reach the end of a tape, the head will be repositioned so that they can record a new track. This time, the tape will follow the opposite direction to again record its whole length. This process will be continued until the tape is full.

(a) Serpentine reading and writing
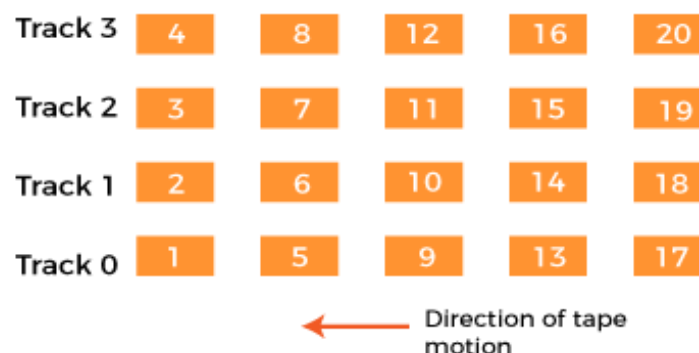
A tape drive can be accessed as a sequential access device. If the current position of the head is beyond the desired result, we have to rewind the tape at a certain distance and starting reading forward. During the operation of reading and writing only, the tape is in motion. The difference between tape and disk drive is that the disk drive can be referred to as a direct access device. A disk drive is able to get the desired result without sequentially reading all sectors on a disk. It has to only wait until the intervening sectors have arrived within one track. After that, it is able to successive access to any track.

The magnetic tape can also be known as a type of second memory. It can also be used as the slowest speed and lowest cost member of the memory hierarchy. There is also a linear tape technology, which is a type of cartridge system. It was developed in late the 1990s. In the market, the LTO can be described as an alternative to various properties systems.

Zip disk

Zip disk is a hardware data storage device developed by Iomega that functions like a standard 1.44" floppy drive and diskette. The Iomega Zip drive unique is having capability to hold up to 100 MB of data or 250 MB of data on the later models. Iomega Zip drives became very popular in late 1990s but quickly became less popular as users needed larger storage capabilities. The drive was eventually replaced by CD-R and CD-RW drives and discs as they became cheaper since they offered much more storage and compatibility.

In the picture is an Iomega Zip disk that is bigger than a floppy diskette and made of a much harder plastic. Much like a floppy diskette, the Zip disk contains a magnetic circular disk that holds information. To read and write information on a Zip diskette, it is placed into a Zip drive that moves the metal cover exposing the magnetic disk.

1.3 CPU
Components of CPU
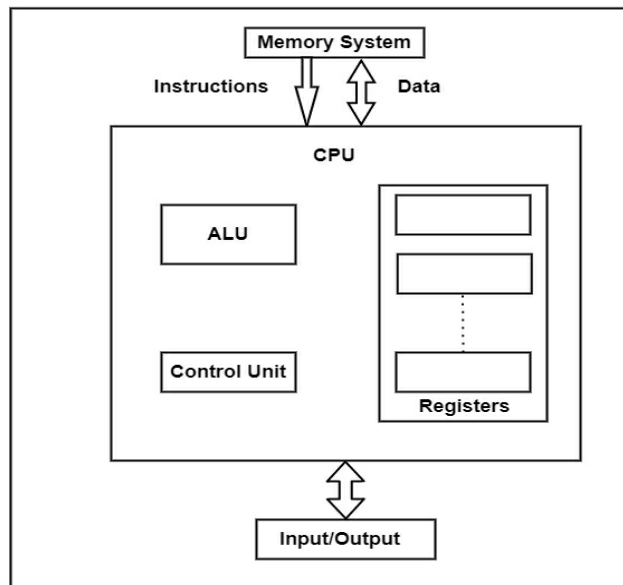
Motherboard

The **motherboard** is the computer's **main circuit board**. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, expansion cards to control the video and audio, and connections to your computer's ports (such as USB ports). The motherboard connects directly or indirectly to every part of the computer.
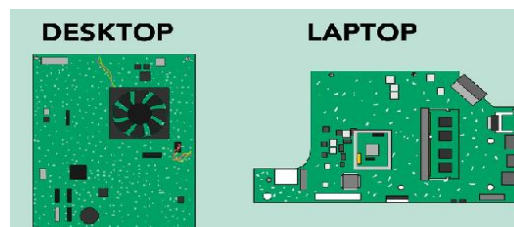
Hard disk

The **hard drive** is where your software, documents, and other files are stored. The hard drive is **long-term storage**, which means the data is still saved even if you turn the computer off or unplug it.
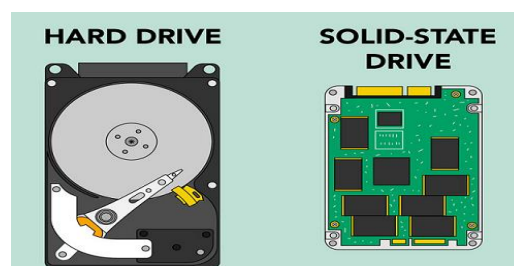
When you run a program or open a file, the computer copies some of the data from the **hard drive** onto the **RAM**. When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive, the faster your computer can **start up** and **load programs**.

SSD

SSD Stands for "Solid State Drive." An SSD is a type of mass storage device similar to a hard disk drive (HDD). It supports reading and writing data and maintains stored data in a permanent state even without power. Internal SSDs connect to a computer like a hard drive, using standard IDE or SATA connections.

RAM (Random Access Memory)
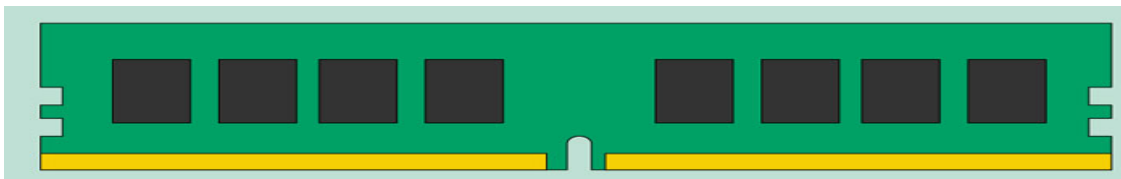
RAM is your system's **short-term memory**. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

This **short-term memory disappears** when the computer is turned off. If you're working on a document, spreadsheet, or other type of file, you'll need to **save** it to avoid losing it. When you save a file, the data is written to the **hard drive**, which acts as **long-term storage**.

RAM is measured in **megabytes (MB) or gigabytes (GB)**. The **more RAM** you have, the more things your computer can do at the same time. If you don't have enough RAM, you may notice that your computer is sluggish when you have several programs open. Because of this, many people add **extra RAM** to their computers to improve performance.

ROM

ROM (read only memory) is a flash memory chip that contains a small amount of non-volatile memory. Non-volatile means that its contents cannot be changed and it retains its memory after the computer is turned off.

Processor / CPU

The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

The CPU is usually a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.
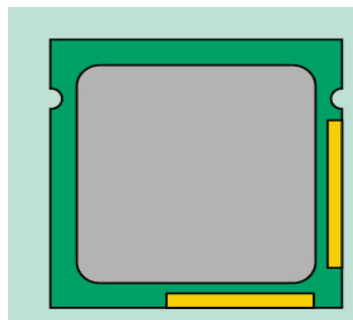
A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor.

SMPS & Connecting wire

SMPS / Power Supply Unit

The SMPS (Switched Mode Power Supply) / Power Supply Unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

Connecting wires

| CPU 4+4 Pin | Motherboad 20+4 Pin | SATA Cable |
| Floppy4 Pin | PCI-e 6 Pin / PCI-e 6+2 Pin | Peripheral 4 Pin |

20 + 4 Pin ATX / Motherboard Connector

This is the main ATX connector that supplies power to motherboard and other components like RAM, Low-end graphics card, PCI cards that are connected to motherboard. Earlier motherboards have 20 pin sockets only but now modern-day motherboards require 24-pin power connectors.

CPU 4 + 4 Pin Connector

This is the 12 Volt connector that supplies power to CPU or Processor. Some motherboards have 4 pins 12V CPU socket and some have 8 pins 12V socket, therefore most of the good power supplies come with 8-pin (4 + 4) detachable connectors which can be split into two 4 pin connectors.

SATA Power Connector

This power connector is used to power up SATA devices that mostly include Hard Disks, DVD Writers / Drives.

Floppy 4 Pin Connector

This 4 pin power connector is used to power floppy drives. Floppy Drives are not being used commonly, but in some cases they can prove very useful.

Peripheral 4 Pin Molex Connector

Peripheral 4 Pin Molex Connector is used to provide power to IDE devices and other peripherals like Fans, case lights etc.

PCI-e 6 Pin / PCI-e 8 Pin Connector

PCI-e 6 Pin or PCI-e 6+2 Pin are 12 Volt Connectors that are used to provide power to mid to high range graphics cards that require extra amount of power for their working.

Graphics Card

A graphics card is a type of display adapter or video card installed within most computing devices to display graphical data with high clarity, color, definition and overall appearance. A graphics card provides high-quality visual display by processing and executing graphical data using advanced graphical techniques, features and functions.

Sound Card

A **sound card** (also known as an **audio card**) is an internal expansion card that provides input and output of audio signals to and from a computer under control of computer programs. The term sound card is also applied to external audio interfaces used for professional audio applications.

Network Interface Card

A network interface controller (NIC, also known as a network interface card, network adapter, LAN adapter or physical network interface and by similar terms) is a computer hardware component that connects a computer to a computer network. Early NIC's were commonly implemented on expansion cards that plugged into a computer bus. The low cost and ubiquity of the Ethernet standard means that most newer computers have a network interface built into the motherboard, or is contained into a USB-connected dongle.

Modem

A modem converts data to a signal so it can be easily sent and received over a phone line, cable, or satellite connection. For transmission over an analog telephone line—which was once the most popular way to access the internet—the modem converts data between analog and digital formats in real time for two-way network communication. In the case of the high-speed digital modems popular today, the signal is much simpler and doesn't require the analog-to-digital conversion.

1.4 Input, Output Devices

Input and output devices allow the computer system to interact with the outside world by moving data *into* and *out of* the system.

An *input device* is used to bring data into the system. Some input devices are:

- Keyboard
- Mouse
- Microphone
- Bar code reader
- Graphics tablet

An *output device* is used to send data out of the system. Some output devices are:
- Monitor
- Printer
- Speaker

Input/output devices are usually called I/O devices. They are directly connected to an electronic module inside the systems unit called a **device controller**. For example, the speakers of a multimedia computer system are directly connected to a device controller called an audio card (such as a Soundblaster), which in turn is connected to the rest of the system. Sometimes secondary memory devices like the hard disk are called I/O devices (because they move data in and out of main memory.) What counts as an I/O device depends on context. To a user, an I/O device is something outside of the system box. To a programmer, everything outside of the processor and main memory looks like an I/O devices. To an engineer working on the design of a processor, everything outside of the processor is an I/O device.

Input, Output devices

A computer is an electronic device used for performing calculations and controlling operations. It is a collection of hardware and software components that help you complete many different tasks.

1.4.1 Input Device
- An input device is used to feed data into computer.
- Input devices are capable of converting data into a form which can be recognized by computer.
- A computer has several input device namely, Keyboard, Mouse, Trackball, Joystick, Scanner, Light pen, Bar Code Reader, OCR, OMR, MICR etc.
  Note: The device used to accept the data and instructions from the user is called **input device.**

Keyboard

- The most common input device is the keyboard.
- It is used to enter both numerical and character type data.
- It is like a mechanical type writer with **alpha numeric** and **special keys, punctuation keys, functional keys** to perform specific. The keyboards contain 101 keys or 104 keys.
- The keyboard detects the key pressed and generates the corresponding ASCII codes which can be recognized by the computer.

Types of keyboard:
1. **Standard keyboard**: The standard keyboards have their basic layout. The average number of keys on a regular keyboard is 105/108; QWERTY keyboards

are the most common and have the six alphabets Q, W, E, R, T, and Y in the first row.

2. **Ergonomics**: It refers to study of method that can reduce stress on muscles to avoid repetitive strain injury. It mostly deals with optimizing posture and technique while working, so the work can be carried out in the easiest manner.

3. **Wireless keyboard**: It is a keyboard that does not need to connect to the computer via a wire. This makes very convenient for the use the keyboard comfortably. Wireless keyboard use Bluetooth, Infrared (IR) to connect to the computer.

4. **Virtual keyboard**: It is a software device that led to use input data just like hardware keyboard. They open up as an application and can be controlled by a mouse or wire touch screen.

5. **Compact keyboard**: These keyboards are slim and usually do not have the numerical keypad that is present on the right side of the keyboard these are typically used in laptops.

Mouse

- Mouse is an input device that controls the movement of the cursor on the display screen.
- Mouse stands for "**M**echanically **O**perated **U**ser **S**erial **E**ngine".
- The Mouse is used as a pointing device.
- Mouse is a small device; you can roll/navigate along a flat surface.
- In a mouse, a small ball/IR rays is kept inside and touches the pad through a hole at the bottom of the mouse.

There are two types of mouse.
  - o Mechanical
  - o Optical

- Mechanical: This mouse has a small rubber ball underneath that moves against two rollers as it passes across a flat surface.
- Optical: This mouse more accurate and has no moving parts. Ts use a laser to detect movement.

Scanner

- The scanner is an input device which works more like a photocopy machine.
- It is used when some information is available on a paper and it is to be transferred to the computer for further manipulation.
- The scanner captures images from the source which are then converted into the digital form.

1.4.2 Output Device

- When the data and instruction are fed into the computer and processed the next step is get the desired output.

- This output may be displayed on the monitor or printed on the computer.
- The output displayed on the monitor is called **soft copy** output.
- The output produced on a computer is called **hard copy** output.
  Note: The device that displays output to the user is called **output device**.

Monitor
- It is commonly used output device sometimes called as display screen/VDU.
- Monitors are connected with the computer are similar in appears to a television set.
- Monitor display image and text.
- The smallest dot that can be displayed is called a **pixel**.
- The resolution of the monitor determines the quality of the display. Some popular resolutions are 640X480 pixels, 800X600 pixels and 1024X768 pixels.
- The different size of the monitor is measured diagonally may be 12", 14", 17", 19", 21".

The different types of monitors:
  - CRT (Cathode Ray Tube)
  - LCD (Liquid Crystal Display)
  - TFT (Thin Film Transistors)
  - LED (Light Emitting Diode)

Printer
- Printer is an output device that prints text or images on paper.
- By printing you create a **'hard copy'** of data.
- There are different kinds of printers, which vary in their speed and print quality.

The two main types of printer namely;
  - Impact Printers
  - Non Impact Printers.

Joystick
- A joystick is an input device consisting of a stick that pivots on a base and reports its angle or direction to the device it is controlling.
- The joystick can be moved in all four directions. The function of the joystick is similar to that of a mouse.
- It is mainly used in playing computer games.
- Joysticks are also used for controlling machines such as cranes, trucks, underwater unmanned vehicles, surveillance cameras and zero turning radius lawn mowers.

Plotter
- Plotter is an output device that draws shapes on paper based on commands from a computer.
- Plotter differs from printers in that they draw lines using a pen. As a result, they

can produce continuous lines, whereas printers can only stimulate lines printing a closely spaced series of dots.

- Multicolor plotters use different colored pens to draw different colors.
- Plotters are more expensive than printers.
- They used in engineering applications.

Digital Camera

A **digital camera** is a camera that captures photographs in digital memory. Most cameras produced today are digital, largely replacing those that capture images on photographic film. Digital cameras are now widely incorporated into mobile devices like smart phones with the same or more capabilities and features of dedicated cameras. While there are still dedicated digital cameras, many more cameras are now incorporated into mobile devices like smart phones. High-end, high-definition dedicated cameras are still commonly used by professionals and those who desire to take higher-quality photographs.

Graphics tablet

A **graphics tablet** (also known as a **digitizer**, **digital graphic tablet**, **pen tablet**, **drawing tablet**, or **digital art board**) is a computer input device that enables a user to hand-draw images, animations and graphics, with a special pen-like stylus, similar to the way a person draws images with a pencil and paper. These tablets may also be used to capture data or handwritten signatures. It can also be used to trace an image from a piece of paper that is taped or otherwise secured to the tablet surface. Capturing data in this way, by tracing or entering the corners of linear polylines or shapes, is called digitizing.

1.4.3 Connecting Port

In the computer world, a port is a means to connect the external devices to the central processing unit (CPU). Effectively they are the sockets found on the back of the PCs and are used to communicate with printers, keyboards, modems, and monitors, or just about any peripheral or component. The ports either connect directly onto the motherboard or onto an expansion card. We are here to talk about two of the commonly used ports – serial ports and parallel ports.
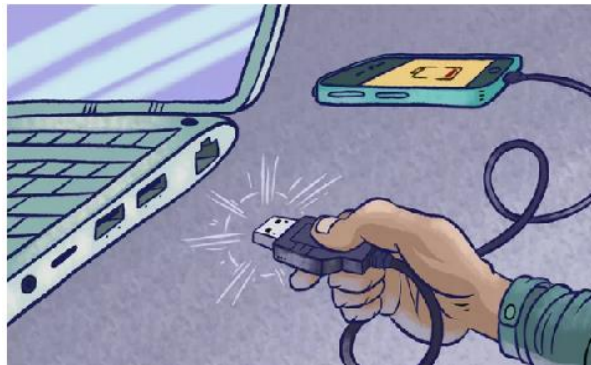
1.4.3.1 Serial Port

A **serial port** is yet another type of port and a great alternative to the parallel ports where the bits of data is sent one at a time in a single stream of 1s and 0s. Unlike the parallel port, it is a serial communication interface through which data is transferred on a single wire or a pair of wires, or in case of wireless communication, a single transmission path. Also known as COM (communication) ports, there are many different types of serial interfaces available for computers, such as the ubiquitous RS-232 port, the RS-485 port, IEEE-394, and the USB. The serial port uses a standard 9-pin D-shaped connector and is used to connect devices such as mouse, modems, gaming controllers, older printers, etc. It is one of the oldest interfaces used to connect mainly modem and printers to the computer. But the modern serial ports are used for specialist devices such as security cameras, flat-screen monitors, GPS receivers, and so on.

1.4.3.2 Parallel Port

A **parallel port** is an external interface found on the back of the personal computers and is used to connect to just about anything you'd want to hook to a computer. It acts as an interface for connecting computer peripherals such as printers, or any other device that requires relatively high bandwidth. The parallel port is one of the most versatile I/O ports in the system because it can be used for a variety of devices, including optical drives, scanners, external CD-ROM, and so on. The name parallel describes the way how the data is sent; it implies parallel communication meaning multiple bits of data is sent all together at the same time without any hold-up. The parallel port uses DB25 female pin connector and the end of the cable that connects to devices uses a centronics connector – after the name of the company that designed the standard interface for connecting a printer to a computer.

1.4.3.3 USB Port

USB port is a standard cable connection interface for personal computers and consumer electronics devices. USB stands for Universal Serial Bus, an industry standard for short-distance digital data communications. USB ports allow USB devices to be connected to each other with and transfer digital data over USB cables. They can also supply electric power across the cable to devices that need it.

Both wired and wireless versions of the USB standard exist, although only the wired version involves USB ports and cables.

1.4.4 Installation of Scanner and Printer

Connect your printer by a wire, plug it into your device. It'll connect automatically, your PC will download the right drivers, and you can use it right away. To connect a wireless printer, follow these steps:

1. Select the **Start** button, then select **Settings** > **Devices** > **Printers & scanners** > **Add a printer or scanner.**
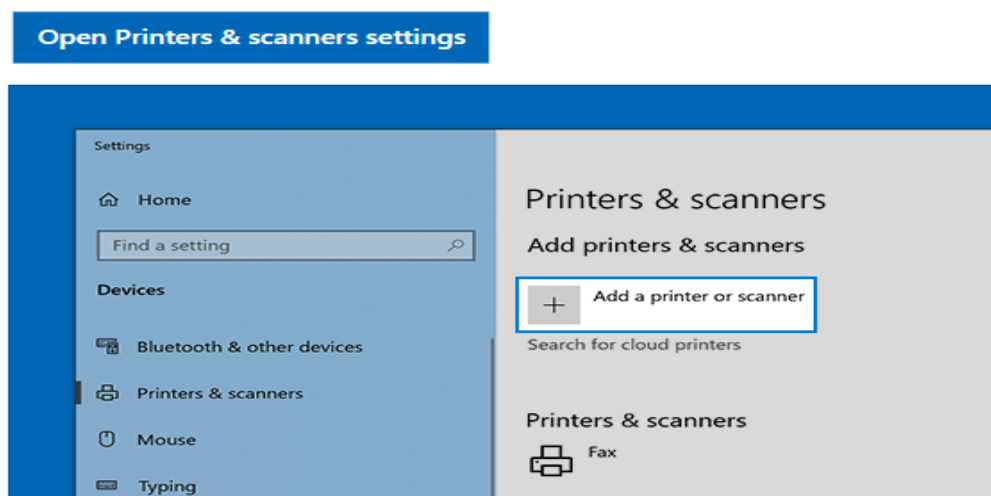
2. Wait for it to find nearby printers, then choose the one you want to use, and select **Add device.** If you want to remove the printer later, just highlight it and select **Remove.**

3. If you don't see your printer, try to fix the problem by using the steps in

1.4.5 Connecting Monitor, Mouse, Keyboard to System Unit

You might need to connect the monitor, keyboard, and mouse to the system. To connect a monitor, mouse and keyboard perform the following steps:

1. Locate the graphics adapter at the rear of the server.

2. Connect a keyboard and mouse to the USB ports.
3. Connect a standard monitor to the adapter to use the console.
4. Power on the console.
5. Connect the power cables for the server and wait for the green light on the operator panel to start flashing.
6. Install an operating system and update the operating system, if required.

*****

UNIT – 2

OPERATING SYSTEM

2.1 Windows

2.1.1 Definition of Operating System

An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of programs.
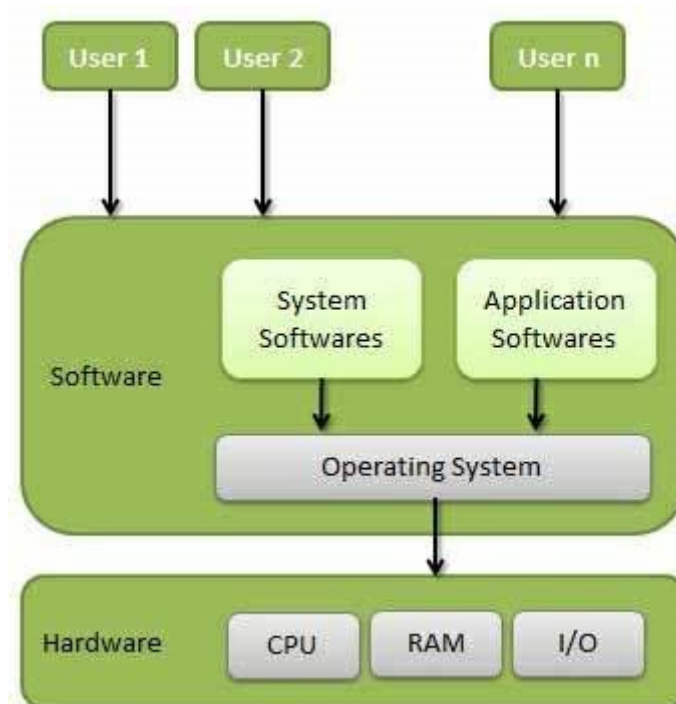
2.1.1.1 Functions of OS

Following are some of important functions of an operating System.

- Memory Management
- Processor Management
- Device Management
- File Management
- Security
- Control over system performance
- Job accounting
- Error detecting aids
- Coordination between other software and users

Memory Management

Memory management refers to management of Primary Memory or Main Memory. Main memory is a large array of words or bytes where each word or byte has its own address.

Main memory provides a fast storage that can be accessed directly by the CPU. For a program to be executed, it must in the main memory. An Operating System does the following activities for memory management

- Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.
- In multiprogramming, the OS decides which process will get memory when and how much.
- Allocates the memory when a process requests it to do so.
- De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

In multiprogramming environment, the OS decides which process gets the processor when and for how much time. This function is called **process scheduling**. An Operating System does the following activities for processor management –

- Keeps tracks of processor and status of process. The program responsible for this task is known as **traffic controller.**
- Allocates the processor (CPU) to a process.
- De-allocates processor when a process is no longer required.

Device Management

An Operating System manages device communication via their respective drivers. It does the following activities for device management –

- Keeps tracks of all devices. Program responsible for this task is known as the **I/O controller.**
- Decides which process gets the device when and for how much time.
- Allocates the device in the efficient way.
- De-allocates devices.

File Management

A file system is normally organized into directories for easy navigation and usage. These directories may contain files and other directions.

An Operating System does the following activities for file management –

- Keeps track of information, location, uses, status etc. The collective facilities are often known as **file system.**
- Decides who gets the resources.
- Allocates the resources.
- De-allocates the resources.

Other Important Activities

Following are some of the important activities that an Operating System performs −

- **Security** − By means of password and similar other techniques, it prevents unauthorized access to programs and data.
- **Control over system performance** − Recording delays between request for a service and response from the system.
- **Job accounting** − Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** − Production of dumps, traces, error messages, and other debugging and error detecting aids.
- **Coordination between other softwares and users** − Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

2.1.1.1 Types of OS

An operating system is a well-organized collection of programs that manages the computer hardware. It is a type of system software that is responsible for the smooth functioning of the computer system.

Single User Operating System

A single-user operating system is a type of operating system developed and intended for use on a computer or similar machine that will only have a single user at any given time. This type of OS is typically used on devices like wireless phones and two-way messaging devices.

The operating system is responsible for handling many different tasks and is typically one of the most important programs used on a computer. It manages memory usage and other resources, hardware connectivity and the proper execution of other applications. A single task operating system can only run one program or application at a time. So it is not as useful for a computer or other device intended to run multiple programs at once.

Single User Single Task Operating System

As the name indicates, Single User Single Task OS is a system in which only one program is executed at one time. It manages the computer in a way that one user can successfully perform one thing at a time. There is a problem with these types of Operating System that the program has to be arranged in a queue.

Advantages
- This operating system occupies less space in memory.

Disadvantages
- It can perform only a single task at a time.

Single User Multi Tasking Operating System

Most people use this Operating-System on their computers, laptop and desktops. Best examples of these types of Operating System are Apple's Mac OS platform and Microsoft's Windows.

This Operating System will allow a single user to operate several programs at the same time. For example, a Windows user may be writing an e-mail while printing a word document while downloading a file from Internet.

Advantages
- It is time saving as it performs multiple tasks at a time yielding high productivity.

Disadvantages
- This operating system is highly complex and occupies more space.

Real-Time Operating System

A real-time operating system (RTOS) is a special-purpose operating system used in computers that has strict time constraints for any job to be performed. It is employed mostly in those systems in which the results of the computations are used to influence a process while it is executing. Whenever an event external to the computer occurs, it is communicated to the computer with the help of some sensor used to monitor the event. The sensor produces the signal that is interpreted by the operating system as an interrupt. On receiving an interrupt, the operating system invokes a specific process or a set of processes to serve the interrupt.

This process is completely uninterrupted unless a higher priority interrupt occurs during its execution. Therefore, there must be a strict hierarchy of priority among the interrupts. The interrupt with the highest priority must be allowed to initiate the process, while lower priority interrupts should be kept in a buffer that will be handled later. Interrupt management is important in such an operating system.

1. Hard Real-Time:

This type handles deadlines very strictly. Thus, the given task must start and finish execution within the assigned time duration. Example: Medical critical care system and aircraft systems.

2. Firm Real-Time:

This type needs to follow deadlines though one or two missing deadlines would not have a big impact they could still cause undesired effects. These effects include a huge reduction in the quality of a product. Example: Multimedia applications.

3. Soft Real-Time:

This type handles delays by the OS softly. Though there is a deadline assigned for a specific job, a little delay is acceptable. Example: Livestock price quotation system.
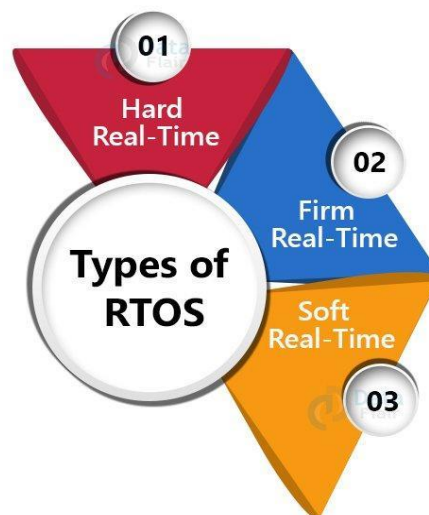
Examples of the real-time operating systems: Airline traffic control systems, Command Control Systems, Airlines reservation system, Heart Pacemaker, Network Multimedia Systems, Robot etc.

Multi User Operating System

Multi User Operating System allows various different users on different desktop or computer to access a single System. A user at the terminal or desktop, through a network takes access of the system and other system attached machines such as printers.

The Operating System takes care of all the requirements of the various users in a balanced manner. Also, it ensures that each of the programs being used has a separate and sufficient resource so that problem of one user doesn't affect the entire community of users.

Multiuser / Multitasking Operating System

It is an operating system that permits several users to utilize the programs that are concurrently running on a single network server. The single network server is termed as "Terminal server". "Terminal client" is software that supports user sessions. Examples include UNIX, MVS, etc.
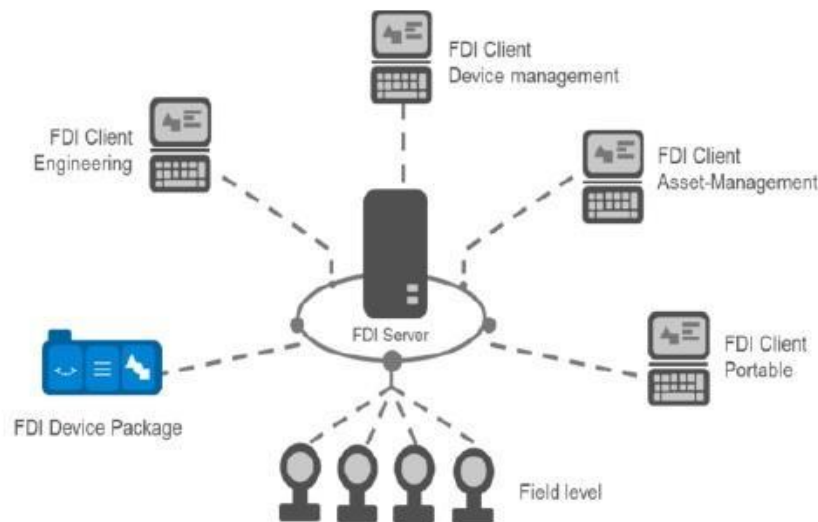
Advantages
- It is highly productive as it performs multiple tasks at a time.
- It is time saving as we don't have to make changes in many desktops, instead can make changes only to the server.

Disadvantages
- If the connection to the server is broken, user cannot perform any task on the client as it is connected to that server.

2.1.2 System Administration

2.1.2.1 Installing Windows

How to install Windows 10: Full installation

Before we get into the installation walkthrough, it's worth noting that installing Windows 10 can be a lengthy process. Make sure you have enough time to wait it out.

1. Check your device meets the Windows 10 system requirements. Below you'll find the minimum specs needed to run Windows 10, so check your device is capable:
CPU: 1GHz or faster processor
RAM: 1GB for Windows 10 32-bit or 2GB for Windows 10 64-bit
Storage: 32GB of space or more
GPU: DirectX 9 compatible or later with WDDM 1.0 driver
Display: 800x600 resolution or higher

2. Create USB installation media. Visit Microsoft's *Windows 10 download page*(opens in new tab) and select "Download tool now" under the "create Windows 10 installation media" section. Transfer the downloaded installer tool to a USB drive.

3. Run the installer tool. Open the installer tool by clicking on it. Accept Microsoft's terms, and then **select "Create installation media for another PC"** on the "What do you want to do?" page. After selecting which language you want Windows 10 to run in, and which edition you want as well (32-bit or 62-bit), you'll be asked what type of media you want to use.

Installing from a USB drive is definitely the preferred option but you can also install from a CD or ISO file. Once you choose your device, the installer tool will download the required files and put them onto your drive.

4. Use your installation media. Insert your installation media into your device and then **access the computer's BIOS or UEFI.** These are the systems that allow you to control your computer's core hardware.

The process of accessing these systems is unique to each device, but the manufacturer's website should be able to give you a helping hand here. Generally, you'll need to **press the F2, F12 or Delete keys** as your computer boots up.

5. Change your computer's boot order. Once you have access to your computer's BIOS/UEFI you'll need to locate the settings for boot order. You need the Windows 10 installation tool to be higher up on the list than the device's current current boot drive: this is the SSD or HDD that your existing OS is stored on. You should **move the drive with the installer files to the very top of the boot order menu.** Now, when you restart your device the Windows 10 installer should load up first.

6. Restart your device. Save your settings in the BIOS/UEFI and reboot your device.

7. Complete the installation. Your device should now load up the Windows 10 installation tool on restart. This will guide you through the rest of the installation process.

How to install Windows 10: Upgrading from an older version of Windows

If you're upgrading to Windows 10 from Windows 7 or Windows 8, the process is much easier. Here's how to upgrade from an older version of the Windows operating system.

1. Download the installer tool. Visit Microsoft's Windows 10 download page(opens in new tab) and select **"Download tool now"** under the "**create Windows 10 installation media**" section.
2. Run installer tool. You can just upgrade your version of Windows directly from the installer tool, without creating separate installation media. When you reach the "**what do you want to do?**" section, **select "Upgrade this PC now."**

3. Complete Windows 10 installation. Now the installer tool will guide you through the rest of the process. Just follow the steps to complete the installation process and you'll have Windows 10 installed on your device at the end of it.

2.1.2.2 Booting the System

Booting is the process of starting a computer. It can be initiated by hardware such as a button press or by a software command. After it is switched on, a CPU has no software in its main memory, so some processes must load software into memory before execution. This may be done by hardware or firmware in the CPU or by a separate processor in the computer system.

Restarting a computer also is called rebooting, which can be "*hard*", e.g., after electrical power to the CPU is switched from off to on, or "*soft*", where the power is not cut. On some systems, a soft boot may optionally clear RAM to zero. Hard and soft booting can be initiated by hardware such as a button press or a software command. Booting is complete when the operative runtime system, typically the operating system and some applications, is attained.

The process of returning a computer from a state of sleep does not involve booting; however, restoring it from a state of hibernation does. Minimally, some embedded systems do not require a noticeable boot sequence to begin functioning and, when turned on, may run operational programs that are stored in ROM. All computer systems are state machines and a reboot may be the only method to return to a designated zero-state from an unintended, locked state.

In addition to loading an operating system or stand-alone utility, the boot process can also load a storage dump program for diagnosing problems in an operating system.

Sequencing of Booting

Booting is a start-up sequence that starts the operating system of a computer when it is turned on. A boot sequence is the initial set of operations that the computer performs when it is switched on. Every computer has a boot sequence.
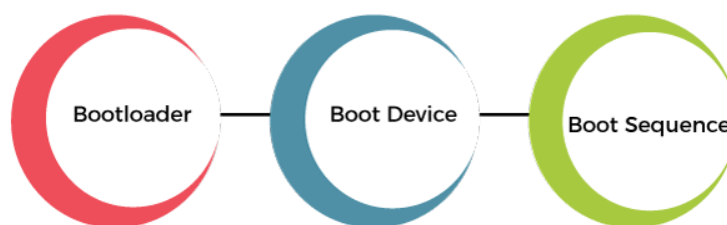
1. Boot Loader: Computers powered by the central processing unit can only execute code found in the system's memory. Modern operating systems and application program code and data are stored on nonvolatile memories. When a computer is first powered on, it must initially rely only on the code and data stored in nonvolatile portions of the system's

memory. The operating system is not really loaded at boot time, and the computer's hardware cannot perform many complex systems actions.

The program that starts the chain reaction that ends with the entire operating system being loaded is the boot loader or bootstrap loader. The boot loader's only job is to load other software for the operating system to start.

2. Boot Devices: The boot device is the device from which the operating system is loaded. A modern PC BIOS (Basic Input/Output System) supports booting from various devices. These include the local hard disk drive, optical drive, floppy drive, a network interface card, and a USB device. The BIOS will allow the user to configure a boot order. If the boot order is set to:

- o CD Drive
- o Hard Disk Drive
- o Network

The BIOS will try to boot from the CD drive first, and if that fails, then it will try to boot from the hard disk drive, and if that fails, then it will try to boot from the network, and if that fails, then it won't boot at all.

3. Boot Sequence: There is a standard boot sequence that all personal computers use. First, the CPU runs an instruction in memory for the BIOS. That instruction contains a jump instruction that transfers to the BIOS start-up program. This program runs a power-on self-test (POST) to check that devices the computer will rely on are functioning properly. Then, the BIOS goes through the configured boot sequence until it finds a bootable device. Once BIOS has found a bootable device, BIOS loads the bootsector and transfers execution to the boot sector. If the boot device is a hard drive, it will be a master boot record (MBR).

The MBR code checks the partition table for an active partition. If one is found, the MBR code loads that partition's boot sector and executes it. The boot sector is often operating system specific, and however, in most operating systems, its main function is to load and execute the operating system kernel, which continues start-up. Suppose there is no active partition, or the active partition's boot sector is invalid. In that case, the MBR may load a secondary boot loader which will select a partition and load its boot sector, which usually loads the corresponding operating system kernel.

Types of Booting

There are two types of booting in an operating system.

1. **Cold Booting:** When the computer starts for the first time or is in a shut-down state and switch on the power button to start the system, this type of process to start the computer is called cold booting. During cold booting, the system will read all the instructions from the ROM (BIOS) and the Operating System will be automatically get loaded into the system. This booting takes more time than Hot or Warm Booting.

2. **Warm Booting:** Warm or Hot Booting process is when computer systems come to no response or hang state, and then the system is allowed to restart during on condition. It is also referred to as rebooting. There are many reasons for this state, and the only solution is to reboot the computer. Rebooting may be required when we install new software or hardware. The system requires a reboot to set software or hardware configuration changes, or sometimes systems may behave abnormally or may not respond properly. In such a case, the system has to be a force restart. Most commonly *Ctrl+Alt+Del* button is used to reboot the system. Else, in some systems, the external reset button may be available to reboot the system.

Booting Process in Operating System

When our computer is switched on, it can be started by hardware such as a button press, or by software command, a computer's central processing unit (CPU) has no software in its main memory, there is some process which must load software into main memory before it can be executed. Below are the six steps to describe the boot process in the operating system, such as:

Step 1: Once the computer system is turned on, *BIOS* (Basic Input /Output System) performs a series of activities or functionality tests on programs stored in ROM, called on *POST* (Power-on Self Test) that checks to see whether peripherals in the system are in perfect order or not.

Step 2: After the BIOS is done with pre-boot activities or functionality test, it read bootable sequence from *CMOS* (Common Metal Oxide Semiconductor) and looks for master boot record in the first physical sector of the bootable disk as per boot device sequence specified in *CMOS*. For example, if the boot device sequence is:

o Floppy Disk
o Hard Disk
o CDROM

Step 3: After this, the master boot record will search first in a floppy disk drive. If not found, then the hard disk drive will search for the master boot record. But if the master boot record is not even present on the hard disk, then the CDROM drive will search. If the

system cannot read the master boot record from any of these sources, ROM displays **"No Boot device found"** and halted the system. On finding the master boot record from a particular bootable disk drive, the operating system loader, also called Bootstrap loader, is loaded from the boot sector of that bootable drive· into memory. A bootstrap loader is a special program that is present in the boot sector of a bootable drive.

Step 4: The bootstrap loader first loads the *IO.SYS* file. After this, *MSDOS.SYS* file is loaded, which is the core file of the DOS operating system.

Step 5: After this, *MSDOS.SYS* file searches to find Command Interpreter in *CONFIG.SYS* file, and when it finds, it loads into memory. If no Command Interpreter is specified in the *CONFIG.SYS* file, the *COMMAND.COM* file is loaded as the default Command Interpreter of the DOS operating system.

Step 6: The last file is to be loaded and executed is the *AUTOEXEC.BAT* file that contains a sequence of DOS commands. After this, the prompt is displayed. We can see the drive letter of bootable drive displayed on the computer system, which indicates that the operating system has been successfully on the system from that drive.

2.1.2.3 Maintaining user accounts

Windows 10 allows you to log in to different user accounts when using your computer. Like we discussed earlier, you can choose which account you want to log in to after turning on the computer.

But you can also configure or manage your user account after you're logged in. To do this, follow these steps −

Step 1 − Open the Start Menu.
Step 2 − Click on **Settings**.
Step 3 − From the **SETTINGS** window, choose **Accounts** option.
Step 4 − In the **ACCOUNTS** window, choose the account setting you want to configure.

2.1.2.4 File systems and special files

A file system is a process of managing how and where data on a storage disk, which is also referred to as file management or FS. It is a logical disk component that compresses files separated into groups, which is known as directories. It is abstract to a human user and related to a computer; hence, it manages a disk's internal operations. Files and additional directories can be in the directories. Although there are various file systems with Windows, NTFS is the most common in modern times. It would be impossible for a file with the same name to exist and also impossible to remove installed programs and recover specific files without file management, as well as files would have no organization without a file structure. The file system enables you to view a file in the current directory as files are often managed in a hierarchy.
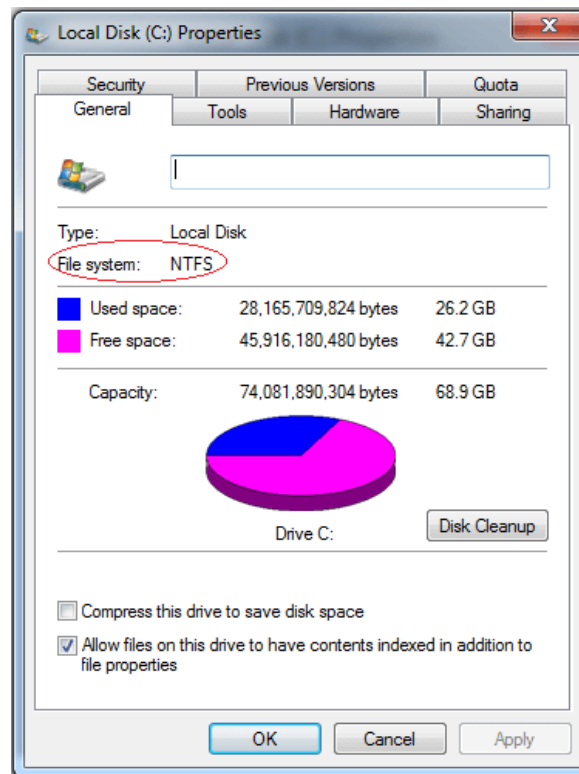
A disk (e.g., Hard disk drive) has a file system, despite type and usage. Also, it contains information about file size, file name, file location fragment information, and where disk data is stored and also describes how a user or application may access the data. The operations like metadata, file naming, storage management, and directories/folders are all managed by the file system.

On a storage device, files are stored in sectors in which data is stored in groups of sectors called blocks. The size and location of the files are identified by the file system, and it also helps to recognize which sectors are ready to be used. Other than Windows, there are some other operating systems that contain FAT and NTFS file system. But Apple product (like iOS and macOS) uses HFS+ as operating system is horizon by many different kinds of file systems.

Sometimes the term "file system" is used in the reference of partitions. For instance, saying, "on the hard drive, two files systems are available," that does not have to mean the drive is divided between two file systems, NTFS and FAT. But it means two separate partitions are there that use the same physical disk.

Types of file systems

There are various kinds of file systems, which are as follows:

1. Disk file systems

On the disk storage medium, a disk file system has the ability to randomly address data within a few amounts of time. Also, it includes the anticipation that led to the speed of

accessing data. Without regard to the sequential location of the data, multiple users can access several data on the disk with the help of a disk file system.

2. Flash file systems

A flash file system is responsible for restrictions, performance, and special abilities of flash memory. It is superior to utilize a file system that is designed for a flash device; however, a disk file system is the basic storage media, which can use a flash memory device.

3. Tape file systems

A tape file system is used to hold files on the tape as it is a tape format and file system. As compared to disks, magnetic tapes are more powerful to access data for a long time, which are the challenges for a general-purpose file system in terms of creation and efficient management.

4. Database file systems

A database-based file system is another method for file management. Files are recognized by their characteristics (like a type of file, author, topic, etc.) rather than hierarchical structured management.

5. Transactional file systems

Some programs require one or more changes to fail for any reason or need several file systems changes but do not make any changes. For instance, a program may write configuration files or libraries mand executables at the time of installing or updating the software. The software may be unusable or broken if the software is stopped while updating or installing. Also, the entire system may leave in an unusable state if the process of installing or updating the software is incomplete.

6. Network file systems

A network file system offers access to files on a server. In remote network-connected computers, with the help of local interfaces, programs are able to transparently create, manage and access hierarchical files and directories. The file-system-like clients for FTP and WebDAV, and AFS, SMB protocols, NFS are all examples of the network file systems.

7. Shared disk file systems

A shared-disk file system allows the same external disk subsystem to be accessed by multiple machines, but when the number of machines accesses the same external disk subsystem, there may be occurred collisions in this condition; so, to prevent the collision, the file system decides which subsystem to be accessed.

2.1.2.5 Backups and restoration

Windows 10 features several tools to help you perform backups of your documents. Here are some of these tools.

File History

File History will perform a back-up of the files located in your libraries (Documents, Pictures, Music, etc.) It allows you to choose a drive, where you can back-up your files and then asks you when to do it.

To configure the File History backup, follow these steps −

Step 1 − Go to **SETTINGS** and select **Update & security.**

Step 2 − In the **UPDATE & SECURITY** window, select **Backup.**
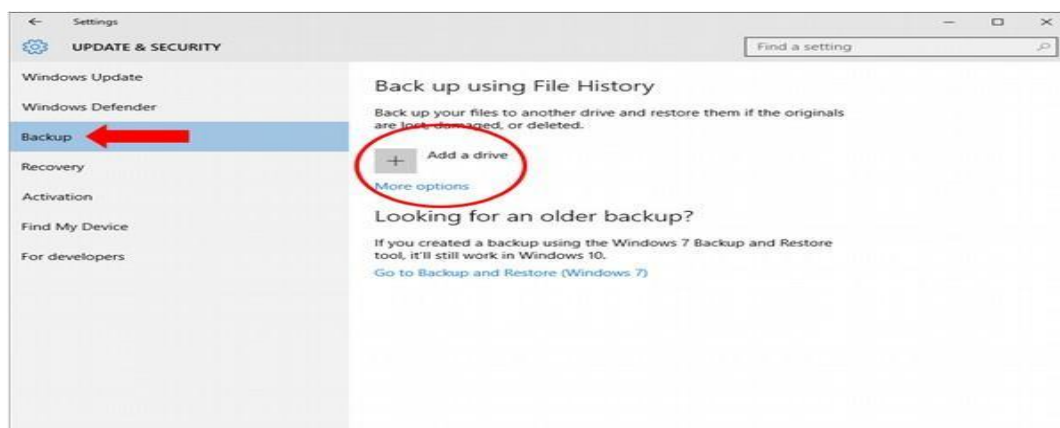
Step 3 − Click "Add a drive" to choose where to store your backup.
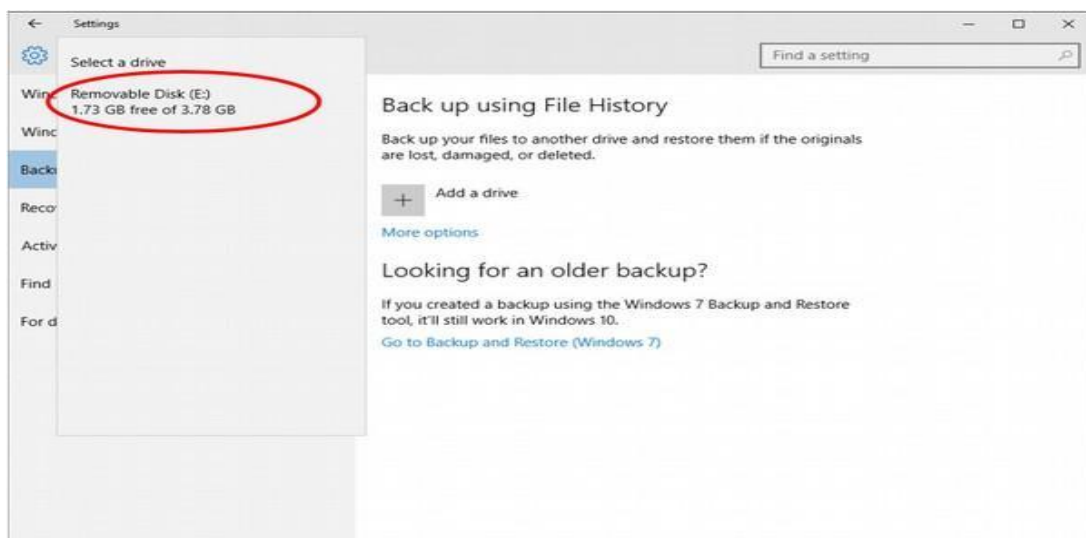
2.1.3 Windows Desktop

2.1.3.1 GUI

GUI stands for graphical user interface. A GUI, which some folks pronounce as 'gooey', is exactly what it sounds like… a graphical way to do stuff. Simply put, a **graphical user interface** is a way to communicate what you want to a computer application (or computer operating system) using graphical symbols rather than typing the instructions in. GUIs let you work with picture-like items (icons and arrows for example) to tell the computer what you want from it. And, rather than a keyboard (which can leave you guessing what to type next), you get to scoot around a blocky thing on your desk called a mouse, which makes the arrows and icons scoot around on the screen. Much easier!

You may not have even heard of the opposite of a GUI, which is a **command-line interface** or CLI. Yep, years ago we used to hunch over keyboards and laboriously type in cryptic, difficult-to-memorize phrases just to do stuff. We also hoped the computer wouldn't reply with something obtuse like 'SYNTAX ERROR', 'INVALID PIP FORMAT' or some other unhelpful reply. Command-line interfaces still exist today. In fact, without them, many important computer tasks would be downright difficult. However, for most daily needs and casual users, the GUI is a nice thing to have.

Cursor

Mouse cursor is a symbol or graphical image on the computer monitor or other display device that echoes movements of the pointing device, commonly a mouse, touchpad, or stylus pen. It signals the point where actions of the user take place. It can be used in text-based or graphical user interfaces to select and move other elements. It is distinct from the cursor, which responds to keyboard input.

GUI Pointer

A pointing device, or sometimes called a pointing tool, is a hardware input device that allows the user to move the mouse cursor in a computer program or GUI operating system. Using a pointing device, you can point at or manipulate any object or text on the screen.

GUI Icons

In computing and digital design, icons are pictograms or ideograms used in the web or mobile interface to support its usability and provide the successful flow of human-computer interaction. Diving into the benefits of icons, one of the most important among them is the ability to replace the text.

GUI Menus

A menu is a set of options presented to the user of a computer application to help the user find information or execute a program function. Menus are common in graphical user interfaces (GUI s) such as Windows or the Mac OS . Menus are also employed in some speech recognition programs.

GUI Shares Data

You can share data between callbacks **by storing the data in the MATLAB handles structure**. All components in a GUI share the same handles structure. It is passed as an input argument to all callbacks generated by GUIDE.

2.1.3.2 Desktop Icons and their Functions

An icon is **a small graphical representation of a program, feature, or file**. When you click or double-click an icon, the associated file or program opens or an action is performed. For example, if you were to double-click My Computer icon, it would open Windows

Functions of My Computer

My Computer allows the user to access the local drives, such as the local disk, also known as the C: Drive. The user can also access external drives. Examples of an external drive are a floppy disk drive (A: Drive) and the CD Drive (D:). My computer also lets the user access My Documents and other files.

Functions of My Document

The My Documents folder is a component of the user profile that is used as a unified location for storing personal data. By default, the My Documents folder is a folder in the user's profile that is used as a default storage location for saved documents.

Network Neighbourhood

My Network Places replaces Network Neighborhood in Windows for browsing available network connections, computer, and devices. In a home network setting, My Network Places can display the other computers, network printers, and other network resources

Functions of Recycle bin

The Recycle Bin acts a 'holding bay' for deleted items, such as files and folders (and even shortcuts!). When you delete a file or folder, it is not deleted from your computer permanently. Instead, Windows 7 places the deleted items into the Recycle Bin

Quick Launch Bar

Quick Launch is a section of the Microsoft Windows taskbar that enables a user the launch programs without having to locate them using the Start menu. The Quick Launch area is located next to the Start button. This feature was first introduced with the release of Microsoft Windows 98.

System Tray

The system tray is a notification area on the operating system taskbar. It contains icons that provide users with easy access to system functions such as email, printer, network connections and volume control. The icons also indicate the statuses of the processes running on the computer.

Start Menu

The Start menu is a graphical user interface element used in Microsoft Windows since Windows 95 and in other operating systems. It provides a central launching point for computer programs and performing other tasks in the Windows shell.

Taskbar

The taskbar is the access point for programs displayed on the desktop. With the new Windows 7 taskbar features, users can give commands, access resources, and view program status directly from the taskbar. The taskbar is the access point for programs displayed on the desktop, even if the program is minimized.

2.1.3.3 Dialog Boxes

Dialog box

A dialog box is a temporary window an application creates to retrieve user input. An application typically uses dialog boxes to prompt the user for additional information for menu items

List box

A list box is a graphical control element that allows the user to select one or more items from a list contained within a static, multiple line text box.

Spin box

A spin box sometimes called a spinner control is a collective term for the combination of a text box with an up-down control. Users can click arrow buttons (the up-down control) or press the UP ARROW or DOWN ARROW key to change the value in the text box. The value ascends or descends incrementally

Slide

A sliding window is often described as a double hung window placed on its side. They can open from either the left or the right side to provide a wide view of your surroundings. Slider windows can also come with a variety of customization, from grids to personalized interior and exterior colors.

Drop-down list

A drop-down list box saves space (it can drop down to cover other dialog box controls temporarily). A combo box allows the user either to select an item from the list or type in a new item. The items displayed in a list box, drop-down list box, or combo box are stored in an array that is defined before the instructions that define the dialog box

Radio Buttons in Dialog Boxes

A radio button control groups options in such a way that they are all displayed, but only one may be selected at a time. Place an **r** inside the braces of the display area to indicate the list of options in the input area of the menu are to be used as a radio button control.

Check box

Check box is either checked or unchecked. Check box is either checked, unchecked or grayed, and it switches between checked and unchecked when clicked. Check box is either checked, unchecked or grayed, and it cycles through all three states as the button is clicked.

Textbox
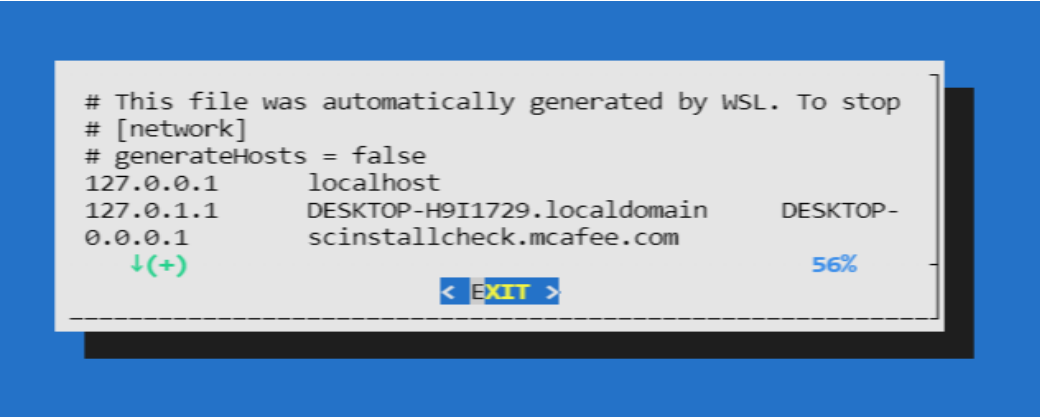
This widget displays the contents of a file in a scroll window. The format for this widget is
--textbox   <file> <height> <width>

The command which we wrote in the script file is dialog –textbox /etc/hosts 10 60

Textbox widget

After running the script, we get the window as shown below

2.1.3.4 Task Bar

System Tray

The System Tray is another name given to the Notification Area, which we can find in the right-side of the Windows Taskbar. The System Tray features different types of notifications and alerts from your computer like your Internet connection, or the volume level.

Quick Launch

Quick Launch is a section of the Microsoft Windows taskbar that enables a user the launch programs without having to locate them using the Start menu. The Quick Launch area is located next to the Start button.

This feature was first introduced with the release of Microsoft Windows 98. The image below shows an example with three Quick Launch icons in-between the Start button and currently-running programs. On the far right of the taskbar is the Windows Notification Area.

Start Menu

The Start Menu is the main point of access to your applications. There are two main ways to open it −

Step 1 − Use your mouse to click Windows icon in the lower-left corner of the taskbar.

Step 2 − Press the Windows key on your keyboard.

The Windows 10 Start Menu features two panes.

The left pane resembles the traditional Start Menu from Windows 7 and earlier, while the right pane features live tiles that were used in Windows 8.

Left Pane

Among the things you can do in the left pane are −

- Click the username at the top of the menu to change account settings or log in with another user.
- Access the applications you use more frequently.
- A small arrow next to an application will open a sub-menu with a list of recent documents opened with that application.
- Open the "File Explorer" to navigate your folders and files.
- Change the settings of your computer like your Internet connection or changing your background.
- See different options to shut down your computer.
- See a list of all the applications installed in your computer.

Right Pane

The right pane features a varied array of tiles, similar to the ones that were seen on the Start Screen of Windows 8.

These tiles can be moved and dragged to different places by holding the mouse button.

2.1.3.5 Parts of Windows

Title Bar

It is a horizontal Bar at the top of the window. The title of the running application or file is displayed in this bar. It is also the means for moving the window-when you point the mouse cursor to this bar and drag the mouse, you move the window on the screen.

Menu Bar

It contains the titles of pull down menus. The titles in the bar may very from application to application. Clicking title of a menu in the menu bar opens the particular menu of commands.

Scroll Bar

Generally, there are two scroll bars to a window. A vertical scroll bar at the right hand edge of the window and a horizontal scroll bar at the button of the window. These scroll bars enables scrolling the contents in the workspace horizontally and vertically. There are a number of button on the window as briefed below.

Status Bar

A status bar is an area at the bottom of a primary window that displays information about the current window's state (such as what is being viewed and how), background tasks (such as printing, scanning, and formatting), or other contextual information (such as selection and keyboard state).

Status bars typically indicate status through text and icons, but they can also have progress indicators, as well as menus for commands and options related to status.

Minimize and Maximize

The size of a window can be minimised or maximised by clicking the minimize or maximize buttons respectively. These are located at the right hand top corner of the window.

Restore Button

The window size can be restored to previous size by clicking restore button.

Close and Resize

- Close button is located at the right hand top corner of the window, near restore button. Clicking the close button will close the window.

- Resize a window by dragging the edges or corner of the window. Hold down Shift while resizing to snap the window to the edges of the screen and other windows.

Move or resize a window using only the keyboard. Press Alt+F7 to move a window or Alt+F8 to resize. Use the arrow keys to move or resize, then press Enter to finish, or press Esc to return to the original position and size.

Moving a Window

Before a window can be moved, make sure it is not maximized. A maximized window cannot be resized. If the window is maximized, click the maximize or resize button.

Move a window using the mouse

Once a window has is resized so it is not full screen, it can be moved anywhere on your screen. Click and hold the left mouse button on the title bar of the window. Then, drag it to any location.

2.1.3.6 Windows

Windows is a group of several proprietary graphical operating system families developed and marketed by Microsoft. Each family caters to a certain sector of the computing industry. Active Windows families include Windows NT and Windows IoT; these may encompass subfamilies, (e.g. Windows Server or Windows Embedded Compact) (Windows CE). Defunct Windows families include Windows 9x, Windows Mobile and Windows Phone

Start Menu

To open the Start menu—which contains all your apps, settings, and files—do either of the following:

- On the left end of the taskbar, select the Start icon.
- Press the Windows logo key on your keyboard

Help Menu

Open the Help window. The Help system must be install for this to be enabled. View pop-up help for the current field. Press Ctrl+H as a shortcut, or click the Help on Field icon on the toolbar.

Preview Menu

This plugin lets you preview your menu on any registered location.

2.1.3.7 Logoff & Shutdown – Keyboard Accelerators

Shutdown and logout is when you shut down everything stops running and the PC is powered off. Logout will logout your session but the computer will remain running.

Accelerator keys (or keyboard accelerators) are keyboard shortcuts that improve the usability and accessibility of your Windows applications by providing an intuitive way for users to invoke common actions or commands without navigating the app UI.

Keyboard Short Keys

- Copy: **Ctrl + C**
- Cut: **Ctrl + X**
- Paste: **Ctrl + V**
- Maximize Window: **F11** or **Windows logo key + Up arrow**
- Open Task View: **Windows logo key + Tab**
- Display and hide the desktop: **Windows logo key + D**
- Switch between open apps: **Alt + Tab**
- Open the Quick Link menu: **Windows logo key + X**
- Lock your PC: **Windows logo key + L**

Depending on your hardware, you can use **Windows logo key + PrtScn** to take a screenshot, or use **Fn + Windows logo key + Spacebar**.

2.1.3.8 Working with Notepad & WordPad

1. NotePad: It is a basic text editor or editing program of the Microsoft Windows which enables the computer users to create documents into it.
2. WordPad: It is also a basic editing type of program which helps in creating documents like letters, reports, notes, etc. with some additional formatting features into it.

Notepad

Notepad is a very basic text-editing program that comes as an included application on Windows operating systems. Notepad is great for writing short documents that you want to save in plain text. Notepad has some additional features to take advantage of as well. However, Notepad is just a text editor, so images are not compatible. Because Notepad is basically the same on both Windows 7 and Windows 8.1, the only difference is how you open the program. Learning the basics of Notepad is quick and easy!

Creating a File

1. **Open Notepad** - On Windows 7, open your Start Menu and type "Notepad" in the search box. Select Notepad to open the application. You can also navigate to the "Accessories" folder in the Start Menu and select Notepad from the list of applications. On Windows 8.1, type "Notepad" into the Start screen search box.

2. **Explore the Notepad user interface** - Once Notepad is open, you will see a simple screen with a limited set of text editing options. Notice menu options for File, Edit, Format, View, and Help.

3. **Open an existing file in Notepad** - Choose Open from the File menu. The Open a File dialog box lists files and folders in your current folder. You can browse the documents listed, or change to a new folder to locate other files on your system. Select the name of the document you want to open, or type the document name in the Enter file name field. Press Return or click OK.

4. **Open the File Menu** - You will see a drop down list with New, Open, Save, Save As, Page Setup, and Print. These are the basic options for word editing. Select "New" to create a document.

   - Whenever you save a file with either Save or Save As, Windows will automatically save the file in .txt format, which will launch it in Notepad.
   - You can choose to save Notepad documents in HTML by choosing Save As and selecting All Files from the list of choices, then saving the file with .htm or .html as its extension. Type your HTML code directly into your document as if you would plain text.
   - In order to properly save a document in HTML, you will need to have Word Wrap enabled. You will find instructions on how to enable this feature a little later.

5. **Format your page Setup** - Navigate to Page Setup from the File menu. You will see just a few simple formatting options. Choose your desired paper size, orientation, and header and footer options from this menu.

6. **Add a header and footer** - Notepad includes a header by default, which is the name of the document and the date it was printed. The default footer text is the page number. You can remove these defaults by selecting the Header and Footer option from the File menu on the menu bar and deleting the codes inside. All header and footer setting must be entered manually each time you want to print a document. These settings cannot be saved. To change headers and footers, choose Page Setup from the File menu and enter the desired command(s) in the Header and Footer text boxes. The following is a short list of header and footer commands:

   - &l Left-align the characters that follow
   - &c Center the characters that follow
   - &r Right-align the characters that follow
   - &d Print the current date

- &t Print the current time
- &f Print the name of the document
- &p Print the page number
- Leaving the Header or Footer text box empty will result in no header footer on your printed document.
- You can insert words into the Header and Footer text box and they will print in their appropriate position. Letters after the "&" sign do not need to be capitalized.
- In Notepad, your header is centered, regardless of the formatting codes you use, if the formatting code is not the first item in the Header text box. For example, to align a title to the left side of the page, use &lTitle text.

Editing and Formatting

1. **Become familiar with the "Edit" tab on the menu bar.** Undo is the first item you will find under the Edit pull down on the menu bar. You can use the keyboard shortcut Ctrl-Z for this function also. Once you use Undo you will find Redo as an option in its place.

   - The rest of the menu, Cut, Copy, Paste, Delete, Find, Find Next, Replace, Go To, Select All, and Time/Date, are standard in nearly all Windows programs that deal with word documents.
   - The "Go To" option is only available if Word Wrap is disabled and if your document contains numbered lines. Notepad defaults with Word Wrap turned off.

2. **Enable Word Wrap.** Unless Word Wrap is enabled, all text you type will be on the same line until you press the "Return" key and the line will scroll indefinitely. In order to fix this, open the next pull down on the menu bar. Word Wrap is the first option you will see. Simply select Word Wrap and your document will be adjusted accordingly.

3. **Adjust your font.** Select Font from the Format option on the menu bar. Now, you have the ability to select from a series of preloaded fonts, choose options for Bold, Italics/Oblique, or Bold/Italics. You can also select your font size from this window.

   - A change in font affects the entire document. You cannot use one type of font on one part of the document and another type on another part.
   - From the dropdown menu item listed as "Script" in the Font window, you can find characters that are not available in the standard "Western" style fonts.

4. **Use the "View" pull down from the menu bar.** The only option you will find is called "Status Bar." This option is also only available when Word Wrap is disabled. When word Wrap is disabled, a notification will display on the lower border of your document window showing you where your cursor is located in the document.

5. **Start typing.** It is recommended that you enable Word Wrap. Adjust the font as you desire and remember that it will be consistent with the entire document text.

- Note that the "Tab" key will move your cursor ten spaces across your text line, unlike Microsoft Word, which moves five spaces.

6. **Save your document.** Once you have finished, navigate to the "Save As" option from the File pull down on the menu bar. Notepad uses the default folder "My Documents" on Windows 7, and the "OneDrive" folder on Windows 8.1.

   - If you would like to save your document in a different place, simply browse your preferred folder from the "Save As" window and select it. Notepad will switch to this choice for future documents.
   - Remember that all of your files will be saved with the .txt extension.

7. **Print your finished document.** Click on the File menu and then select the Print option from the dropdown. This will bring you to a separate window where you can select the printer and options you would like, and click print. To change the settings that determine how your printed document will look, click the File menu, and then click Page Setup:

   - To change the paper size, tap or click a size in the Size list.
   - To change the paper source, tap or click a tray name or a feeder in the Source list.
   - To print the file vertically, click Portrait; to print the file horizontally, click Landscape.
   - To change the margins, enter a width in any of the Margins boxes

Learning Shortcuts

1. **Use the "Escape" key.** You can use the escape key as a quick and easy way to get out of any dialogs. The escape key is essentially a "cancel" button. Pressing the escape key will also hide outputs. The escape key is generally located toward the right-hand side of your keyboard and is sometimes indicated by a small arrow pointing to the left.

2. **Navigate to another window.** To go to the next window, you can use either Ctrl-Tab or Ctrl-F6. Press and hold these buttons together to activate the shortcut. Depending on your options, this will navigate through documents in Windows' own recent window order, or will use a Visual-Studio window stack system.

   - You can hold down the Shift key with either of these combinations to scroll through windows in the opposite direction.

3. **Toggle your output window.** Press the F8 key located along the top of your keyboard and the shift key located on the left-hand side to scroll through dockable output windows and individual output windows.

4. **Learn more shortcuts.** Using shortcuts reduces the time you spend on minor adjustments while working on your document. Notepad has a ton of shortcuts ranging

from simple actions to complex ones. Here are some of the popular shortcuts for Notepad:

F2 Next Bookmark	Alt+Enter Show Document Properties
F3 Find Next	Alt+G Jump To (tags)
F8 Toggle Output Window	Ctrl+F2 Set Bookmark
Ctrl+W Close Window	Ctrl+F4 Close Window
Alt+F6 Toggle Project Window	Ctrl+F6 Next Window
Alt+F7 Toggle Text Clips Window	Ctrl+Space Autocomplete
Alt+F8 Toggle Find Results Window	Ctrl+Tab Next Window
Ctrl+Alt+C Copy as RTF	Ctrl+Insert Copy
Alt+F9 Toggle CTags Window	Shift+F3 Find Previous
Ctrl+Shift+T Copy Line	Ctrl+/ Quick Find
Alt+F10 Toggle Scripts Window	Ctrl+A Select All
Ctrl+H Replace Dialog	Ctrl+C Copy
Ctrl+F6 Next Window	Ctrl+D Duplicate Line
Ctrl+L Cut Line	Ctrl+F Find Dialog
Ctrl+N New File	Ctrl+N New File
Ctrl+O Open File	Ctrl+R Replace Dialog
Ctrl+V Paste	Ctrl+S Save
Ctrl+P Print	Ctrl+Y Redo
Ctrl+Shift+S Save All	Ctrl+Z Undo

Saving Files

1. Choose Save As from the File menu. The Save As dialog box lists files and folders located in your current folder.
2. Optional.
3. Type a new file name in the Enter file name field.
4. Press Return or click OK.

Formatting

Formatting text in Microsoft Word refers to controlling how text appears in your document. This includes the size, color, and font of the text. It also covers text alignment, spacing, and letter case. Microsoft Word styles make it easy to change and apply styles throughout a document.

Printing

1. Select File > Print.

2. To preview each page, select the forward and backward arrows at the bottom of the page. If the text is too small to read, use the zoom slider at the bottom of the page to enlarge it.

3. Choose the number of copies, and any other options you want, and select the Print button.

Inserting Objects

In the Insert Object dialog box,
- Click the Create New option and then select an option from the Object type list. The default program for that file type opens, where you can enter any text or data you want.

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

- Click the Create from file option and browse the file you want to insert.
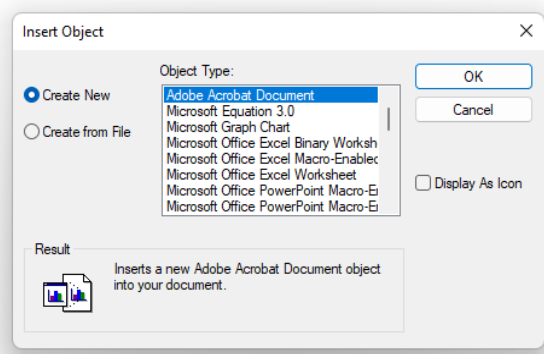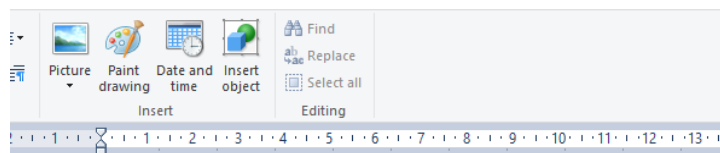
Finding and replacing

1. Go to Home > Replace.
2. Enter the word or phrase you want to replace in Find what.
3. Enter your new text in Replace with.
4. Choose Replace All to change all occurrences of the word or phrase. ...
5. To specify only upper or lowercase in your search, select More > Match case

Creating and Editing Images with Microsoft Paint

How to Edit a Photo in Paint

1. Click "File" then "Open" on the Paint main menu. ...
2. Select the "Line" tool to add straight or curved lines to your photo. ...

3. Create a draw shape within your photo using the "Shape" tool from the toolbar. ...
4. Click the "Text" tool if you want to add a message to your photo, such as a name or caption.

Using the Calculator

Windows Calculator is a software calculator developed by Microsoft and included in Windows. In Windows 10, it has four modes: standard, scientific, programmer, and a graphing mode. The standard mode includes a number pad and buttons for performing arithmetic operations. The scientific mode takes this a step further and adds exponents and trigonometric function, and programmer mode allows the user to perform operations related to computer programming. Graphing mode was added to the Calculator, allowing users to graph equations on a coordinate plane.

To use the Calculator, follow these steps
- Select the Start menu button.
- Select All apps.
- Select Calculator.
- Click the menu icon.
- Select a mode.
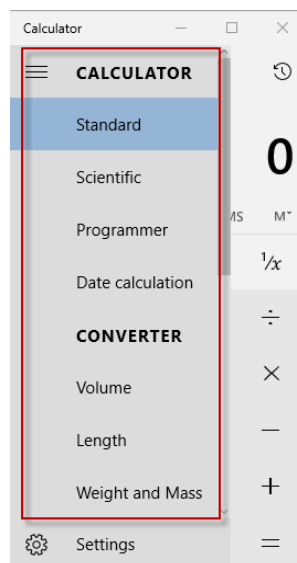
Personalising windows

Desktop personalization is the process of adjusting the look, feel and organization of a Windows end-user experience. In general, any adjustment to the user interface that deviates from the default installation settings may be considered to be a personalization, but users typically personalize a desktop to improve the personal comfort of the user interface, enhance its visual behaviours or reflect personal interests.

To access the Personalization settings, right-click anywhere on the desktop, then select Personalize from the drop-down menu. The Personalization settings will appear.
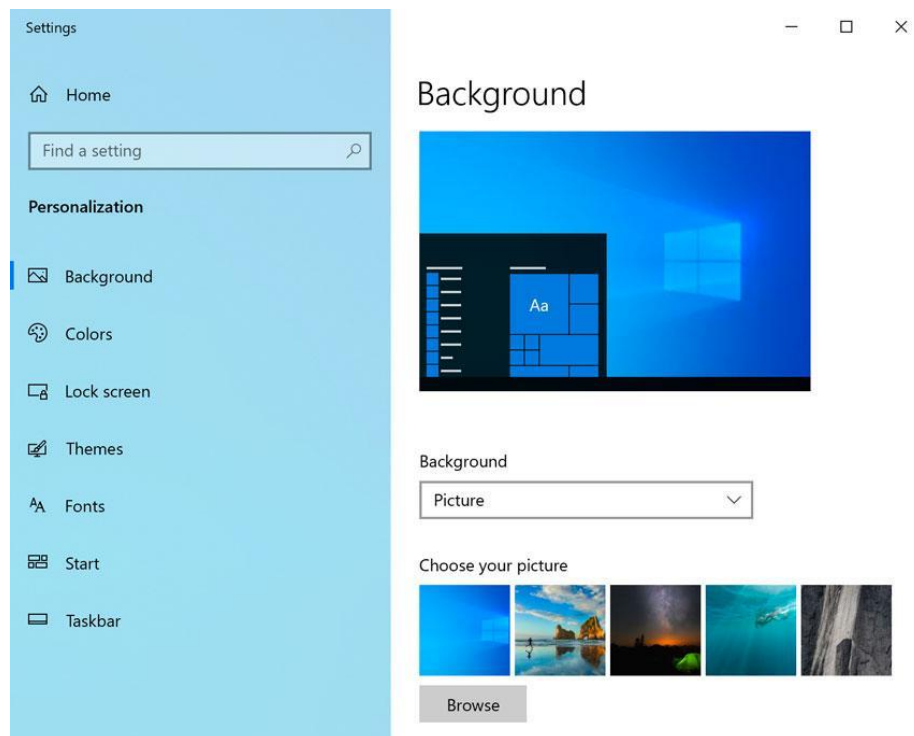
2.2 Linux

2.2.1 Linux Programming and Administration

2.2.1.1 Introduction to Linux

Linux is the best-known and most-used open source operating system. As an operating system, Linux is software that sits underneath all of the other software on a computer, receiving requests from those programs and relaying these requests to the computer's hardware.

2.2.1.2 Features of Linux

Following are some of the important features of Linux Operating System.

- **Portable** – Portability means software can works on different types of hardware in same way. Linux kernel and application programs supports their installation on any kind of hardware platform.
- **Open Source** – Linux source code is freely available and it is community based development project. Multiple teams work in collaboration to enhance the capability of Linux operating system and it is continuously evolving.
- **Multi-User** – Linux is a multiuser system means multiple users can access system resources like memory/ ram/ application programs at same time.
- **Multiprogramming** – Linux is a multiprogramming system means multiple applications can run at same time.
- **Hierarchical File System** – Linux provides a standard file structure in which system files/ user files are arranged.

- **Shell** – Linux provides a special interpreter program which can be used to execute commands of the operating system. It can be used to do various types of operations, call application programs. etc.
- **Security** – Linux provides user security using authentication features like password protection/ controlled access to specific files/ encryption of data

2.2.1.3 Components of Linux

Linux Operating System has primarily three components

- **Kernel** – Kernel is the core part of Linux. It is responsible for all major activities of this operating system. It consists of various modules and it interacts directly with the underlying hardware. Kernel provides the required abstraction to hide low level hardware details to system or application programs.
- **System Library** – System libraries are special functions or programs using which application programs or system utilities accesses Kernel's features. These libraries implement most of the functionalities of the operating system and do not requires kernel module's code access rights.
- **System Utility** – System Utility programs are responsible to do specialized, individual level tasks.
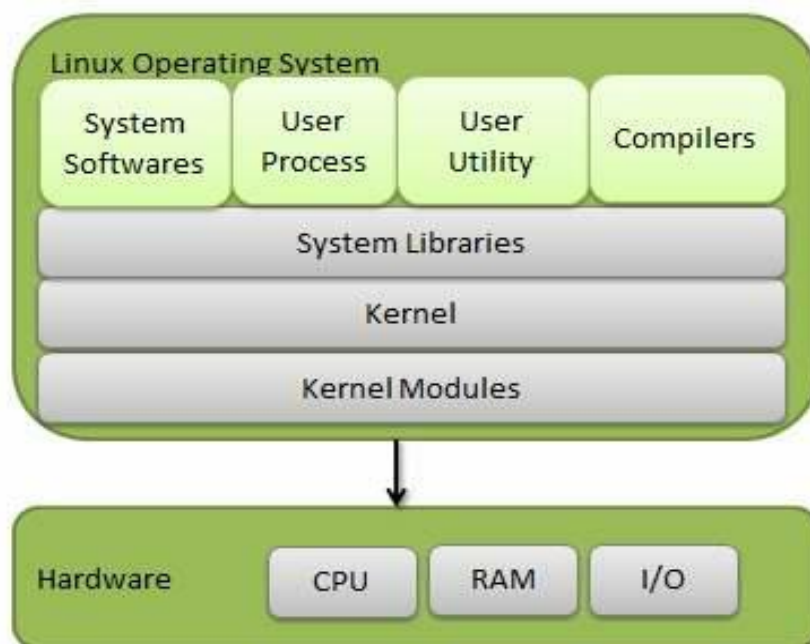
2.2.1.4 Linux Process and Thread Management

Processes in Linux

A program/command when executed, a special instance is provided by the system to the process. This instance consists of all the services/resources that may be utilized by the process under execution.

- Whenever a command is issued in Unix/Linux, it creates/starts a new process. For example, pwd when issued which is used to list the current directory location the user is in, a process starts.
- Through a 5 digit ID number Unix/Linux keeps an account of the processes, this number is call process ID or PID. Each process in the system has a unique PID.
- Used up pid's can be used in again for a newer process since all the possible combinations are used.
- At any point of time, no two processes with the same pid exist in the system because it is the pid that Unix uses to track each process.

Thread management

Thread management is done in user space by the thread library. When thread makes a blocking system call, the entire process will be blocked. Only one thread can access the Kernel at a time, so multiple threads are unable to run in parallel on multiprocessors.

Single Process P with single thread   Single Process P with three threads
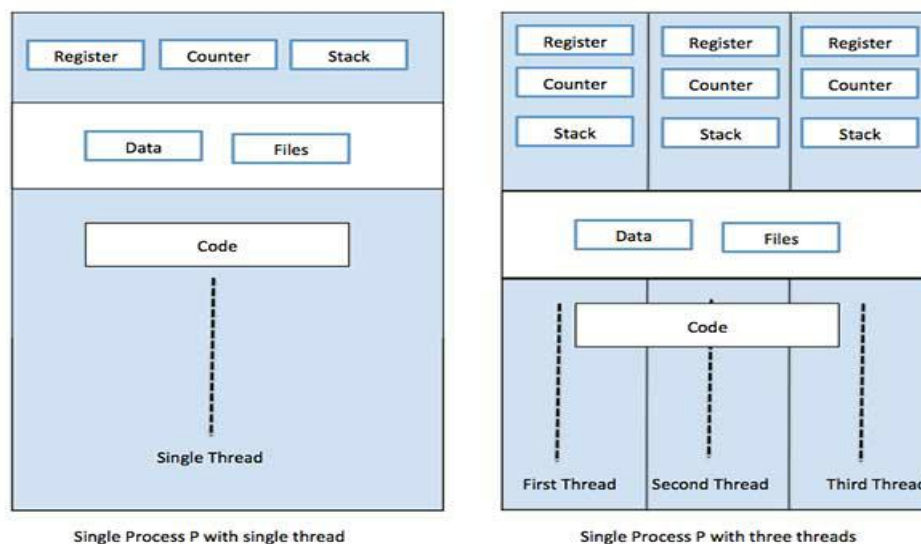
File Management in Linux

In Linux, most of the operations are performed on files. And to handle these files Linux has directories also known as folders which are maintained in a tree-like structure. Though, these directories are also a type of file themselves.

Linux has 3 types of files:

1. **Regular Files:** It is the common file type in Linux. it includes files like – text files, images, binary files, etc. Such files can be created using the touch command. They consist of the majority of files in the Linux/UNIX system. The regular file contains ASCII or Human Readable text, executable program binaries, program data and much more.

2. **Directories:** Windows call these directories as folders. These are the files that store the list of file names and the related information. The root directory(/) is the base of the system, /home/ is the default location for user's home directories, /bin for Essential User Binaries, /boot – Static Boot Files, etc. We could create new directories with mkdir command.

3. **Special Files:** Represents a real physical device such as a printer which is used for IO operations. Device or special files are used for device Input/Output(I/O) on UNIX and Linux systems. You can see them in a file system like an ordinary directory or file

Linux File System

A Linux file system is a structured collection of files on a disk drive or a partition. A partition is a segment of memory and contains some specific data. In our machine, there can be various partitions of the memory. Generally, every partition contains a file system.

The general-purpose computer system needs to store data systematically so that we can easily access the files in less time. It stores the data on hard disks (HDD) or some equivalent storage type. There may be below reasons for maintaining the file system:

o Primarily the computer saves data to the RAM storage; it may lose the data if it gets turned off. However, there is non-volatile RAM (Flash RAM and SSD) that is available to maintain the data after the power interruption.

o Data storage is preferred on hard drives as compared to standard RAM as RAM costs more than disk space. The hard disks costs are dropping gradually comparatively the RAM.

The Linux file system contains the following sections:

o The root directory (/)
o A specific data storage format (EXT3, EXT4, BTRFS, XFS and so on)
o A partition or logical volume having a particular file system.

Linux file system is generally a built-in layer of a Linux operating system used to handle the data management of the storage. It helps to arrange the file on the disk storage. It manages the file name, file size, creation date, and much more information about a file.

If we have an unsupported file format in our file system, we can download software to deal with it.

Linux File System Structure

Linux file system has a hierarchal file structure as it contains a root directory and its subdirectories. All other directories can be accessed from the root directory. A partition usually has only one file system, but it may have more than one file system.

A file system is designed in a way so that it can manage and provide space for non-volatile storage data. All file systems required a namespace that is a naming and organizational methodology. The namespace defines the naming process, length of the file name, or a subset of characters that can be used for the file name. It also defines the logical structure of files on a memory segment, such as the use of directories for organizing the specific files. Once a namespace is described, a Metadata description must be defined for that particular file.

The data structure needs to support a hierarchical directory structure; this structure is used to describe the available and used disk space for a particular block. It also has the other details about the files such as file size, date & time of creation, update, and last modified. Also, it stores advanced information about the section of the disk, such as partitions and volumes.

The advanced data and the structures that it represents contain the information about the file system stored on the drive; it is distinct and independent of the file system metadata.

Linux file system contains two-part file system software implementation architecture. Consider the below image:

Kernel

Virtual File System

(EXT3) (HPFS) (VFAT) (EXT4) (FreeBSD)

Hardware
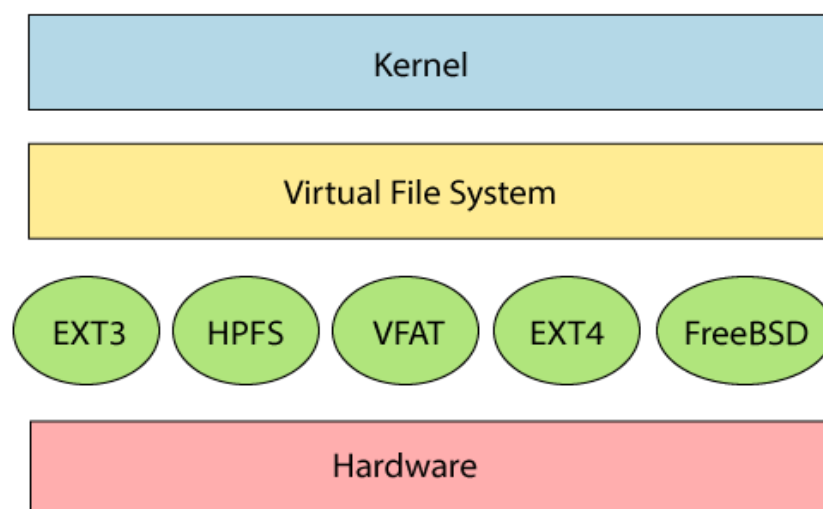
The file system requires an API (Application programming interface) to access the function calls to interact with file system components like files and directories. API facilitates tasks such as creating, deleting, and copying the files. It facilitates an algorithm that defines the arrangement of files on a file system.

The first two parts of the given file system together called a **Linux virtual file system**. It provides a single set of commands for the kernel and developers to access the file system. This virtual file system requires the specific system driver to give an interface to the file system.

Linux File System Features

In Linux, the file system creates a tree structure. All the files are arranged as a tree and its branches. The topmost directory called the **root (/) directory**. All other directories in Linux can be accessed from the root directory.

Some key features of Linux file system are as following:

- o **Specifying paths:** Linux does not use the backslash (\) to separate the components; it uses forward slash (/) as an alternative. For example, as in Windows, the data may be stored in C:\ My Documents\ Work, whereas, in Linux, it would be stored in /home/ My Document/ Work.

- o **Partition, Directories, and Drives:** Linux does not use drive letters to organize the drive as Windows does. In Linux, we cannot tell whether we are addressing a partition, a network device, or an "ordinary" directory and a Drive.

- o **Case Sensitivity:** Linux file system is case sensitive. It distinguishes between lowercase and uppercase file names. Such as, there is a difference between test.txt and Test.txt in Linux. This rule is also applied for directories and Linux commands.

- o **File Extensions:** In Linux, a file may have the extension '.txt,' but it is not necessary that a file should have a file extension. While working with Shell, it creates some problems for the beginners to differentiate between files and directories. If we use the graphical file manager, it symbolizes the files and folders.

- o **Hidden files:** Linux distinguishes between standard files and hidden files, mostly the configuration files are hidden in Linux OS. Usually, we don't need to access or read the hidden files. The hidden files in Linux are represented by a dot (.) before the file name (e.g., .ignore). To access the files, we need to change the view in the file manager or need to use a specific command in the shell.

Types of Linux File System

When we install the Linux operating system, Linux offers many file systems such as **Ext, Ext2, Ext3, Ext4, JFS, ReiserFS, XFS, btrfs,** and **swap.**

Types of Linux File System
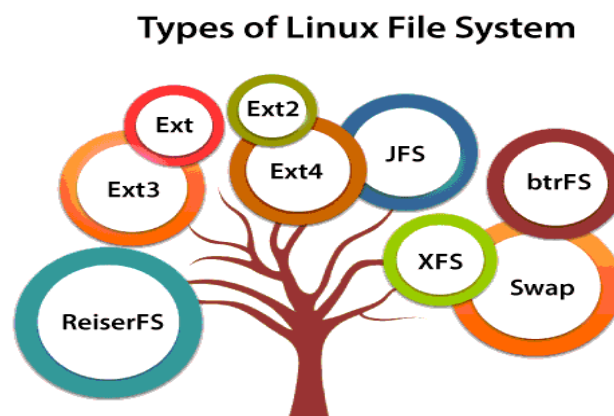
Let's understand each of these file systems in detail:

1. Ext, Ext2, Ext3 and Ext4 file system

The file system Ext stands for **Extended File System**. It was primarily developed for **MINIX OS**. The Ext file system is an older version, and is no longer used due to some limitations.

Ext2 is the first Linux file system that allows managing two terabytes of data. Ext3 is developed through Ext2; it is an upgraded version of Ext2 and contains backward compatibility. The major drawback of Ext3 is that it does not support servers because this file system does not support file recovery and disk snapshot.

Ext4 file system is the faster file system among all the Ext file systems. It is a very compatible option for the SSD (solid-state drive) disks, and it is the default file system in Linux distribution.

2. JFS File System

JFS stands for **Journaled File System**, and it is developed by **IBM for AIX Unix**. It is an alternative to the Ext file system. It can also be used in place of Ext4, where stability is needed with few resources. It is a handy file system when CPU power is limited.

3. ReiserFS File System

ReiserFS is an alternative to the Ext3 file system. It has improved performance and advanced features. In the earlier time, the ReiserFS was used as the default file system in SUSE Linux, but later it has changed some policies, so SUSE returned to Ext3. This file system dynamically supports the file extension, but it has some drawbacks in performance.

4. XFS File System

XFS file system was considered as high-speed JFS, which is developed for parallel I/O processing. NASA still using this file system with its high storage server (300+ Terabyte server).

5. Btrfs File System

Btrfs stands for the **B tree file system**. It is used for fault tolerance, repair system, fun administration, extensive storage configuration, and more. It is not a good suit for the production system.

6. Swap File System

The swap file system is used for memory paging in Linux operating system during the system hibernation. A system that never goes in hibernate state is required to have swap space equal to its RAM size.

Backup and Recovery

Before exploring methods particular to CentOS for deploying a standard backup plan, let's first discuss typical considerations for a standard level backup policy. The first thing we want to get accustomed to is the **3-2-1 backup rule**.

Backup Strategy

Throughout the industry, you'll often hear the term 3-2-1 backup model. This is a very good approach to live by when implementing a backup plan. 3-2-1 is defined as follows: **3** copies of data; for example, we may have the working copy; a copy put onto the CentOS server designed for redundancy using rsync; and rotated, offsite USB backups are made from data on the backup server. **2** different backup mediums. We would actually have three different backup mediums in this case: the working copy on an SSD of a laptop or workstation, the CentOS server data on a RADI6 Array, and the offsite backups put on USB drives. **1** copy of data offsite; we are rotating the USB drives offsite on a nightly basis. Another modern approach may be a cloud backup provider.

System Recovery

A bare metal restore plan is simply a plan laid out by a CentOS administrator to get vital systems online with all data intact. Assuming 100% systems failure and loss of all past system hardware, an administrator must have a plan to achieve uptime with intact user-data costing minimal downtime. The monolithic kernel used in Linux actually makes bare metal restores using system images much easier than Windows. Where Windows uses a micro-kernel architecture.

A full data restore and bare metal recovery are usually accomplished through a combination of methods including working, configured production disk-images of key operational servers, redundant backups of user data abiding by the 3-2-1 rule. Even some sensitive files that may be stored in a secure, fireproof safe with limited access to the trusted company personnel.

A multiphase *bare metal restore* and *data recovery plan* using native CentOS tools may consist of −

- dd to make and restore production disk-images of configured servers
- rsync to make incremental backups of all user data
- tar & gzip to store encrypted backups of files with passwords and notes from administrators. Commonly, this can be put on a USB drive, encrypted and locked in a safe that a Senior Manager access. Also, this ensures someone else will know vital security credentials if the current administrator wins the lottery and disappears to a sunny island somewhere.

If a system crashes due to a hardware failure or disaster, following will be the different phases of restoring operations −

- Build a working server with a configured bare metal image
- Restore data to the working server from backups

- Have physical access to credentials needed to perform the first two operations

Use rsync for File Level Backups

rsync is a great utility for syncing directories of files either locally or to another server. *rsync* has been used for years by System Administrators, hence it is very refined for the purpose of backing up data. In the author's opinion, one of the best features of *sync* is its ability to be scripted from the command line. In this, we will discuss rsync in various ways −

- Explore and talk about some common options
- Create local backups
- Create remote backups over SSH
- Restore local backups

rsync is named for its purpose: *Remote Sync* and is both powerful and flexible in use.

Following is a basic *rsync* remote backup over ssh −

MiNi:~ rdc$ rsync -aAvz --progress ./Desktop/ImportantStuff/
rdc@192.168.1.143:home/rdc/ Documents/RemoteStuff/
rdc@192.168.1.143's password:
sending incremental file list
6,148 100% 0.00kB/s 0:00:00 (xfr#1, to-chk=23/25)
2017-02-14 16_26_47-002 - Veeam_Architecture001.png
33,144 100% 31.61MB/s 0:00:00 (xfr#2, to-chk=22/25)
A Guide to the WordPress REST API | Toptal.pdf
892,406 100% 25.03MB/s 0:00:00 (xfr#3, to-chk=21/25)
Rick Cardon Technologies, LLC..webloc
77 100% 2.21kB/s 0:00:00 (xfr#4, to-chk=20/25)
backbox-4.5.1-i386.iso
43,188,224 1% 4.26MB/s 0:08:29
sent 2,318,683,608 bytes received 446 bytes 7,302,941.90 bytes/sec
total size is 2,327,091,863 speedup is 1.00
MiNi:~ rdc$

The following sync sent nearly 2.3GB of data across our LAN. The beauty of rsync is it works incrementally at the block level on a file-by-file basis. This means, if we change just two characters in a 1MB text file, only one or two blocks will be transferred across the lan on the next sync!

Furthermore, the incremental function can be disabled in favor of more network bandwidth used for less CPU utilization. This might prove advisable if constantly copying several 10MB database files every 10 minutes on a 1Gb dedicated Backup-Lan. The reasoning is: these will always be changing and will be transmitting incrementally every 10 minutes and may tax load of the remote CPU. Since the total transfer load will not exceed 5 minutes, we may just wish to sync the database files in their entirety.

Following are the most common switches with *rsync* −
rsync syntax:
rsync [options] [local path] [[remote host:remote path] or [target path

2.2.2 Linux Commands and Utilities

1. Cat Command

The cat command is a multi-purpose utility in the Linux system. It can be used to create a file, display content of the file, copy the content of one file to another file, and more.

Syntax:

        cat [OPTION]… [FILE]..

To create a file, execute it as follows:

    cat **> <file** name**>**

    // Enter file content

Press "**CTRL+ D**" keys to save the file. To display the content of the file, execute it as follows:

cat **<file** name**>**

2. Tail Command

The tail command is similar to the head command. The difference between both commands is that it displays the last ten lines of the file content. It is useful for reading the error message.

Syntax: tail **<file** name**>**

3. Wc Command

The wc command is used to count the lines, words, and characters in a file.

Syntax: wc **<file** name**>**

4. Sort Command

The sort command is used to sort files in alphabetical order.

Syntax: sort **<file** name**>**

5. Mkdir Command

The mkdir command is used to create a new directory under any directory.

Syntax: mkdir **<directory** name**>**

6. cd Command

The cd command is used to change the current directory.

Syntax: cd **<directory** name**>**

7. rmdir Command

The rmdir command is used to delete a directory.

Syntax: rmdir **<directory** name**>**

8. pwd Command

The pwd command is used to display the location of the current working directory.

Syntax: pwd

9. cp Command

The cp command is used to copy a file or directory.

Syntax:

To copy in the same directory:
cp **<existing** file name> **<new** file name>

10. more command

The more command is quite similar to the cat command, as it is used to display the file content in the same way that the cat command does. The only difference between both commands is that, in case of larger files, the more command displays screenful output at a time.

In more command, the following keys are used to scroll the page:

ENTER key : To scroll down page by line.
Space bar : To move to the next page.
b key : To move to the previous page.
/ key : To search the string.

Syntax: more **<file** name>

11. passwd Command

The passwd command is used to create and change the password for a user.

Syntax: passwd **<username>**

12. mv Command

The mv command is used to move a file or a directory form one location to another location.

Syntax: mv **<file** name> **<directory** path>

13. mail Command

The mail command is used to send emails from the command line.

Syntax: mail -s "Subject" **<recipient** address>

14. who Command

The who command is used to identify the users currently logged in.

Syntax: who [-a | -b -d -i -l -m -p -q -r -s -t -u -w -A -H -T -X_] [*File*]

15. whoami command yntax: $who [options] [filename]

The whoami command allows Linux users to see the currently logged-in user. The output displays the username of the effective user in the current shell.

Syntax: Whoami[option]

16. chmod Command
The chmod command is used to change the access permissions of files and directories. It stands for **change mode**. It cannot change the permission of symbolic links.
Syntax: chmod <options> <permissions> <file **name**>

17. kill command
Syntax: $ type -a kill

18. Write command
Opens a line of communication to send messages to other users on the system in real time.

Syntax:

To query all messages awaiting replies from users on a host and display them with their handles, type the following:

write -q [-n *Host*]

19. wall Command
Writes a message to all users that are logged in.

Syntax: wall [-a] [-g *Group*][*Message*]

20. news Command
Writes system news items to standard output.

Syntax: news [-a | -n | -s | *Item ...*]

21. diff Command
Compares text files.

Syntax:
To Compare the Contents of Two Files

diff [-c| -C *Lines* | -D_[*String*] | -e | -f | -n | -u | -U *Lines*] [-b] [-i] [-t] [-w] *File1* *File2*

diff [-h] [-b] *File1 File2*

22. cmp Command
Compares the contents of two files and reports the first character that differs.

Syntax: cmp [-l | -s] *File1 File2*

23. merge command
merge command is used for Three-way file merge. This post describes "merge" command used in Linux along with usage examples and/or output.

Syntax: *merge [options] file1 file2 file3*

*****

UNIT – 3

OFFICE APPLICATIONS - I

Introduction to MS Office – MS Word and Open Office - Writer
3.1 MS Word

Introduction to MS Office

MS Office helps simplify basic office tasks and improve work productivity. Each application is designed to address specific tasks, such as word processing, data management, making presentations and organizing emails.

Microsoft has developed multiple versions of Office that can be supported by different operating systems, including Windows, Linux, and mac OS.

Microsoft Office Common Applications

The most common Office applications are Word, Excel, PowerPoint, and Outlook. Other apps include Publisher, Access and OneNote.

- Microsoft Word: is a word processor that lets users make and edit text documents, such as reports, letters, and résumés and run spell-checks on writing
- Microsoft Excel: is an electronic spreadsheet program that helps you store, organize and manipulate data by creating simple to complex spreadsheets
- Microsoft PowerPoint: allows you to visually display information, using anything from basic slideshows to professional multimedia presentations
- Microsoft Outlook: is a personal information manager mainly used for emails but that can also be used to store calendars and contact information, manage tasks as well as organize meetings
- Microsoft Publisher: is a graphic design app that gives users creating material for marketing or publications more options in the layout and design of their documents
- Microsoft Access: is a database management system that allows you to link and use data from other sources, manipulate the data you've gathered in different ways, as well as create simple business applications
- Microsoft OneNote: is a digital alternative to a paper notebook that allows you to create, organize and share your notes easily

Microsoft Office is either available as a package or you can buy stand-alone Microsoft Office applications, such as Word or Excel separately.

MS Word and Open Office Writer

Microsoft word is word processor software developed by Microsoft in 1983. It is the most commonly used word processor software. It is used to create professional quality documents, letters, reports, resumes, etc and also allows you to edit or modify your new or existing document. The file saved in Ms Word has .docx extension. It is a component of the Microsoft Office suite, but you can buy it separately and is available for both Windows and macOS. The latest version of Ms Word is 2019.

OpenOffice Writer is the free word processor in the OpenOffice suite, which also includes a spreadsheet program, presentation program, and database program. Writer holds up well when compared to professional and expensive word processors such as Microsoft Word.

While it supports many basic functions such as spell check and custom font styles, Writer also includes advanced tools like macros, bookmarks, math functions, a built-in image gallery, and keyboard shortcuts.

MS Word

Microsoft Office Word allows you to create and edit personal and business documents, such as letters, reports, invoices, emails and books. By default, documents saved in Word are saved with the .docx extension. Microsoft Word can be used for the following purposes −

- To create business documents having various graphics including pictures, charts, and diagrams.
- To store and reuse readymade content and formatted elements such as cover pages and sidebars.
- To create letters and letterheads for personal and business purpose.
- To design different documents such as resumes or invitation cards etc.
- To create a range of correspondence from a simple office memo to legal copies and reference documents.

3.1.1 Working with Documents

Following is the basic window, the various important parts of this window.
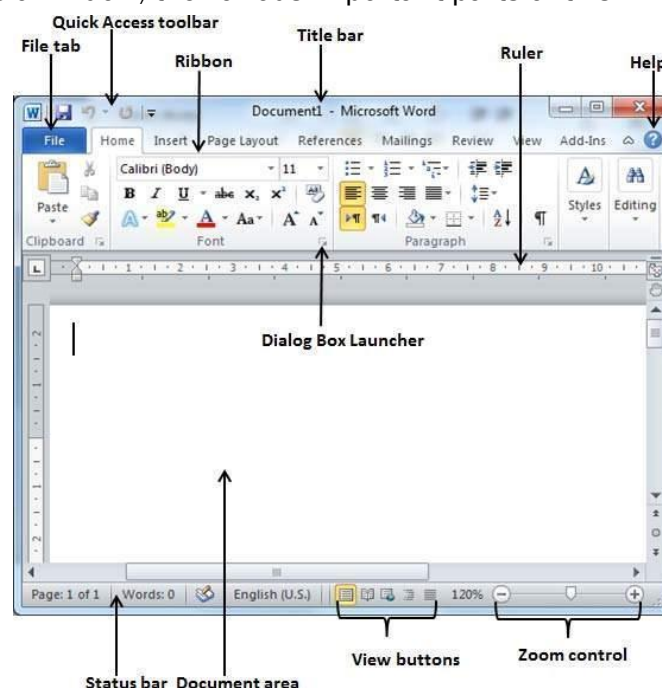
Working with Documents - Opening & Saving files

Steps to start the Word application

Step 1 – Click the **Start** button.
Step 2 – Click the **All Programs** option from the menu.
Step 3 - Search for **Microsoft Office** from the submenu and click it.
Step 4 – Search for **Microsoft Word 2010** from the submenu and click it.

Opening New Document

A new, blank document always opens when you start Microsoft Word. Suppose you want to start another new document while you are working on another document, or you closed an already opened document and want to start a new document.

Here are the steps to open a new document:-

Step 1 – Click the **File tab** and select the **New** option.
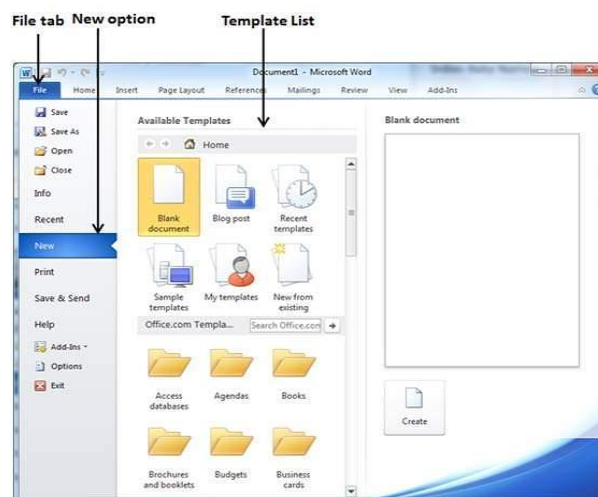
Step 2 – When you select the **New** option from the first column, it will display a list of templates in the second column. Double-click on the **Blank document**; this is the first option in the template list. The blank document as shown below. The document is now ready to start typing the text.
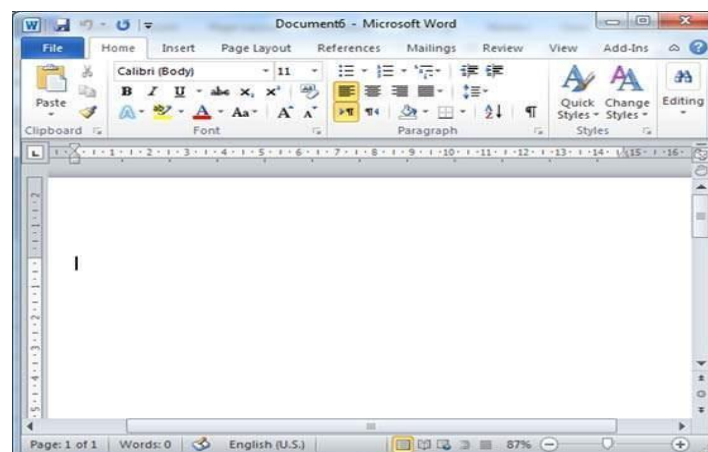
Shortcut to open a blank document anytime by pressing **Ctrl + N** keys, a new blank document will appear similar to the one in the above screenshot.

Opening Existing Document

To open an existing document to edit it partially or completely. Follow the steps given below to open an existing document −

Step 1 − Click the **File tab** and select the **Open** option.
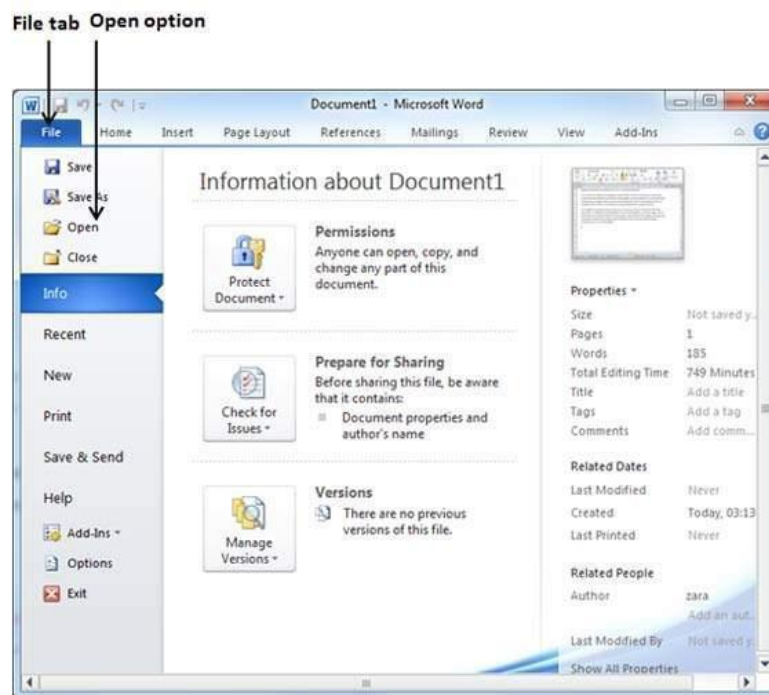
Step 2 − This will display the following file **Open dialog box**, navigate through different folders and files, and can select a file to open.

Step 3 – Finally, locate and select a file to open and click the small triangle available on the **Open** button to open the file.

Saving New Document

To save the document the following steps to save an edited Word document:

Step 1 – Click the **File tab** and select the **Save As** option.
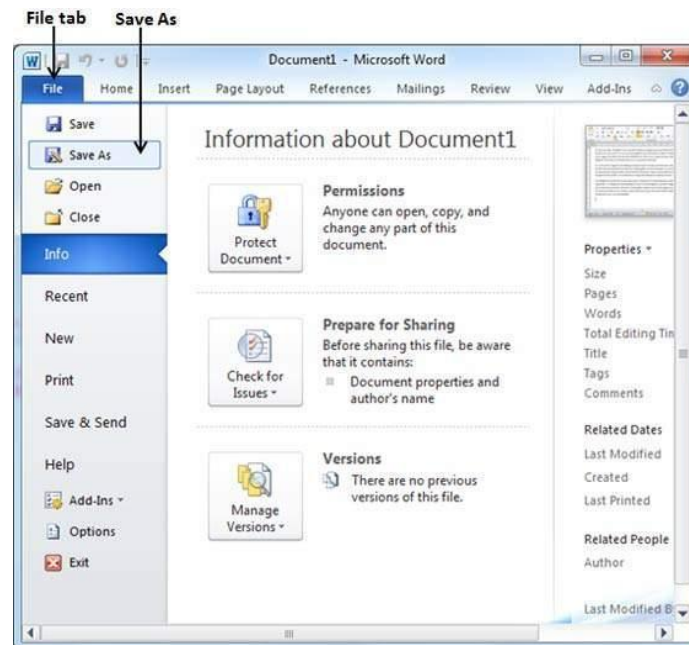
Step 2 – Select a folder where to save the document, Enter the file name of the document and Select the **Save As** option, by default it is the **.docx** format.

Editing text documents

Select Text

Selecting text is a very important skill in Word. Whenever you want to edit or format text, you first need to select it. There are multiple ways to select text, letting you select a small amount to entire paragraphs at once.

Click and drag across the text you want to select. You can select any amount of text with this method, from a single character to your entire document.

- Press and hold down the Shift key, and move the insertion point either with your mouse or the arrow keys to select text.
- Double-click a single word to select it.
- Press the Ctrl key and click in a sentence to select it.
- Triple-click in a paragraph, or double-click in the left margin next to a paragraph, to select it.

- Click in the left margin to select an entire line, or click and drag in the left margin to select multiple lines.
- Press Ctrl + A to select everything in the document.
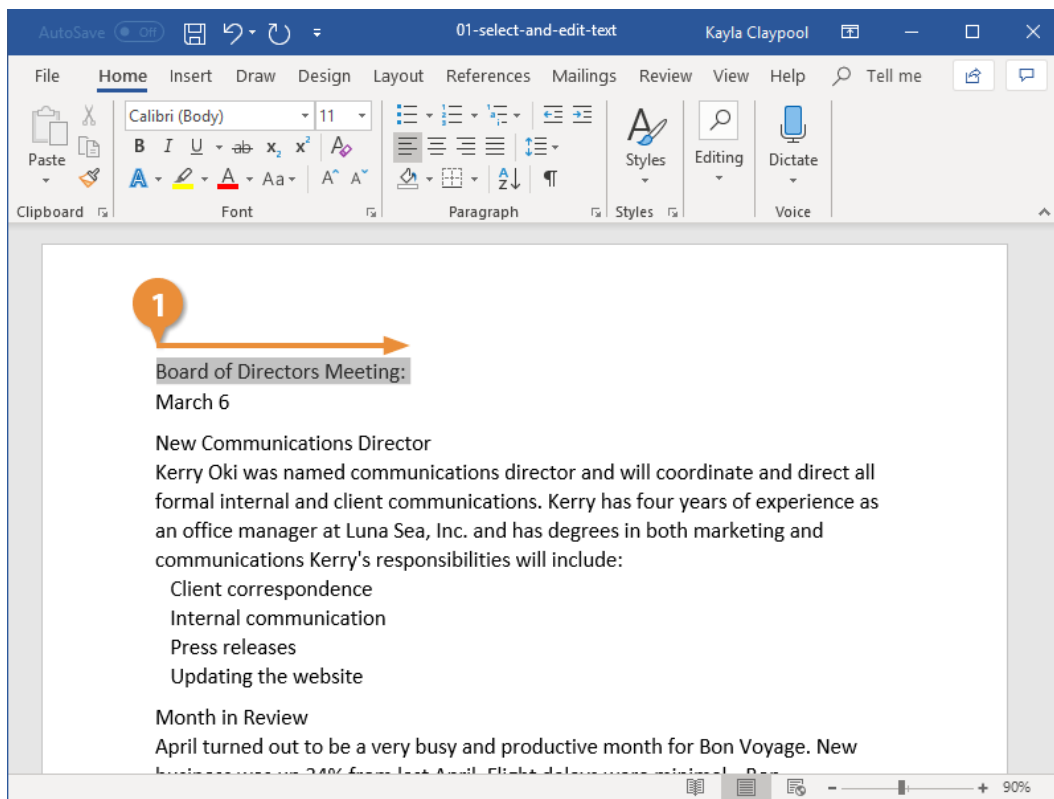
Edit Text

Select the text you want to replace, then start typing the new text.

Inserting and Deleting Text

Insert and Add Text

First we will see how inserted text will be added into the existing content without replacing any existing content.

Step 1 – Click the location where to insert the text.

Step 2 – Start typing the text that needs to be inserted. Word inserts the text to the left of the insertion point, moving the existing text to the right.

Delete text

To delete a single character: Place the insertion point next to the text that to deleted. Press

the DELETE key to delete text after, or to the right of, the insertion point. Press the BACKSPACE key to delete text before, or to the left of, the insertion point.

Copy and Paste or Cut and Paste Operations

Word makes use of a temporary memory which is called the **clipboard**. When copy or cut a text is selected, it stay on the clipboard temporarily and in the second step the text can paste the content at the desired location.

Copy & Paste Operation

The **Copy** operation will just copy the content from its original place and create a duplicate copy of the content at the desired location without deleting the text from its the original location. Procedure to copy the content in word –

Step 1 – Select a portion of the text using any of the text selection methods.

Step 2 – The various options available to copy the selected text in clipboard the different options are:

- **Using Right-Click** –it will display the **copy** option, click this option to copy the selected content in clipboard.

- **Using Ribbon Copy Button** – the copy button available at the ribbon to copy the selected content in clipboard.

- **Using Ctrl + c Keys** – After selecting a text, just press **Ctrl + c** keys to copy the selected content in clipboard.

Step 3 – Finally click at the place where to copy the selected text and use either of these two simple options –

- **Using Ribbon Paste Button** – Just click the Paste button available at the ribbon to paste the copied content at the desired location.

- **Using Ctrl + v Keys** – This is simplest way of pasting the content. Just press **Ctrl + v** keys to paste the content at the new location.

Cut & Paste Operation

The Cut operation will cut the content from its original place and move the content from its original location to a new desired location. Following is the procedure to move the content in word –

Step 1 – Select a portion of the text using any of the text selection methods.

Step 2 – The various options available to cut the selected text and put it in the clipboard.

- **Using Right-Click** –it will display **cut** option, just click this option to cut the selected content and keep it in clipboard.

- **Using Ribbon Cut Button** –use cut button available at the ribbon to cut the selected content and keep it in clipboard.

- **Using Ctrl + x Keys** – After selecting a portion of text, just press **Ctrl + x** keys to cut the selected content and keep it in clipboard.

Step 3 – Finally, click at the place to move the selected text and use either of these two simple options –

- **Using Ribbon Paste Button** – Just click the **Paste** button available at the ribbon to paste the content at the new location.

- **Using Ctrl + v Keys** – This is simplest way of pasting the content. Just press **Ctrl + v** keys to paste the content at the new location.

Undo and Redo operation

Microsoft word provides two important features called the **Undo** and the **Repeat** or **Redo**. The Undo feature is used to undo the previous action and the **Repeat** or **Redo** feature is used to repeat the previous action.

The Undo and Repeat buttons from the Quick Access toolbar. The **Repeat** button is also called **Redo** button and both the operations have the same meaning.

Procedure to apply **undo** or **repeat** (redo) operations –

Step 1 – click the **Repeat** (Redo) button, Word will repeat the same operation.

Step 2 – Now to examine the **undo** operation, let us delete the last word **operation** character by character.

Step 3 – Let us try to click the **Undo** button one by one.Word will recover all the deleted characters one by one after performing a few undo operations.
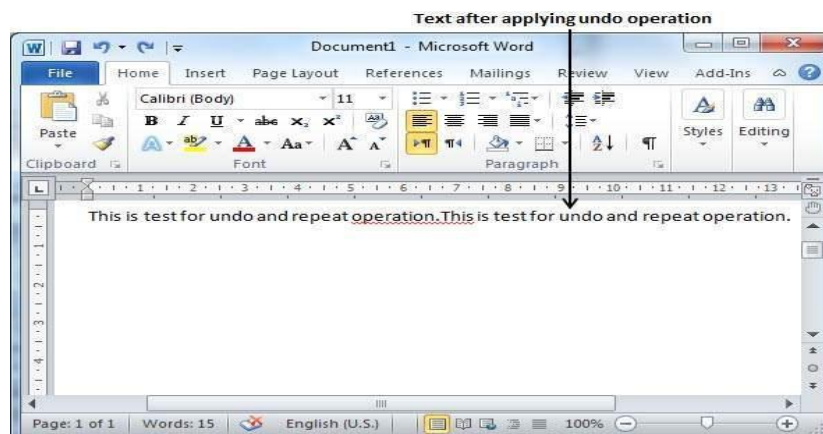
Shortcut keys for **undo Ctrl + Z, redo Ctrl + Y**

Find search and replace

Find and Replace operation in Word 2010. While working on editing a document to search a particular word in the document and to replace this word with another word at a few or all the places throughout the document.

To replace an existing word with any other word using simple steps.

Find Command

The **Find** command enables to locate specific text in the document.

Step 1 – Click the **Find option** in the **Editing group** on the Home tab or press **Ctrl + F** to launch the Navigation pane.

Step 2 – Enter a word to search in the Search box, Word searches for the text entered and displays the results in the navigation pane and highlights the word in the document.

Step 3 - Click the **clear button (X)** to clear the search and results and perform another search.
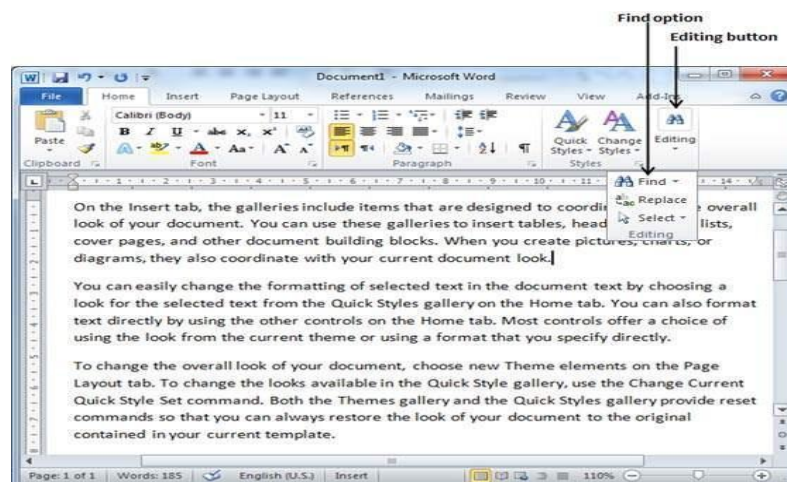
Step 4 – finally click the **close button (X)** to close the Navigation Pane.

Find & Replace Operation
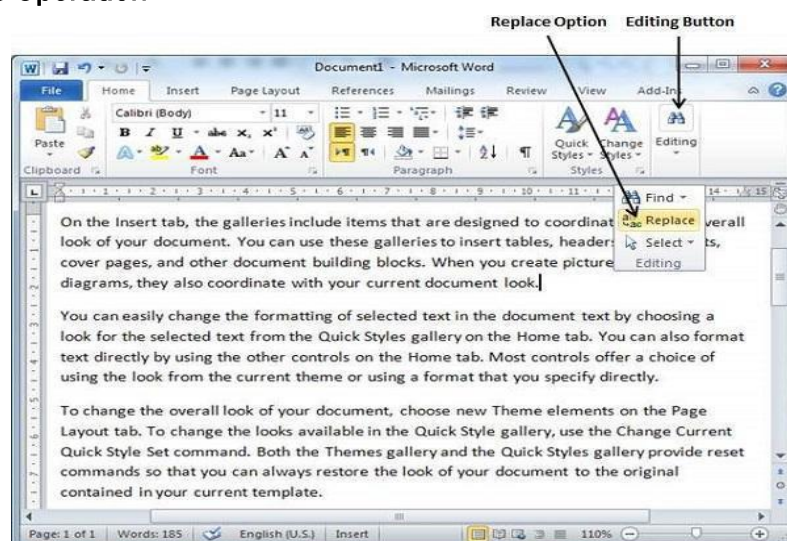
Simple steps replace an existing word in the document.

Step 1 − Click the **Replace option** in the **Editing group** on the Home tab or press **Ctrl + H** to launch the **Find and Replace** dialog box shown in Step 2 −

Step 2 − Type a word want to search,replace the word using the **Find and Replace** dialog box as in the following screenshot −
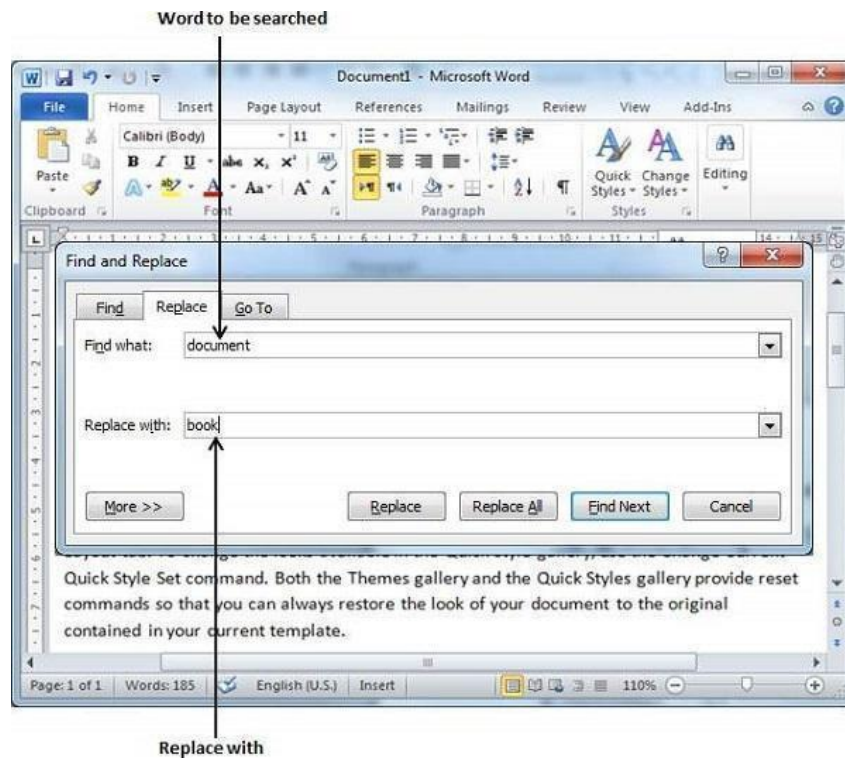
Step 3 − Click the **Replace** button available on the **Find and Replace** dialog box and will see the first occurrence of the searched word would be replaced with the replace with word. Clicking again on **Replace** button would replace next occurrence of the searched word,to replace in all occurrences click **Replace All** button.

Step 4 − use **More >>** button available on the dialog box to use more options and to make search more specific like case sensitive search or searching for whole word only etc.

Step 5 − Finally click the **Close (X)** or **Cancel** button of the dialog box to close the box.

Formatting page in Word 2010

To change page size

1. Select the **Page Layout** tab.

2. Click the **Size** command, and a drop-down menu will appear. The current page size is highlighted.

3. Click the **size option** you want. The page size of the document changes.
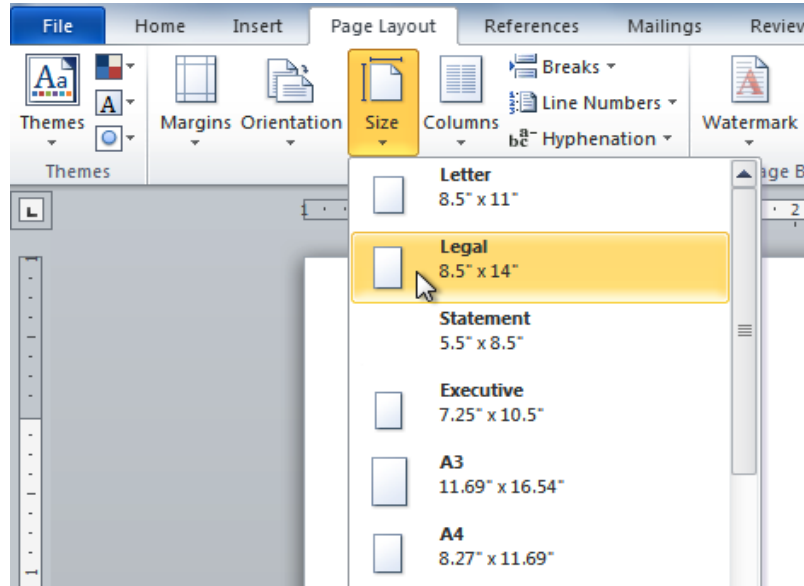
Setting Margins

Margins are the space between the edge of the paper and the text. Adjust the right, left, top, and bottom margins of the document. By default, Word sets all margins left, right, top, and bottom to 1 inch.

The following steps will help you understand how to set margins for an open document.
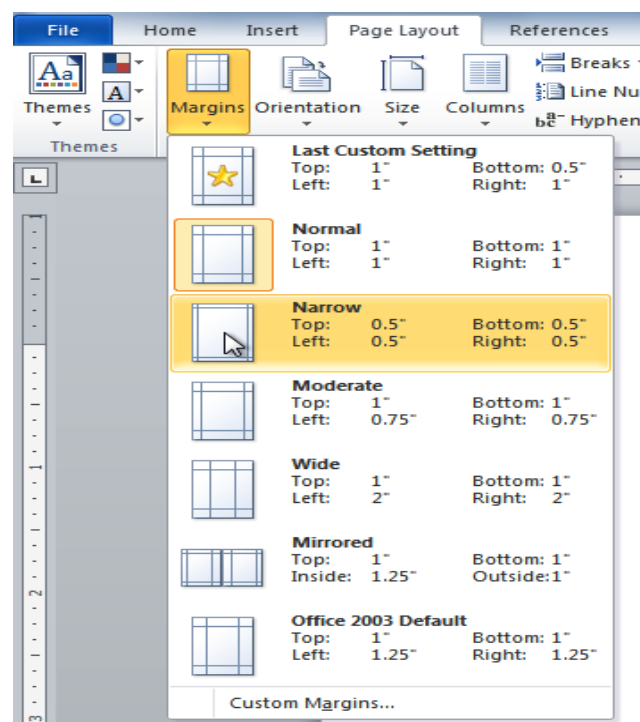
Converting files to different formats

How to convert Word document to a PDF

Converting a Word document to a PDF is the easiest task .To convert a Word document to a PDF because word document is not portable with all software

Microsoft Word is a powerful word processor tool that is used for creating documents, memos, brochures, pamphlets, books, and more.PDF stands for Portable Document Format. It is one of the most commonly used file formats which allows us to distribute read-only documents.

The file extension for PDF file format is **.pdf**. PDF file is used for documents like eBooks, application forms, scanned documents, etc. There are the following methods to convert Word document to a PDF –

Method 1: Using Word

Microsoft Word provides the easiest way to convert Word document to a PDF.

Step 1: Open the Word document to convert in PDF file format.

Step 2: Click on the **File** tab at the top left corner of the word document.
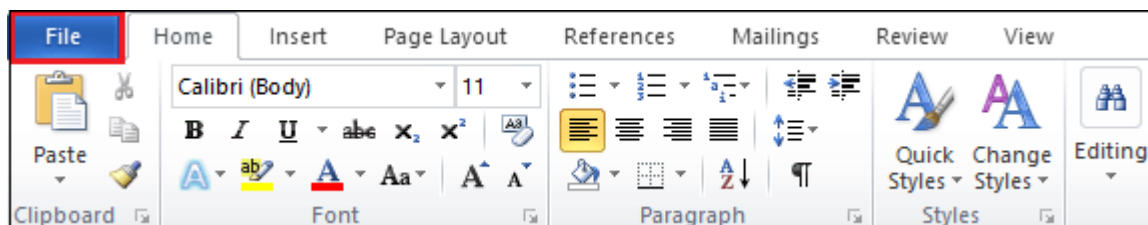
Step 3: A list of File options appears on the screen. Click on **Save As**.
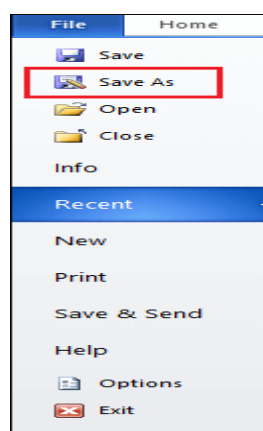
Step 3: Browse the location where to save the PDF file. Go to the **Save as type**. Click on the drop-down icon associate with Save as type. Select **PDF (*.pdf)** from the drop-down menu and click on the **Save** button at the bottom of the screen.
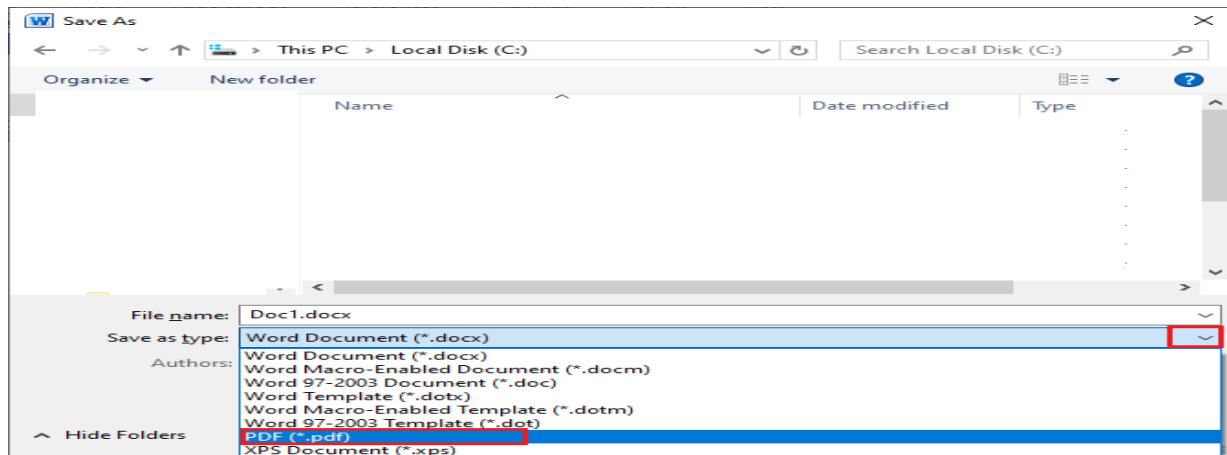
Importing & Exporting documents

Click the File tab in Outlook 2010,Click the Open tab at left bar; Then you will see the Import button in middle section. After clicking this Import button, it displays the Import and Export Wizard dialog box.

The Export Wizard and Import Wizard help you transfer project data between Microsoft Project and other programs. The following is a list of formats you export to or import from.

- Microsoft Excel (as a workbook or PivotTable report)
- text-only (tab delimited)
- comma-separated values (CSV)
- Extensible Markup Language (XML)

By defining or editing the export or import maps of these wizards helps to transfer data to and from the task, resource.

Sending files to others,

Sending Word documents to friends, clients, teachers, co-workers or anyone else through email - have to print the document to share it with somebody for reading -- but straightforward, as well. Send your manuscript, research paper, reports, stories or virtually anything, as long as it is in a document format. Send a Word document via email as an attachment or with the Share feature in Word software.

Using Tool bars, Ruler, Using Icons, Using Help

Using Tool bars

The Quick Access Toolbar displays a small selection of the more commonly used commands in the top left hand corner of the application window (above the Office

Button). By default, the Quick Access Toolbar includes the following commands: Save, Undo, Redo

Customize Quick Access Toolbar button

When you click on the Customize Quick Access Toolbar button (the down arrow to the right of the toolbar), a selection of popular commands is displayed for selection.
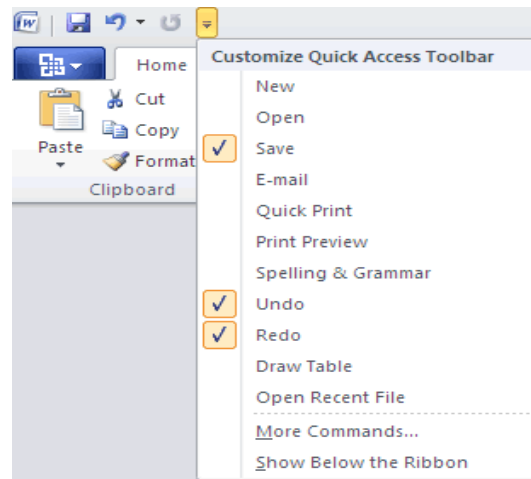
Click on the command you want to add to the toolbar and the newly added command displays immediately. If you can't see the command you need to add, click on More Commands to display the full list.

Another way to get to the Quick Access Toolbar tab in Word Options is to click the Office Button > Word > Options > Quick Access Toolbar.

Ruler

If you don't see the ruler at the top of your document, go to **View** > **Ruler** to display it.
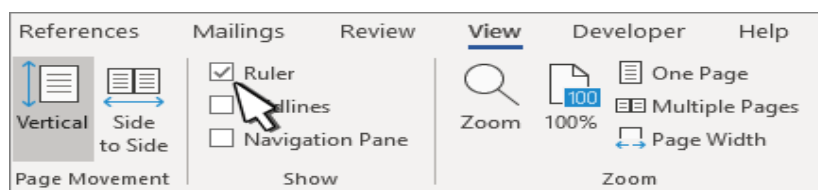
Set a tab stop using the ruler

1. Select **Left Tab** ⌐ at the left end of the horizontal ruler to change it to the type of tab required.
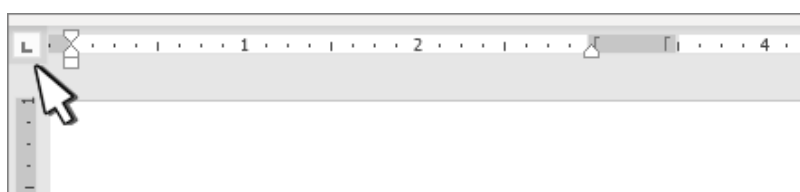
2. Choose one of the following types:

o ⌐ A **Left** tab stop sets the left end of the text line. The text fills toward the right.

o ⊥ A **Center** tab stop sets the position at the middle of the text line. The text centers on this position.

o ⌐ A **Right** tab stop sets the right end of the text line. The text fills toward the left.

o ⊥ A **Decimal** tab stop aligns numbers around a decimal point. Without regard to the number of digits, the decimal point remains in the same position. Use decimal tabs to line up numbers with decimal points.

o | A **Bar** tab stop doesn't position text. It inserts a vertical bar at the tab position. Unlike other tabs, the bar tab is added to the text as soon as you click the ruler. Clear the bar tab stop before printing the document, else the vertical line is printed.

3. Click or tap the bottom of the horizontal ruler where to set the tab stop.

Using Icons

1. Select **Insert > Icons**.
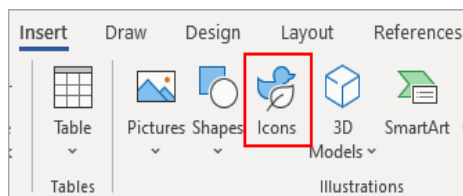
Scroll through the icons or jump to a category by choosing a name in the navigation pane at the left. Also search by using the box near the top left corner.
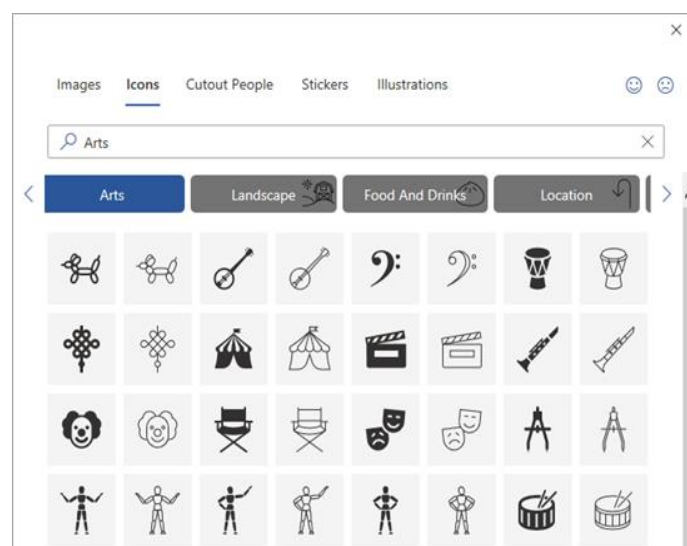
2. Choose an icon and then select **Insert** at the lower right.

Insert multiple icons at the same time by choosing each of them before clicking **Insert**.

Using the Help Window

To directly access the Help window, select **Help** and then the help command for the application such as **Microsoft Word Help.** Press the **F1** key to make the Help window appear.

The Help window provides two panes. The pane on the left provides three tabs: Contents, Answer Wizard, and Index. The right pane of the Help window provides either help subject matter or links to different Help topics. It functions a great deal like a Web browser window. You click a link to a particular body of information and that information appears in the right pane.

Using the Contents Tab

The Contents tab of the Help system is a series of books you can open. Each book has one or more Help topics in it, which appear as pages or chapters. To select a Help topic from the Contents tab, follow these steps:

- In the Help window, click the Contents tab on the left side of the Help window.
- Find the book that describes, in broad terms, the subject for which you need help.
- Double-click the book, and a list of Help topics appears below the book, as shown in Figure
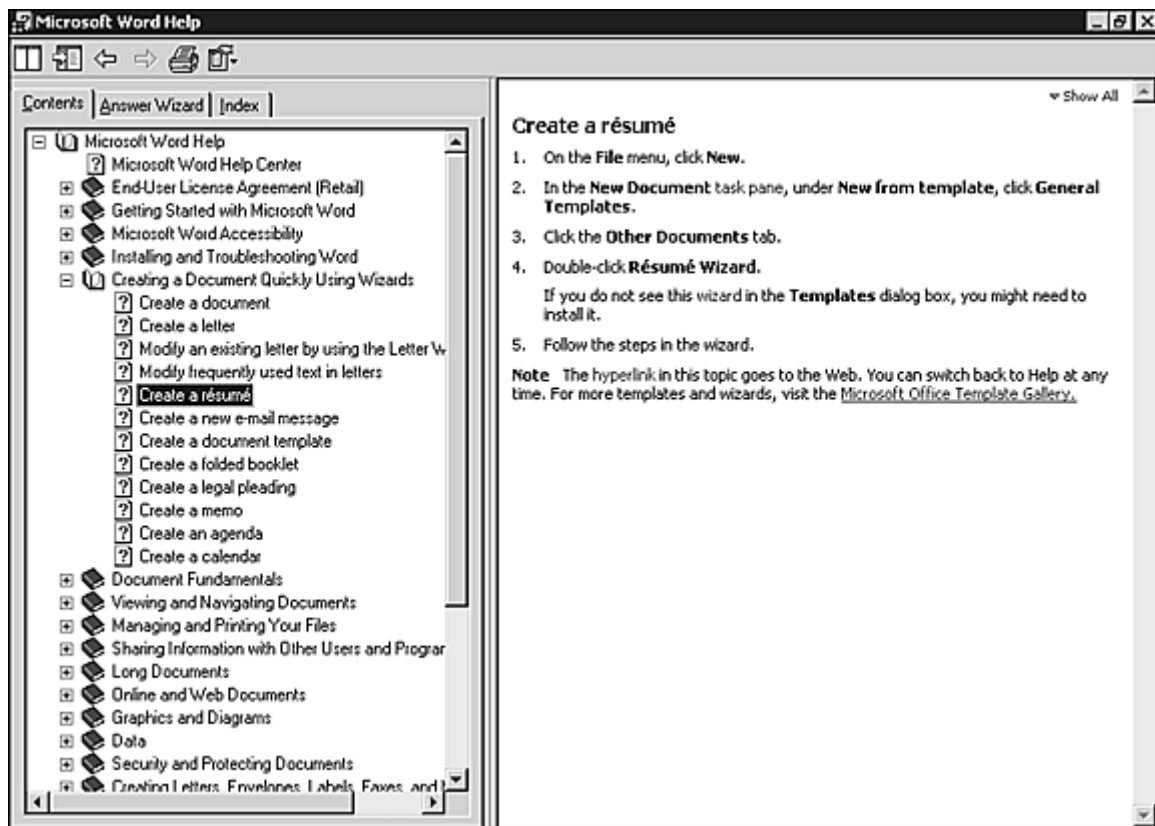
- Click one of the pages (the pages contain a question mark) under a Help topic to display it in the right pane of the Help window.

- When you finish reading a topic, select another topic on the Contents tab or click the Help window's Close (X) button to exit Help.

Using the Answer Wizard

Another way to get help in the Help window is to use the Answer Wizard. The Answer Wizard works the same as the Ask a Question box or the Office Assistant; you ask the wizard questions and it supplies you with a list of topics that relate to your question. You click one of the choices provided to view help in the Help window. To get help using the Answer Wizard, follow these steps:

- Click the Answer Wizard tab in the Help window.
- Type your question into the What Would You Like to Do? box. For example, you might type the question, How do I format text?
- After typing your question, click the Search button. A list of topics appears in the Select Topic to Display box. Select a particular topic, and its information appears in the right pane of the Help window, as shown in Figure
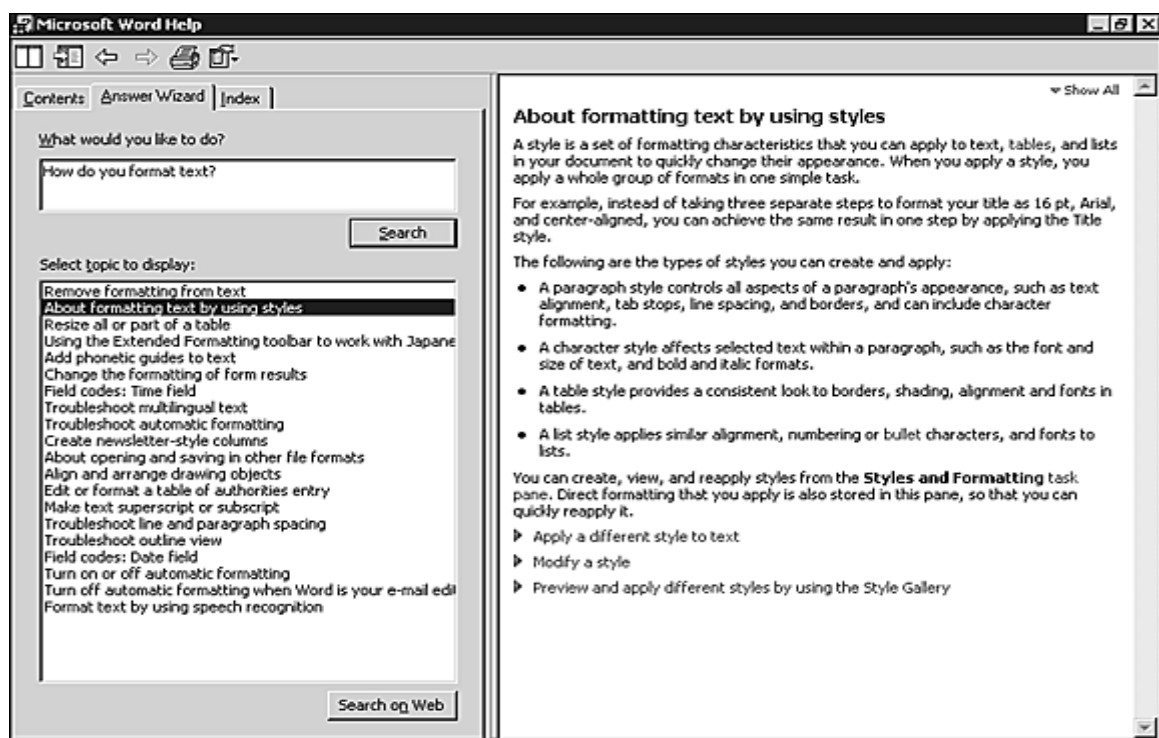
Using the Index

The Index is an alphabetical listing of every Help topic available. It's like an index in a book. Follow these steps to use the index:

- In the Help window, click the Index tab.

- Type the first few letters of the topic for which you are looking. The Or Choose Keywords box jumps quickly to a keyword that contains the characters you have typed.
- Double-click the appropriate keyword in the keywords box. Topics for that keyword appear in the Choose a Topic box.
- Click a topic to view help in the right pane of the Help window.

3.1.2 Formatting Documents

Setting font styles, font selection-style, size, colour.

Following is a screenshot to show a few font related buttons.
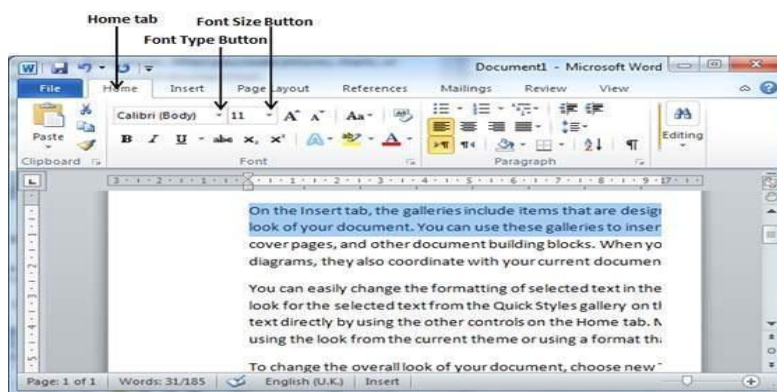
Step 1 – Select the portion of text the font of which needs to be changed and click the **Home tab.** Now click the **Font Type** button to list down all the fonts available.
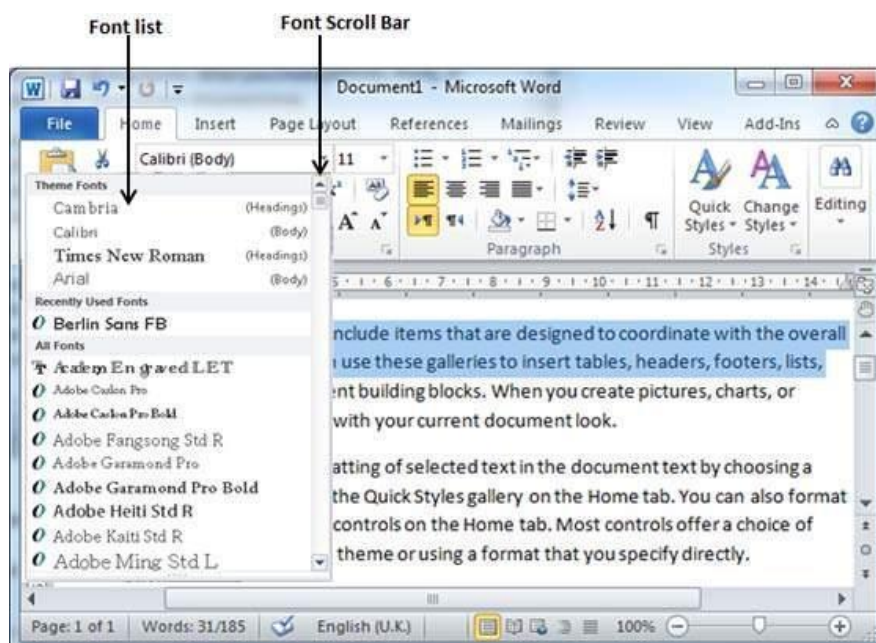
Step 2 – Try to move the mouse pointer over the listed fonts.

Step 3 – Similar way, to change the font size, click over the Font Size button which will display a font size list. Use the same procedure to select a desired font used while selecting a font type.

Change Font Colors

The text that we type comes in black by default; to change the color of the font by following two simple steps −

Step 1 − Select the portion of text the font color of which needs to be changed. Use any of the text selection method to select the portion of text.

Step 2 − Click the Font Color button triangle to display a list of colors. Try to move the mouse pointer over different colors , the text color will change automatically.

Home tab   Font Color Button   Changed Font Color

List of Colors
More Colors Option
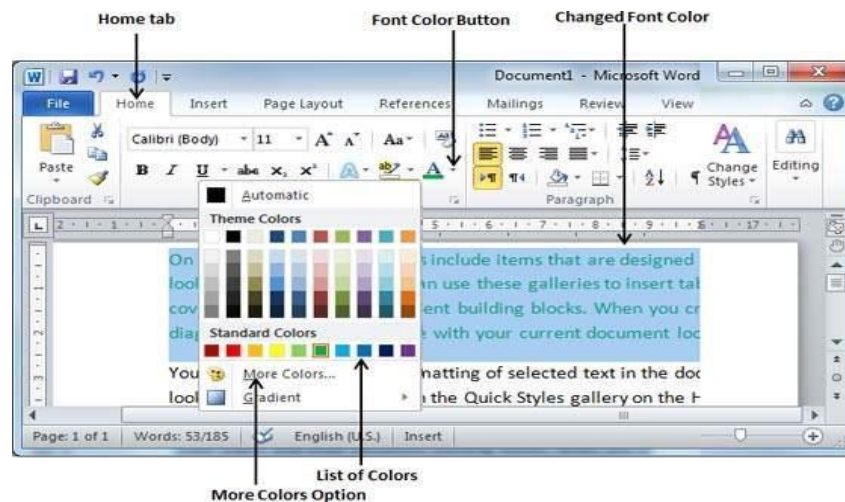
Apply Text Effects

Microsoft word provides a list of text effect which add to the beauty of the document, especially to the cover page or the headings of the document. This is very simple to apply various text effects by following two simple steps −

Step 1 − Select the portion of text to change to a bold font.

Step 2 − Click the Text Effect button to display a list of effects including shadow, outline, glow, reflection etc. Try to move the mouse pointer over different effects and see the text effect will change automatically. Select any of the text effect available by simply clicking over it.

Home tab   Text Effect Button   Text with Effect

List of Effects
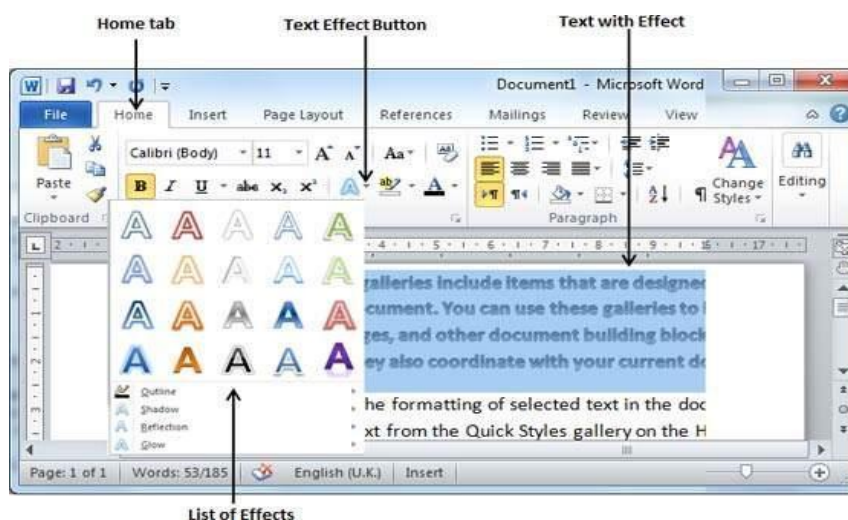
Making text bold

It is very simple to change a selected portion of text into bold font by following two simple steps

Step 1 − Select the portion of text that the font to be made bold.

Step 2 − Click the Font Bold [B] button in the Home tab Font group, or simply use Ctrl + B keys to make the selected portion of text bold.

Making Text Italic

Step 1 − Select the portion of text the font of which needs to be italicized.

Step 2 − Click the Font Italic *[I]* button in the Home tab Font group, or simply use the Ctrl + I keys to convert the portion of text in italic font.

Underline the Text

An underlined portion of text appears with an underline and we use the underlined portion of text to make it more distinguished from other text. It is very simple to change the selected text into underlined font by following two simple steps −

Step 1 − Select the portion of text which needs to be underlined.

Step 2 − Click Font Underline [U] button in the Home tab Font group, or simply use the Ctrl + U keys to put an underline under the text.

Case settings

Change Text to Lowercase

Changing text to lowercase is where every word of a sentence is in lowercase. It is very simple to change a selected portion of text into lowercase by following two simple steps −

Step 1 − Select the portion of text that needs to be put in lowercase.

Step 2 − Click the Change Case button and then select Lowercase option to display all the selected words in lowercase.

Change Text to Uppercase

This is where every word of a sentence is in uppercase. It is very simple to change selected text into uppercase by following two simple steps −

Step 1 − Select the portion of text that you want to change to a bold font.

Step 2 − Click the Change Case button and then select UPPERCASE option to display all selected words in all caps. All characters of every selected word will be capitalized.
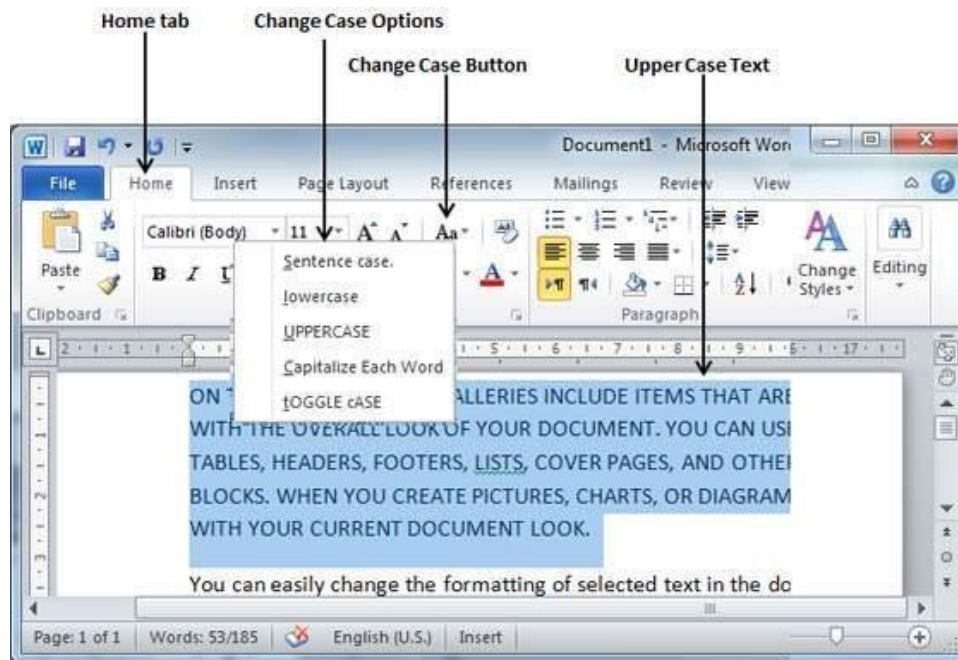
Highlight Text with Colors

It is very simple to highlight a portion of text with a color by following two simple steps.

Step 1 – Select the portion of text that needs to be highlighted with color.

Step 2 – Click the Text Highlight Color button triangle to display a list of colors. Move mouse pointer over different colors and the text color changes automatically.

Usually we highlight a text using yellow color.
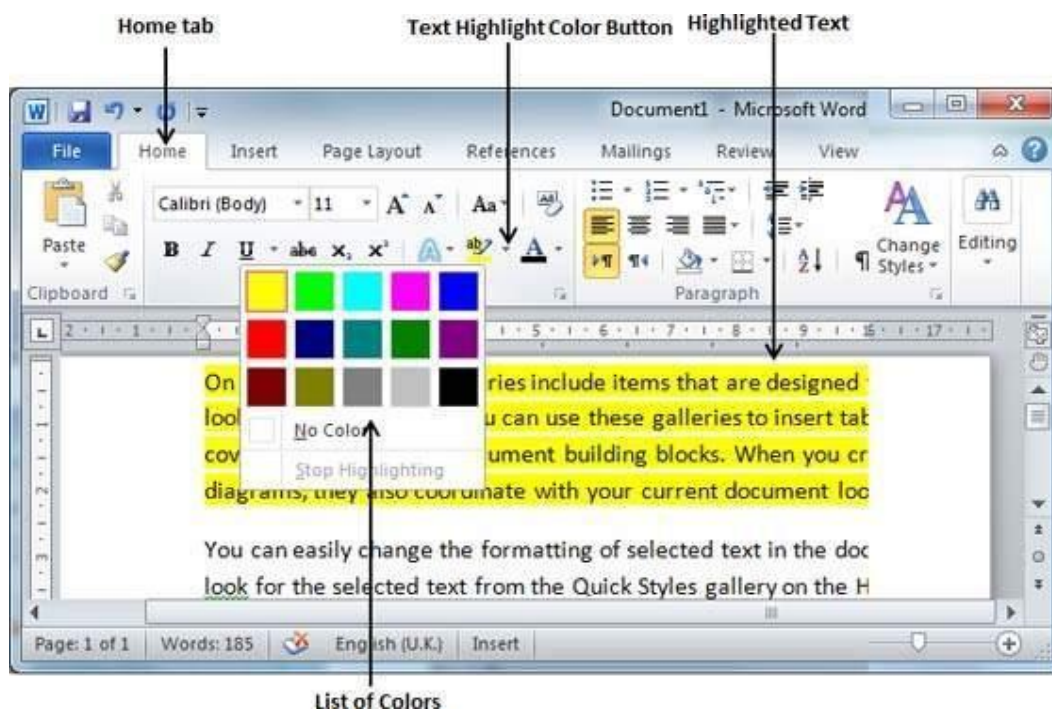
Insert Special Symbols

Here is a simple procedure to apply zoom-in or zoom-out operation using the View tab −

Step 1 − To insert a special symbol, bring the cursor at the place where to insert the symbol. Click the **Insert** tab. Find two options under the symbol button **(a) Equation** and **(b) Symbols**.
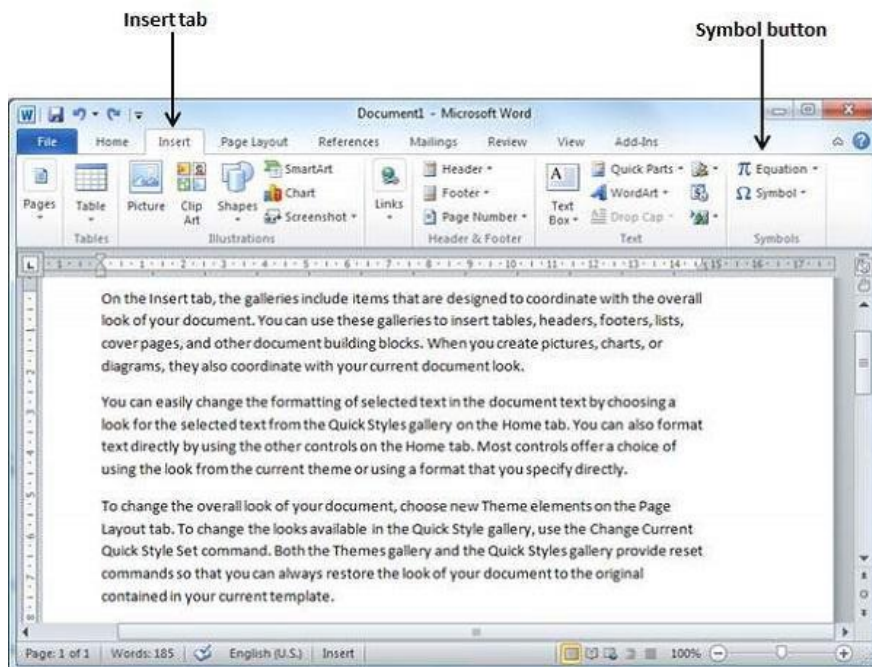
Step 2 − While clicking the **Symbol** button, a small list of symbols will appear as shown below.
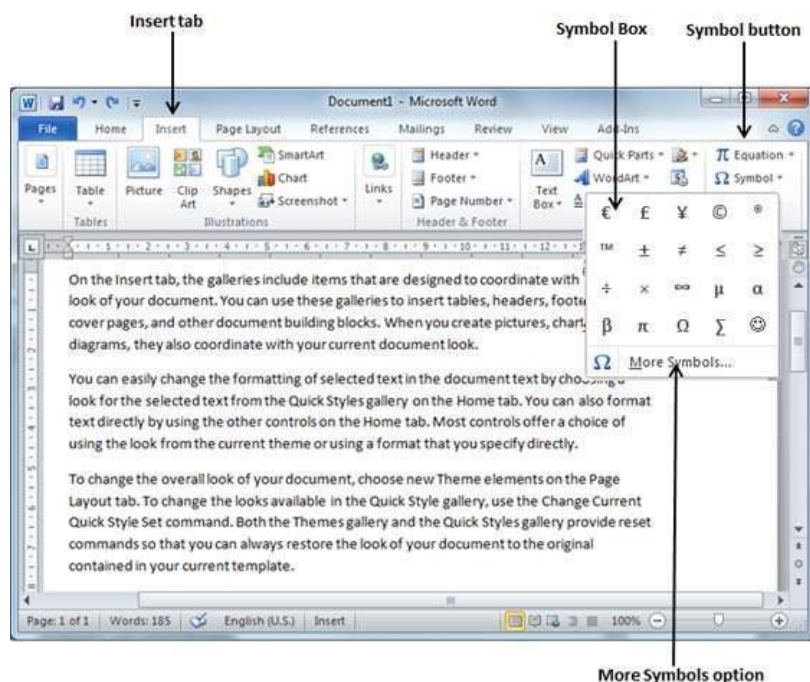
Step 3 − Now click on any of the available symbols in the box to insert that in the document at the selected location.

Setting Paragraph Style

A paragraph style can contain formatting specifications, such as font, font size and color, indentation, alignment, and line spacing.

Alignments

The text in your paragraphs is aligned to the left margin by default, but you can easily align it to the right margin, center it between the margins, or justify it to spread evenly between the margins on a page.
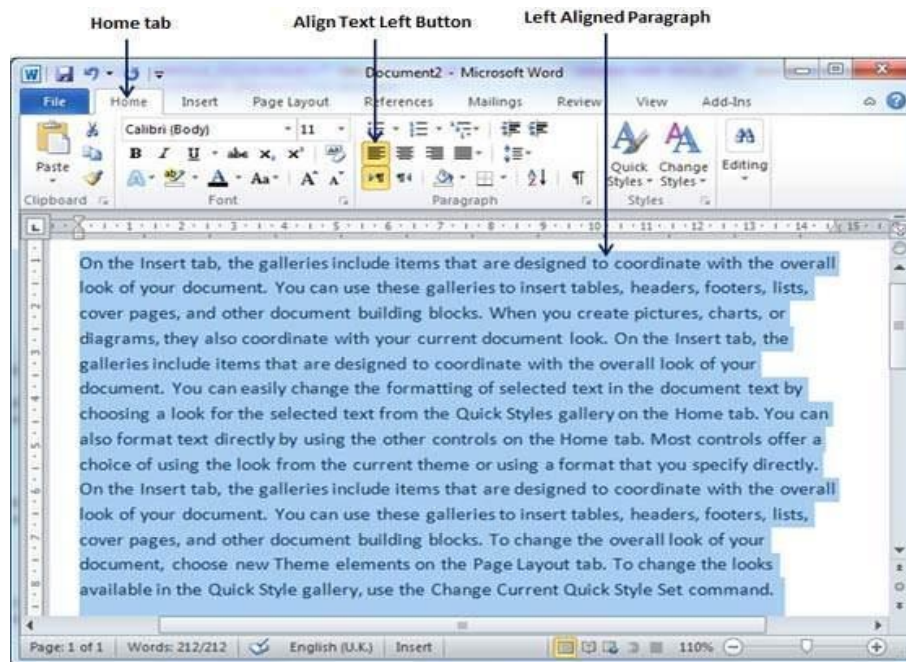
Left-Aligned Text

A paragraph's text is left aligned when it is aligned evenly along the left margin. Here is a simple procedure to make a paragraph text left-aligned.

Click anywhere on the paragraph you want to align and click the Align Text Left button available on the Home tab or simply press the Ctrl + L keys.

Center Aligned Text

Click anywhere on the paragraph you want to align and click the Center button available on the Home tab or simply press the Ctrl + E keys.

Right-Aligned Text

Click anywhere on the paragraph you want to align and click the Align Text Right button available on the Home tab or simply press the Ctrl + R keys.

Justified Text

A paragraph's text is justified when it is aligned evenly along both the left and the right margins. Following is a simple procedure to make a paragraph text justified.

Indent

In word processing, the word indent is used to describe the distance, or number of blank spaces used to separate a paragraph from the left or right margins.

Left Indentation

Left indentation means to move the left edge of the paragraph inward towards the center of the paragraph. Click anywhere on the paragraph you want to indent left and click the Increase Indent button available on the Home tab or simply press the Ctrl + M keys.

To remove left indentation by clicking the Decrease Indent button available on Home tab or simply press Ctrl + Shift+ M keys.

Right Indentation

Right indentation means to move the right edge of the paragraph inward towards the center of the paragraph.

Click anywhere on the paragraph to indent and then click on the Increase Right Indent spinner available on the Page Layout tab.

The Paragraph Dialog Box can also be used to set the left and the right indentations.

First Line Indentation

Move the left side of the first line of a paragraph inward toward the center.

Hanging Indentation

Move the left side of the first line of a paragraph leftward, away from the center which is called the hanging indentation.

Line spacing

A line spacing is the distance between two lines in a Microsoft Word document. Can increase or decrease this distance as per user requirement.

Use the Line Spacing option available at the dialog box to set line spacing.

Spacing between Lines

Following are the simple steps to adjust spacing between two lines of the document.

Step 1 – Select the paragraph or paragraphs to define spacing.

Step 2 – Click the Line and Paragraph Spacing Button triangle to display a list of options to adjust space between the lines. Select any of the option available by simply clicking over it.
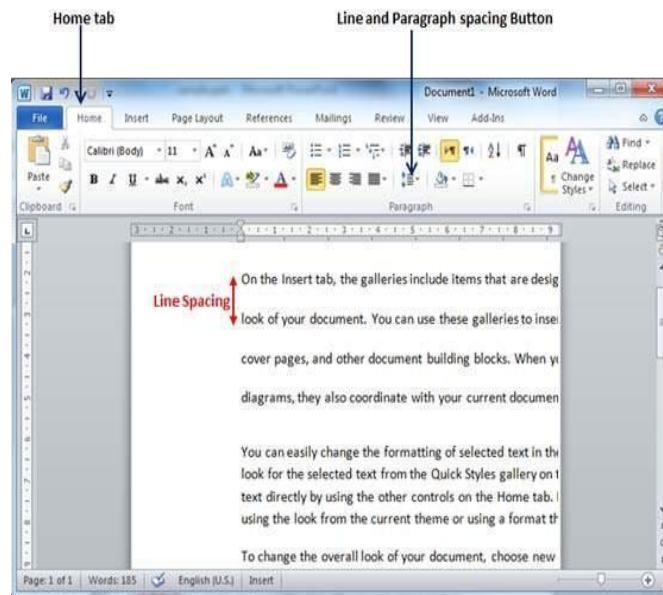
Spacing between Paragraphs

Set distance between two paragraphs. Following are the simple steps to set this distance.

Step 1 – Select the paragraph or paragraphs for which you want to define spacing and click the Paragraph Dialog Box launcher available on the Home tab.

Step 2 – Click the Before spinner to increase or decrease the space before the selected paragraph. Similar way, click the After spinner to increase or decrease the space after the selected paragraph. Finally, click the OK button to apply the changes.
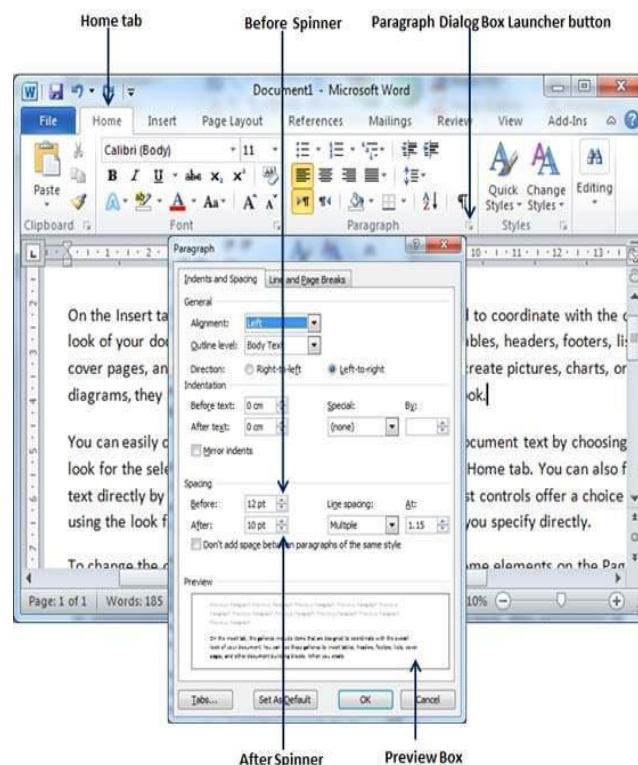
Margins

Margins are the blank spaces that line the top, bottom, and left and right sides of a document. They are important because they help make a document look neat and professional. To change margins, click on the Margins button, found on the Page Layout tab. Word lists a number of pre-formatted options,by selecting "Custom Margins," found at the bottom of the Margins list to customize the margin as required by the user.. To apply the settings, click "OK."

Bullets and Numbering

Simple steps to create either the bulleted or the numbered lists in simple steps.

Create a List from Existing Text

This is very simple to convert a list of lines into a bulleted or numbered list. Following are the simple steps to create either bulleted list or numbered list.

Step 1 – Select a list of text to assign bullets or numbers.

Step 2 – Click the Bullet Button triangle to display a list of bullets , select any of the bullet style available by simply clicking over it.
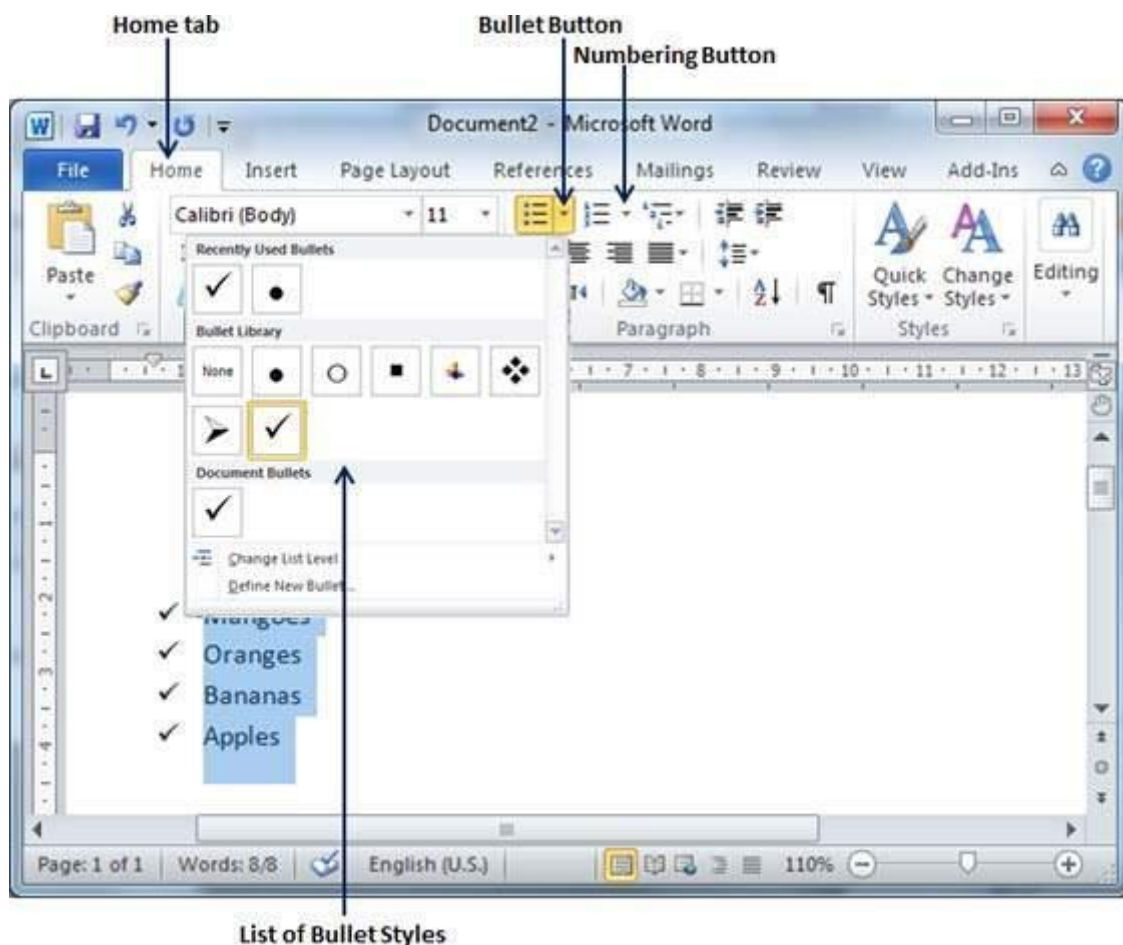
Step 3 – to create a list with numbers, then click the Numbering Button triangle instead of the bullet button to display a list of numbers to assign to the list, select any of the numbering style available by simply clicking over it.

3.1.3 Setting Page Style

Formatting Page

Page Tab

Using tabs gives you more control over the placement of text. By default, every time you press the Tab key, the insertion point will move 1/2 inch to the right. Adding tab stops to the Ruler allows you to change the size of the tabs, and Word even allows you to apply more than one tab stop to a single line. For example, on a resume you could left-align the beginning of a line and right-align the end of the line by adding a Right Tab, as shown in the image below.

The tab selector

The tab selector is located above the vertical ruler on the left. Move the mouse over the tab selector to see the name of the active tab stop.
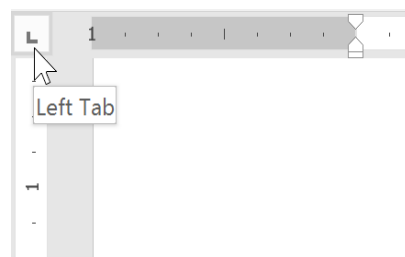
Types of tab stops:
- Left Tab - left tab stop left-aligns the text at the tab stop
- Center Tab - center tab stop centers the text around the tab stop
- Right Tab - right tab stop right-aligns the text at the tab stop
- Decimal Tab - decimal tab aligns decimal numbers using the decimal point
- Bar Tab - bar tab draws a vertical line on the document
- First Line Indent - first line indent inserts the indent marker on the Ruler and indents the first line of text in a paragraph
- Hanging Indent - hanging indent inserts the hanging indent marker and indents all lines other than the first line

Page margins

A margin is the space between the text and the edge of your document. By default, a new document's margins are set to Normal, which means it has a one-inch space between the text and each edge. Depending on your needs, Word allows you to change your document's margin size.

To format page margins:

1. Select the Page Layout tab, then click the Margins command.
2. A drop-down menu will appear. Click the predefined margin size you want.
3. The margins of the document will be changed.
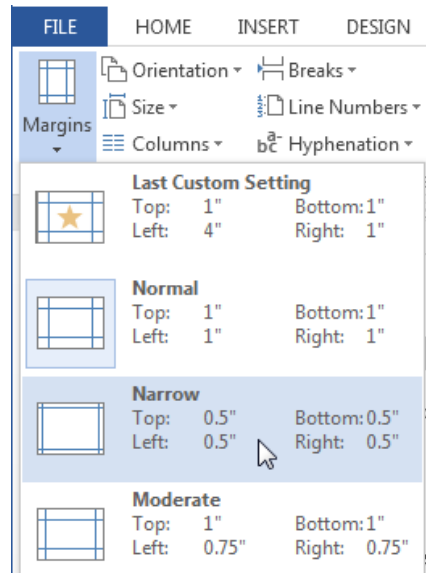
Layout Settings

Page orientation

Word offers two page orientation options: landscape and portrait. Landscape means the page is oriented horizontally, while portrait means the page is oriented vertically. Compare our example below to see how orientation can affect the appearance and spacing of text and images.

To change page orientation

1. Select the Page Layout tab.
2. Click the Orientation command in the Page Setup group.
3. A drop-down menu will appear. Click either Portrait or Landscape to change the page orientation.
4. The page orientation of the document will be changed.
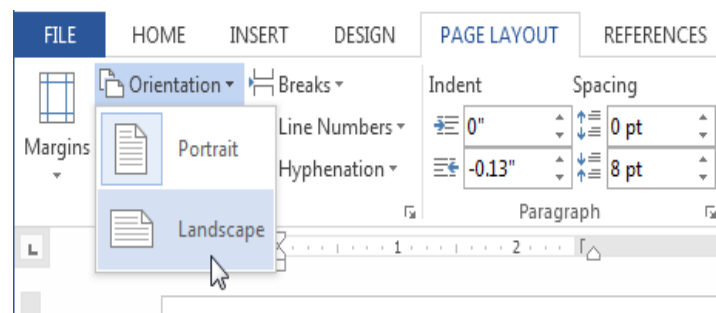
Paper Tray
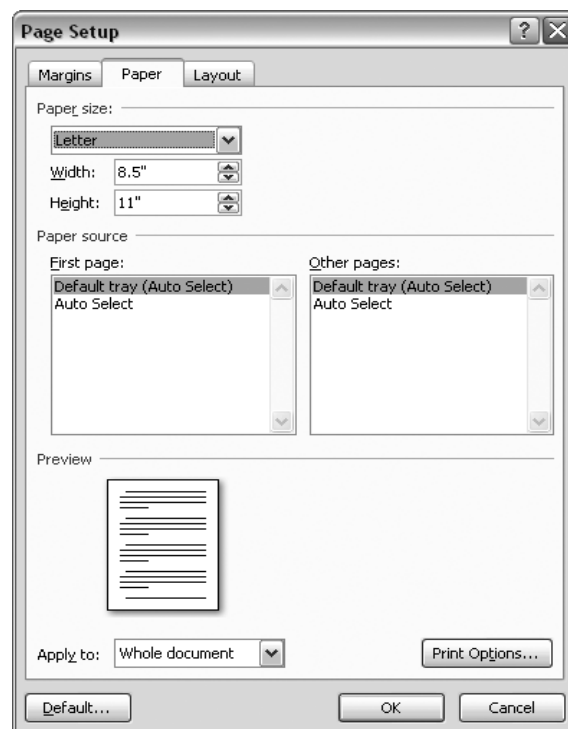
If you can't find the paper size you need on the Size menu, then you need to customize your paper size, which you do in the Page Setup dialog box's Paper tab. Here are the steps:

- Choose Page Layout → Page Setup → Size. At the bottom of the Size menu, click More Paper Sizes.
- In the Width and Height boxes, enter the size of your custom paper.
- Click OK at the bottom, to close the dialog box and make the changes.
- The Page Setup box closes, and your custom-sized document shows in Word.

Border & Shading

In MS Word we can apply the Borders and Shading to the written text, paragraph, etc. to make them look good and appealing like they pop out of the page.

Applying Borders

The border as the name suggests provides an outer/inner lining on the selected text/paragraph. In MS Word there are multiple types of borders which are as follows:

- Bottom Border– Border at the bottom of the Paragraph.
- Top Border– Border at the top of the Paragraph.
- Left Border– Border on the left side of the Paragraph.
- Right Border– Border on the right side of the Paragraph.
- No Border– Removes all the borders.

- All Borders– Border on all sides of the Paragraph.
- Outside Borders– Border outside the Paragraph.
- Inside Borders– Border inside the Paragraph.
- Inside Horizontal Border– Horizontal borders on both sides inside the Paragraph.
- Inside Vertical Border– Vertical borders on both sides inside the Paragraph.

GEEKSFORGEEKS

Machine Learning is the field of study that gives computers the capability to learn without being explicitly programmed. ML is one of the most exciting technologies that one would have ever come across. As it is evident from the name, it gives the computer that makes it more similar to humans: *The ability to learn*. Machine learning is actively being used today, perhaps in many more places than one would expect.

Python is a high-level, general-purpose and a very popular programming language. Python programming language (latest Python 3) is being used in web development, Machine Learning applications, along with all cutting-edge technology in Software Industry. Python Programming Language is very well suited for Beginners, also for experienced programmers with other programming languages like C++ and Java.

Competitive Programming is a mental sport which enables you to code a given problem under provided constraints. The purpose of this article is to guide every individual possessing a desire to excel in this sport. This article provides a detailed syllabus for Competitive Programming designed by industry experts to boost the preparation of the readers.

Steps to Apply:
Step 1: Select the text/Paragraph to apply Border.
Step 2: Now, go to the Borders tab in the Paragraph menu under the Home bar.
Step 3: Select the border of your choice.

Applying Shades
Shading feature in the Word Document is similar to highlighting the text/Paragraph.

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Steps to Apply:
Step 1: Select the text to apply the Shading.
Step 2: Now, go to the Shading tab in the Paragraph menu under the Home bar.

Step 3: Select the Shading Color of your choice.

Columns

Columns are used in many types of documents, but they are most commonly used in newspapers, magazines, academic journals, and newsletters. In this lesson, you will learn how to insert columns into a document and create column breaks.
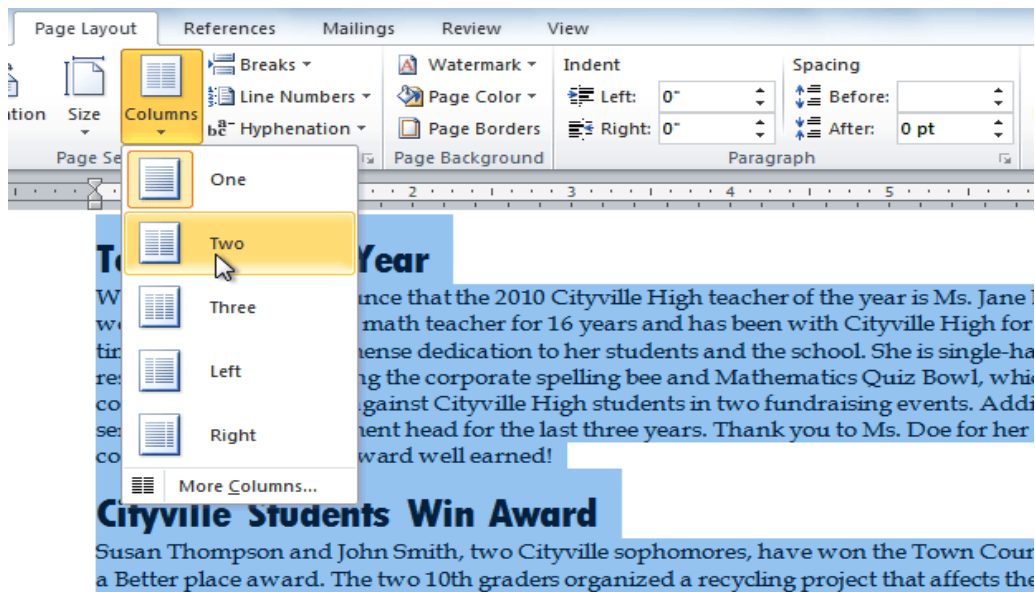
To add columns to a document:

- Select the text you want to format.
- Click the Page Layout tab.
- Click the Columns command. A drop-down menu will appear.
- Select the number of columns you want to insert. The text will then format into columns.
- If you want to remove the columns, click the Columns command and select One for the number of columns.

Header and Footer

Headers and footers are parts of a document that contain special information such as page numbers and the total number of pages, the document title, company logo, any photo, etc. The header appears at the top of every page, and the footer appears at the bottom of every page.

The following steps to add header and footer in a Word document.

Step 1 – Click the Insert tab, and click either the Header button or the Footer button that which needs to be added first.
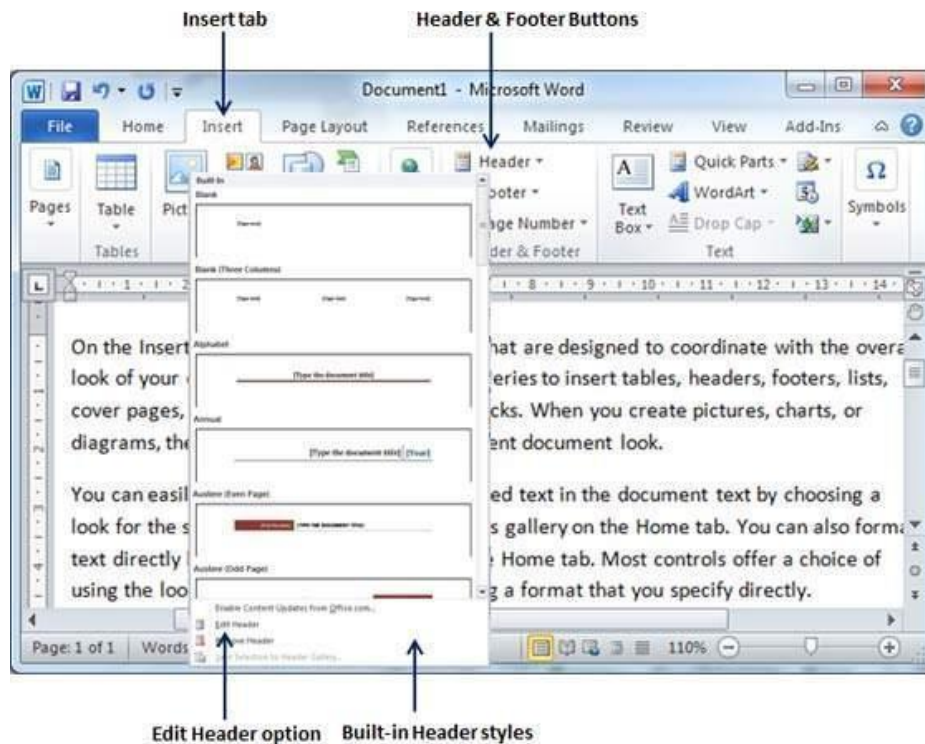
Step 2 – Once you select any of the headers, it will be applied to the document in editable mode and the text in the document will appear dimmed, Header and Footer buttons appear on the Ribbon and a Close Header and Footer button will also appear at the top-right corner.
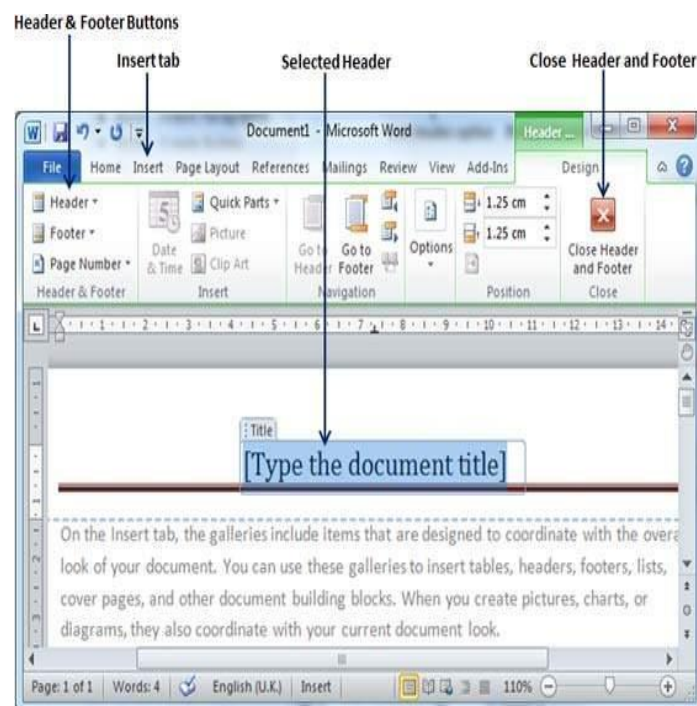
Step 3 – Type the information for document header and click Close Header and Footer to come out of the header insertion mode.

Setting Foot notes and End notes

Footnotes and Endnotes are used to explain, comment on, or provide references to something in a document. Usually, footnotes appear at the bottom of the page, while endnotes come at the end of the document or section.

Add a footnote

- Click where you want to add the footnote. Click Insert > Insert Footnote.
- Word inserts a reference mark in the text and adds the footnote mark at the bottom of the page.
- Type the footnote text.

Add an endnote

- Click where you want to add the endnote. Click Insert > Insert Endnote.
- Word inserts a reference mark in the text and adds the endnote mark at the end of the document.
- Type the endnote text.

Shortcut Keys for Footnotes and Endnotes

- Alt+Ctrl+F to insert a footnote
- Alt+Ctrl+D to insert an endnote

Insert Page Breaks

The following steps is to insert page breaks in a Word document.

Step 1 – Bring the insertion point immediately before the text that has to appear on a new page.

Step 2 – Click the Insert tab, and click the Page Break button available in the Pages group.
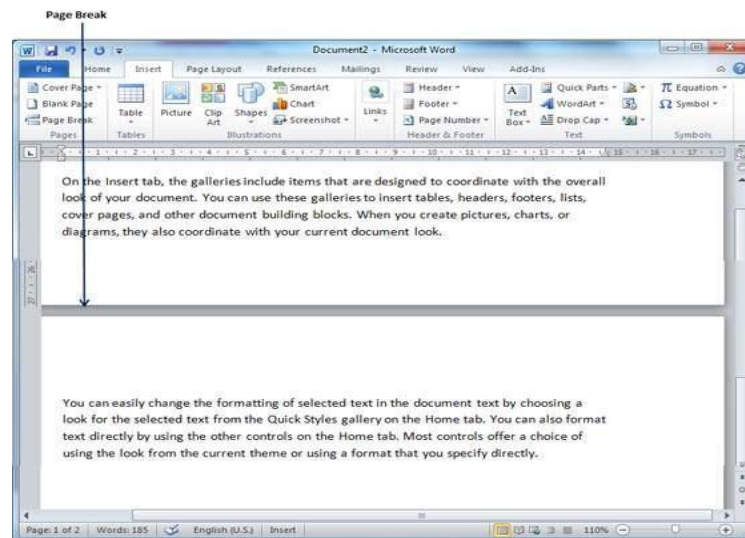
Word inserts a page break and moves all text after the page break onto a new page, use the Ctrl + Enter keys to create a page break at the pointed location.

Column Break and Line Break
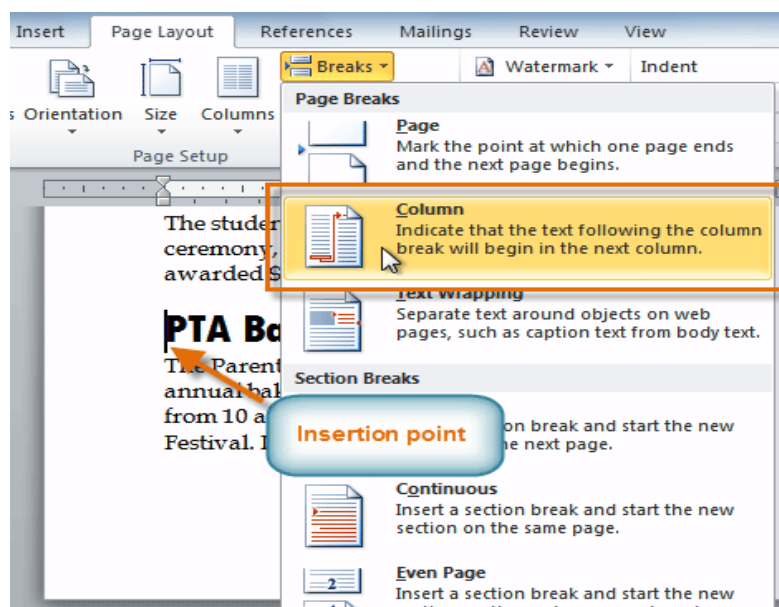
- Place the insertion point where you want to add the break.
- Click the Page Layout tab.
- Click the Breaks command in the Page Setup group. A drop-down menu will appear.
- Select Column / Section Breaks from the list of break types.
- The text will shift to reflect the break.

Insert Frames into Document in Word

1. In Word 2010 click File>Options>Customize Ribbon.
2. In Word Options dialog of 2010 click Customize Ribbon from the left pane, and then check the Developer box in the right pane. See screenshot:
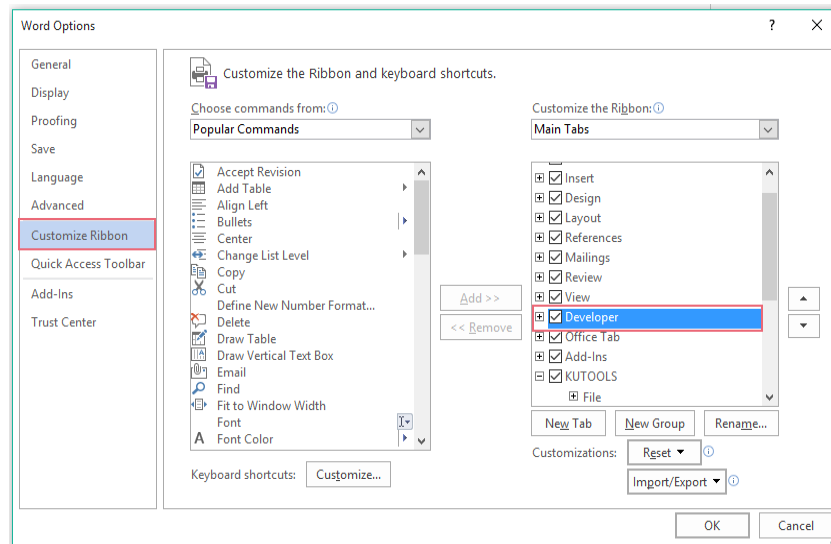
3. Then click **Developer>Legacy Forms>Insert Frame** button, and then drag the mouse to draw a frame as required. See screenshot:
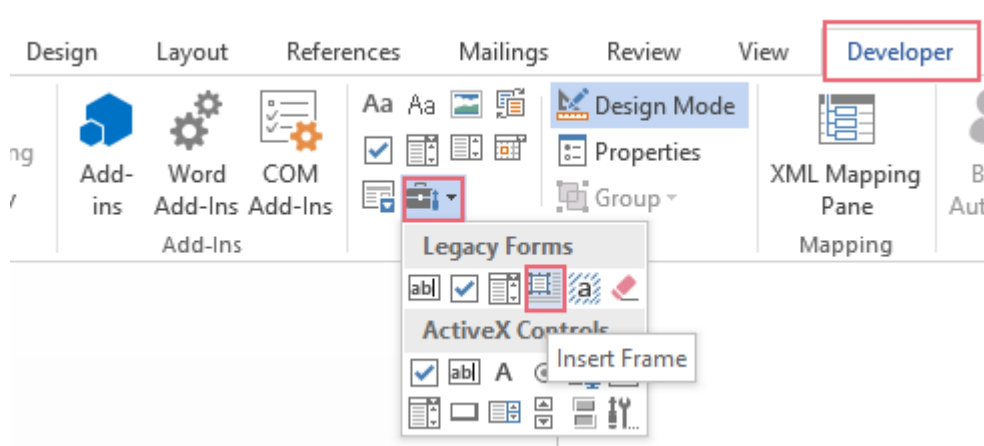
Creating Sections

To create sections to divide the document into sections and each section can have a specific set of formatting that will only apply to the chosen section. Steps to create sections in Word:

1. Place the cursor in the location where to split the document (the new section to begin).
2. Click on the **Page Layout** tab in the *Office Ribbon*.
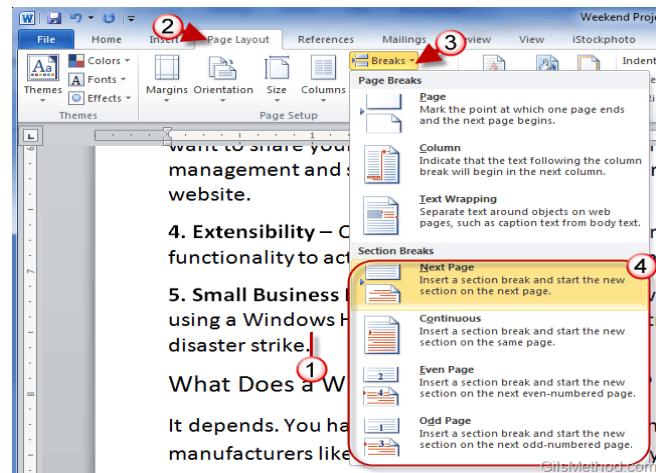
3. Click on the **Breaks** button in the *Page Setup* section.

4. Click on one of the **Section Breaks** listed.

- **Next Page**" Inserts a section break to start a new section on the next page.
- **Continuous**" Inserts a section break and starts the new section on the same page.
- **Even Page** " Inserts a section break and starts a new section on the next even-numbered page.
- **Odd Page** – Inserts a section break and starts a new section on the next even-numbered page.

Anchoring and wrapping

In Word, an anchor symbol in the left margin **shows where a floating object (picture, text box, table) is attached to the text**. To remove the anchor, select the object and delete it from the document.

Anchoring Charts, Graphics and Other Objects

Word contains features which facilitate insertion of graphics, charts, tables, photographs and other types of objects within a document.

Instructions to anchor objects to the text to appear near.

Anchoring objects in a word document

To anchor graphics, tables & charts in your document:

1. Select the item to be anchored

2. Click the **Format** Tab in the **Drawing Tools.**
Note: The Drawing Tools option will only be visible if an image is selected
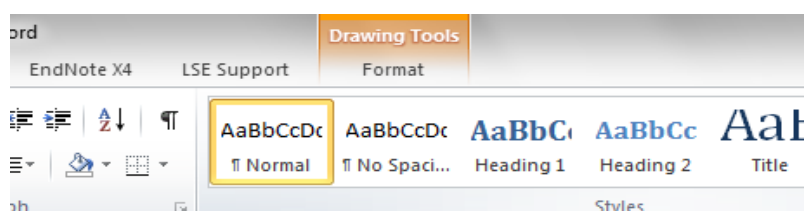
3. Click on the **Wrap Text** button in the **Arrange** group and select **More Layout Options**

4. In the **Text Wrapping** tab, choose any layout other than **In Line with Text**

5. Click the **Position** tab

6. In the Options section at the bottom of the dialogue box, tick both the **Move object with text** and **Lock anchor** boxes.

7. Use the options in the Horizontal and Vertical sections of the same dialogue box to fix the position of the object as required

8. To make text to flow around the object, move to the **Text Wrapping** tab and select the option.

9. Click **OK** to close the Advanced Layout dialog box

10. Click **OK** to activate the settings you've chosen

3.1.4 Setting Document Style

A **style** is a predefined combination of font style, color, and size of text that can be **applied to selected text.**

To select a style:
1. Select the text you want to format.

AdWorks, Inc.

Sales Team Monthly Report

January 2010

2. In the **Style** group on the **Home** tab, hover over each style to see a live preview in the document. Click the **More** drop-down arrow to see additional styles.
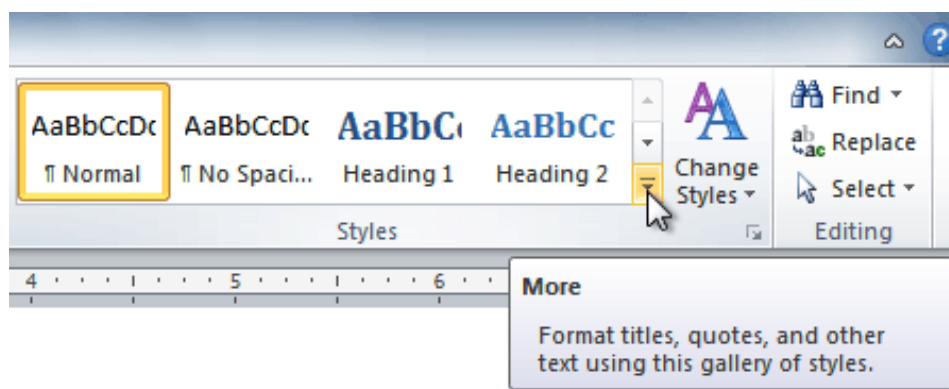
3. Select the style you want. The **selected text appears formatted** in the style.
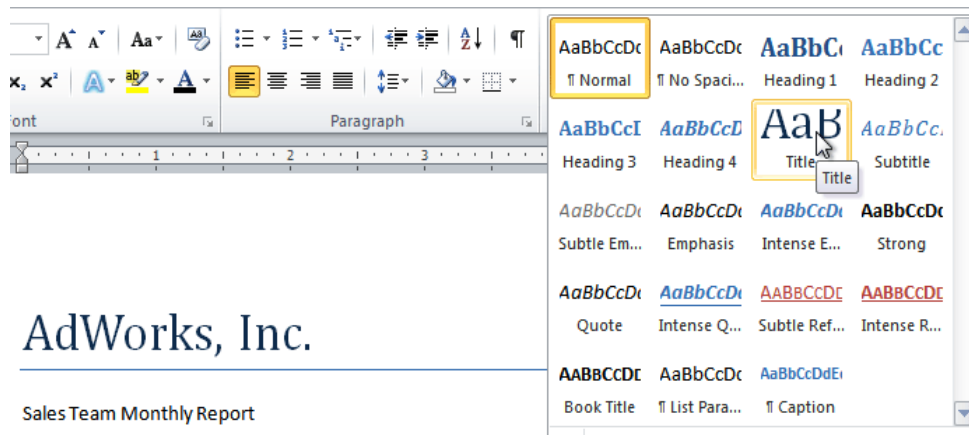
To apply a style set

Style sets include a combination of title, heading, and paragraph styles. Style sets allows to **format all of the elements of the document** at once.

Table of Contents

A table of contents (or TOC) is a list of headings in the order in which they appear in the document. List of headings can be set, which should be a part of the table of contents. A table of content helps in navigating through a Word document by providing associated page numbers and direct links to various headings available on those pages.

Create Table of Contents

The following will help you to create Table of Contents in your Microsoft Word using various levels of headings.

Step 1 – Consider a document having different levels of headings.
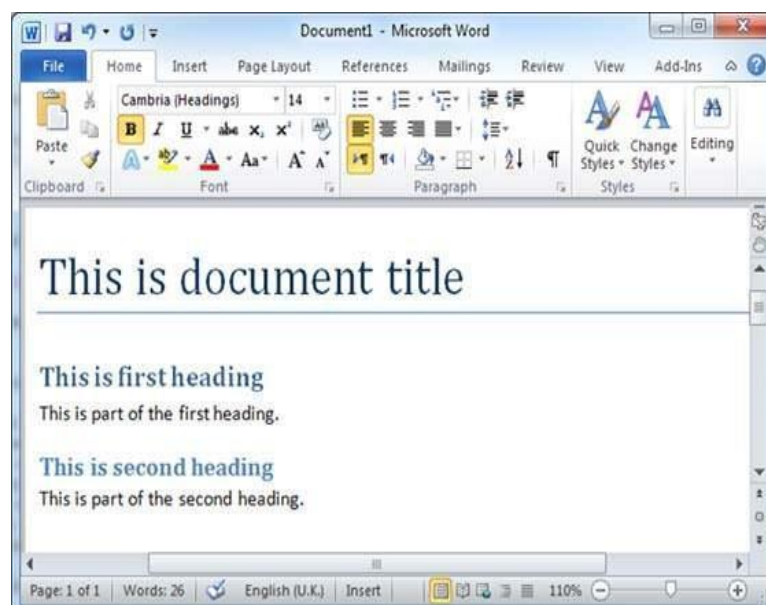
Step 2 – insert a table of content anywhere in the document, but the best place is always at the beginning of the document and then click the References tab followed by the Table of Content button; this will display a list of Table of Contents options.
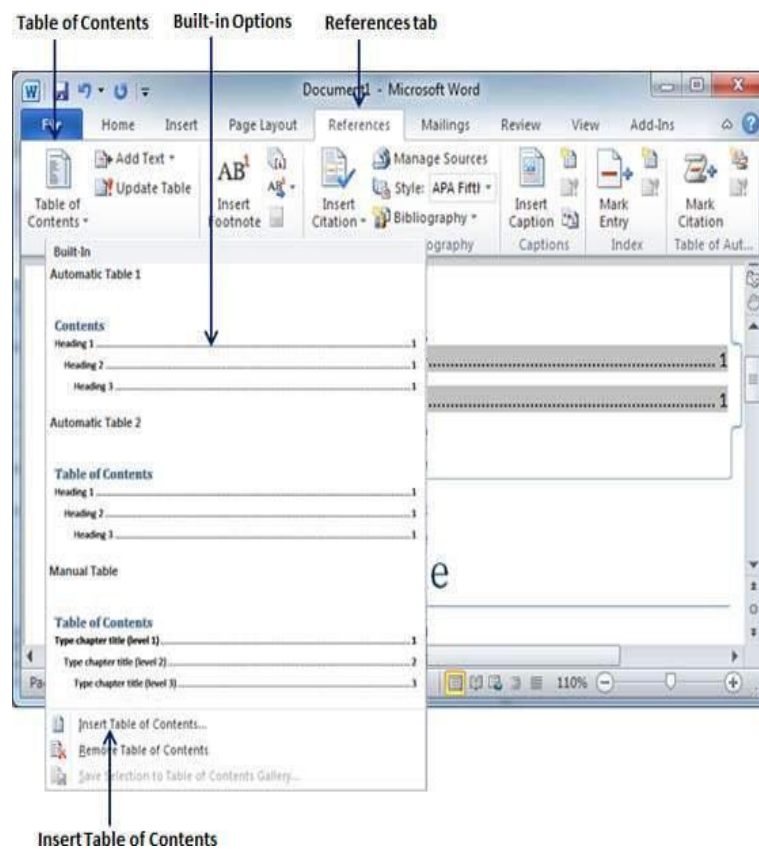
Step 3 – Select any of the displayed options by simply clicking on it. A table of content will be inserted at the selected location.
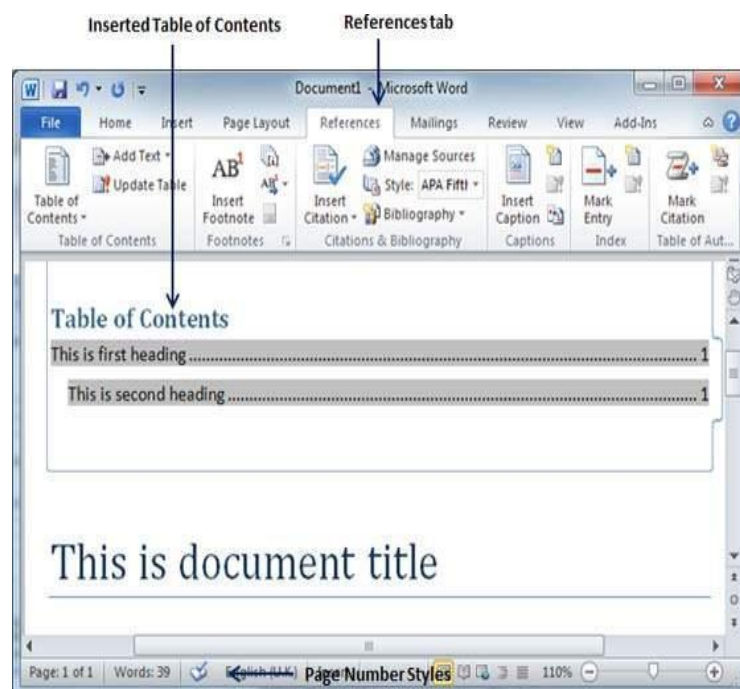
Step 4 − Select number of levels of headings in the table of content. Click on the Insert Table of Content option available in the option menu, dialog box appears, select the number of levels needed in table of content. Turn ON or turn OFF the Show Page Numbers option. Once done, click the OK button to apply the options.
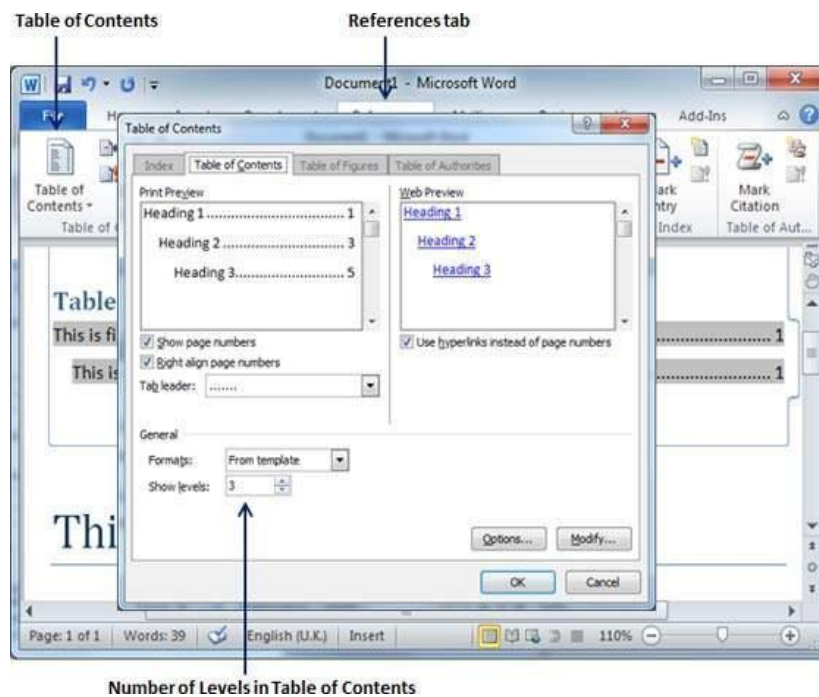
Press the Ctrl key and then click over the any link available in the table of content, it will take you directly to the associated page.

Index

An index lists the terms and topics that are discussed in a document, along with the pages that they appear on. To create an index, mark the index entries by providing the name of the main entry and the cross-reference in document, and then build the index.

Mark the entries

1. Select the text you'd like to use as an index entry, or just click where you want to insert the entry.
2. On the References tab, in the Index group, click Mark Entry.

3. You can edit the text in the Mark Index Entry dialog box.
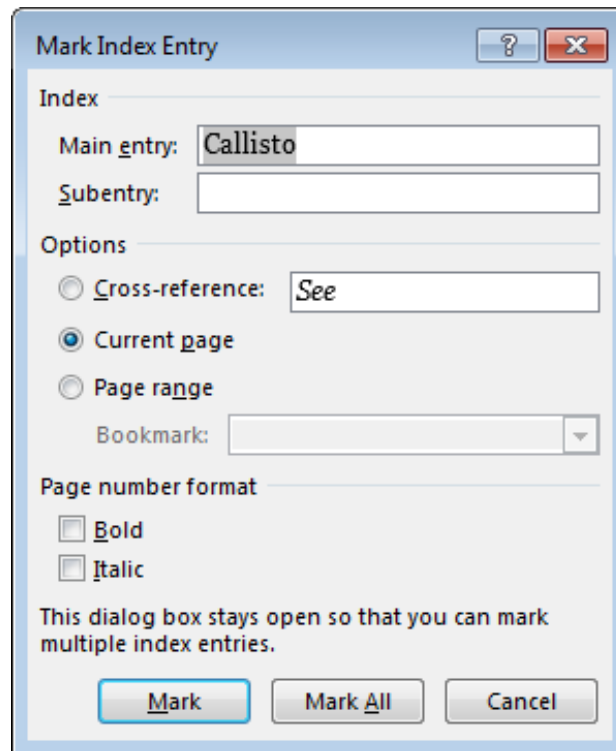
- You can add a second-level in the Subentry box. If you need a third level, follow the subentry text with a colon.
- To create a cross-reference to another entry, click Cross-reference under Options, and then type the text for the other entry in the box.
- To format the page numbers that will appear in the index, select the Bold check box or Italic check box below Page number format.

4. Click Mark to mark the index entry. To mark this text everywhere it shows up in the document, click Mark All.
5. To mark additional index entries, select the text, click in the Mark Index Entry dialog box, and then repeat steps 3 and 4.

Create the index

After you mark the entries, you're ready to insert the index into your document.
1. Click where you want to add the index.
2. On the References tab, in the Index group, click Insert Index.

3. In the Index dialog box, you can choose the format for text entries, page numbers, tabs, and leader characters.
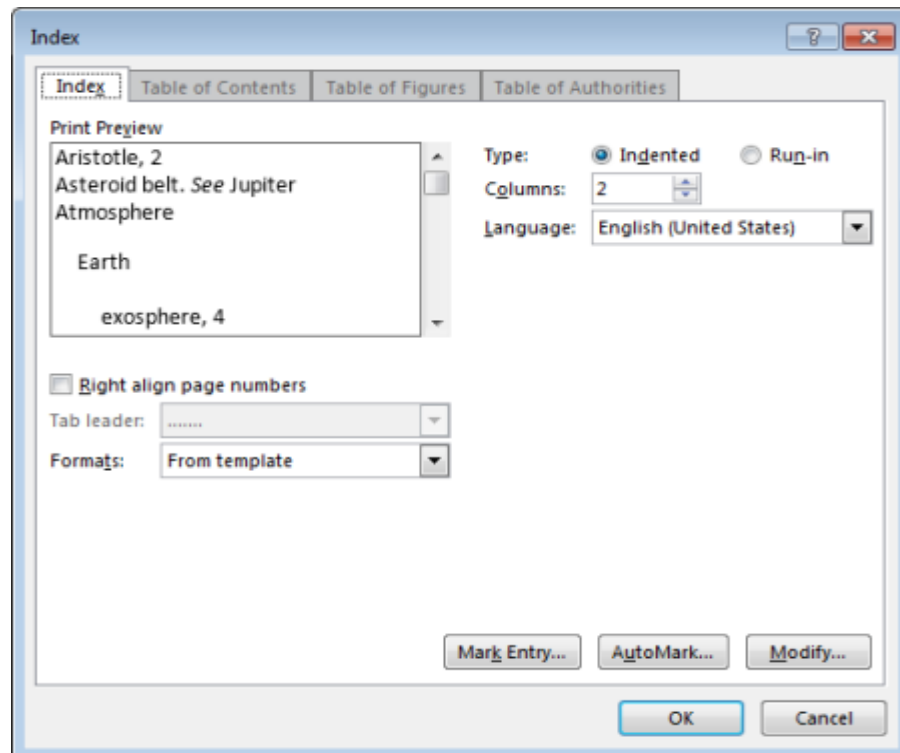
4. You can change the overall look of the index by choosing from the Formats dropdown menu. A preview is displayed in the window to the top left.
5. Click OK.

Page Numbering

Add Page Numbers
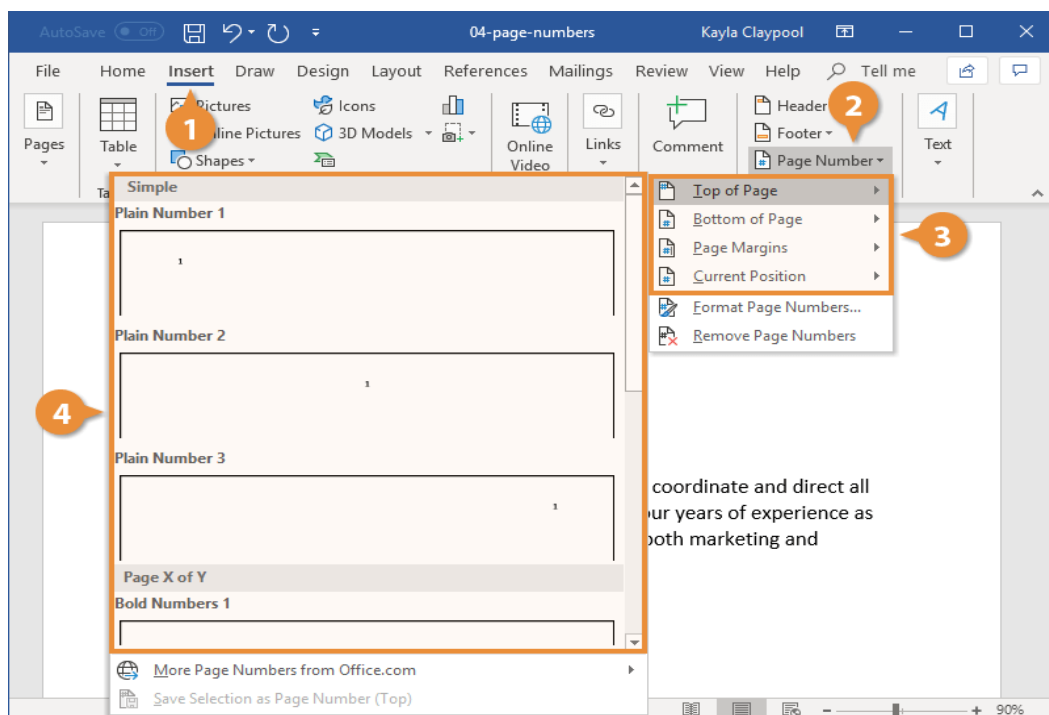
1. Click the Insert tab.
2. Click the Page Number button.
   Next, choose where you want the page number to appear. You can choose either the header or footer, in the side margins, or where the text cursor is currently placed.
3. Select a part of the page.
   There are plenty of built-in designs available, from plain numbers to more stylized numbers and shapes.
4. Select a page number style.
   The page number is added as a new page header or footer. The page number will increment automatically for each page, while the other text and decoration will stay the same.
5. Click the Close Header and Footer button. The page number is added.

Date & Time

1. Click the Insert tab.
2. Click the Date and Time button.
3. Select a date format.
4. Check the Update automatically check box.
   If the Update automatically check box isn't checked, the date will be inserted as static text.
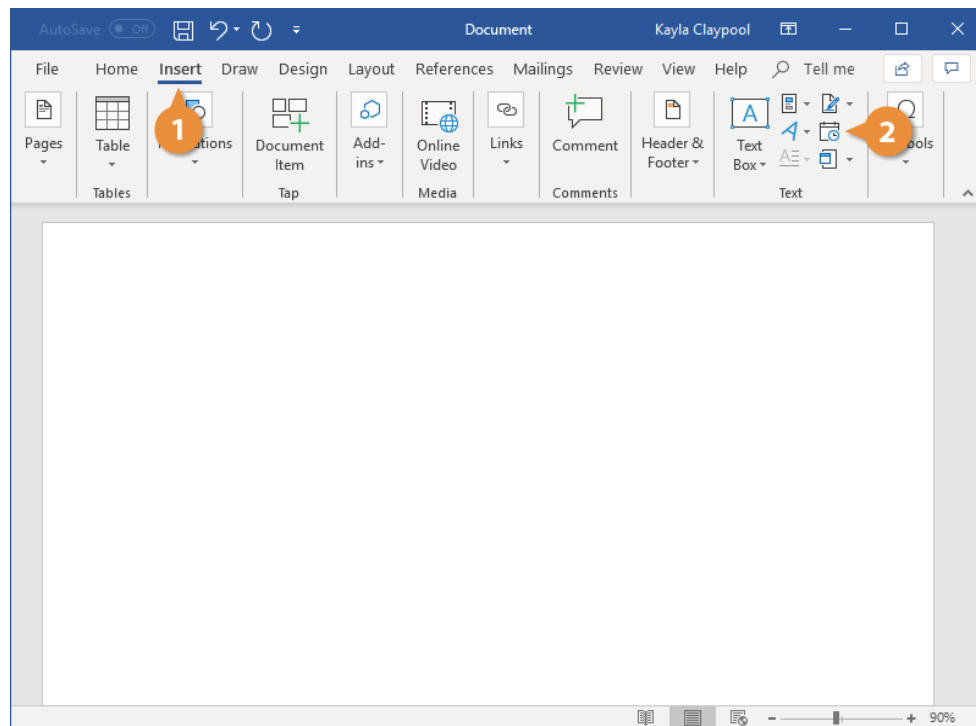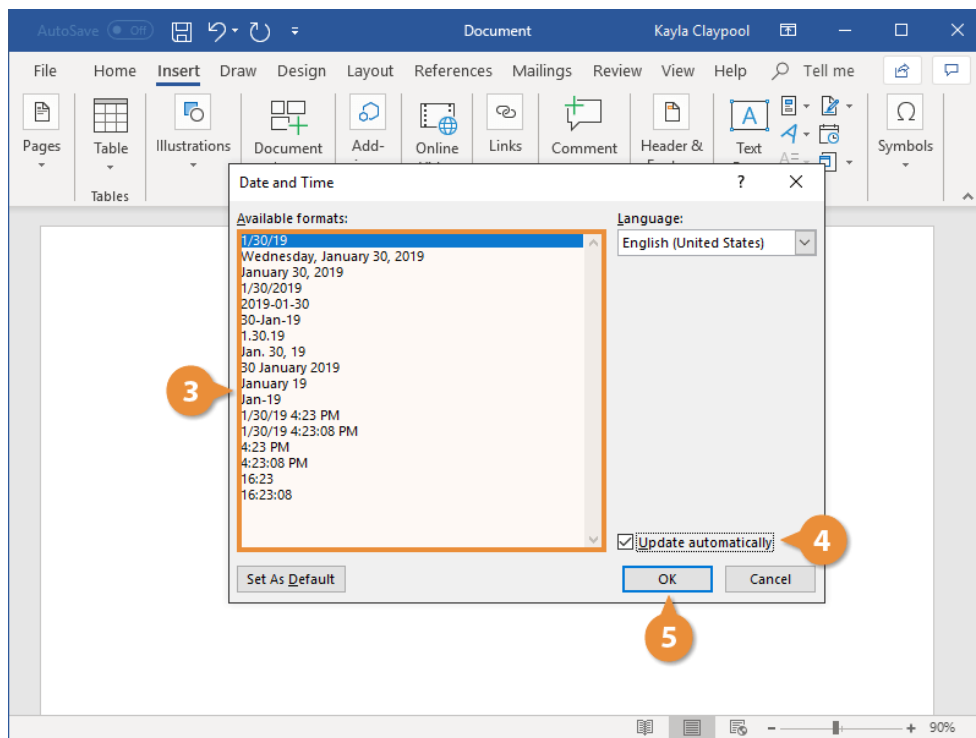
If it is checked, the date will be inserted as a field that can be updated automatically to reflect the current date.

5. Click OK.

The date and time field is inserted. By default, the field displays the current date and/or time in the selected format.

Author

By default, the author of a document is set to the user name which entered during installation of Word. However, you can change the user name, thus changing the main author, as well as add authors to or remove authors from a document.

1. Click File, and then look for Author under Related People on the right.
2. Right-click the author name, and then click Edit Property.
3. Type a new name in the Edit person dialog box.

Creating Master Document

A master document is a Word file that contains links to a set of other, separate Word files, called subdocuments. The content of the subdocuments is not inserted into the master document. The master document only contains links to the subdocuments. This allows to edit the subdocuments separately. Any changes made to subdocuments are incorporated into the master document automatically. If there are multiple people working on a single document, a master document allows to send different parts of the document to different people to work on.

Creating Web pages

1. Open Word.

2. When the application opens, from the "File" menu, choose "Open." Then, from the list of available documents, double click the document you wish to convert. Note: When the document opens, familiarize yourself with the layout. The converted document will not look exactly like the original.

3. From the "File" menu, choose "Save as Web Page." Click "Save." Note: When you convert a document to HTML format, you retain the original document as a separate file. The new HTML file has the same file name but a different file extension (.htm).

4. When the conversion is complete, the converted file appears in the window (filename.htm). View the HTML source code file by selecting the "View" menu, then "HTML Source."

5. Close your document by selecting the "File" menu, then choosing "Close." Click the Close button (the "X" in the upper-right corner) to close Word.

6. Open your HTML file in a WWW browser to see how it will appear. You can adjust the layout of the page if necessary using Mozilla's editing options.

7. Next, you must move your files to your Web directory using SSH Secure Shell file transfer software.

8. Once you have published your page, view it in Mozilla to see how it will appear to the world.

3.1.5 Creating Tables

A table is a structure of vertical columns and horizontal rows with a cell at every intersection. Each cell can contain text or graphics, and can format the table in any way. Usually the top row in the table is kept as a table header and can be used to put some informative instruction.

Create a Table

The following steps to understand how to create a table in a Word document.

Step 1 – Click the Insert tab followed by the Table button. This will display a simple grid as shown below. When the mouse is moved over the grid cells, it makes a table in the table that appears in the document. Pick the desired number of rows and columns.
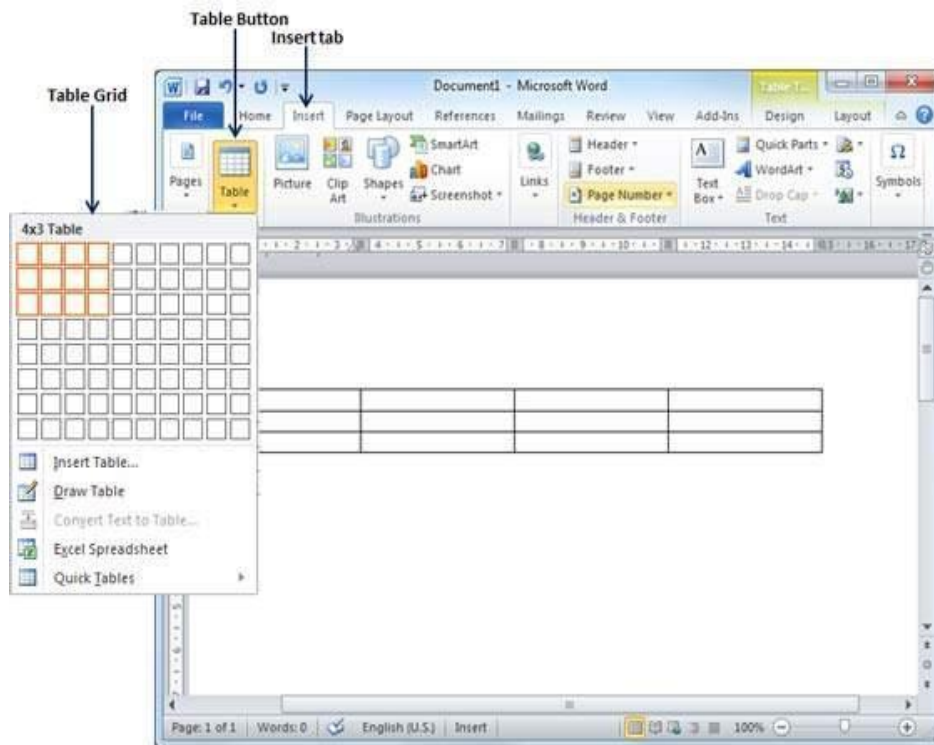
Step 2 − Click the square representing the lower-right corner of the table, which will create an actual table in the document and Word goes in the table design mode.

Delete a Table

Following are the simple steps to delete an existing table from a word document.

Step 1 − Click anywhere in the table to delete.

Step 2 − Click the Layout tab, and click the Delete Table option under the Delete Table Button to delete the complete table from the document along with its content.
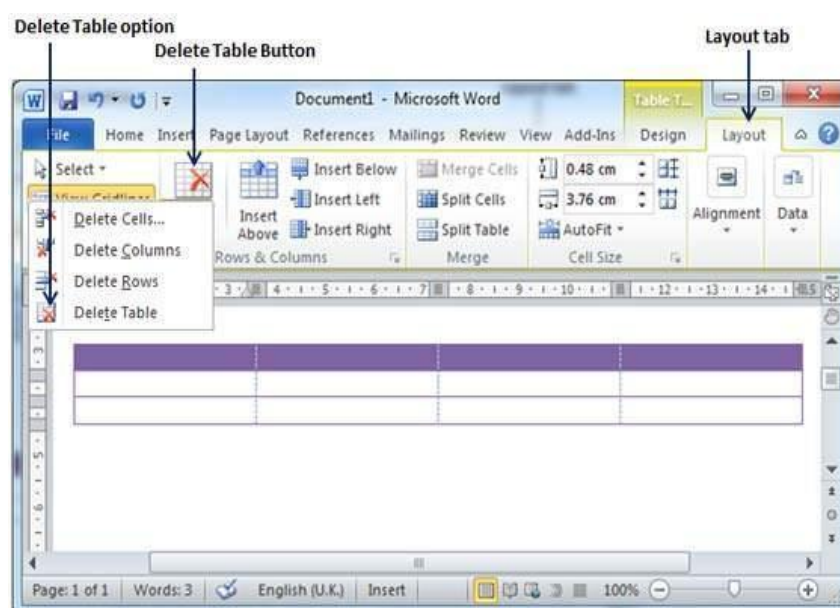
Rows and Columns

A table is a structure of vertical columns and horizontal rows with a cell at every intersection. A Word table can contain as many as 63 columns but the number of rows is unlimited.

Add a Row

Following are the simple steps to add rows in a table of a word document.

Step 1 − Click a row where to add an additional row and then click the Layout tab.

Step 2 − Now use the Row & Column group of buttons to add any row below or above to the selected row,click the Insert Below button- it will add a row just below the selected row.

Click the Insert Above button-it will add a row just above the selected row.

Delete a Row

The following steps will help you delete rows from a table of a Word document.

Step 1 − Click a row which to delete from the table and then click the Layout tab.

Step 2 − Click the Layout tab, and then click the Delete Rows option under the Delete Table Button to delete the selected row.

Add a Column

The following steps will help you add columns in a table of a Word document.

Step 1 − Click a column where to add an additional column and then click the Layout tab.

Step 2 − Now use the Row & Column group of buttons to add any column to the left or right of the selected column. Click the Insert Left button- it will add a column just left to the selected column..

Click the Insert Right button, it will add a column just next to the selected column.

Delete a Column

Following are the simple steps to delete columns from a table of a word document.

Step 1 − Click a column to delete from the table and then click the Layout tab.

Step 2 − Click the Layout tab, and click the Delete Column option under the Delete Table Button to delete the selected column.

Splitting Table

Microsoft Word allows splitting a table into multiple tables but a single operation will always divide a table into two tables. Following are the simple steps to split a table into two tables in a Word document.

Step 1 – Bring the mouse pointer position anywhere in the row that should appear as the first row of the new table.

Step 2 – Now click the Layout tab and then click the Split Table button which will split the table into two tables and the selected row will become the first row of the lower table.

After splitting the table into two tables, it can be further divide it into two parts and can continue dividing the Word tables as long as a table has more than one row.

Merging Cells

The following steps will help to merge table cells in a Word document.

Step 1 – Bring the mouse pointer position inside the first cell that to be merged. Now press the Shift key and click the cells around the cell which should be merged into the first cell. This will highlight the cells which you click and they will be ready to be merged.

Step 2 – Now click the Layout tab and then click the Merge Cells button which will merge all the selected cells.

Split a Cell

The following steps to split a cell into two sub-cells of a table available in word document.

Step 1 – Bring your mouse pointer position inside the cell that has to be divided into multiple cells.

Step 2 – Now click the Layout tab and then click the Split Cells button; this will display a dialog box asking for the number of rows and columns to be created from the selected cell.

Step 3 – Select the desired number of rows and columns that have to go into the resultant cell and finally click the OK button to apply the result.

Add Borders to Table

The following steps will help you add borders in a table cell available in Word document.

Step 1 – Select the table to add border. To select a table, click over the table anywhere which will make the Cross icon visible at the top-left corner of the table. Click this cross icon to select the table.

Step 2 – Click the Border button to display a list of options to put a border around the selected table. Select any of the option available by simply clicking over it.

Step 3 – Try to add and remove different borders like left, right, top or bottom by selecting different options from the border options.

Step 4 – Apply border to any of the selected row or column.

Step 5 – To delete the existing border, simply select the No Border option from the border options.

Sorting in Table

Sort the data in a Word 2010 table as well, which can make it a simpler process to get the data into a format that is suitable for the information that are presented with the document.

Step 1: Open the Word document that contains that table that is to be sorted.
Step 2: Select the table data that to be sorted by.
Step 3: Click the **Layout** tab under **Table Tools** at the top of the window.
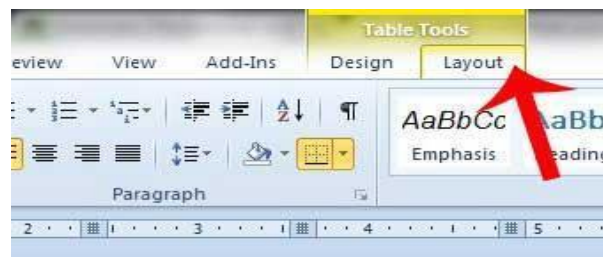
Step 4: Click the **Sort** button in the **Data** section of the ribbon at the top of the window.
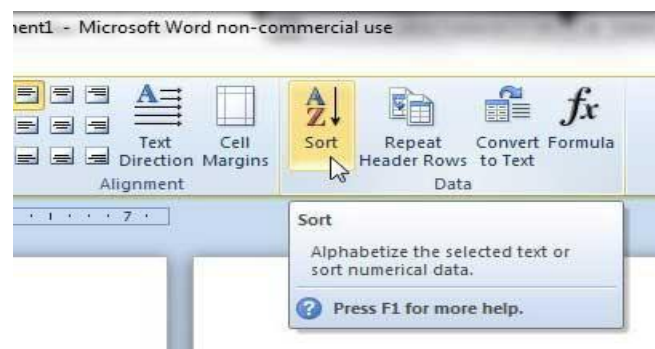
Step 5: Set the parameters for the sort criteria, then click the **OK** button at the bottom of the window.
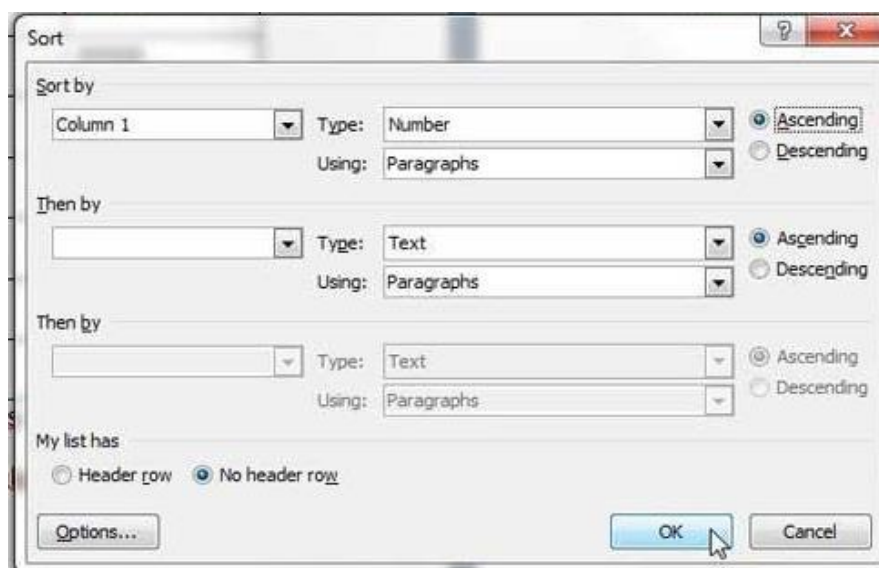
Add a Formula

Following are the simple steps to add formula in a table cell available in Word document.

Step 1 − Consider the following table with the total number of rows. Click in a cell that should contain the sum of the rows.

Step 2 − Now click the Layout tab and then click the Formula button; this will display a Formula Dialog Box which will suggest a default formula, which is =SUM(LEFT).

Select a number format using Number Format List Box to display the result or change the formula using the Formula List Box.
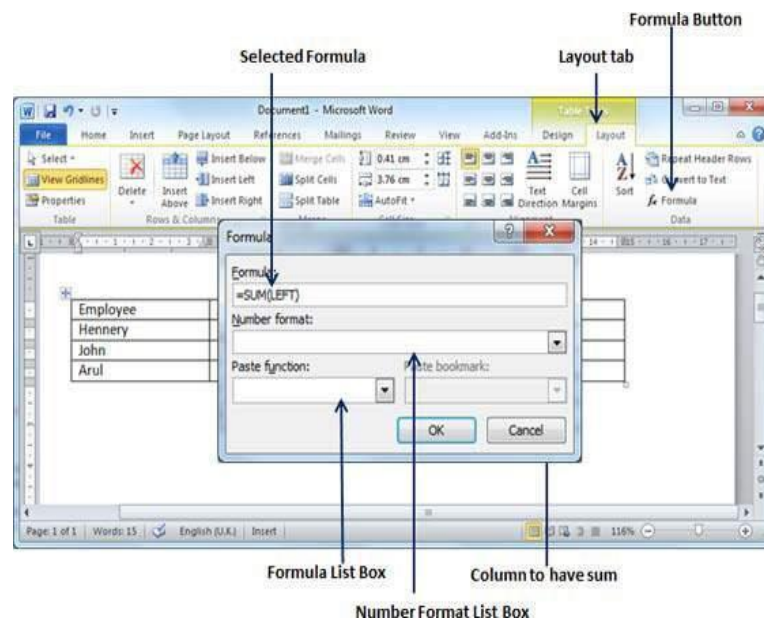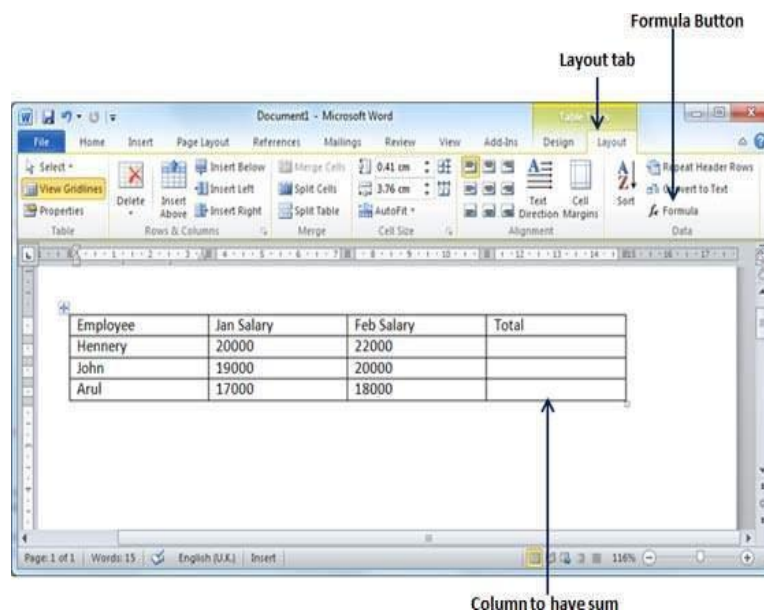
Step 3 − Now click OK to apply the formula and see that the left cells have been added and the sum has been put in the total cell.

Layout tab

Total of the row
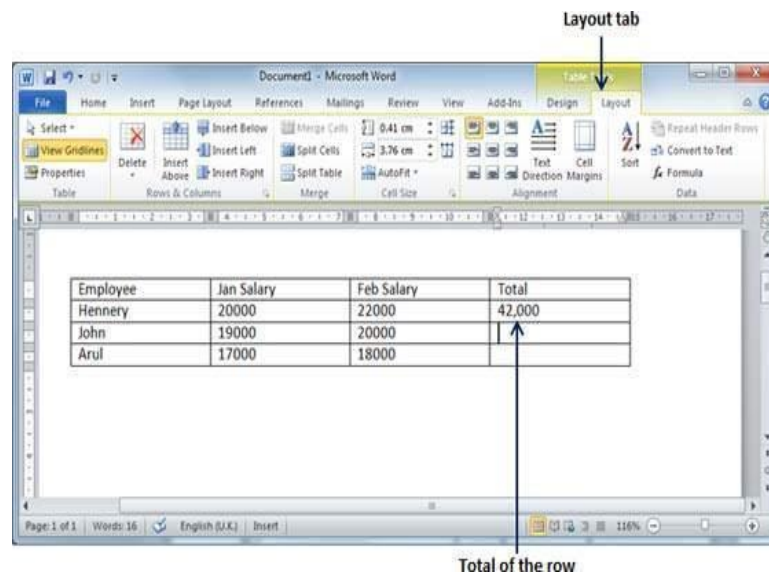
Cell Formulae

The Formula dialog box provides the following important functions to be used as formula in a cell.

Word formulae uses a reference system to refer to an individual table cells. Each column is identified by a letter, starting with A for the first column, B for the second column, and so on. After the letter comes the row number. Thus, the first cell in the first row is A1, the third cell in the fourth row is C4, and so on.

3.1.6 Drawing

Inserting Clip Arts

Adding clip art in document can be a great way to illustrate important information or add decorative accents to existing text.

- Select the Insert tab.
- Click the Clip Art command in the Illustrations group.
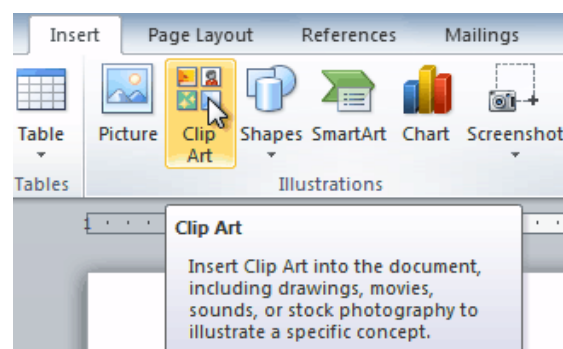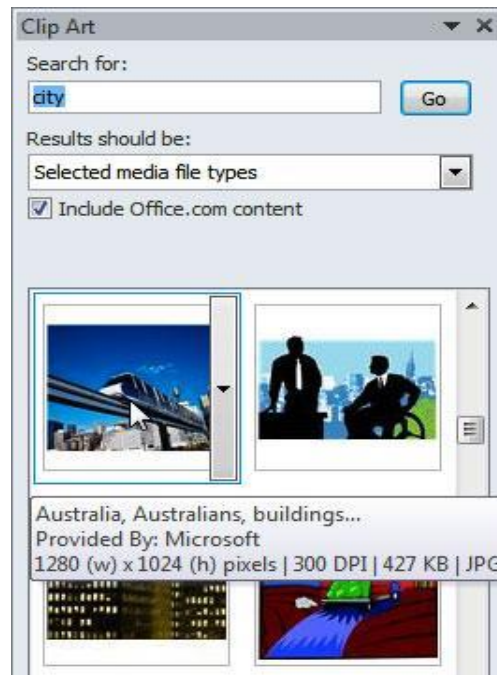
- The clip art options appear in the task pane to the right of the document.
- Enter keywords in the Search for: field that are related to the image you want to insert.
- Place your insertion point in the document where you want to insert the clip art.
- Click an image in the Clip Art pane. It will appear in the document.

Adding Picture in Document

The following steps will help you add an existing picture in your word document. It is assumed that you already have a picture available on your machine before you add this picture in your Word document.

Step 1 – Click on the document where to add a picture.

Step 2 – Click the Insert tab and then click the Picture option available in illustrations group, which will display the Insert Picture dialog box.

Step 3 – Select a required picture using the Insert Picture dialog box. Click the Insert button, selected picture will be inserted into the document.

Adding Shapes

- Select the Insert tab, then click the Shapes command. A drop-down menu of shapes will appear.
- Select the desired shape.
- Click, hold, and drag in the desired location to add the shape to your document.
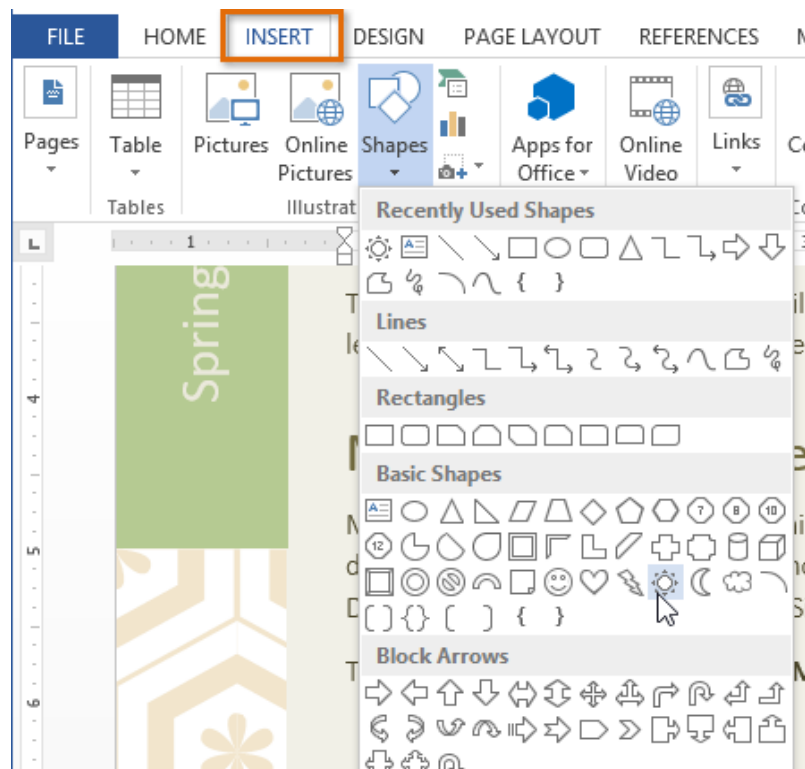
3.1.7 Tools

Word Completion

Autocomplete, or **word completion**, is a feature in which an application predicts the rest of a word a user is typing. In Android and iOS smartphones, this is called **predictive text.** In graphical user interfaces, users can typically press the tab key to accept a suggestion or the down arrow key to accept one of several.

Autocomplete speeds up human-computer interactions when it correctly predicts the word a user intends to enter after only a few characters have been typed into a text input field. It works best in domains with a limited number of possible words (such as in command line interpreters), when some words are much more common (such as when addressing an e-mail), or writing structured and predictable text.

Check Spelling and Grammar using Review tab

Here is the simple procedure to find out the spelling mistakes and fix them −

Step 1 − Click the Review tab and then click the Spelling & Grammar button.

Step 2 − A Spelling and Grammar dialog box will appear and will display the wrong spellings or errors in grammar.

Ignore, ignore all, add to dictionary,change, change all, autocorrect.

Following are the different options in case you have grammatical mistake −

Next Sentence,explain,options,undo

Step 3 – Select one of the given suggestions you want to use and click the Change option to fix the spelling or grammar mistake and repeat the step to fix all the spelling or grammar mistake.

Step 4 – Word displays a dialog box when it finishes checking for spelling and grammar mistakes, finally Click OK.
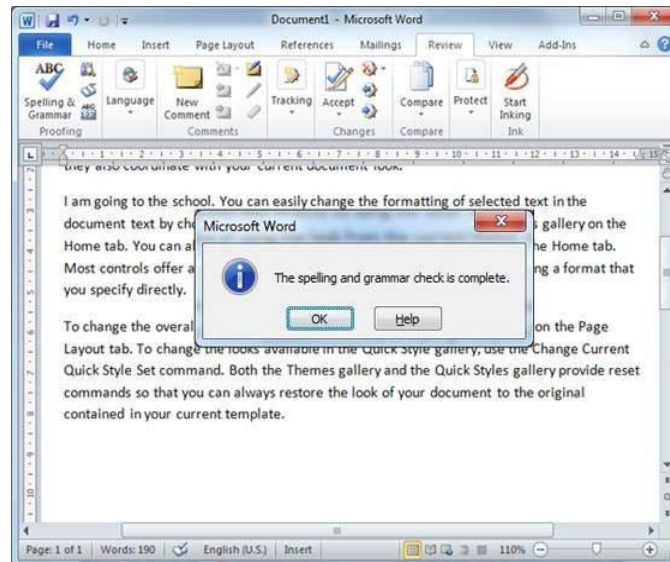
Mail Merge

Mail Merge is a useful tool that will allow to produce multiple letters, labels, envelopes, nametags, and more using information stored in a list, database, or spreadsheet. While performing a Mail Merge two documents are required (i) **Word document** (also can start with an existing one or create a new one) and (2) a **recipient list**, which is typically an **Excel workbook.**

To use Mail Merge
1. Open an existing Word document, or create a new one.
2. Click the Mailings tab.
3. Click the Start Mail Merge command.
4. Select Step by Step Mail Merge Wizard.
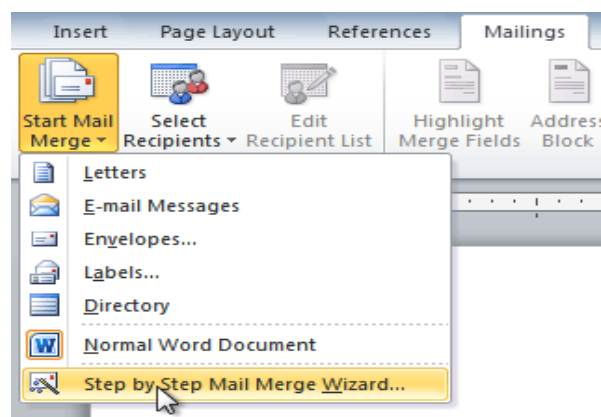
The Mail Merge task pane appears follow the ough the six main steps to complete a merge. The following is an example of how to create a form letter and merge the letter with a recipient list.

Step 1:

    1. Choose the type of document you want to create. In this example, select Letters.
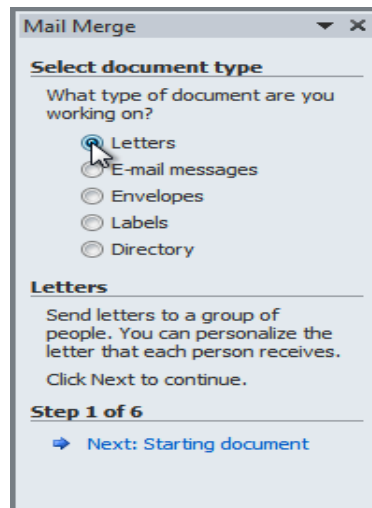
    2. Click Next: Starting document to move to Step 2.

Step 2:

    1. Select Use the current document.
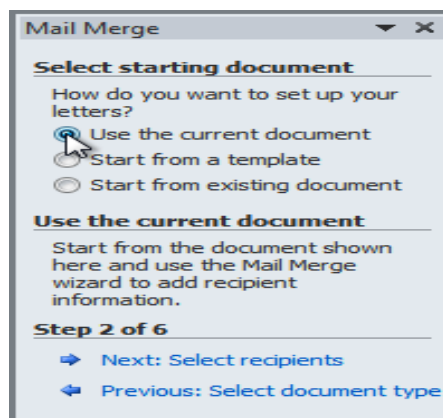
    2. Click Next: Select recipients to move to Step 3.

Step 3:

From the address list so Word can automatically place each address into the document. The list can be in an existing file, such as an Excel workbook, or type a new address list from within the Mail Merge Wizard.

    1. From the Mail Merge task pane, select Use an existing list, then click Browse.
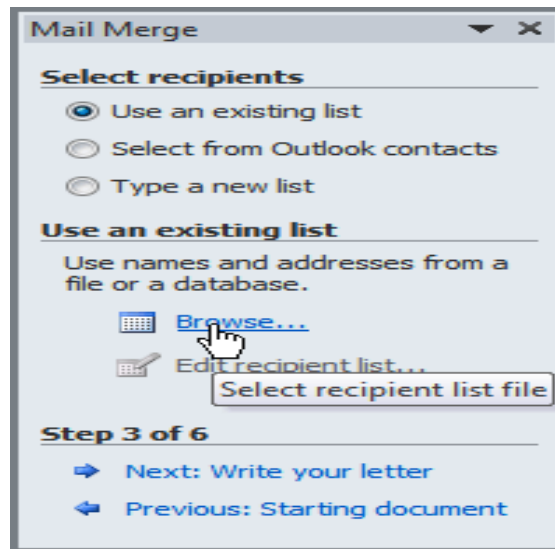
2. Locate your file in the dialog box, then click Open.
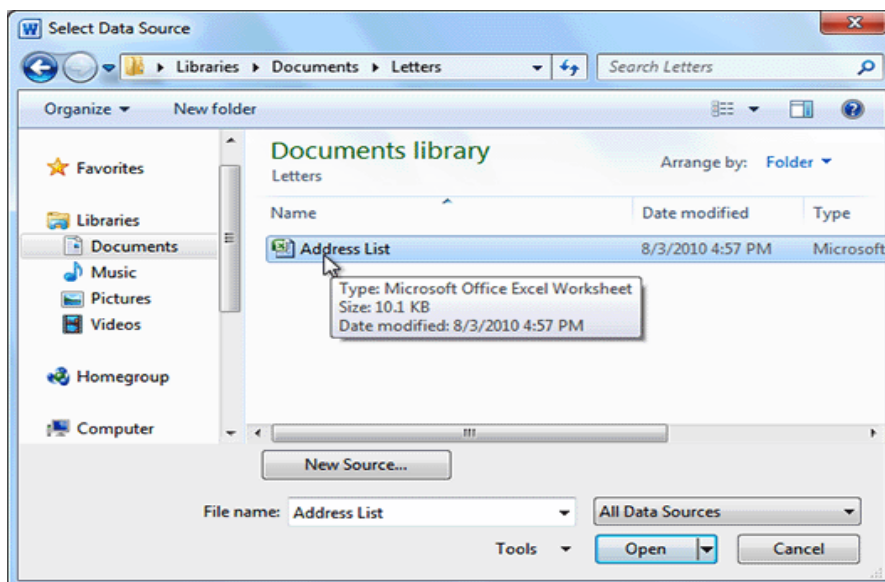
3. If the address list is in an Excel workbook, select the worksheet that contains the list, then click OK.
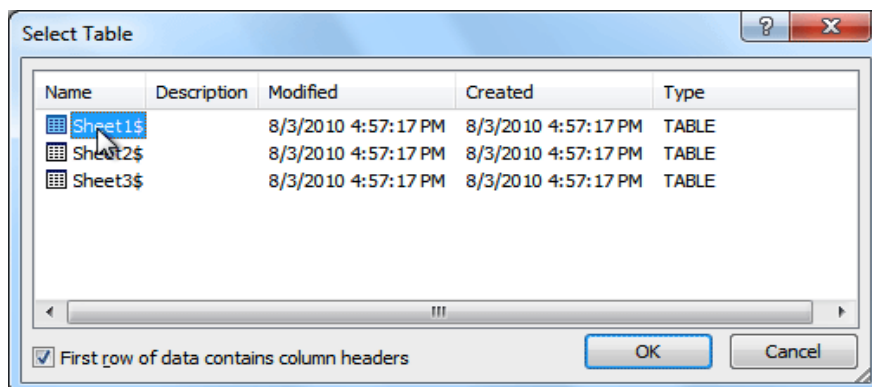
4. In the Mail Merge Recipients dialog box,can check or uncheck each recipient to control which ones are used in the merge. Click OK to close the dialog box.
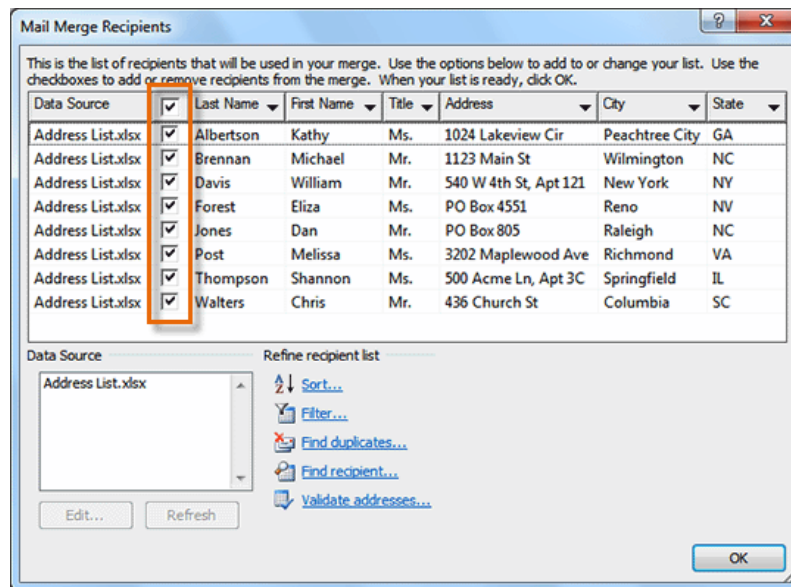
5. From the Mail Merge task pane, click Next: Write your letter to move to Step 4.

Step 4:

When it's printed, each copy of the letter will basically be the same, except the recipient data—like the name and address—will be different on each one. Add placeholders for the recipient data so Mail Merge knows exactly where to add the data. In this step if the Mail Merge is with an existing letter, make sure the file is open.

To insert recipient data

1. Place the insertion point in the document where to add the information to appear.
2. Select Address block, Greeting line, Electronic postage, or More items from the task pane.
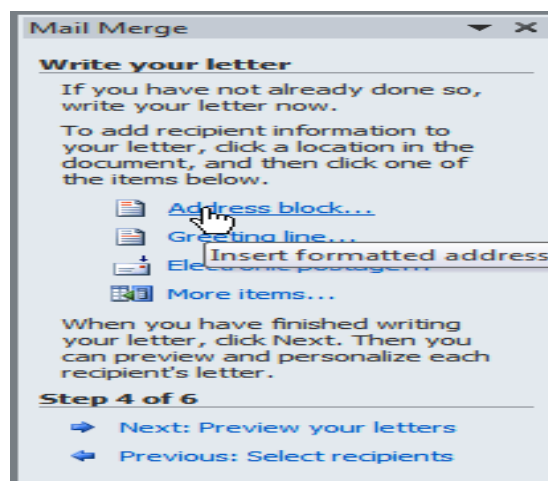
3. Depending on the selection, a dialog box may appear with various options. Select the desired options, then click OK.
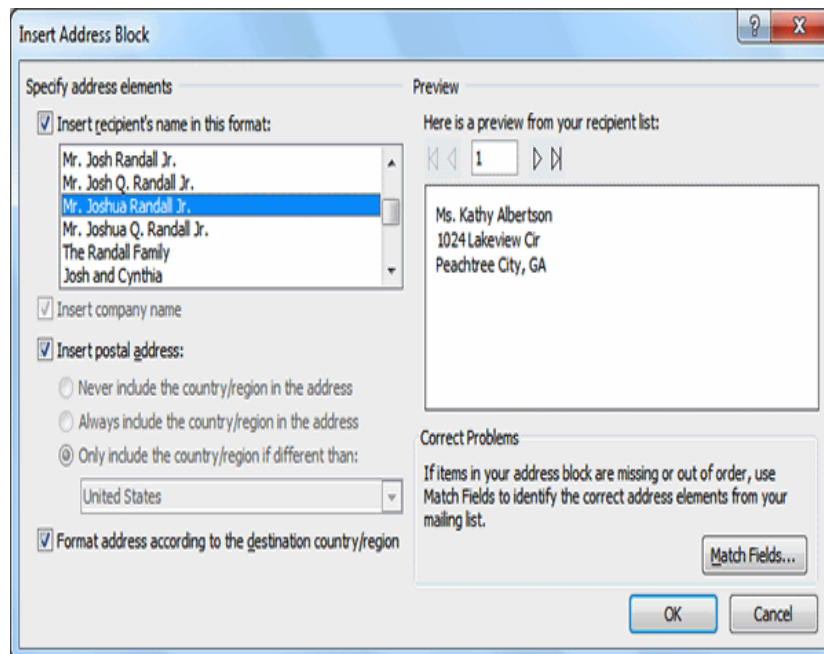
4. A placeholder appears in the document (for example: «AddressBlock»).
5. Repeat these steps each time to enter information from the data record.
6. From the Mail Merge task pane, click Next: Preview the letters to move to Step 5.

Step 5:

1. Preview the letters to make sure information from the recipient list
2. Click Next: Complete the merge, followed by printing

Template

Microsoft Word template is a collection of styles which defines paragraph styles for regular text paragraphs, a title, and different levels of headings. Can also use any of the already existing templates for the Word document or can design a template which can be used for all the company documents.

Using Existing Template

A template is selected at the time when to create a new blank document.

Step 1 – To start a new document, click the File tab and then click the New option; this will display the Available Templates.
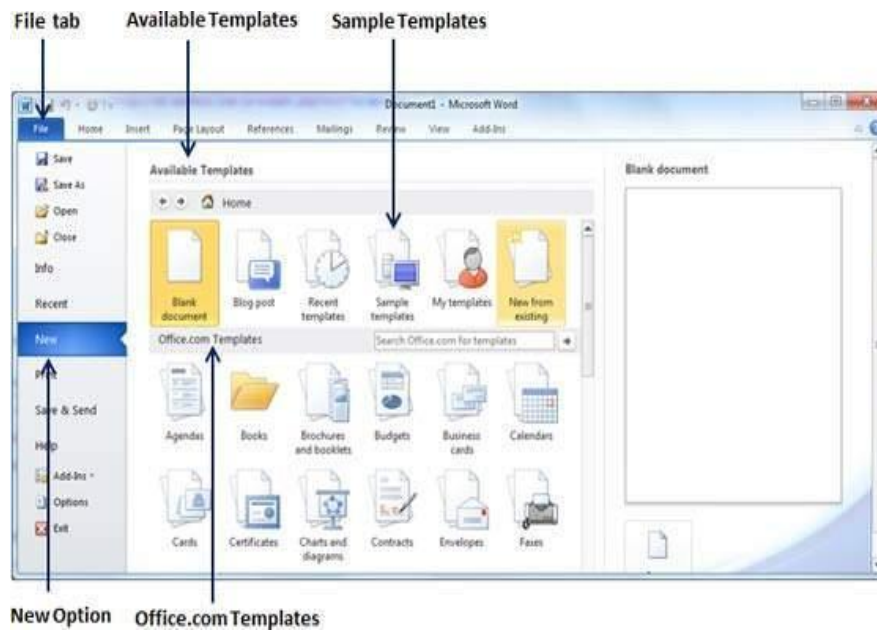
Step 2 – Microsoft Word provides a list of templates arranged under Sample Templates

Step 3 – Browse a list of available templates and finally select one by double-clicking over the template. While selecting a template select the Document Option available in the third column. This opens the document with predefined setting with which can modify document title, author name, heading, etc. based on the document requirement. The file type is .dotx.

Creating contents for books

Whether you are working on a school project or creating advertising materials, a decent booklet can come in handy and inspire the wow factor. Using Microsoft Word 2010, you can create professional-looking booklets and print them out.

Few simple steps

How-To Create Booklets Using Microsoft Word 2010

1. *Click* **File,** then **Print**, and at the bottom of the list, click **Page Setup**.

2. In the Page Setup window, click the **Margins** tab. Then under Multiple pages, select **Book fold** from the drop menu. Under Sheets, either select**All** or the exact amount of pages.

3. Create the **booklet content**, but keep in mind that content will print differently than a regular document. Page 1 and 4 will be printed on the same side, as Page 2 and 3 will be on the opposite side. Each page size shrinks to the scale of half a regular page in landscape mode. The image below should help illustrate.
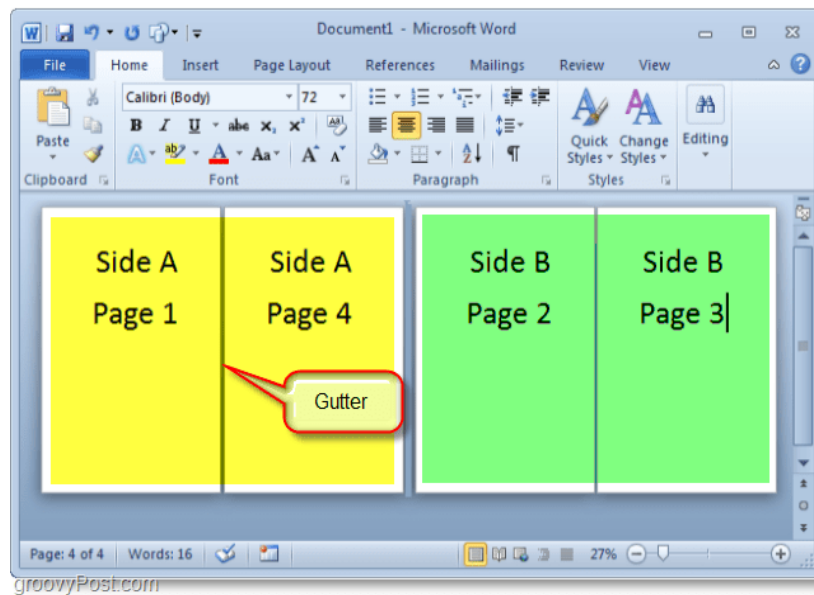
4. Click **File** then **Print,** and change the printing preference to the correct setting for the printer. For example, if the printer can automatically re-feed printed documents, use one of the **Print on Both Sides** settings.

Creating Letter/Faxes

Fax cover letters not only inform the fax recipient of the nature of the attached document but also provide the recipient with your business contact information. The cover letter doesn't have to contain a great deal of detail, but add the fax recipient's name and number, sender contact information, a date, the number of pages within the fax and a short description of the document that are faxing.

Creating Web pages, Using Wizards,

Creating a web page using Microsoft Word might not be the first option one considers. But Word XP has a web page wizard that allows you to create a web page. Here is how to use it.

1. From the File menu, click New.
2. In the New Document task pane, click General Templates under New from template.
3. Select the Web Pages tab, and then double-click on Web Page Wizard. Click the Next button.
4. Type the title for the website and the location where it should be saved, and then click the Next button.
5. Choose Vertical frame, Horizontal frame or Separate page as the navigation type for the website, and then click the Next button.
6. Choose whether to add new pages to the website from blank new pages, template pages or existing word documents, and then click the **Next** button.
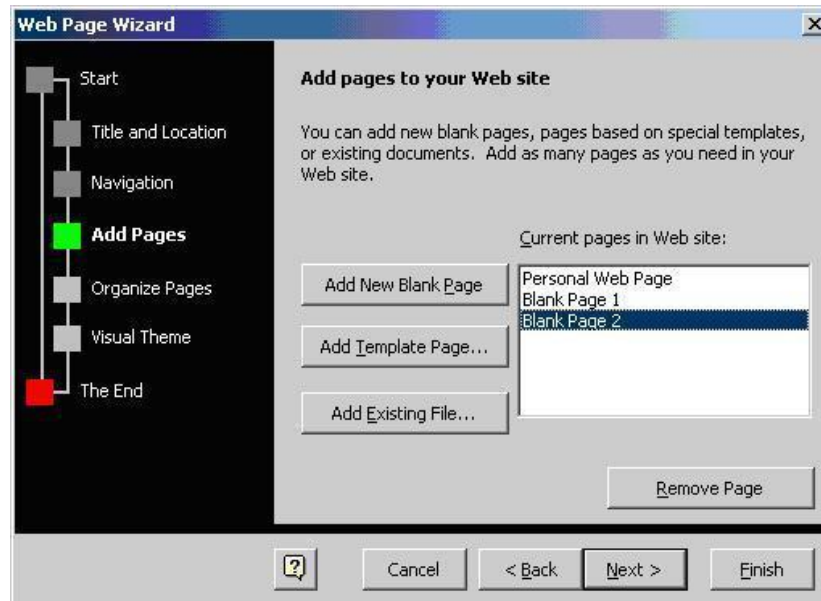
7. Modify the order of the pages as desired, and then click **Next.**
8. Choose whether to add a visual theme to the website or not, and then click **Next.**
9. Click **Finish.**

After saving your file, you can open the HTML files in IE to check how things will look. Once satisfied, upload the web pages to a hosting provider to bring it online. For this you can use the hosting file manager, or a FTP client.

Tracking Changes

Track Changes is a feature built into Microsoft Word that keeps track of all the edits made to your document and lets you make comments. When Track Changes is turned on, the edit you make are highlighted, appearing in different colors or styles to separate them from the original text.

Security

A security word is a word chosen by you to help us verify your identity when you phone us or at any other time when we need to validate that it is you asking us for information or to do something on your account(s) . The security word is a memorable word chosen by you and can be anything you want. You will have provided this either as part of an online or paper application, on a form you've sent us by post or you may have set or changed it when you were logged into your internet banking. For example it could be a memorable name or place or something that means something to you. For additional security we do not provide any guidance on what this word should be.

Digital Signature

A digital signature is an electronic, encrypted, stamp of authentication on digital information such as e-mail messages, macros, or electronic documents. A signature confirms that the information originated from the signer and has not been altered.

3.1.8 Printing Documents

To print a document, computer needs to be connected to a printer.

1. A computer with Microsoft Word installed
2. A printer set up and connected to your computer (wireless or connected by cable)

Follow these step-by-step instructions to print a document from Microsoft Word

Step 1: Open an existing Microsoft Word document or start a new document, if you have Windows 10 you can use Cortana to search for it. Before you print, type your text in the blank document or insert an image.

Step 2: When you are ready, click on File in the top left-hand corner of your document. Then, click on Print.
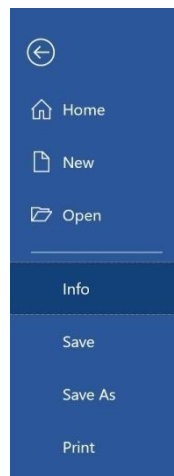
Step 3: Click on File then **Print** in the menu, this will bring up the 'Print' dialogue box. Choose number of copies to be printed.

Step 4: Printing features like to print all pages or only certain pages.,can also change the orientation of the print from portrait to landscape and also printing on a certain size of paper and the quality of print.

Step 5: To see each page, click the arrow at the bottom of the preview, and if the text is too small, use the zoom slider to adjust it.

Step 6: After finishing the settings, click **Print**.

Shortcut keys

Shortcuts for MS Word Functions	Windows 10
Open New Word Doc	CTRL + N
Open Existing Word Doc	CTRL + O
Save a Word Doc	CTRL + S
Save As a Word Doc	F12
Print a File	CTRL + P
Open Print Preview	CTRL + F12
Close a Word Doc	CTRL + W
Close MS Word	ALT + F4
Close Specific Word file	CTRL + F4
Undo	CRLT + Z
Re-do	CRLT + Y
Move cursor to the bottom of screen	Ctrl + End
Move cursor to the top of screen	Ctrl + Home
Scroll Up document by one screen	Page Up
Scroll down document by one screen	Page Dn
Move cursor to previous insertion point	SHFT + F5
Cut select content to Clipboard	CTL + X
Copy select content to Clipboard	CTRL + C
Paste select content to Clipboard	CTRL + V
Paste Clipboard content with matching format	Ctrl + Shift + V
Display the Paste Special dialog	CTRL + Shift + V
Cut selected content to Spike	CTRL + F3
Paste select content of Spike	CTRL + Shift + F3
Insert graphics	ALT + N,M
Find	CTRL + F
Bold	CTRL + B
Italic	CTRL + I
Underscore	CTRL + U
Underline for words	CTRL + Shift + W
Strikethrough	CTRL + 5
Change letter case	Shift + F3
Center Align Text	CTRL + E
Left Align Text	CTRL + L
Right Align Text	CTRL + R
Justify Text	CTRL + J
Apply subscript format	CTRL + =

3.2 Open Office – Writer

3.2.1 Introduction to Open Office Suite

OpenOffice is the leading open-source office software suite for word processing, spreadsheets, presentations, graphics, databases and more. It is available in many languages and works on all common computers. It stores all your data in an International open standard format and can also read and write files from other common office software packages. OpenOffice is easy to learn.

3.2.2 Selecting the Application Package

OpenOffice is a productive office suite with a collection of different software packages such as

- OpenOffice Writer - Word Processor to create text documents
- OpenOfficeCalc - Spreadsheet to create worksheets
- OpenOffice Base - Database
- OpenOffice Impress - Presentation software
- OpenOffice Draw - Drawing Software
- OpenOffice Formula - Create formula and equations

OpenOffice Writer is the word processor component of OpenOffice. In addition to the usual features of a word processor (spelling check, thesaurus, hyphenation, autocorrect, find and replace, automatic generation of tables of contents and indexes, mail merge and others), Writer provides these important features:

- Templates and styles.
- Page layout methods, including frames, columns, and tables.
- Embedding or linking of graphics, spreadsheets, and other objects.
- Built-in drawing tools.
- Master documents-to group a collection of documents into a single document.
- Change tracking during revisions.
- Database integration, including a bibliography database.
- Export to PDF.

3.2.3 Working with Documents

Creating a new document

Creating a blank document

You can create a new, blank document in Writer in a number of ways:

- Press the Control+N keys.
- Use **File > New > Text Document**.

- Click the **New** button on the main toolbar.

Each method opens a new, empty document. If you already have a document open, the new document appears in a new window.

Creating a document from a template

You can use templates to create new documents in Writer. Templates serve as the foundation of a set of documents, to make sure they all have a similar layout. For example, all the documents of the Writer Guide are based on the same template. As a result, all the documents look alike—they have the same headers and footers, use the same fonts, and so on.

Once you do have templates on your system, you can create new documents based on them by using **File > New > Templates and Documents**. This opens a window where you can choose the template you want to use for your document.

The example shown below uses a template called "book" in the My Templates folder. Select it, then click the **Open** button. A new document is created based on the formats defined in the template.
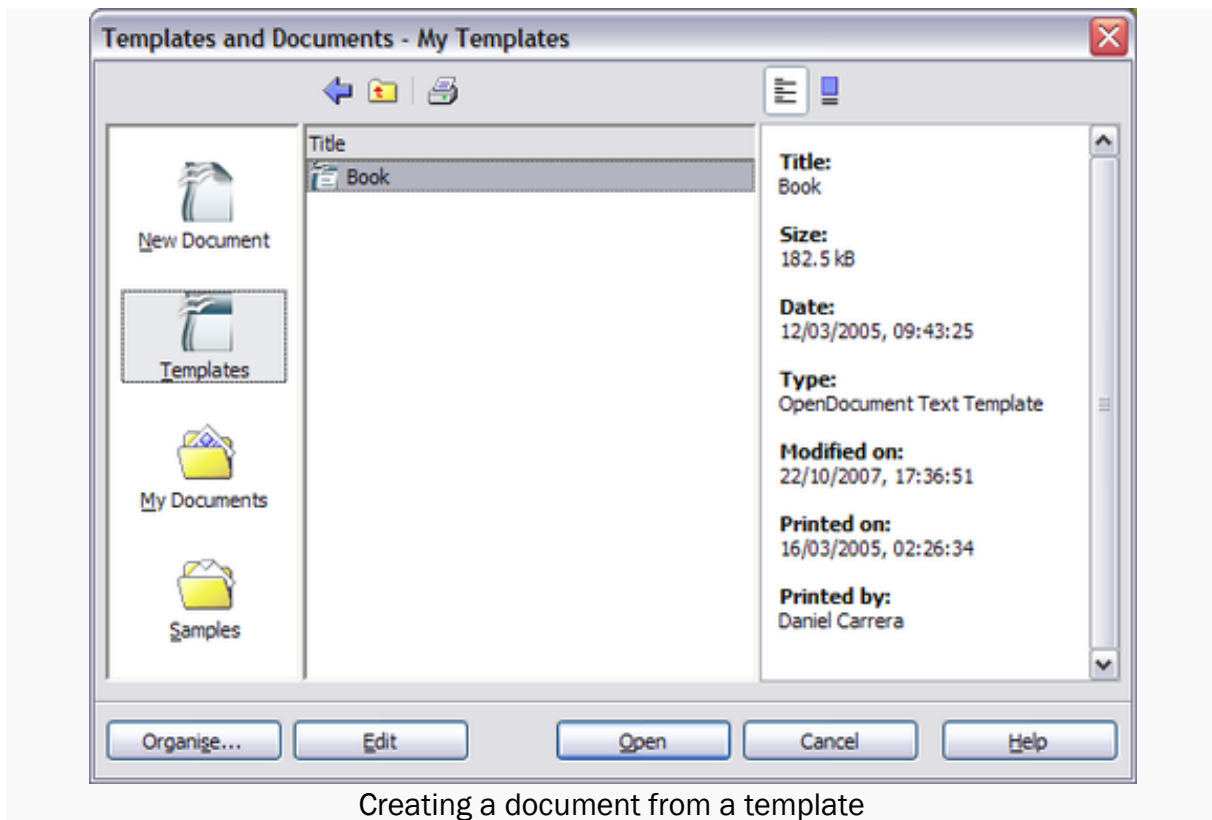
Creating a document from a template

Opening an existing document

Here is one way to open an existing document in Writer:

1. Click **File > Open** (or press Control+O).
2. In the file chooser, you can reduce the list of files by selecting the type of file you are looking for. If you choose **Text documents** as the file type, you will only see documents Writer understands.
3. Select the file you want, and then click **Open.**

This method opens Word (*.doc) files, as well as OOo files and other formats.

You can also open an existing OOo Writer document using the same methods you would use to open any document in your operating system.

Saving a document

There are three ways to save a document in Writer:

- Press Control+S.
- Select **File > Save.**
- Click the **Save** button on the main toolbar.

You also can tell Writer to save your document automatically at regular intervals. To enable this, you must configure OpenOffice.org to save all documents automatically.

1. Select **Tools > Options.** The Options window appears.
2. Select **Load/Save > General**.
3. Click on **Save AutoRecovery information every**. This enables the box to set the interval. The default value is 30 minutes. Enter the value you want by typing it or by pressing the up or down arrow keys.

Saving as a Microsoft Word document

You may need to share your documents with other people who do not use OpenOffice.org, but use Microsoft Word instead. Fortunately, OpenOffice.org can read and write Word files. To save a document as a Microsoft Word file:

1. First save your document in OpenOffice.org's format (*.odt). If you do not, any changes you made since the last time you saved will only appear in the Microsoft Word version of the document.
2. Then click **File > Save As.** The Save As dialog box (shown below) appears.
3. In the **Save as type** drop-down menu, select the type of Word format you need.
4. Click **Save.**

From this point on, all changes you make to the document will occur only in the Microsoft Word document. You have actually changed the name of your document. If you want to go back to working with the OpenOffice.org version of your document, you must open it again.

To have OOo save documents in a default Microsoft Word file format, go to **Tools > Options > Load/Save > General**. There is a section named Default file format. Under Document type, select **Text document**, under Always save as, select your preferred file format.
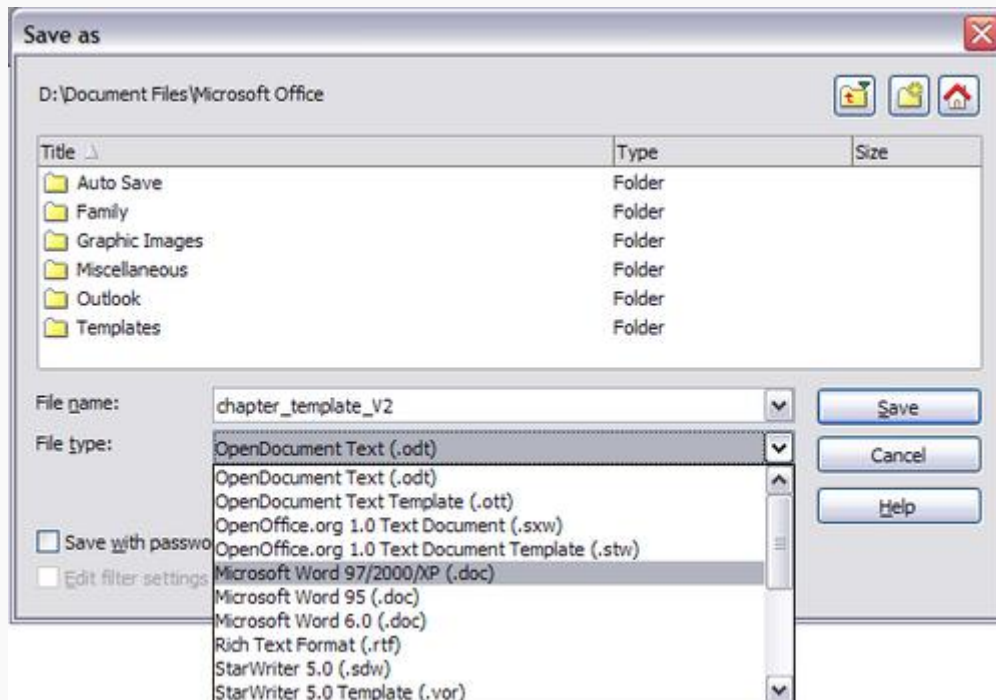
Save As dialog box.

3.2.4 Formatting Documents

In Apache OpenOffice, you can apply formatting to documents in two different ways. You can do so directly using menus and toolbars, or you can use styles and templates.

To a new user, it may seem easier to format a document directly, applying formatting only as needed. However, this can be repetitive, and problematic when working with longer documents. You can save yourself a lot of time and trouble by using styles and templates, which cause your document to follow predefined formatting rules. While this may seem complex at first glance, it is actually an easy-to-learn tool that affords a great deal of flexibility and consistency when authoring documents.

Styles can be used in all Apache OpenOffice programs with the exception of Apache Math.

Benefits of Styles Over Direct Formatting

Suppose we've written a long report that is divided into chapters, each marked by a heading. We need these headings to be displayed in a particular sans serif font. We also need these headings to be displayed in large, bold text, and centered on the page. To apply this formatting manually, we would need to set up the following formatting for each heading individually:

<div align="center">

"**Liberation Sans, 16 point, bold, centered...**"

</div>

At the same time, we want the rest of our text to be displayed in a smaller, serif font, as follows:

<div align="center">

"Liberation Serif, 11 points, justified..."

</div>

While it is possible to accomplish this with direct formatting, two problems arise: consistency (remembering to use the exact same font size, font face, and alignment each time) and maintenance. What happens if you decide you need the body of your report to be displayed in a different font, or that you need your chapter headings to be slightly smaller? If you've applied the formatting directly, you'll need to do a lot of work to fix this.

This is where styles come in. Suppose that instead of setting each chapter heading's formatting individually, as shown above, we predefine all these rules in a style named "Heading 1". This way, each time we come across text we want to make into a chapter heading, we can simply select "Heading 1" as its formatting.

Likewise, we can predefine the body formatting in a style named "Body Text" and apply this style to the body text of the document as necessary. In this way, the administration of document becomes much simpler. For example, to change the font used for all chapter headings, we only need to modify the definition of "Heading 1". The change will then be reflected throughout our document.

Beyond this, styles can provide a lot more than just consistency and ease of administration. They permit the creation of an automatic table of contents, numbered chapters, the setting of colors, insertion of symbols, and more.

Adding Styles to Your Document

You can create, edit, and apply styles to your document through the 'Styles and Formatting' panel. This panel is accessed through one of the following methods:
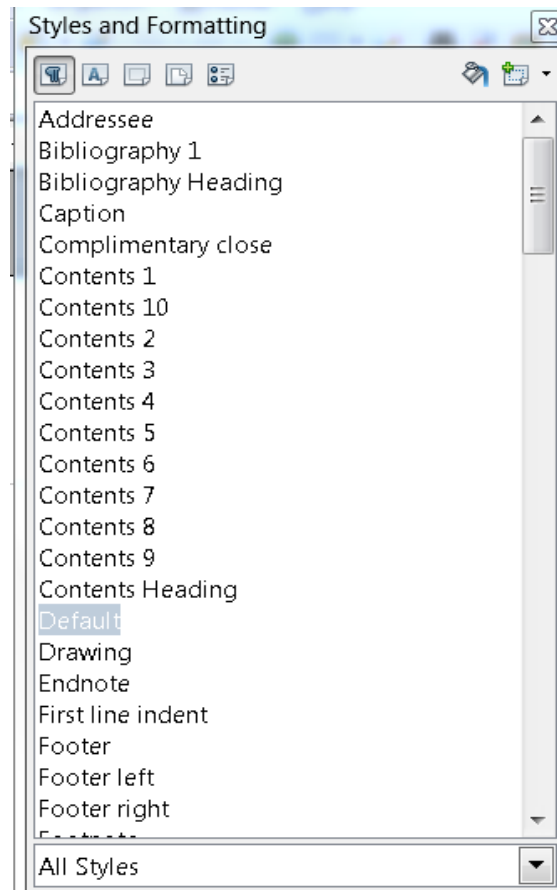
Method 1:
- **Format → Styles and Formatting**

Method 2:
- Press `F11`
- The 'Styles and Formatting' panel will appear

Method 3:
- Open the 'Styles and Formatting' panel as an option through the Sidebar **Once the panel is open:**
- Right click anywhere inside the 'Styles and Formatting' panel
- Select "New" or "Modify"

You will then be presented with a large selection of options. The best way to learn is to experiment and set up a style according to your own preferences.

Templates

Once a style has been defined, it can be saved in a file called a "Template" for future use in additional documents. This allows for easy consistency across documents or projects.

File → Templates → Save will save a copy of the current document as a template. We can use this template for a new document by selecting **File → New → Templates and documents → Templates** and double clicking on the needed template.

Note that both the styles AND the content of that document will be saved in the template

It is possible to go further and set our preferred template as the default template for all documents. To do so:

- File → Templates → Organize
  - ❖ Double-click "My Templates"
  - ❖ Select the required template
  - ❖ Click the Commands button
  - ❖ Select "Set as Default Template"

  Right-clicking on the template in the list will also provide this option

To modify an existing template:
- File → Templates → Edit
  - ❖ Double click template file

Alternate method:
- File → Templates → Organize
  - ❖ Double-click My Templates
  - ❖ Select template from list
  - ❖ Select Edit under Commands

Once the changes are ready, save the document as a normal document.

3.2.5 Setting Page style

In Writer, page styles define the basic layout of pages, including page size, margins, headers and footers, borders and backgrounds, number of columns, and so on.

Writer comes with several page styles, which you can modify as you wish, and you can define your own. You can have one or many page styles in a single document.

All pages in a Writer document are based on styles. If you do not apply a specific page style, Writer uses the Default page style. Refer to Applying styles to change the page style.

Any modifications of page styles, including the Default page style, apply only to the document you are working on. If you want the changes to be the default for all documents, you need to put the changes into a template and make that template the default template.

Setting up a book chapter sequence of pages

Book chapters typically start on a right-hand page, with the first page of the chapter having a different layout from the rest of the pages. The other pages in the chapter are "mirrored" for double-sided printing. For example, page numbers in the header or footer may be positioned on the outside edge of pages and a wider margin (allowing for binding) may be placed on the inside edge.

Table shows the properties of two page styles (Right Page and Default) set up for a typical book chapter's sequence of pages.

Page Style	Desired effect	Property: setting
Right Page	First page always on the right (an odd numbered page)	Page > Page Layout: Right
	No header or footer	Header > Header on: Not selected
	Top margin of page larger than on other pages	Page > Margins > Top: 6.00cm
Default	Mirrored margins	Page > Page Layout: Mirrored
	Header with page number on the top outside of the page, and chapter title in the top middle center of the page	Header > Header on: Selected Header > Header > Same content left/right: Not selected

Table - Properties of customized page styles to be used in a book chapter

The figure below illustrates the transitions from Right Page to Default, with the change of header between left and right pages shown by the # symbol.
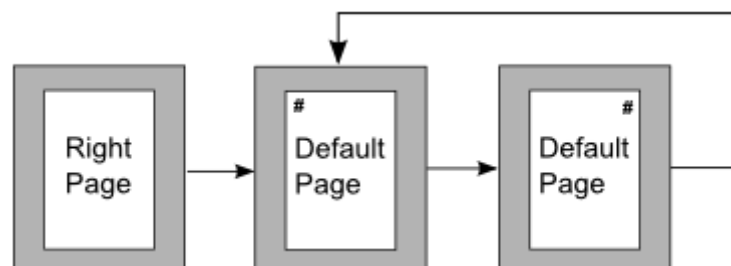
Right Page and then Default page style with different header for alternate pages

To apply this page scenario

1. Set up the page styles.

    On the Styles and Formatting window, click the **Page Styles** icon (fourth from left) to display a list of page styles.

    a. Right-click on Right Page and select **Modify** from the pop-up menu.
    b. On the Organizer page of the Page Style: Right Page dialog box, change Next Style to **Default.**
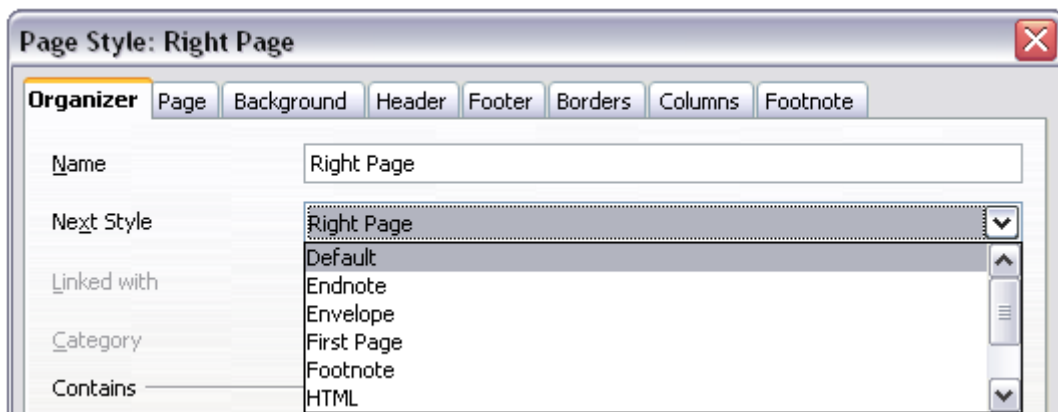
Specifying the next style after the first page of a chapter

c. On the Page page, specify a larger left margin for binding, and a larger top margin to move the chapter title down the page.
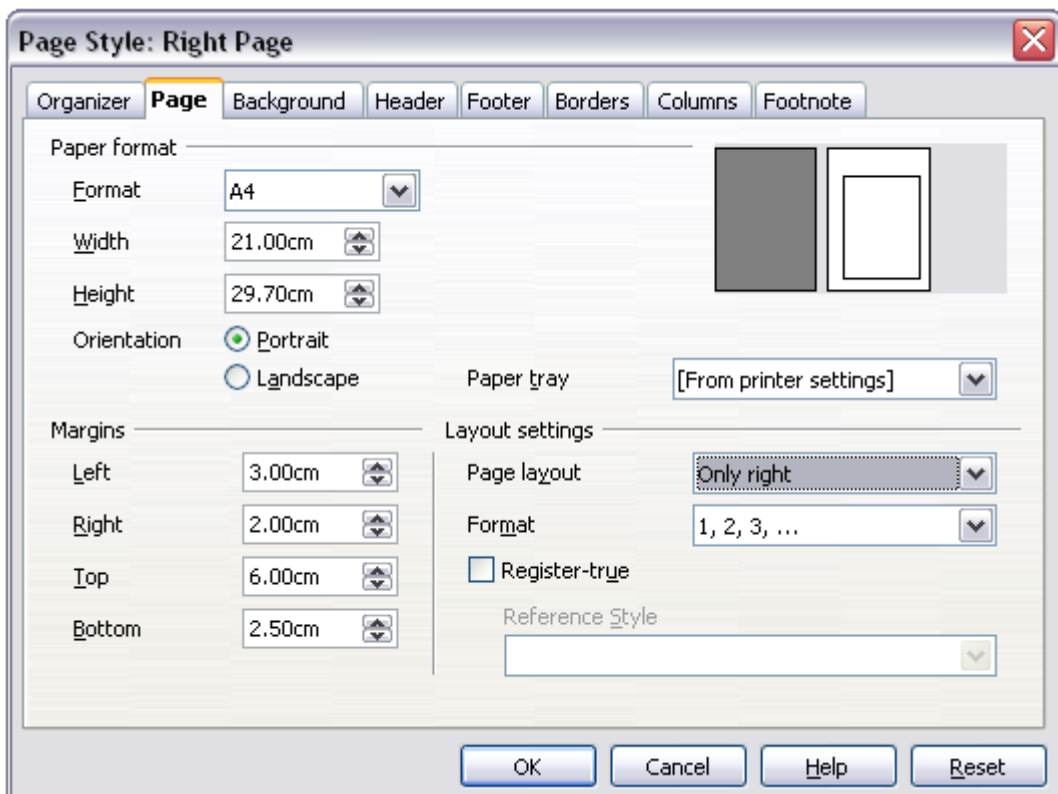
Setting page margins and layout for the Right Page style.

d. On the Header and Footer pages, be sure the **Header on** and **Footer on** checkboxes are not selected. Click **OK** to save your changes.

e. On the Styles and Formatting window, in the list of page styles, right-click on Default and select **Modify** from the pop-up menu.

f. On the Organizer page of the Page Style: Default dialog box, be sure Next Style is **Default**.

g. On the Page page of the Page Style: Default dialog box, select **Mirrored** for Page layout and   set   the Inner and Outer margins   to   the   same   width   as the Left and Right margins, respectively, on the Right Page style.
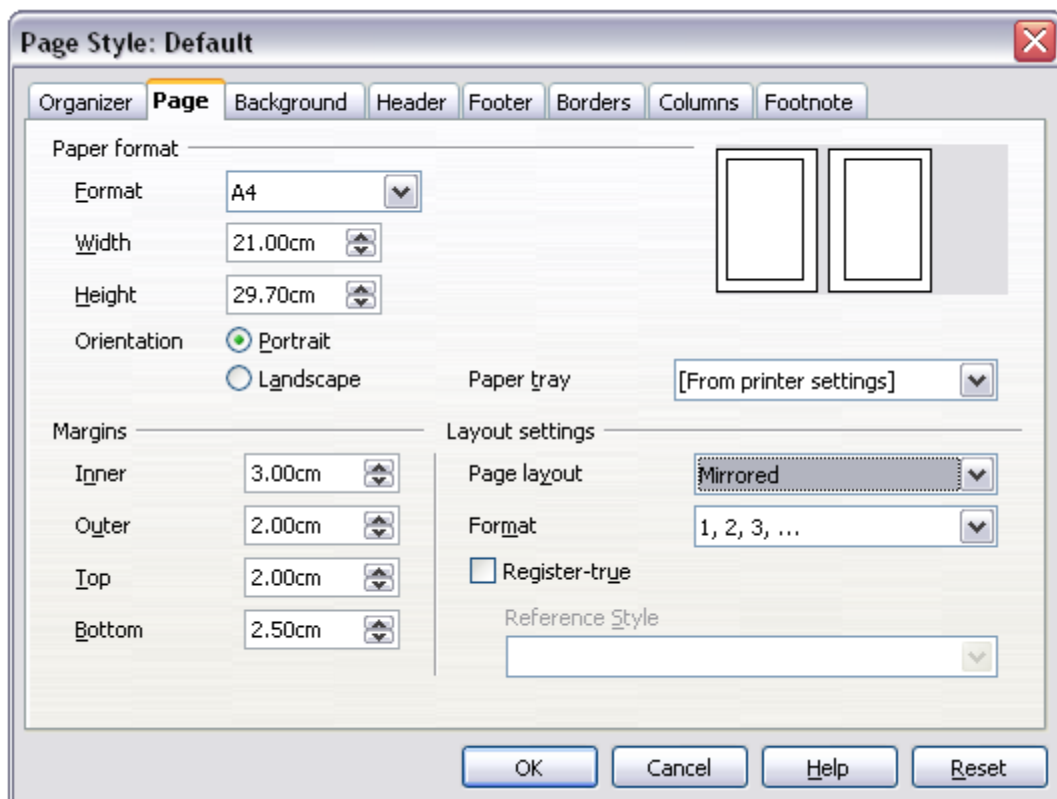
Setting page margins and layout for the Default page style

h. On the Header page of the Page Style: Default dialog box, select the **Header on** checkbox and deselect the **Same content left/right** checkbox. Click **OK** to save your changes.
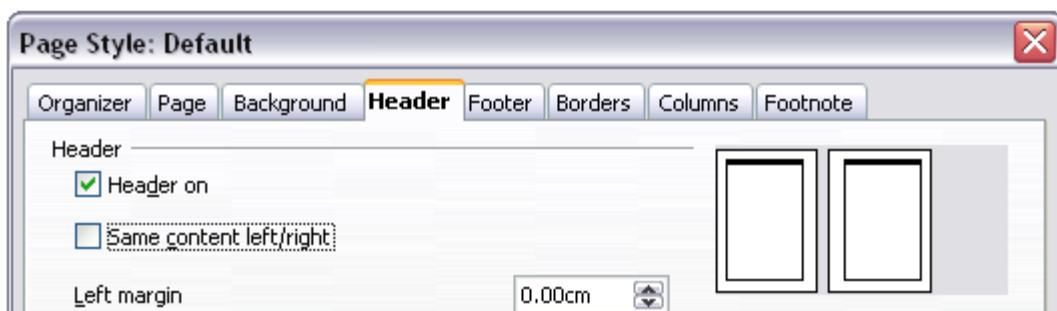
Setting up the header properties for the Default page style

2. Set up the Heading 1 paragraph style to start on a new right-hand page.
    In the Styles and Formatting window, right-click on Heading 1 and select Modify.
    a. On the Text Flow page of the Paragraph Style dialog box, in the Breaks section, select Insert, With Page Style, and Right Page. Click OK to save your changes.
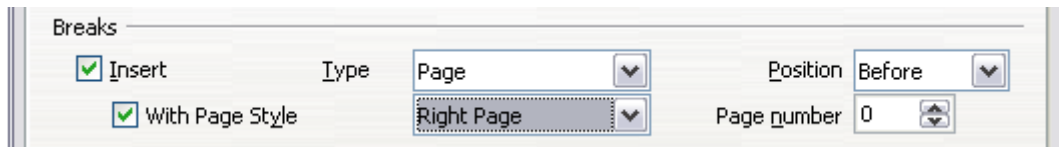
Setting a paragraph style to start on a page of a selected style

3. To start a new chapter, apply the paragraph style Heading 1 to the first paragraph, which will be the title of the chapter.

By default, paragraph style Heading 1 is assigned to Outline Level 1. The assignment of paragraph styles to outline levels is done through Tools > Outline Numbering.

4. To set up the headers:
   On a left page, put the cursor in the header and insert a page number field on the left (Insert > Fields > Page Number).

   a. Press Tab to put the cursor in the middle and insert a Chapter reference: Press Control+F2 to display the Fields dialog box. On the Document page, for Type select Chapter and for Format select Chapter name. Make sure that Layer is set to 1, and then click Insert.
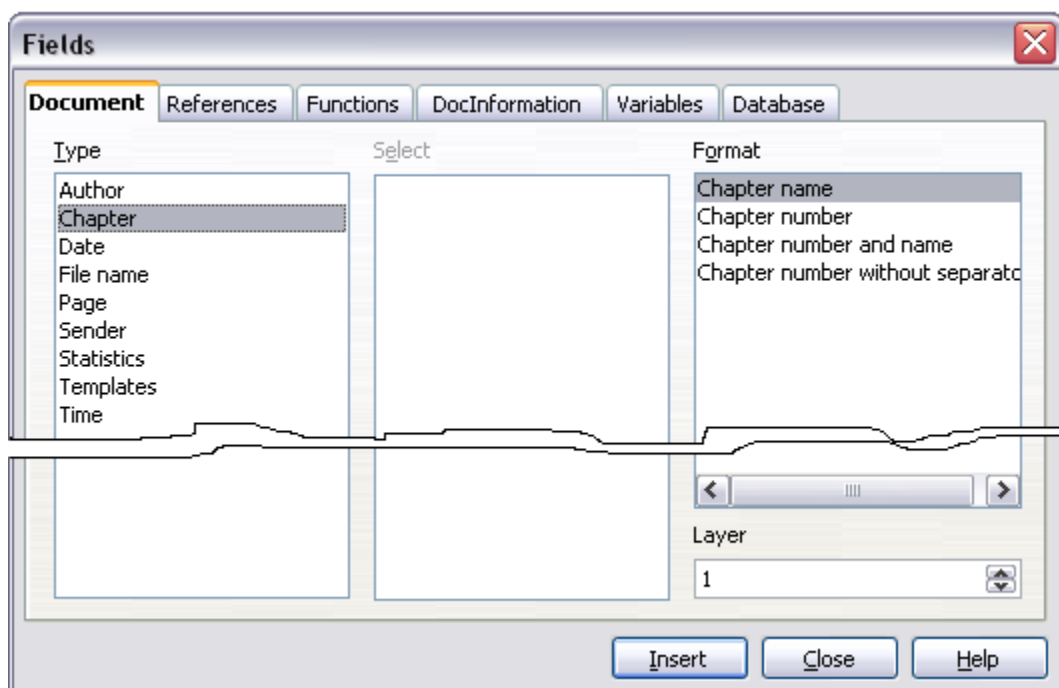
Inserting a chapter title into the header of a page

   b. On a right page, put the cursor in the header, press Tab, insert a Chapter reference, press Tab again, and insert a page number field.

   c. If you need to adjust the tab stops for the header, modify the Header paragraph style. Do not manually adjust the tab stops.

3.2.6 Creating Tables

Before you insert a table into a document, it helps to have an idea of the visual result you want to obtain as well as an estimate of the number of rows and columns required. Every parameter can be changed at a later stage; however, thinking ahead can save a large amount of time as changes to fully formatted tables often require a significant effort.

Inserting a new table

To insert a new table, position the cursor where you want the table to appear, then use any of the following methods to open the Insert Table dialog box:

- From the main menu, select Table > Insert > Table.
- Press Control+F12.
- From the Standard toolbar, click the Table icon
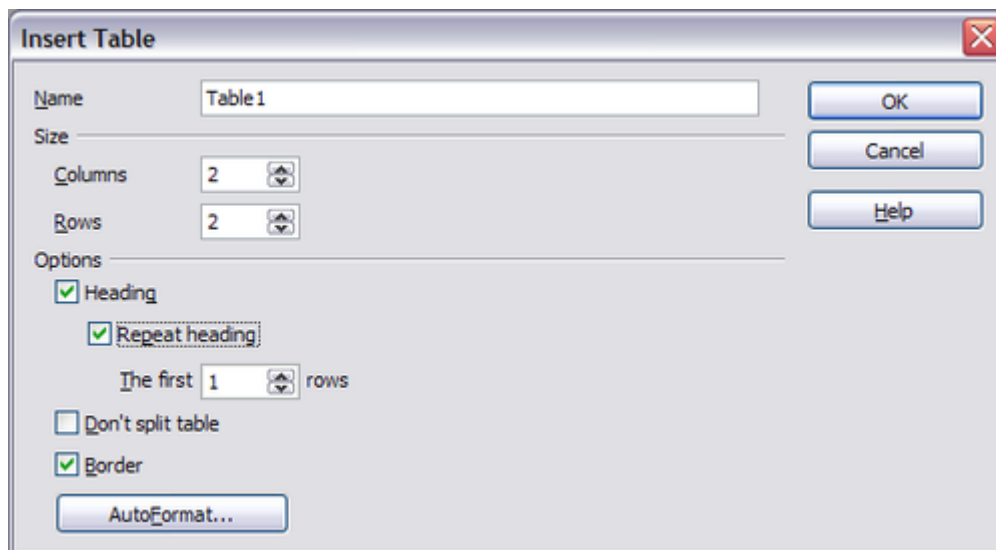
Inserting a new table using the Insert Table dialog box

Here you can specify the properties for the new table.

Under Name, you can enter a different name than the OOo-generated default for the table. This might come in handy when using the Navigator to quickly jump to a table.

Under Size, specify the initial number of columns and rows for the new table. You can change the size of the table later, if necessary.

Under Options, set up the initial table characteristics. Selecting the options in this section of the dialog produces the following results:

- **Heading** — Defines the first row(s) in the table as headings. The default Table Heading paragraph style is applied to the heading rows and thus makes the text

centered, bold, and italic. You can edit the OOo-predefined Table Heading paragraph style in the Styles and Formatting window to change these default settings. When splitting a table into two tables, the Heading row(s) are copied in the second table.

- **Repeat heading** — Repeats the heading row(s) of the table at the top of subsequent pages if the table spans more than one page. The first ... rows —Specifies the number of rows to be repeated. Default is 1.

- **Don't split table** — Prevents the table from spanning more than one page. This can be useful if the table starts near the end of a page, and would look better if it were completely located on the following page. If the table becomes longer than would fit on one page, you will need to either deselect this option or manually split the table.

- **Border** — Surrounds each cell of the table with a border. This border can be modified or deleted later.

The **AutoFormat** button opens a dialog from where it is possible to select one of the many predefined table layouts. See Automatic formatting of tables for more information.

After making your choices, click **OK**. Writer creates a table as wide as the text area (from the left page margin to the right page margin), with all columns the same width and all rows the same height. You can then adjust the columns and rows later to suit your needs.

To directly insert a table with the default properties, click on the little arrow next to the Table icon on the Standard toolbar. A graphic appears where you can choose the table's size (rows and columns). To create the table, click on the cell that you want to be on the last row of the last column. Holding down the mouse button over the Table icon will also display the graphic.

Creating nested tables

You can create tables within tables, nested to a depth only limited by imagination and practicality. The figure below demonstrates a simple, two-level example.

To achieve this, simply click in a cell of an existing table and use any of the methods mentioned in Inserting a new table above.

Nested table example. The shaded table is nested in a cell of the larger table

Using AutoCorrect to create a table

You can also create a table by typing a series of hyphens (-) or tabs separated by plus signs. Use the plus signs to indicate column dividers, while hyphens and tabs are used to indicate the width of a column.

For example, this character sequence:
+---------------+-------------+-----+

Creates a table like this:

¶	¶	¶

This function can be disabled or enabled in **Tools > AutoCorrect.** On the Options tab, deselect or select **Create table.**

When using tabs instead of a table to line up your data, always make sure that you know how wide they are set and remember that default tabs may be different when the document is displayed on a different computer or even when copying the same data in a new document.

Create a table from formatted text

It is possible to create a table starting from plain text by means of the **Table > Convert > Text to Table menu.** In order for this command to work effectively, the starting text needs to have clear demarcation between what will become the columns of the table. Paragraph marks indicate the end of a row.

To convert text to a table, start by selecting the text you want to convert and select **Table > Convert > Text to Table** to open the dialog box shown below.
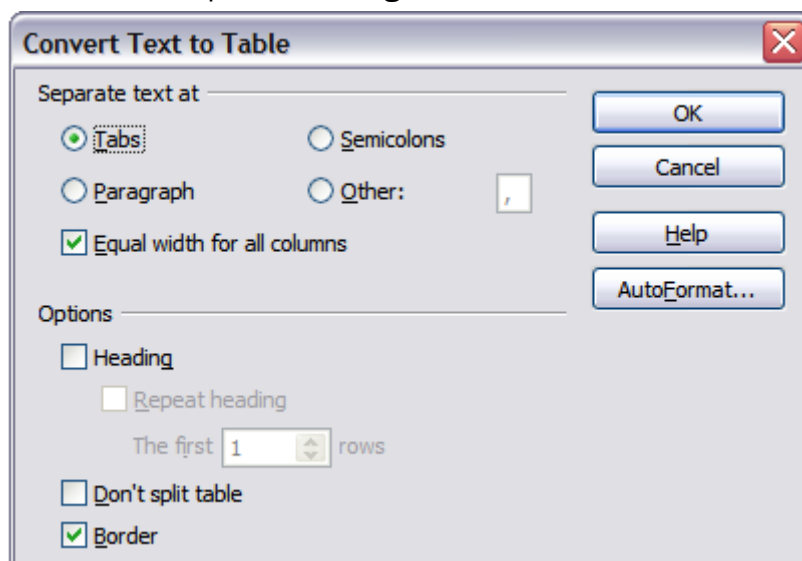
Dialog box to configure the text to table conversion

In the top part of the dialog box, select the symbol that separates the columns. This would normally be a tab, but it could be a semicolon or comma if you are importing a CSV file. The other options in this dialog are the same as those in the dialog used to insert a table shown above.

Example

In this example we will convert the following text into a table.

Row 1 Column 1; Row 1 Column 2; Row 1 Column 3
Row 2 Column 1; Row 2 Column 2; Row 2 Column 3

In this case, the separator between elements is a semicolon. By selecting the text and applying the conversion, we obtain the following result.

Row 1 Column 1   Row 1 Column 2   Row 1 Column 3
Row 2 Column 1   Row 2 Column 2   Row 2 Column 3

You can also use the **Convert** menu to perform the opposite operation; that is, to transform a table into plain text. This may be useful when you want to export the table contents into a different program.

To transform a table into text, place the cursor anywhere in the table, select **Table > Convert > Table to Text** in the main menu, pick the preferred row separator, and click **OK** to finish.

3.2.7 Drawing - Tools

You can use Writer's drawing tools to create graphics, such as simple diagrams using rectangles, circles, lines, text, and other predefined shapes. You can also group several drawing objects to make sure they maintain their relative position and proportion.
You can place the drawing objects directly on a page in your document, or you can insert them into a frame.

You can also use the drawing tools to annotate photographs, screen captures, or other illustrations produced by other programs, but this is not recommended because:

- You cannot include images in a group with drawing objects, so they may get out of alignment in your document.
- If you convert a Writer document to another format, such as HTML, the drawing objects and the graphics will not remain associated; they are saved separately.

In general, if you need to create complex drawings, it is recommended to use OpenOffice.org Draw, which includes many more features such as layers, styles, and so on.

Creating drawing objects

To begin using the drawing tools, display the Drawing toolbar, by clicking **View > Toolbars > Drawing.**

If you are planning to use the drawing tools repeatedly, you can tear off this toolbar and move it to a convenient place on the window.
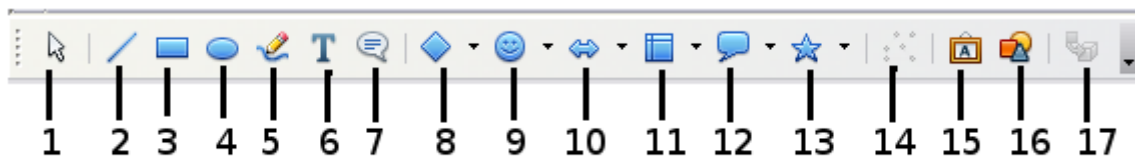
1 Select | 2 Line | 3 Rectangle | 4 Ellipse | 5 Freeform Line | 6 Text | 7 Callouts
| 8 Basic Shapes | 9 Symbol Shapes | 10 Block arrows | 11 Flowcharts | 12 Callouts
| 13 Stars | 14 Points | 15 Fontwork Gallery | 16 From File | 17 Extrusion On/Off
Drawing toolbar

To use a drawing tool

1. Click in the document where you want the drawing to be anchored. You can change the anchor later, if necessary.
2. Select the tool from the Drawing toolbar. The mouse pointer changes to a drawing-functions pointer.
3. Move the cross-hair pointer to the place in the document where you want the graphic to appear and then click-and-drag to create the drawing object. Release the mouse button. The selected drawing function remains active, so you can draw another object of the same type.
4. To cancel the selected drawing function, press the Esc key or click on the Select icon (the arrow) on the Drawing toolbar.
5. You can now change the properties (fill color, line type and weight, anchoring, and others) of the drawing object using either the Drawing Object Properties toolbar or the choices and dialog boxes reached by right-clicking on the drawing object.

Set or change properties for drawing objects

To set the properties for a drawing object before you draw it:

1. On the Drawing toolbar, click the **Select** tool.
2. On the Drawing Object Properties toolbar, click on the icon for each property and select the value you want for that property.
3. For more control, or to define new attributes, you can click on the **Area** or **Line** icons on the toolbar to display detailed dialog boxes.

The default you set applies to the current document and session. It is not retained when you close the document or close Writer, and it does not apply to any other document you open. The defaults apply to all the drawing objects except text objects.

1 Line | 2 Arrow Style | 3 Line Style | 4 Line Width | 5 Line Color | 6 Area | 7 Area Style / Filling | 8 Rotate | 9 To Foreground | 10 To Background | 11 Bring to Front | 12 Send to Back | 13 Alignment | 14 Change Anchor | 15 Ungroup | 16 Group
Drawing Object Properties toolbar
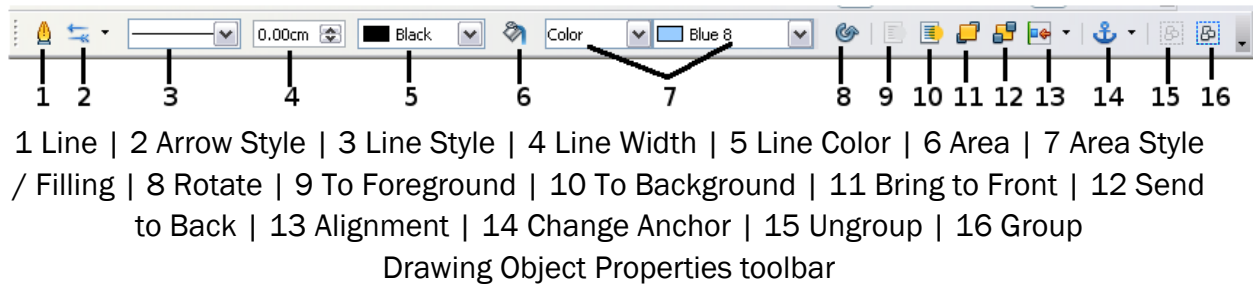
To change the properties for an existing drawing object
1. Select the object.
2. Continue as described above.

You can also specify the position and size, rotation, and slant and corner radius properties of the drawing object:

1. Right-click on the drawing object and then click Position and Size from the pop-up menu. The Position and Size dialog box is displayed.
2. Choose any properties, as required.

Resizing a drawing object

The same considerations for resizing an image apply also to resizing an object. Select the object, click on one of the eight handles around it and drag it to its new position. For a scaled resizing, select one of the corner handles and keep the Shift key pressed while dragging the handle to its new position.

For more sophisticated control of the size of the object, select **Format > Object > Position and Size** from the menu bar. Use the Position and Size dialog box to set the width and height independently. If the **Keep ratio** option is selected, then the two dimensions change so that the proportion is maintained, allowing for a scaled resizing.

Grouping drawing objects

To group drawing objects:

1. Select one object, then hold down the Shift key and select the others you want to include in the group. The bounding box expands to include all the selected objects.
2. With the objects selected, hover the mouse pointer over one of the objects and choose **Format > Group > Group** from the menu bar or right-click and choose **Group > Group** from the pop-up menu.

3.2.8 Printing Documents

Quick printing

Click the Print File Directly icon ![print icon] to send the entire document to the default printer defined for your computer.

Controlling printing using the Print dialog box

For more control over printing, use File > Print to display the Print dialog box.
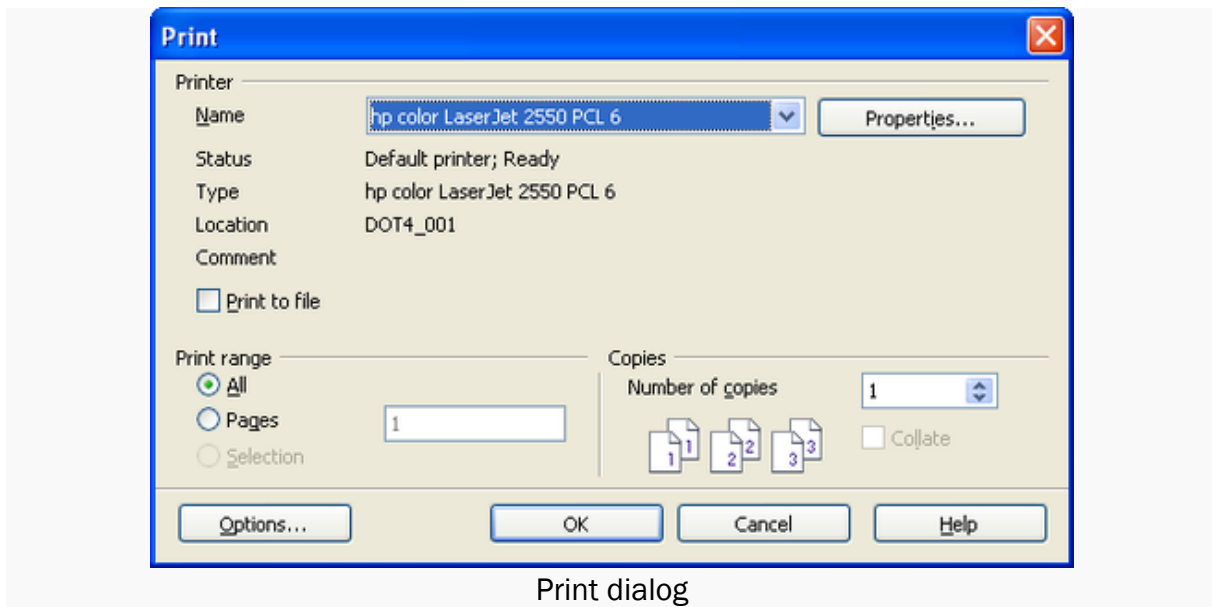
Print dialog

On the Print dialog box, you can choose:

- Which printer to use (if more than one are installed on your system) and the properties of the printer—for example, orientation (portrait or landscape), which paper tray to use, and what paper size to print on. The properties available depend on the selected printer; consult the printer's documentation for details.
- Which pages to print, how many copies to print, and in what order to print them.
- Use dashes to specify page ranges and commas or semicolons to separate ranges; for example, 1, 5, 11-14, 34-40.
- **Selection** is the highlighted part of a page or pages.
- Which items to print. Click the **Options** button to display the Printer Options dialog box. For details about print options and setting defaults for Writer(Printing, Faxing, Exporting, and Emailing).

Previewing pages before printing

The normal page view in Writer shows what each page will look like when printed, but it shows only one page at a time. If you are designing a document to be printed double-

sided, you may want to see what facing pages look like. OOo provides a way to do this in Page Preview.

Click **File** > **Page Preview**, or click the **Page Preview icon.**

The Writer window changes to display the current page and the following page and the Page Preview toolbar replaces the Formatting toolbar.
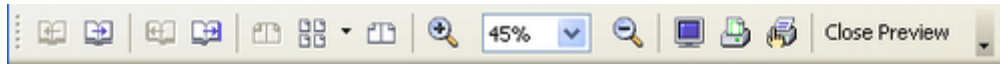
Page Preview toolbar

- To display left and right pages in their correct orientation (facing pages), click the **Book Preview** icon .

- To print the document in this page view, click the **Print page view** icon.

- To choose margins and other options for the printout, click the Print options page view icon to display the Print Options dialog box. For more information, (Printing, Faxing, Exporting, and Emailing).

Exporting to PDF

OpenOffice.org can export documents to PDF (Portable Document Format). This industry-standard file format for file viewing is ideal for sending the file to someone else to view using Acrobat Reader or other PDF viewers.

Quick export to PDF

Click the **Export Directly as PDF** icon to export the entire document using the default PDF settings. You are asked to enter the file name and location for the PDF file, but you do not get a chance to choose a page range or the print quality.

Controlling PDF content and quality

For more control over the content and quality of the resulting PDF, use File > Export as PDF. You are asked to enter the location and file name of the PDF to be created, and then the PDF Options dialog box opens.

Here you can choose which pages to include in the PDF, the type of compression to use for images (which affects the quality of images in the PDF), and other options.

Closing a document

To close a document, click **File** > **Close**.

You can also close a document by clicking on the **Close** icon on the document window. In Windows XP, this button looks like the red X shown in Figure 10.

If more than one OOo window is open, each window looks like the sample shown on the left in Figure 10. Closing this window leaves the other OOo windows open.

If only one OOo window is open, it looks like the sample shown on the right in Figure 10. Notice the small black X below the large red X. Clicking the small X closes the document but leaves OOo open. Clicking the large red X closes OOo completely.

Figure 10 Close icons in Windows XP

If the document has not been saved since the last change, a message box is displayed. Choose whether to save or discard your changes.
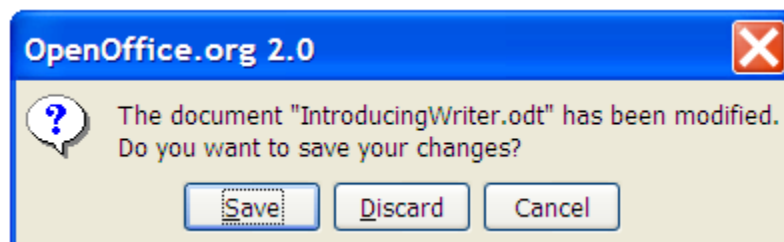
Figure 11 Warning about unsaved changes on close

- **Save:** The document will be saved and then closed.
- **Discard:** The document will be closed, and all modifications since the last save will be lost.
- **Cancel:** Nothing will happen, and you will return to the document.

3.2.9 Operating with MS Word documents

Create and edit doc and docx documents with OpenOffice Writer online

OpenOffice Writer online is an extension that allows to create, edit and view any Microsoft Word documents in both doc and docx formats. It is a word processor and publishing tool. It allows to create large documents, reports, and books, and simple enough for a quick memo.

It is a document editor integrated with our file manager to manage only DOC, DOCX and ODT file types with this desktop app.

The Open Office writer main features are:

- Wizards for standard documents such as letters, faxes, agendas, minutes, or carrying out more complex tasks such as mail merges. You can also create your own templates, or download templates from the Templates repository.
- Advanced Styles and Formatting.
- Table of Contents & References to increase the usefulness of your long, complex documents by generating a table of contents or indexing terms, bibliographical references, illustrations, tables, and other objects.
- Text frames and linking for publishing tasks like newsletters and flyers
- Notes and comments on the side of the document. This makes notes a lot easier to read.
- AutoCorrect dictionary to trap typing mistakes on the fly, checking your spelling as you type.
- AutoComplete to reduce typing effort. It also suggests common words and phrases to complete while you are typing.

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UNIT – 4

OFFICE APPLICATIONS - II

Introduction to MS Office – MS Excel and Open Office - Calc

4.1. MS Excel

4.1.1 Introduction

Spreadsheet and its application

- Microsoft Excel is a spreadsheet tool capable of performing calculations, analyzing data and integrating information from different programs.

- By default, documents saved in Excel 2010 are saved with the .xlsx extension.

How to open Excel?

Start the excel application following the below mentioned steps.

Step 1 – Click on the Start button.

Start Button

Step 2 – Click on All Programs option from the menu.

Step 3 – Search for Microsoft Office from the sub menu and click it.

Step 4 – Search for Microsoft Excel 2010 from the submenu and click it.

The following basic window appears as below:
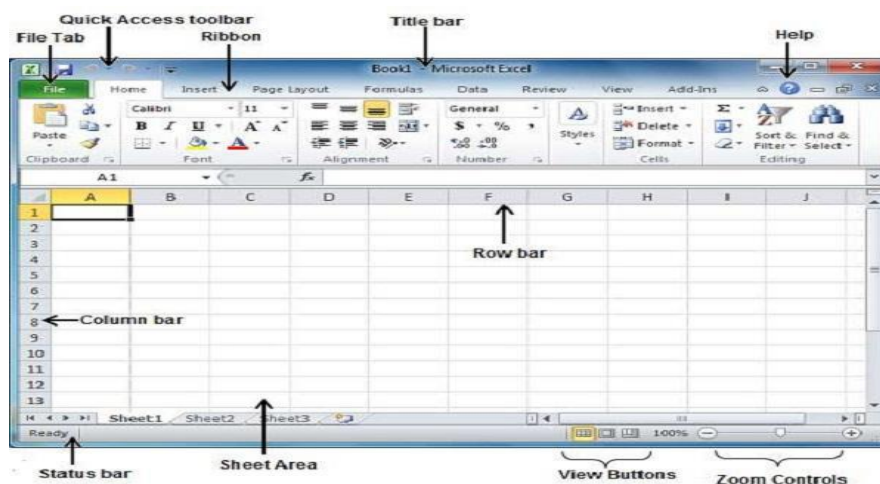
Menus

Main Menu

The Main Menu Bar at the top of the screen gives you access to different commands that are used for such tasks as opening and closing files, printing documents, formatting data, and other operations.
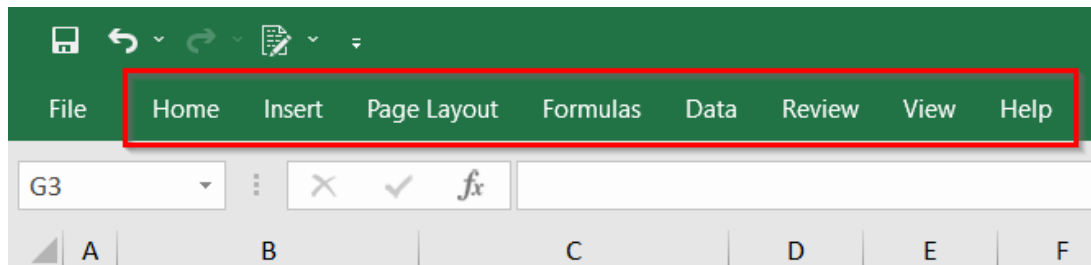
File
The File menu is the leftmost item in the Excel ribbon. The File ribbon items enable you to perform file management functions, including open, save, close, and print.

Home
The Home menu is the second menu in the Excel menu bar. The Home ribbon items include options for formatting font, color, conditional formatting, filter, number type, and more.

Insert
The Insert menu helps you insert various options and items into an Excel spreadsheet. You can insert a variety of things ranging from pivot table to picture, clip art, shapes, screen shots, charts and graphs, text box, header and footer, symbols, equation, and more.

Page Layout
Page Layout menu has the collection of functions like configuring pages for viewing and printing—including page size, margins, colors and fonts, and so on. You can also customize cell height and width on the Page Layout menu.

Formulas
The Formulas menu is where you find all the number-crunching options. Excel comes with lots of formulas including financial, logical, text, date & time, lookup & reference, and math & trigonometry.

Data
The Data menu also contains many important functions like including imports and connections with databases. You also access the sort, filter, remove duplicates, data validation, consolidation, group, ungroup, and subtotal functions on the Data menu.

Review

The Review menu is where many of those tasks take place. You can make comments in cells, check spelling, track changes, and even restrict permission using items in the Review menu.

View

On the View menu, you customize the way spreadsheets appear on the screen. Options include displaying grid lines between cells, toggling the formula bar and headings, and more. This menu also gives you options to view and record macros.

Quick Access Toolbar

This toolbar just above the File tab and its purpose is to provide a convenient resting place for the Excel's most frequently used commands.

Ribbon
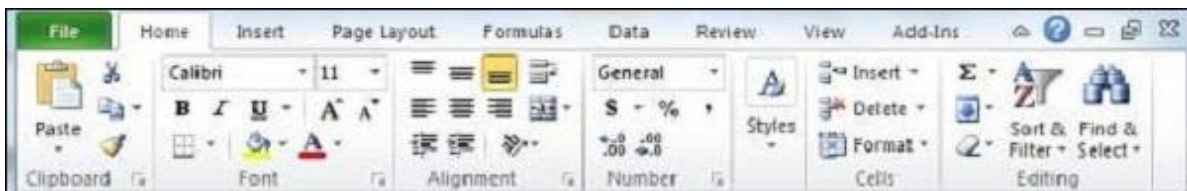
Ribbon contains commands organized in three components −

- Tabs − They appear across the top of the Ribbon and contain groups of related commands. Home, Insert, Page Layout are the examples of ribbon tabs.
- Groups − They organize related commands; each group name appears below the group on the Ribbon. For example, group of commands related to fonts or group of commands related to alignment etc.
- Commands − Commands appear within each group as mentioned above.

Title Bar

This lies in the middle and at the top of the window. Title bar shows the program and the sheet titles.

Help

The Help Icon can be used to get excel related help anytime. This provides nice tutorial on various subjects related to excel.

Zoom Control

Zoom control lets you zoom in for a closer look at your text. The zoom control consists of a slider that you can slide left or right to zoom in or out. The + buttons can be clicked to increase or decrease the zoom factor.

View Buttons

The group of three buttons located to the left of the Zoom control, near the bottom of the screen, lets you switch among excel's various sheet views.

- Normal Layout view – This displays the page in normal view.
- Page Layout view – This displays pages exactly as they will appear when printed. This gives a full screen look of the document.
- Page Break view – This shows a preview of where pages will break when printed.

Sheet Area

The area where the data is entered. The flashing vertical bar is called the insertion point and it represents the location where text will appear.

Row Bar

Rows are numbered from 1 onwards to Maximum limit is 1,048,576 rows.

Column Bar

Columns are numbered from A to Z start the series of AA, AB and so on. Maximum limit is 16,384 columns.

Status Bar

This displays the current status of the active cell in the worksheet. A cell can be in either of the four states

a) Ready mode which indicates that the worksheet is ready to accept user input
b) Edit mode indicates that cell is editing mode.
c) A cell enters into Enter mode when a user types data into a cell
d) Point mode triggers when a formula is being entered using a cell reference by mouse pointing or the arrow keys on the keyboard.

Dialog Box Launcher

This appears as a very small arrow in the lower-right corner of many groups on the Ribbon. Clicking this button opens a dialog box or task pane that provides more options about the group tab located in the upper-left corner of the Excel Ribbon.

Sl.No.	Option & Description
1	Save-If an existing sheet is opened, it would be saved as is, otherwise it will display a dialogue box asking for the sheet name.
2	Save As-A dialogue box will be displayed asking for sheet name and sheet type. By default, it will save in sheet 2010 format with extension .xlsx.
3	Open-This option is used to open an existing excel sheet.

4	Close-This option is used to close an opened sheet.
5	Info-This option displays the information about the opened sheet.
6	Recent-This option lists down all the recently opened sheets.
7	New-This option is used to open a new sheet.
8	Print-his option is used to print an opened sheet.
9	Save & Send-This option saves an opened sheet and displays options to send the sheet using email etc.
10	Help-This option is to get the required help about excel 2010.
11	Options-This option to set various option related to excel 2010.
12	Exit-Use this option to close the sheet and exit.

If you already have an opened sheet then it will display a window showing the details about the in case of already opened sheet the screen will appear as shown below. Backstage view shows three columns.

First column of the backstage view will have the following options –

Sheet Information

Click Info option available in the first column, it displays the following information in the second column of the backstage view –

- Compatibility Mode – If the sheet is not a native excel 2007/2010 sheet, a Convert button appears here, enables easily to update its format. Otherwise, this category does not appear.
- Permissions – Use this option to protect the excel sheet. Set a password so that nobody can open the sheet, or can lock the sheet so that nobody can edit the sheet.

- Prepare for Sharing – This section highlights important information about the sheet before send it to others, such as a record of the edits developed the sheet.
- Versions – If the sheet has been saved several times, to access previous versions of it from this section.
- Sheet Properties
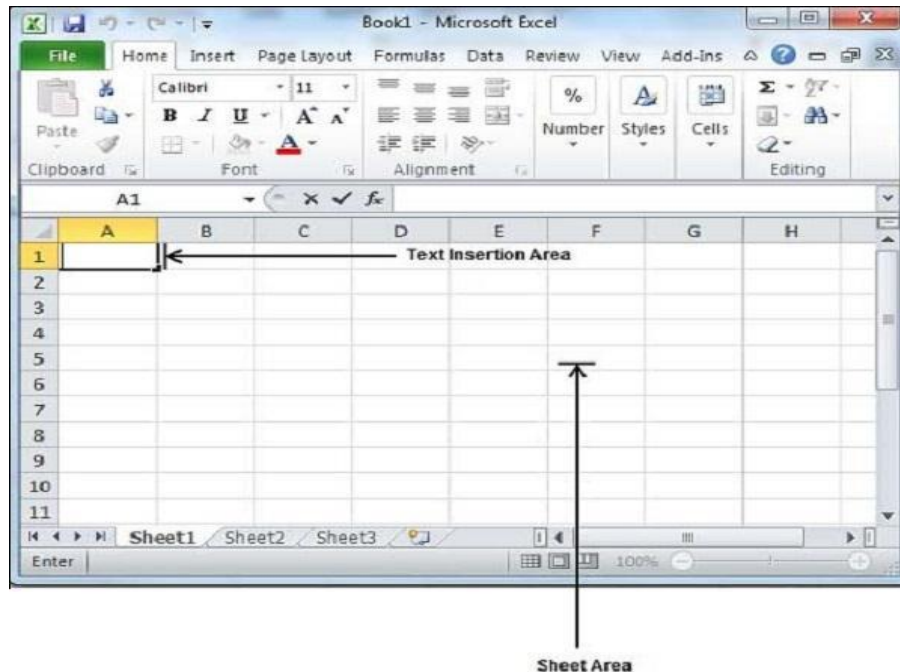
Sheet area is the place where the text is typed. The flashing vertical bar is called the insertion point and it represents the location where text will appear when typed. When you click on a box then the box is highlighted. When you double click the box, the flashing vertical bar appears and start entering the data.

Keep the mouse cursor at the text insertion point and start typing.

There are following three important points while typing –

- Press Tab to go to next column.
- Press Enter to go to next row.
- Press Alt + Enter to enter a new line in the same column.

Open the workbook

How to open workbook from excel in the below mentioned steps.

Step 1 – Click the File Menu as shown below

There are two more columns Recent workbooks and Recent places, recently opened workbooks and the recent places from where workbooks are opened.
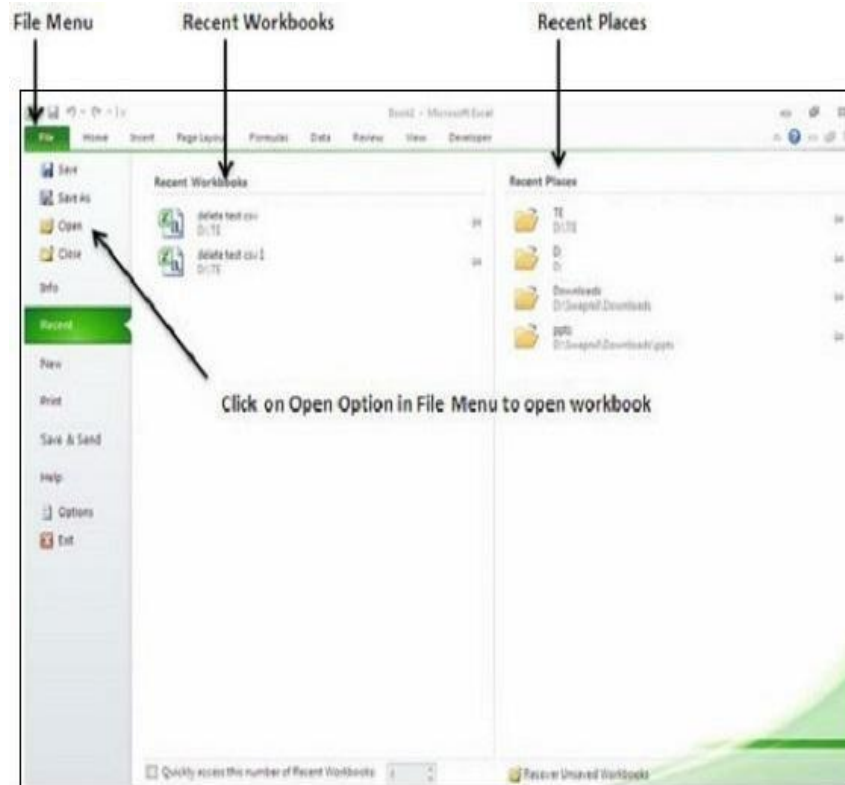
Step 2 – Clicking the Open Option will open the browse dialog as shown below. Browse the directory and find the file to open.
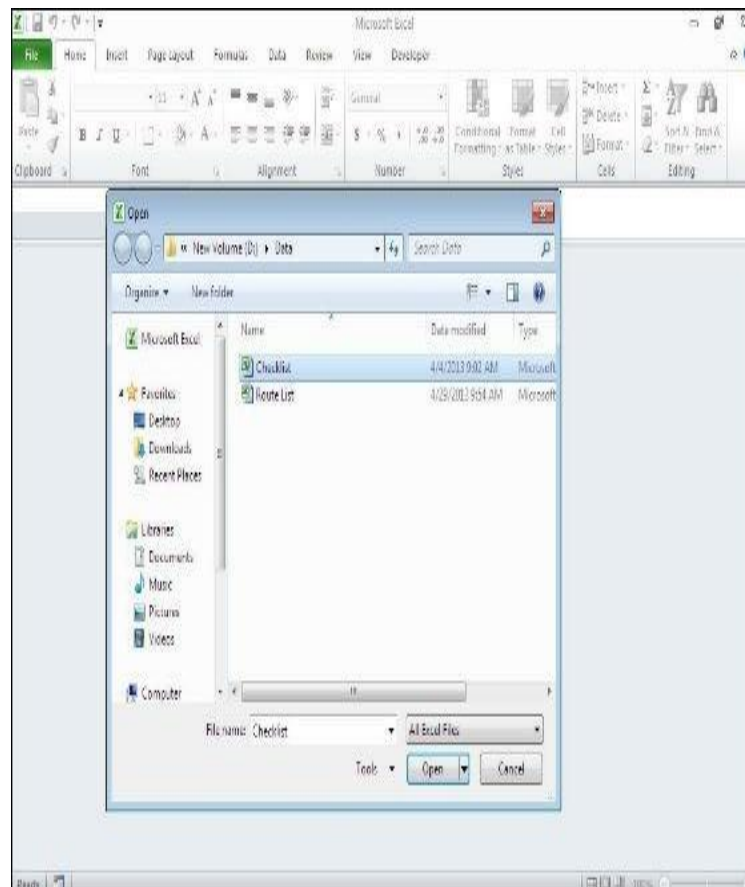
Step 3 – Select the workbook
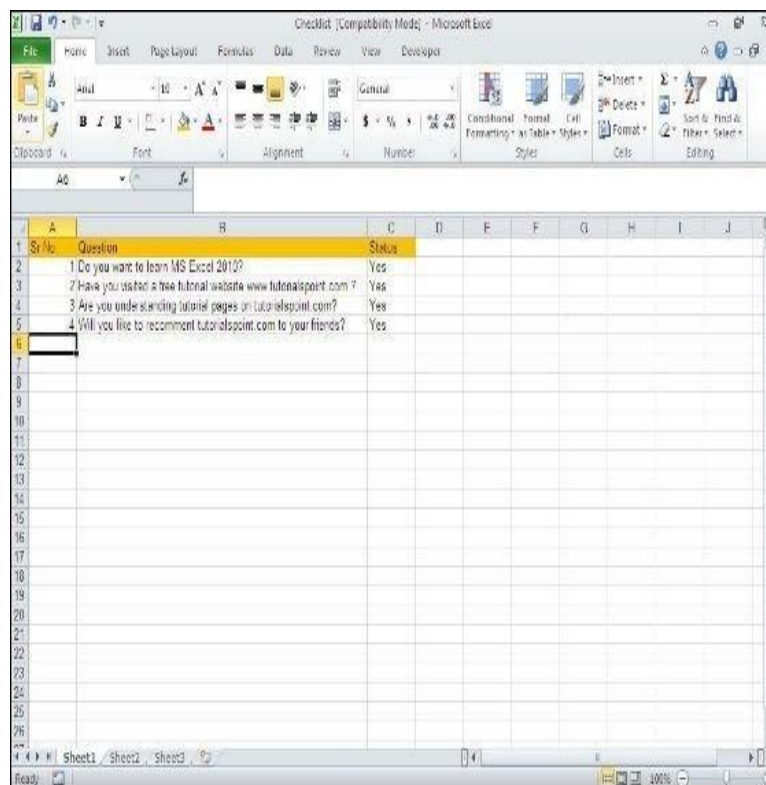
Formulas in MS Excel

Formulas are the Bread and butter of worksheet. Without formula, worksheet will be just simple tabular representation of data. A formula consists of special code, which is entered into a cell. It performs some calculations and returns a result, which is displayed in the cell.

Formulas use a variety of operators and worksheet functions to work with values and text. The values and text used in formulas can be located in other cells, which makes changing data easy and gives worksheets their dynamic nature. For example, you can quickly change the data in a worksheet and formulas works.

Elements of Formulas

A formula can consist of any of these elements −

- Mathematical operators, such as +(for addition) and *(for multiplication)
  Example −
  ▪ =A1+A2 Adds the values in cells A1 and A2.
- Values or text
  Example −
  ▪ =200*0.5 Multiplies 200 times 0.15. This formula uses only values, and it always returns the same result as 100.
- Cell references (including named cells and ranges)

Example −
- =A1=C12 Compares cell A1 with cell C12. If the cells are identical, the formula returns TRUE; otherwise, it returns FALSE.
● Worksheet functions (such as SUM or AVERAGE)
Example −
- =SUM(A1:A12) Adds the values in the range A1:A12.

Creating Formula

For creating a formula you need to type in the Formula Bar. Formula begins with '=' sign. When building formulas manually, you can either type in the cell addresses or you can point to them in the worksheet. Using the Pointing method to supply the cell addresses for formulas is often an easier and more powerful method of formula building. When you are using built-in functions, you click the cell or drag through the cell range that you want to use when defining the function's arguments in the Function Arguments dialog box. See the below screenshot.

As soon as you complete a formula entry, Excel calculates the result, which is then displayed inside the cell within the worksheet (the contents of the formula, however, continue to be visible on the Formula bar anytime the cell is active). If you make an error in the formula that prevents Excel from being able to calculate the formula at all, Excel displays an Alert dialog box suggesting how to fix the problem.
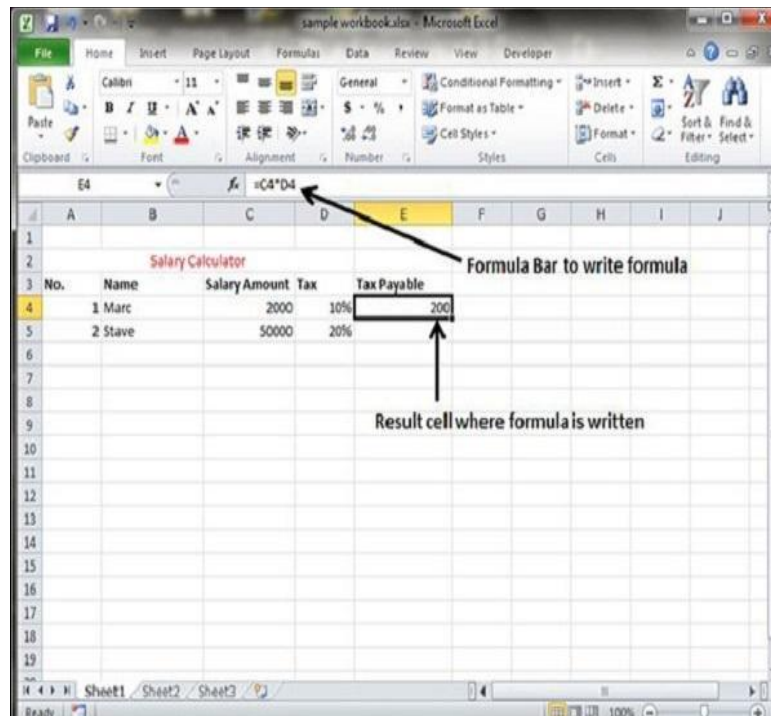
Copying Formulas in MS Excel

Copying formulas is one of the most common tasks that you do in a typical spreadsheet that relies primarily on formulas. When a formula uses cell references rather than

constant values, Excel makes the task of copying an original formula to every place that requires a similar formula.

Relative Cell Addresses

MS Excel does it automatically adjust the cell references in the original formula to suit the position of the copies that you make. It does this through a system known as relative cell addresses, whereby the column references in the cell address in the formula change to suit their new column position and the row references change to suit their new row position.

After writing the formula in the 9th row, we can drag it to the remaining columns and the formula gets copied. After dragging we can see the formula in the remaining columns as below.

- column C : =SUM(C3:C8)
- column D : =SUM(D3:D8)
- column E : =SUM(E3:E8)
- column F : =SUM(F3:F8)
- column G : =SUM(G3:G8)
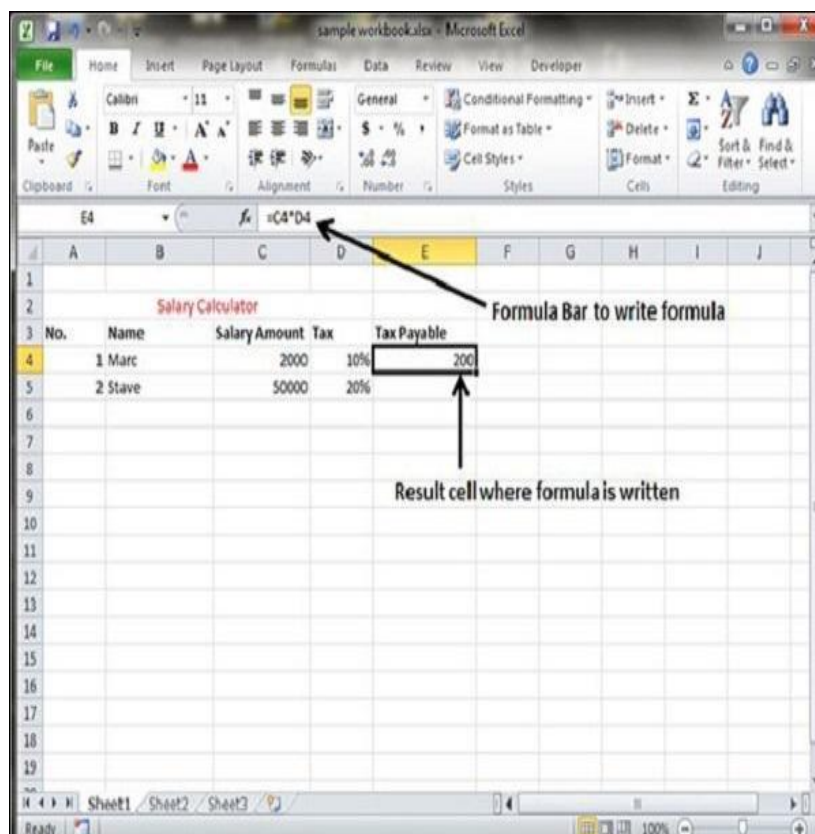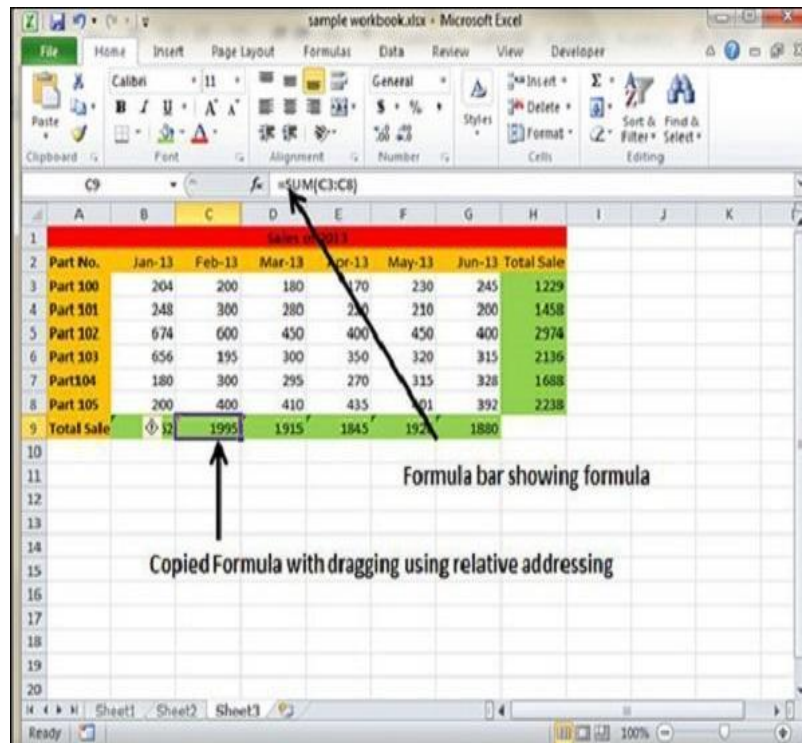
Excel calculates the result, which is then displayed inside the cell within the worksheet (the contents of the formula, however, continue to be visible on the Formula bar anytime the cell is active).

Cell References in Formulas

Most formulas you create include references to cells or ranges. These references enable your formulas to work dynamically with the data contained in those cells or ranges. For example, if your formula refers to cell C2 and you change the value contained in C2, the formula result reflects new value automatically.

When you use a cell (or range) reference in a formula, you can use three types of references – relative, absolute, and mixed references.

Relative Cell References

The row and column references can change when you copy the formula to another cell because the references are actually offsets from the current row and column. By default, Excel creates relative cell references in formulas.
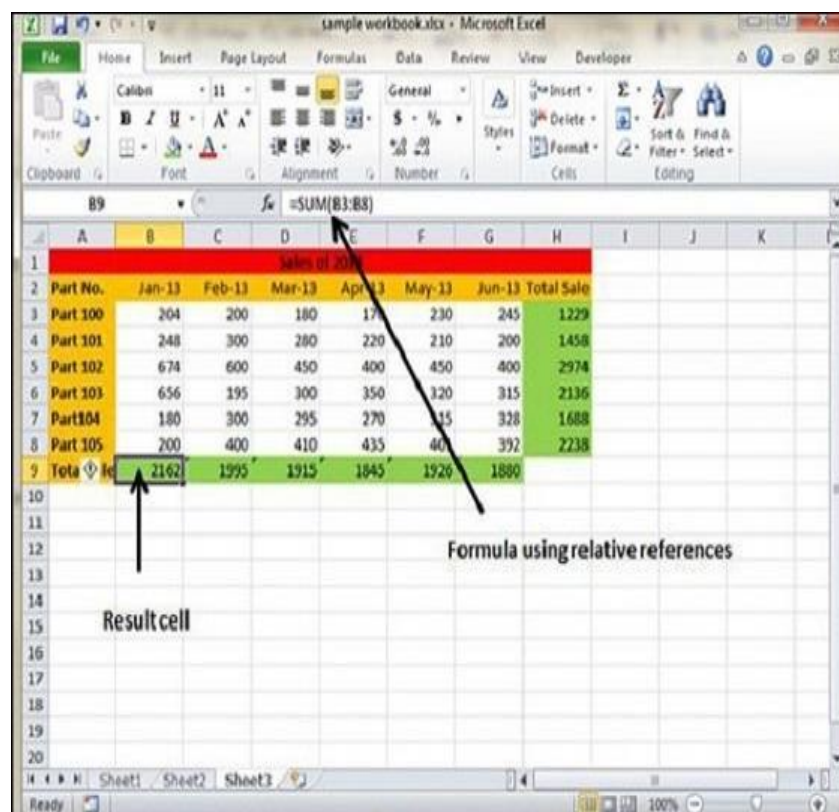
Absolute Cell References

The row and column references do not change when you copy the formula because the reference is to an actual cell address. An absolute reference uses two dollar signs in its address: one for the column letter and one for the row number (for example, A5).
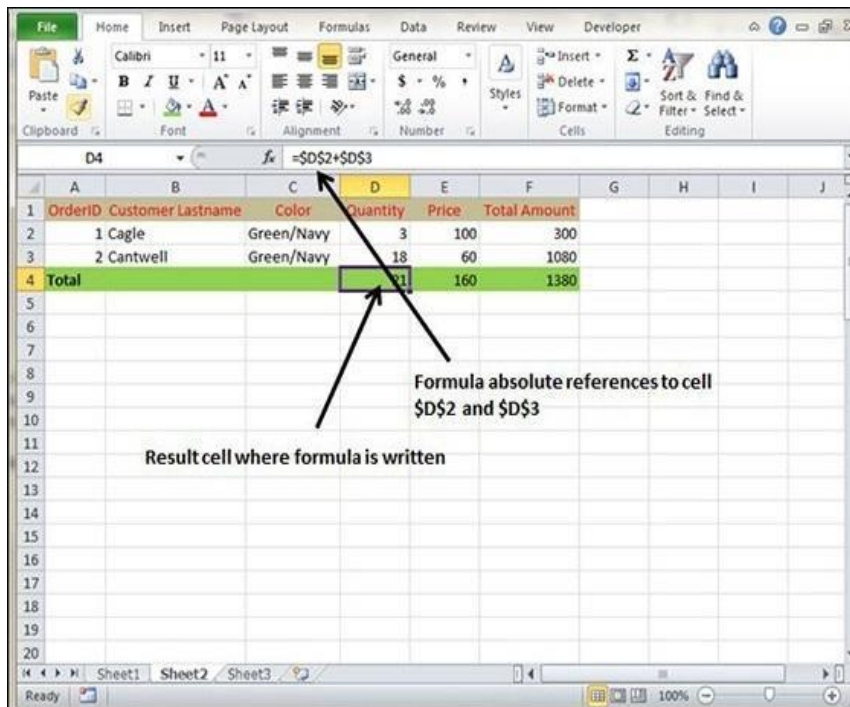
Formatting Cell

MS Excel Cell can hold different types of data like Numbers, Currency, Dates, etc. You can set the cell type in various ways as shown below −

- Right Click on the cell » Format cells » Number.
- Click on the Ribbon from the ribbon.
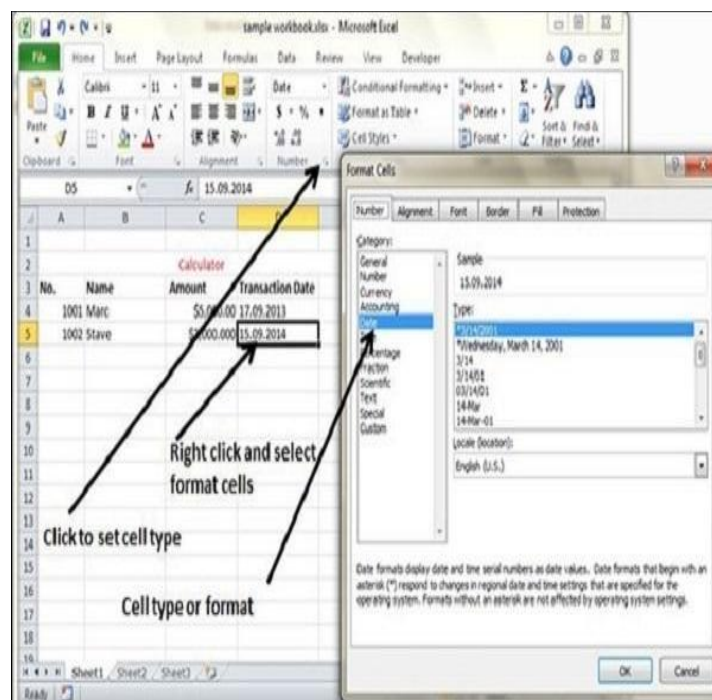
Various Cell Formats

Below are the various cell formats.

- General – This is the default cell format of Cell.
- Number – This displays cell as number with separator.
- Currency – This displays cell as currency i.e. with currency sign.
- Accounting – Similar to Currency, used for accounting purpose.
- Date – Various date formats are available under this like 17-09-2013, 17th-Sep-2013, etc.
- Time – Various Time formats are available under this, like 1.30PM, 13.30, etc.
- Percentage – This displays cell as percentage with decimal places like 50.00%.
- Fraction – This displays cell as fraction like 1/4, 1/2 etc.
- Scientific – This displays cell as exponential like 5.6E+01.
- Text – This displays cell as normal text.
- Special – Special formats of cell like Zip code, Phone Number.
- Custom – You can use custom format by using this.

Toolbars in Excel

Excel toolbar (also called Quick Access Toolbar). It **enables users to save important shortcuts and easily access them when needed** is presented to get access to various commands to perform the operations. It is presented with an option to add or delete commands to it to access them quickly.

Using Icons

In Excel 2010, there is an option which facilitates user to show icons in data cells by applying desired condition. Excel includes 20 Icon Sets in four categories; Shapes, Directional, Indicators, and Ratings, and along with this it also enables user to easily format and customize the icon sets to make data cells prominent, which shows an exclusive importance.

Using Help

If you get stuck and need help with Excel 2010 features, you can use the Excel Help window to quickly find the answers. The Excel Help button — the blue circle with a question mark, located to the right of the last Ribbon tab — provides quick access to Help.

Certain commands on the Ribbon display a ScreenTip that says Press F1 for Help when you hover the mouse cursor over them. When you see this, press F1 to see Help information related specifically to that command.

MS Excel Keyboard Shortcuts

MS Excel offers many keyboard short-cuts. Below is the list of all the major shortcut keys in Microsoft Excel.

- Ctrl + A – Selects all contents of the worksheet.
- Ctrl + B – Bold highlighted selection.
- Ctrl + I – Italicizes the highlighted selection.
- Ctrl + K – Inserts link.
- Ctrl + U – Underlines the highlighted selection.
- Ctrl + 1 – Changes the format of selected cells.
- Alt + = – Creates a formula to sum all of the above cells
- Ctrl + ' – Inserts the value of the above cell into cell currently selected.
- Ctrl + Home – Moves to cell A1.
- Ctrl + ~ – Switches between showing Excel formulas or their values in cells.
- F2 – Edits the selected cell.
- Alt + Enter – While typing text in a cell pressing Alt + Enter will move to the next line allowing for multiple lines of text in one cell.

Spreadsheet Types

Excel offers three general ways to arrange data in your spreadsheet so you can use it as a database with your worksheet formulas:

1. **Simple (or "Gray Cell") Tables**, which I've used since Excel 2.0.
2. **Excel Tables**, introduced in Excel 2007.
3. **PivotTables** with a Tabular Report Layout, introduced in Excel 2010.

Working with Spreadsheets

Creating New Worksheet

Three new blank sheets always open when you start Microsoft Excel.

How to create a new worksheet

Step 1 – Right Click the Sheet Name and select Insert option.
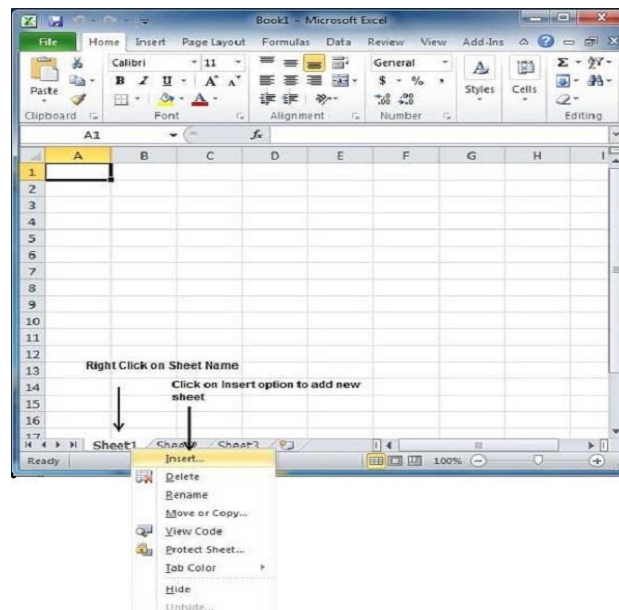
Step 2 – Insert dialog with select Worksheet option as selected from the general tab. Click the Ok button.
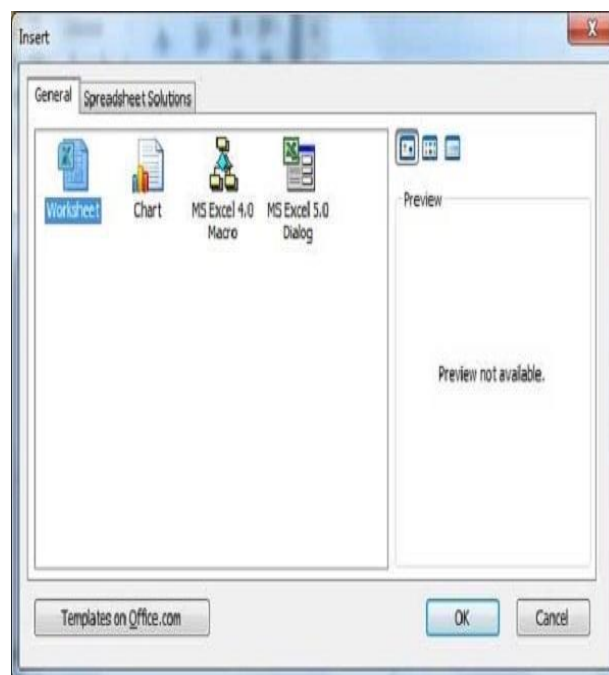
Now you should have your blank sheet as shown below ready to start typing your text.

Using the Shift+F11 keys new blank sheet is opened.

How to open workbook from excel

Step 1 – Click the File Menu as shown below. Open option in File Menu.

There are two more columns Recent workbooks and Recent places, where you can see the recently opened workbooks and the recent places from where workbooks are opened.
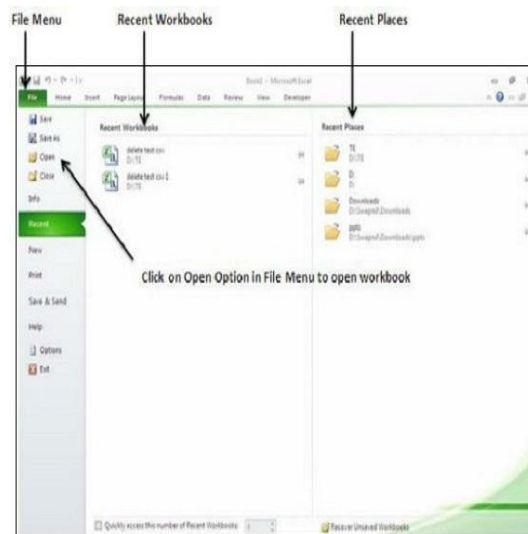
Step 2 − Clicking the Open Option will open the browse dialog as shown below. Browse the directory and find the file you need to open.

Step 3 − Once you select the workbook your workbook will be opened as below −
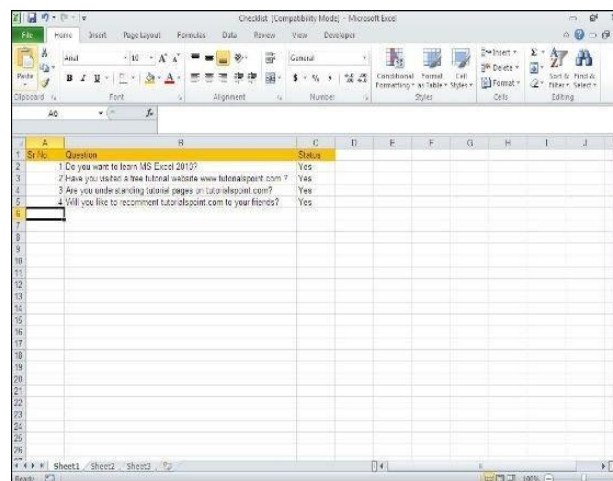
Saving New Sheet

To save your sheet/workbook following are the steps to save an edited excel sheet –

Step 1 – Click the File tab and select Save As option.
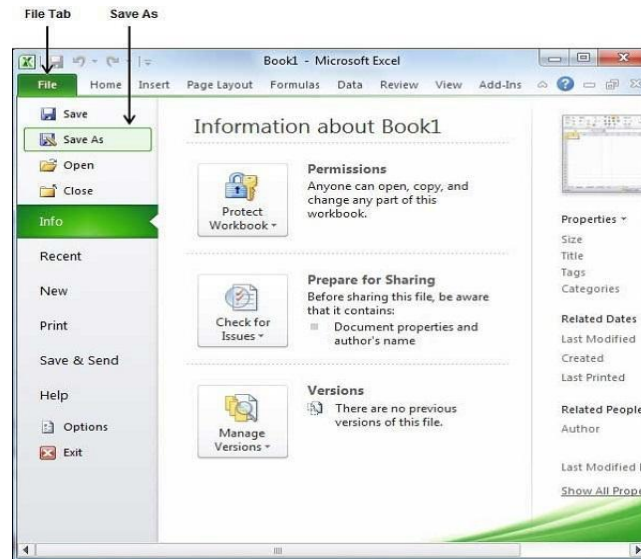
Step 2 – Select a folder where to save the sheet, Enter file name Select a Save as type, by default it is .xlsx format.

Step 3 – Finally, click on Save button and saved with the entered name in the selected folder.

Saving New Changes

After opening workbook and to save this sheet with the same name, then use either of the following simple options –

- Just press Ctrl + S keys to save the changes.
- click on the floppy icon available at the top left corner and just above the File tab. This option will also save the changes.
- Save option available just above the Save As option as shown in the above screen capture.

If your sheet is new and it was never saved so far, then with either of the three options, word would display you a dialogue box to let you select a folder, and enter sheet name and click save.

Setting Margins

Margins

Margins are the unprinted areas along the sides, top, and bottom of a printed page. All printed pages in MS Excel have the same margins.

Steps to set the margin

Choose Page Layout » Page Setup » Margins drop-down list, can select Normal, Wide, Narrow, or the custom Setting.
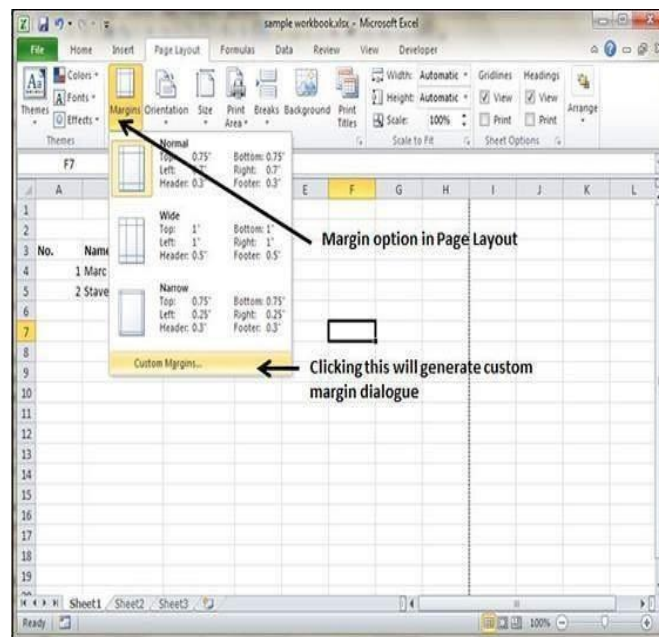
Converting files to different formats

In Excel, open the workbook that you want to save for use in another program.
- On the File tab, click Save As.
- To save the workbook to a different location, specify the drive and location in the file path and folder boxes.
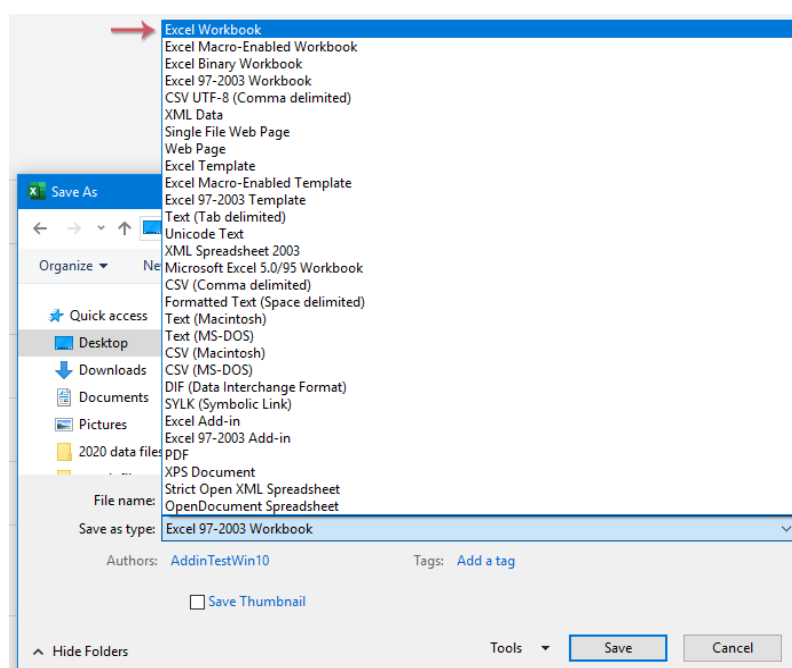
- In the File name box, accept the suggested name or type a new name for the workbook.
- In the Save as type list, click the format (PDF, XPS, etc.) that you know you can open in the other program.

In Excel, you can import data from different data sources. Some of the data sources are as follows −

- Microsoft Access Database
- Web Page
- Text File
- SQL Server Table
- SQL Server Analysis Cube
- XML File

Importing Data from Microsoft Access Database

To import data from MS Access database, follow the steps given below

Step 1 − Open a new blank workbook in Excel.
Step 2 − Click the DATA tab on the Ribbon.
Step 3 − Click From Access in the Get External Data group. The Select Data Source dialog box appears.
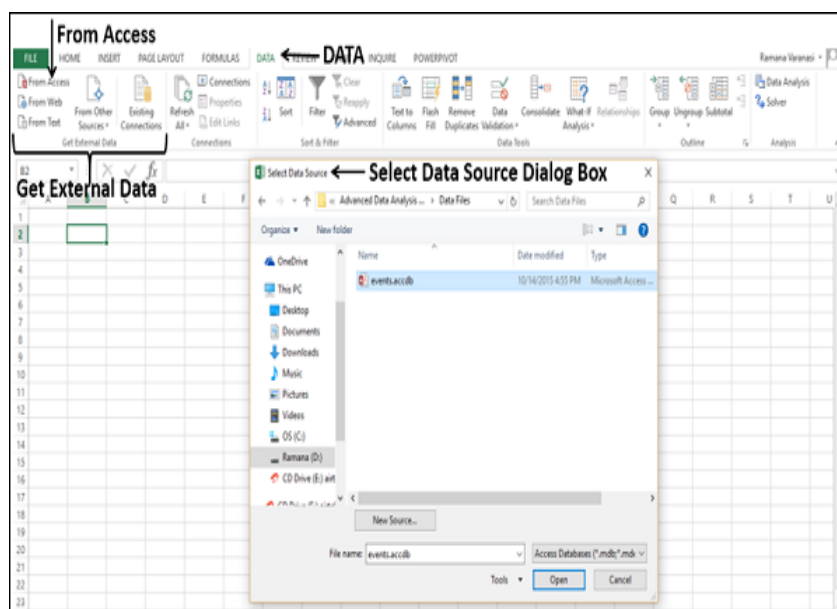
Step 4 − Select the Access database file to import. Access database files will have the extension .accdb.

The Select Table dialog box appears displaying the tables found in the Access database. Import all the tables in the database at once or import only the selected tables.
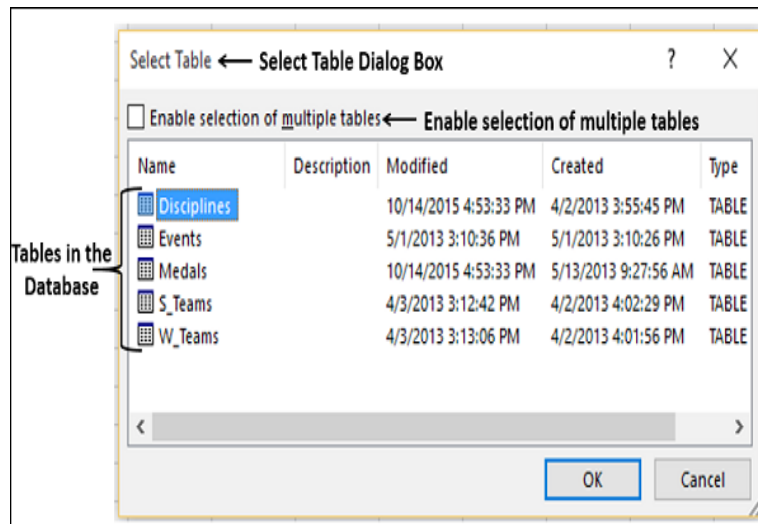
Step 5 – Select the Enable selection of multiple tables box and select all the tables.
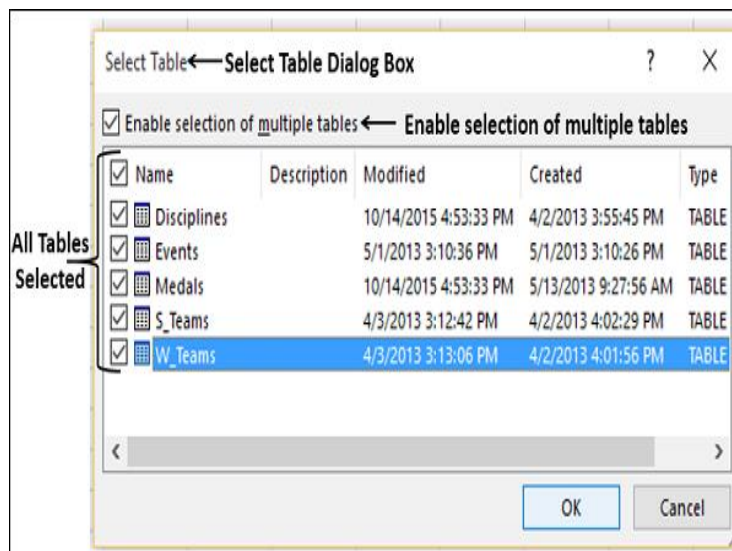
Step 6 – Click OK. The Import Data dialog box appears.
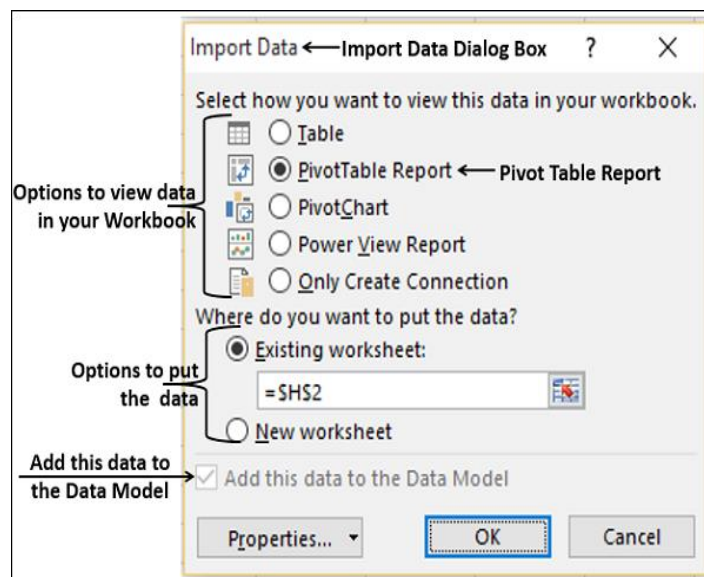
The following options to view the data you are importing in the workbook −

- Table
- PivotTable Report
- PivotChart
- Power View Report

PivotTable Report is selected by default.

Excel also gives the options to put the data in your workbook −

- Existing worksheet
- New worksheet

Another check box that is selected and disabled – Add this data to the Data Model. Whenever you import data tables into your workbook, they are automatically added to the Data Model in the workbook.

- If we select Table, Existing worksheet option gets disabled, New worksheet option gets selected and Excel creates as many worksheets as the number of tables are imported from the database. The Excel tables appear in these worksheets.
- If you select PivotTable Report, Excel imports the tables into the workbook and creates an empty PivotTable for analyzing the data in the imported tables.
- Excel tables for the imported data tables will not appear in the workbook. However, you will find all the data tables in the PivotTable fields list, along with the fields in each table.
- If you select PivotChart, Excel imports the tables into the workbook and creates an empty PivotChart for displaying the data in the imported tables.
- If you select the option - Only Create Connection, a data connection will be established between the database and your workbook.

Importing Data from Other Sources

Excel provides the options to choose various other data sources. Import data from these in few steps.

Step 1 – Open a new blank workbook in Excel.
Step 2 – Click the DATA tab on the Ribbon.
Step 3 – Click from Other Sources in the Get External Data group.
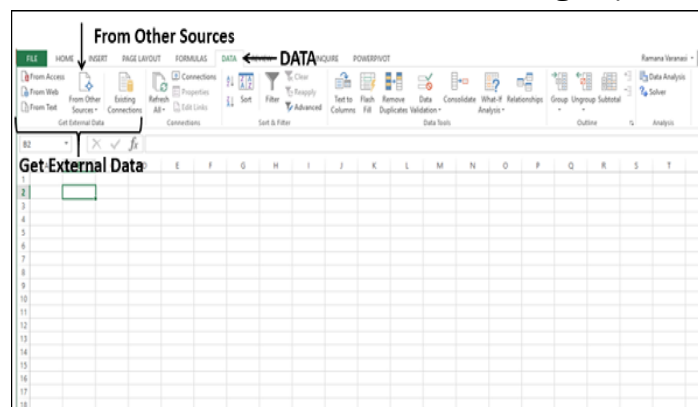
Dropdown with various data sources appears.
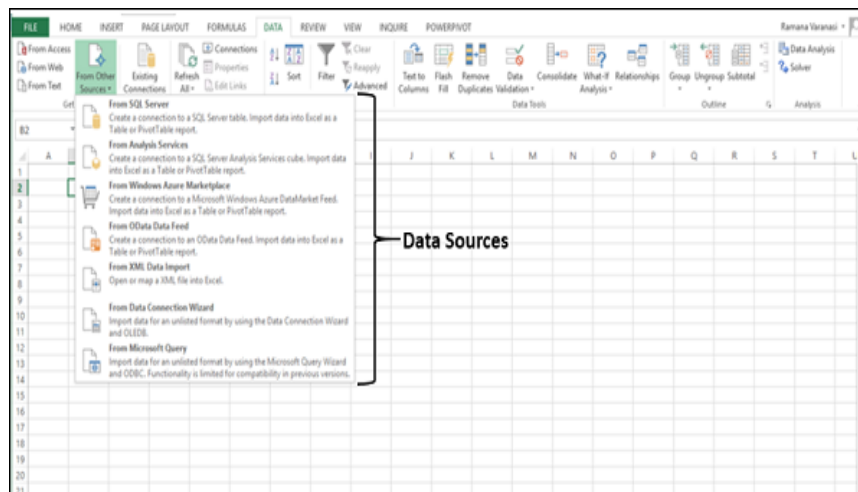
Export Excel sheet

If your data is shared between other programs, like a database, you may need to save data as a different file type or bring in files of a different file type.

Exporting Data

When you have data that needs to be transferred to another system, export it from Excel in a format that can be interpreted by other programs, such as a text or CSV file.

1. Click the File tab.
2. At the left, click Export.
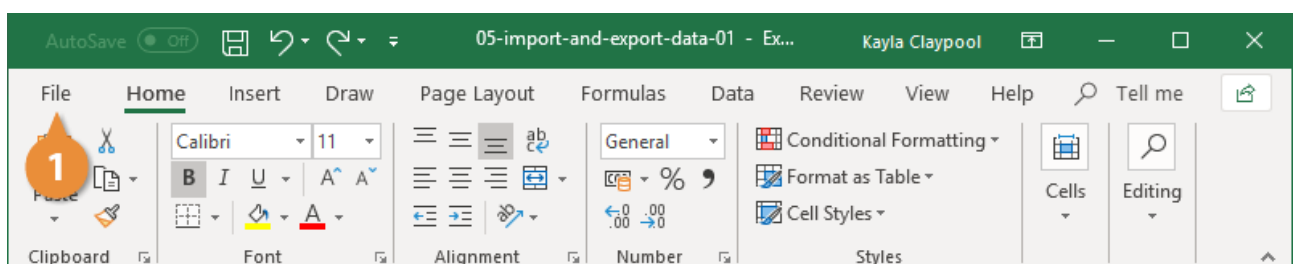
3. Click the Change File Type.
4. Under Other File Types, select a file type.

*   Text (Tab delimited): The cell data will be separated by a tab.
*   CSV (Comma delimited): The cell data will be separated by a comma.
*   Formatted Text (space delimited): The cell data will be separated by a space.
*   Save as Another File Type: Select a different file type when the Save As dialog box appears.
*   The file type you select will depend on what type of file is required by the program that will consume the exported data.
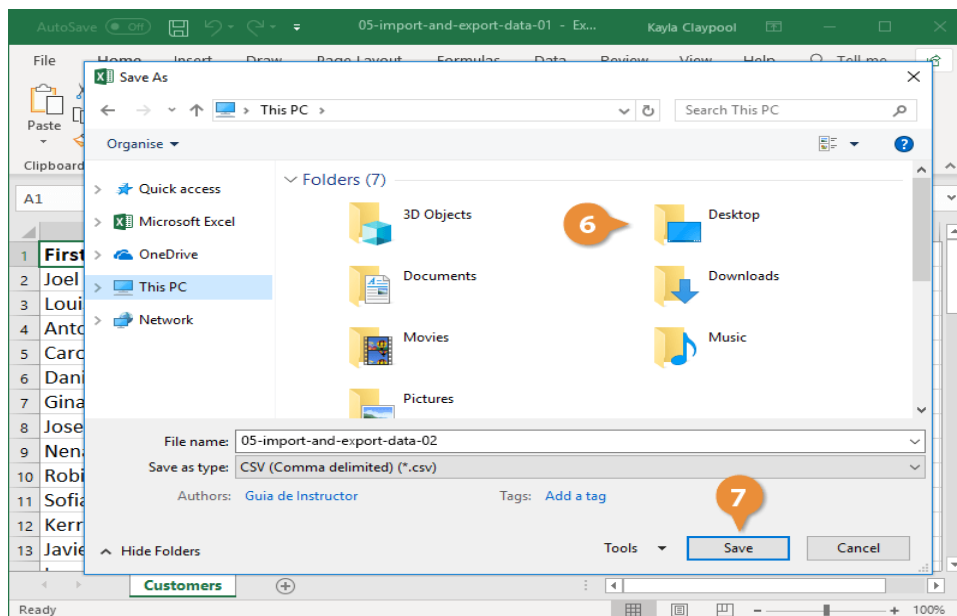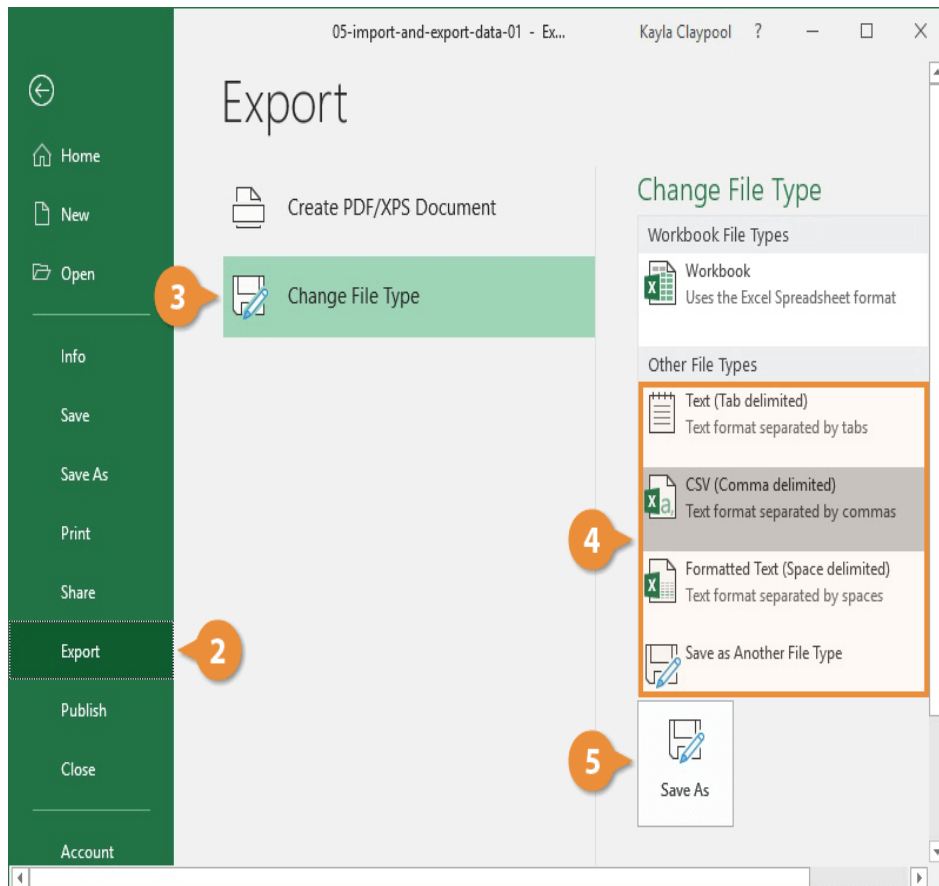
5. Click Save As.
6. Specify where you want to save the file.
7. Click Save.

● A dialog box appears stating that some of the workbook features may be lost. Click Yes.

Sending files to others

Workbook can be shared to others within Excel. Others can edit the workbook or just view it.

1. Select Share.
2. Select permissions and then Apply.
3. Add people.
4. Type a message if you like.
5. Select Send.
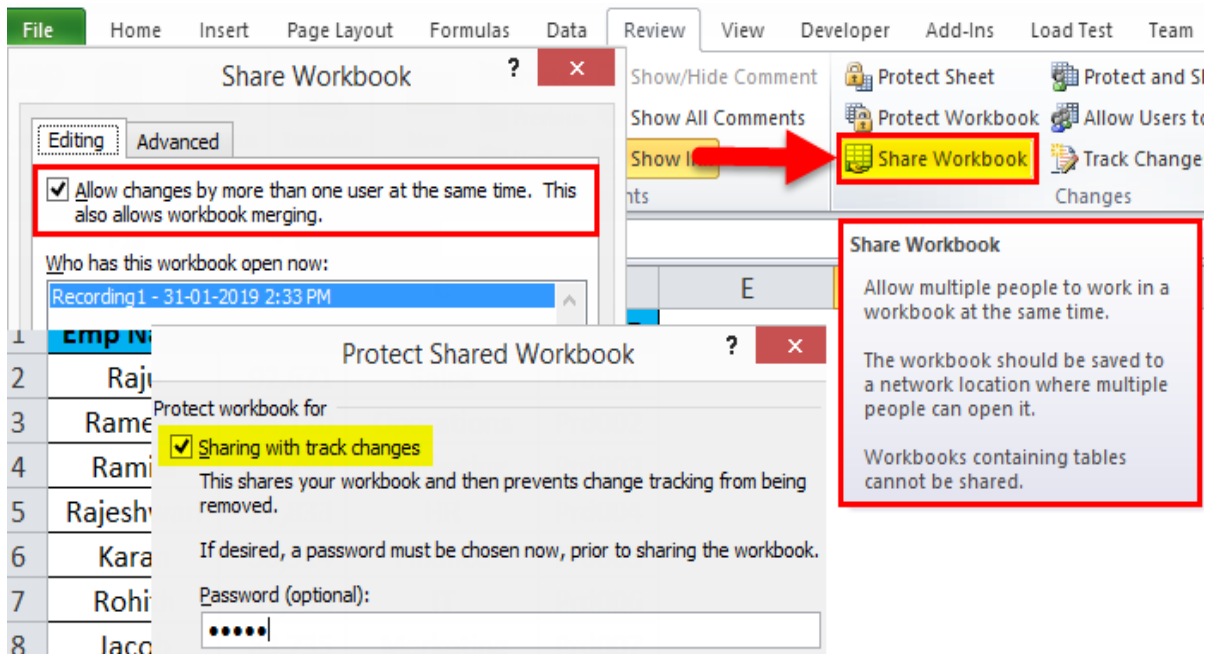
Spreadsheet Addressing - Rows, Columns and Cells

MS Excel is in tabular format consisting of rows and columns.
● Row runs horizontally while Column runs vertically.
● Each row is identified by row number, which runs vertically at the left side of the sheet.
● Each column is identified by column header, which runs horizontally at the top of the sheet.
● For MS Excel 2010, Row numbers ranges from 1 to 1048576; in total 1048576 rows, and Columns ranges from A to XFD; in total 16384 columns.

Navigation with Rows and Columns

Let us see how to move to the last row or the last column.

- You can go to the last row by clicking Control + Down Navigation arrow.
- You can go to the last column by clicking Control + Right Navigation arrow.
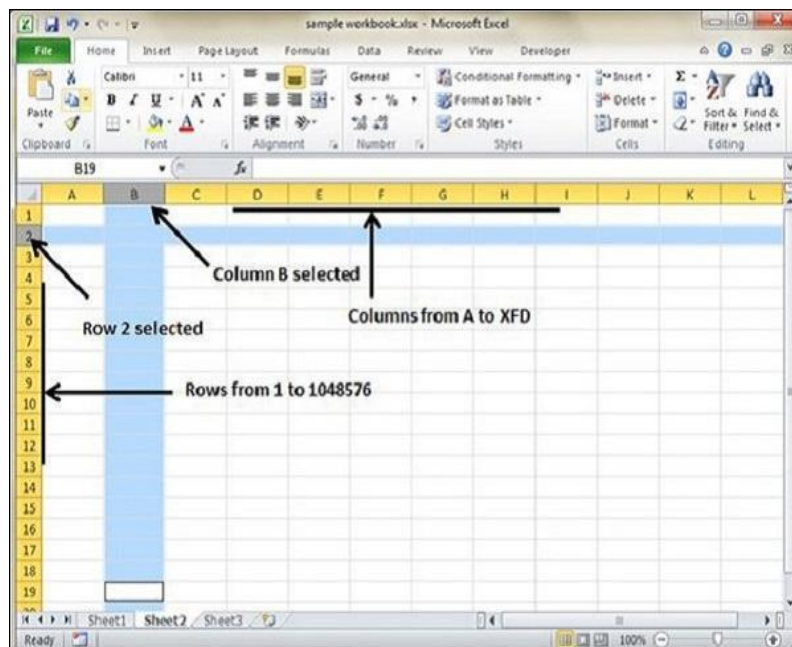
Cell Introduction

The intersection of row and column is called cell. Cell is identified with Combination of column header and row number. For example – A1, A2.
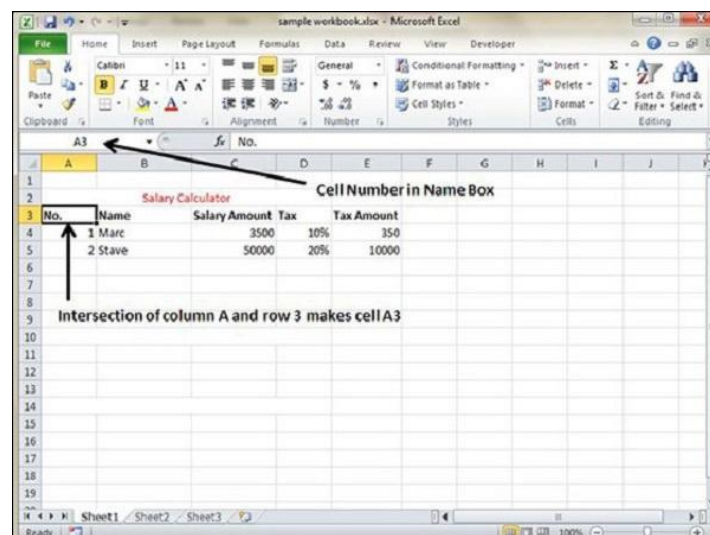
Excel 2010 includes two types of referencing, i.e, Absolute and Relative, these referencing. To find out the different type of data cell address, then you can easily show it by providing certain parameters. Excel ADDRESS function provide list of options to

show address in desired ways; with row/column headers or row/column numbers, with absolute, relative or mixed format, etc. The syntax of ADDRESS function is;

=ADDRESS(row_number, column_num,[abs_num],[a1],[sheet_text])

The first argument row_number refers to the number of row in which data cell is existed, next argument column_num refers to column number in which it is present, third argument [abs_num] refers to list which provide different options; Absolute, Absolute row/Relative column, Relative row/Absolute column, and Relative. On choosing desired option from the list, you will see the address in specified format, the [a1] refers to two different ways, i.e, with row/column number(R1C1) or row/column headers(A1B1) in which you want to show address. The last argument shows sheet text in the address.

Selecting cells - shortcut

1. Select the Last Used Cell
> The keyboard shortcut to select the last used cell on a sheet is: Ctrl+End. Ctrl+End   will take you to the intersection of the last used column and last used row.
2. Select the First Visible Cell
3. The keyboard shortcut to select the first visible cell on a sheet is: Ctrl+Home
> Using Ctrl+Home will always take you to the first visible cell (excluding hidden rows/columns) on the sheet, unless your sheet has Freeze Panes.
4. The keyboard shortcut to select the last cell in a contiguous range is: Ctrl+Arrow Key
5. Add Cells to the Selected Range
> The keyboard shortcut to add cells to the selected range is: Shift+Arrow Key
6. Select Multiple Cells in Contiguous Range Ctrl+Shift+Arrow Key
7. Select All Cells
> The keyboard shortcut to all cells in the current used range is: Ctrl+A

4.1.2 Entering Data and Deleting Data

In MS Excel, there are 1048576*16384 cells. MS Excel cell can have Text, Numeric value or formulas. An MS Excel cell can have maximum of 32000 characters.

Inserting Data
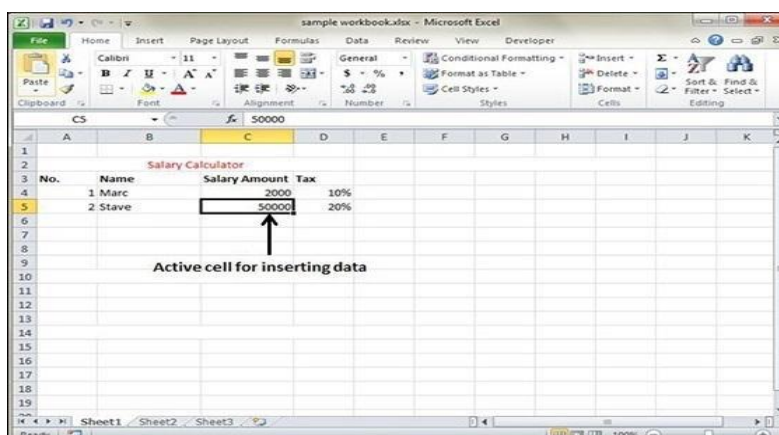
For inserting data in MS Excel, just activate the cell type text or number and press enter or Navigation keys.

Cut Copy Paste

MS Excel provides copy paste options in different ways. The simplest method of copy paste is as below.

Copy Paste

● To copy and paste, just select the cells you want to copy. Choose copy option after right click or press Control + C.
● Select the cell where you need to paste this copied content. Right click and select paste option or press Control + V.
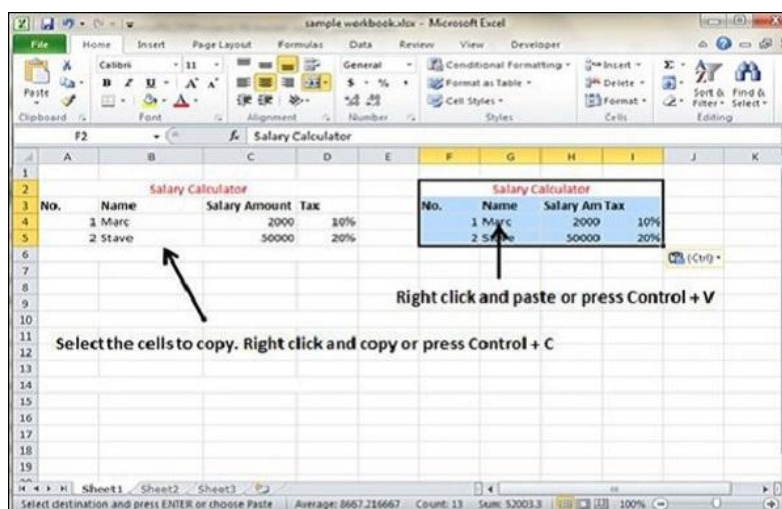
Copy Paste using Office Clipboard

When you copy data in MS Excel, it puts the copied content in Windows and Office Clipboard. You can view the clipboard content by Home → Clipboard. View the clipboard content. Select the cell where you need to paste. Click on paste, to paste the content.
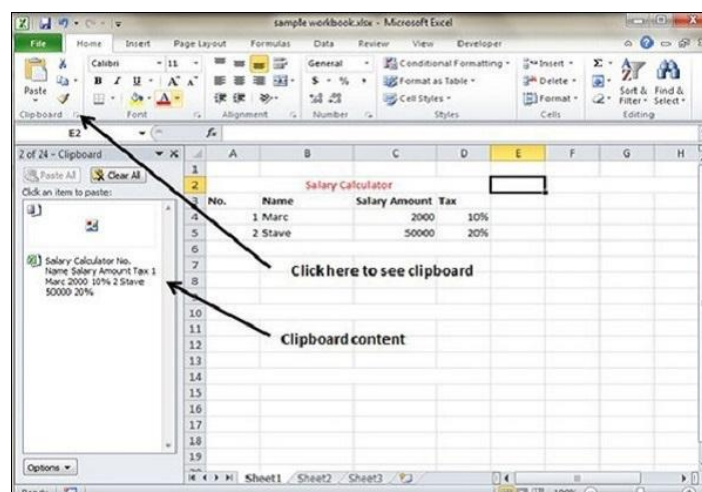
Below are the various options available in paste special.

- All – Pastes the cell's contents, formats, and data validation from the Windows Clipboard.
- Formulas – Pastes formulas, but not formatting.
- Values – Pastes only values not the formulas.
- Formats – Pastes only the formatting of the source range.
- Comments – Pastes the comments with the respective cells.
- Validation – Pastes validation applied in the cells.
- All using source theme – Pastes formulas, and all formatting.
- All except borders – Pastes everything except borders that appear in the source range.
- Column Width – Pastes formulas, and also duplicates the column width of the copied cells.
- Formulas & Number Formats – Pastes formulas and number formatting only.
- Values & Number Formats – Pastes the results of formulas, plus the number.
- Merge Conditional Formatting – This icon is displayed only when the copied cells contain conditional formatting. When clicked, it merges the copied conditional formatting with any conditional formatting in the destination range.
- Transpose – Changes the orientation of the copied range. Rows become columns, and columns become rows. Any formulas in the copied range are adjusted so that they work properly when transposed.
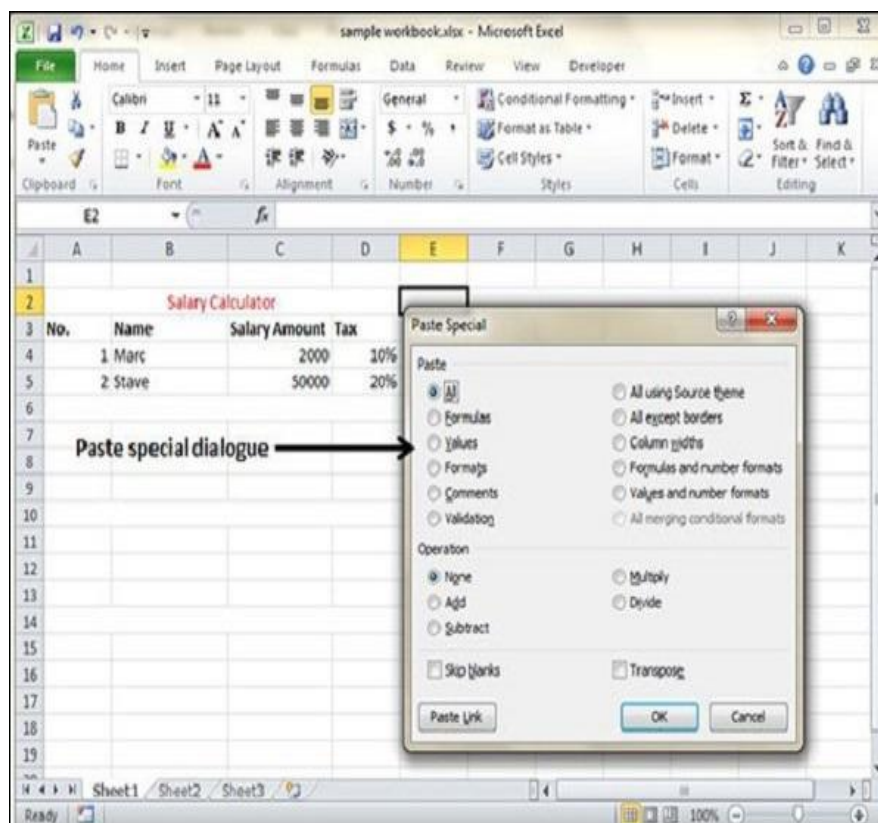
Undo and Redo

The Undo and Redo features let you remove or repeat single or multiple typing actions, but all actions must be undone or redone in the order you did or undid them

- The **Ctrl + Z** (for undo) and **Ctrl + Y** (for redo) keyboard shortcuts.
- The undo and redo buttons in the **Quick Access Toolbar**.

Filling Continuous rows, columns, Highlighting values

1. Select one or more cells you want to use as a basis for filling additional cells. For a series like 1, 2, 3, 4, 5..., type 1 and 2 in the first two cells. ...
2. Drag the fill handle .
3. If needed, click Auto Fill Options. and choose the option you want.

You can easily add sequential numbers to rows of data by dragging the fill handle to fill a column with a series of numbers or by using the ROW function.

Fill a column with a series of numbers

1. Select the first cell in the range that you want to fill.
2. Type the starting value for the series.
3. Type a value in the next cell to establish a pattern.

For example, if you want the series 1, 2, 3, 4, 5..., type **1** and **2** in the first two cells. If you want the series 2, 4, 6, 8..., type **2** and **4**.

1. Select the cells that contain the starting values.
2. Drag the fill handle across the range that you want to fill.

To fill in increasing order, drag down or to the right. To fill in decreasing order, drag up or to the left.

Highlighting Values

Conditional formatting makes it easy to highlight certain values or make particular cells easy to identify. This changes the appearance of a cell range based on a condition (or criteria). You can use conditional formatting to highlight cells that contain values which meet a certain condition. Or you can format a whole cell range and vary the exact format as the value of each cell varies.

Highlighting the values can be done based on highlight cells rules,top/bottom rules,Data bars, Color scales, Icon sets.

Example:

1. Select **Highlight Cells Rules** or **Top/Bottom Rules**. We'll choose Highlight Cells Rules for this example. A menu will appear with several **rules.**
2. Select the desired rule (**Greater Than,** for example).
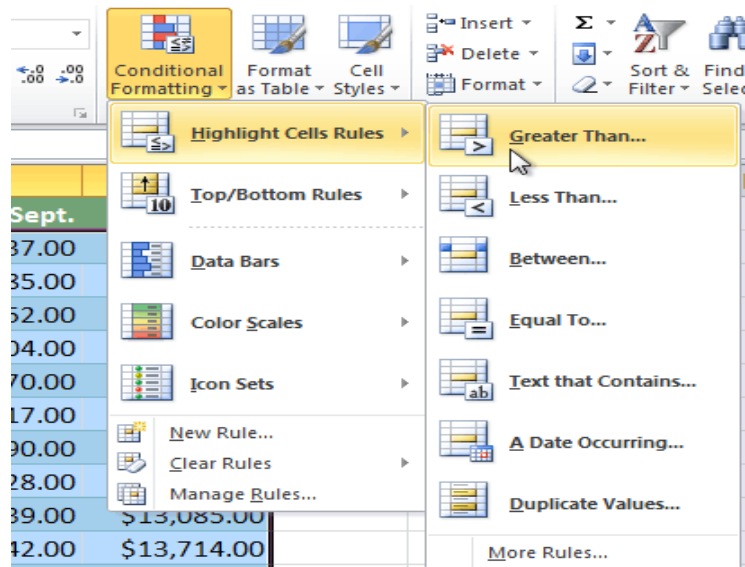
3. From the dialog box, enter a **value** in the space provided, if applicable. In this example, we want to format cells that are greater than $5000, so we'll enter 5000 as our value. If you want, you can enter a **cell reference** instead of a number.
4. Select a formatting style from the drop-down menu.
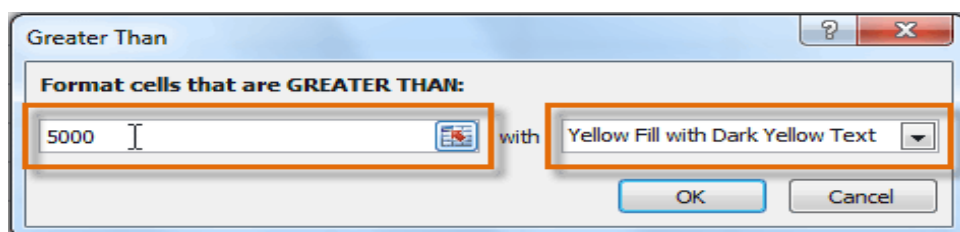
5. The formatting will be applied to the selected cells.

Find, Sesarch and Replace

MS Excel provides Find & Replace option for finding text within the sheet.

Find and Replace Dialogue

Let us see how to access the Find & Replace Dialogue.
To access the Find & Replace, Choose Home → Find & Select → Find or press Control + F Key.
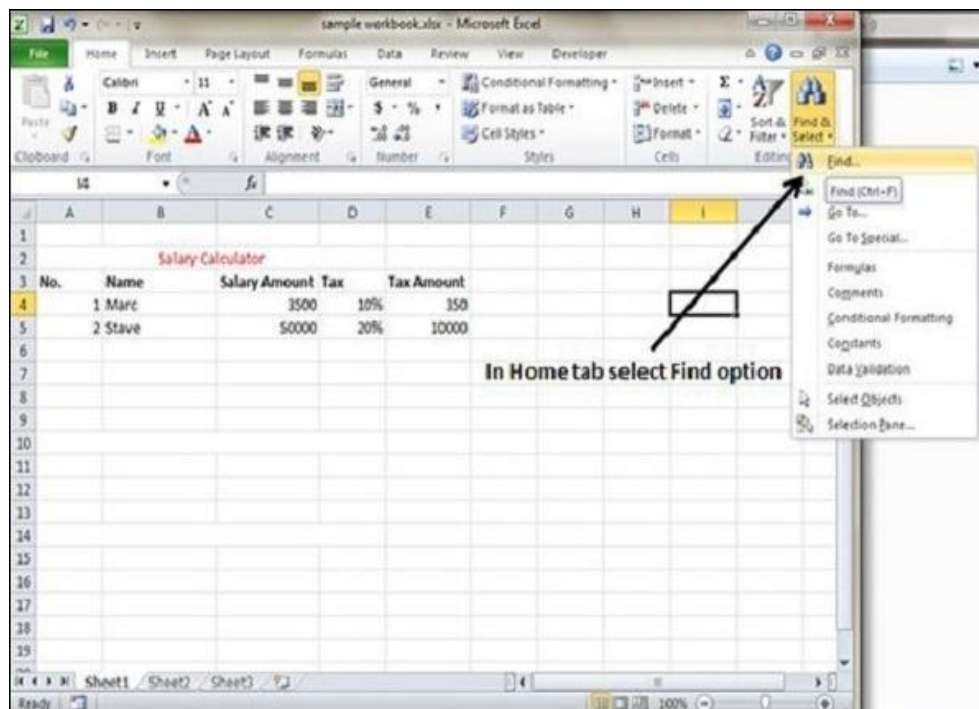
You can see the Find and Replace dialogue as below.
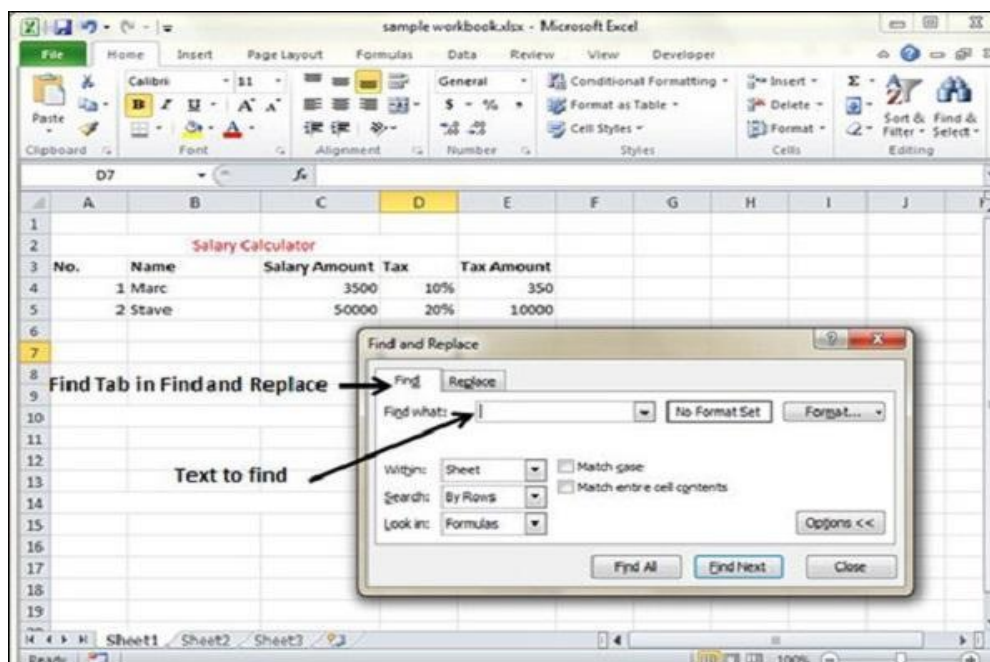
You can replace the found text with the new text in the Replace tab.
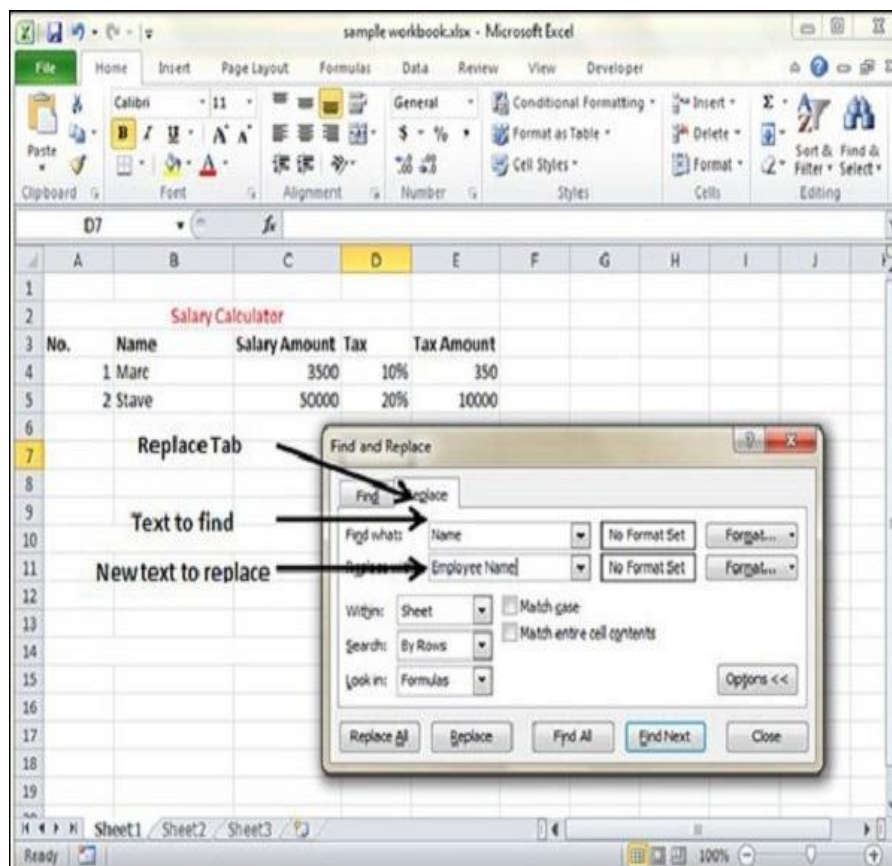
Inserting Data

MS Excel cell can have Text, Numeric value or formulas. An MS Excel cell can have maximum of 32000 characters.

For inserting data in MS Excel, just activate the cell type text or number and press enter or Navigation keys.

Inserting Cells, Rows, Columns, Sheets

To insert Cells

To add a new individual cell to an Excel spreadsheet, follow the steps below:

1. Select the cell of where you want to insert a new cell by clicking the cell once with the mouse.
2. Right-click the cell of where you want to insert a new cell.
3. In the right-click menu that appears, select Insert.
4. Choose either Shift cells right or Shift cells down depending on how you want to affect the data around the cells.

To insert rows

1. Select the row **below** where you want the new row to appear.

2. Click the **Insert** command on the **Home** tab.

3. The new row appears in your worksheet.

When inserting new rows, columns, or cells, can see the **Insert Options** button by the inserted cells. This button allows to choose how Excel formats them. By default, Excel formats inserted rows with the same formatting as the cells in the row above them. To access more options, however your mouse over the Insert Options button and click the drop-down arrow that appears.

To insert columns

1. Select the column to the **right** of where you want the new column to appear. For example, if you want to insert a column between A and B, select column B.

2. Click the **Insert** command on the **Home** tab.

3. The new column appears in your worksheet.

By default, Excel formats inserted columns with the same formatting as the column to the left of them. To access more options, hover your mouse over the **Insert Options** button and click the drop-down arrow that appears.

To insert a new worksheet in front of an existing worksheet, **select that worksheet and then, on the Home tab, in the Cells group, click Insert, and then click Insert Sheet**. Tip: You can also right-click the tab of an existing worksheet, and then click Insert. On the General tab, click Worksheet, and then click OK.

Insert Sheets

The default number of sheets that appears by clicking the Microsoft Office button and choosing Excel Options can be changed and also have the ability to insert new worksheets if needed while working.

To insert a new worksheet:

● Left-click the Insert Worksheet icon. A new sheet will appear. It will be named Sheet4, Sheet5, or whatever the next sequential sheet number may be in the workbook.
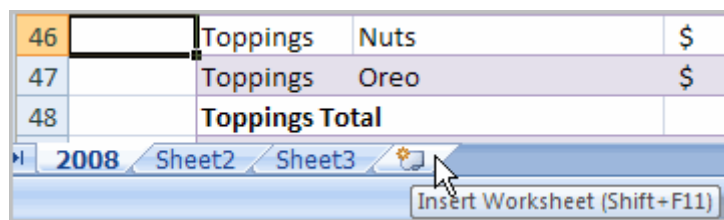
● Press the Shift and the F11 keys on your keyboard.

Insert Symbol

You can easily insert a special character, fraction, or other symbol in your PowerPoint presentations and Excel workbooks. The most important thing to understand when inserting symbols, fractions, special characters, or international characters is that the font you use is critical. Not all fonts have the same characters in them. For example, the Elephant font has no fraction characters in it, while Verdana does. As a result it's important to use the right font to find the symbol or character you want.

These marks are static symbols. If you're looking for an interactive check box that you can click on to check or uncheck, see: Add a check box or option button (Excel).

Symbol such as currency (¥), music (♫), or check marks (✔)
1. Place your cursor in the file at the spot where you want to insert the symbol.
2. Go to **Insert > Symbol**.
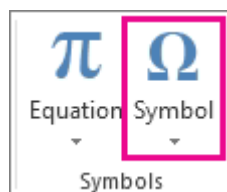
3. Pick a symbol, or choose **More Symbols.**

4. Scroll up or down to find the symbol you want to insert. Different font sets often have different symbols in them and the most commonly used symbols are in the **Segoe UI Symbol** font set. Use the **Font** selector above the symbol list to pick the font you want to browse through.

5. When you find the symbol you want, double-click it. The symbol will be inserted in your file.
6. Select **Close**.

How do I import data from an external source in Excel?

Excel can import data from external data sources including other files, databases, or web pages.
1. Click the Data tab on the Ribbon..
2. Click the Get Data button. ...
3. Select From File.
4. Select From Text/CSV. ...
5. Select the file you want to import.
6. Click Import. ...
7. Verify the preview looks correct. ...
8. Click Load.

Insert Frames

You can use a group box or a frame control to group related controls (such as option buttons, check boxes, or closely related contents) into one visual unit. Group boxes and frame controls are **rectangular objects with optional labels**. Use a group box or a frame control to visually organize related items on a form.

Insert Clip Art

1. Choose Insert Tab » Clip Art.
2. Clicking Clip Art will open the search box as shown in the below screen-shot. Choose from the list of available Clip Arts.
3. Click on Clip Art to Insert it in the worksheet.
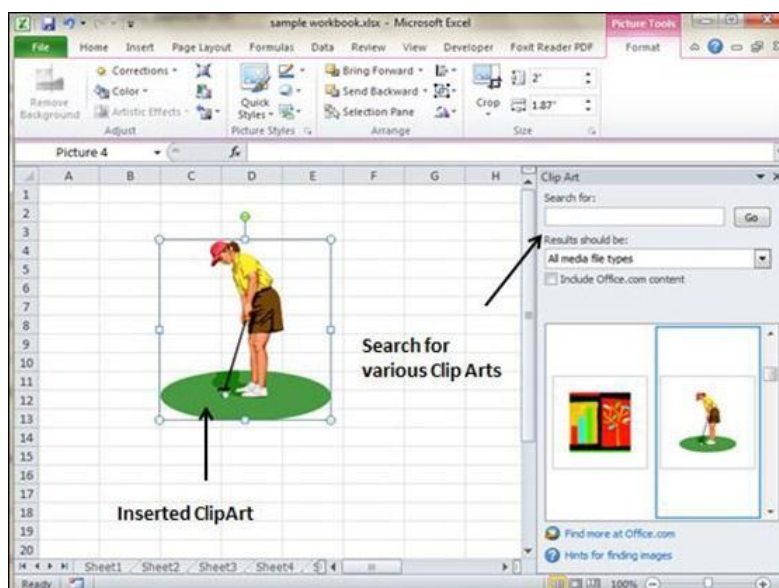
Insert Pictures

1. Go to the Insert tab.
2. Click the Illustrations button.
3. Select Picture and choose where the image should come from. Typically, the image is located on your computer. If that's the case, select 'From this device'.
4. Select the images you want to insert.
5. Resize the image to fit the cell.
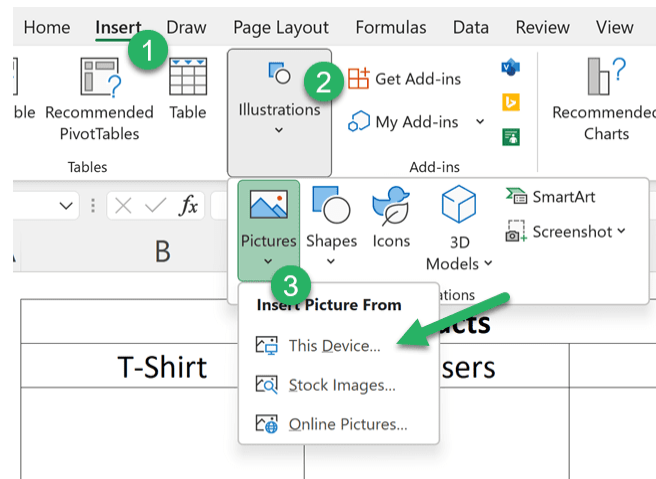
Insert Files

1. Click inside the cell of the spreadsheet where you want to insert the object.
2. On the Insert tab, in the Text group, click Object Object icon on the ribbon.
3. In the Object dialog box, click the Create from File tab.
4. Click Browse, and select the file you want to insert.

If you want to insert an icon into the spreadsheet instead of show the contents of the file, select the Display as icon check box. If you don't select any check boxes, Excel shows the first page of the file. In both cases, the complete file opens with a double click. Click OK.
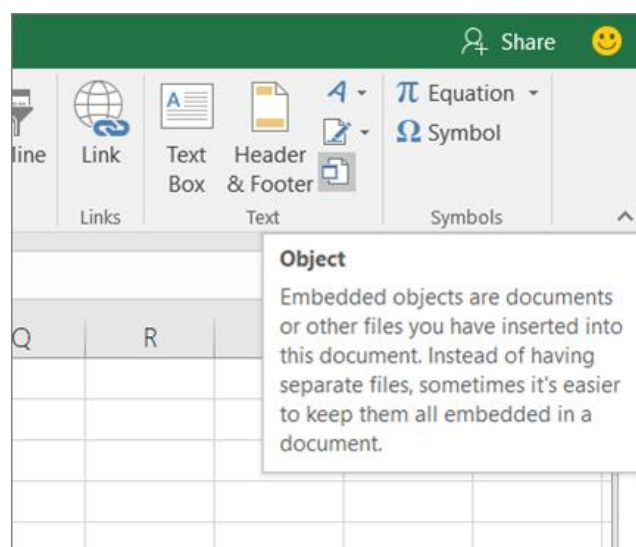
Insert Functions in Excel

1. Click the cell where you want to add a formula.
2. Click the Insert Function button.
3. Search for a function using one of these methods: Type a few keywords that describe the function you want and click Go.
4. Select the desired function. Click OK.
5. Enter the formula arguments. Click OK.

Inserting Page Breaks

Insert Horizontal Page Break – For example, if you want row 14 to be the first row of a new page, select cell A14. Then choose Page Layout » Page Setup Group » Breaks » Insert Page Break.
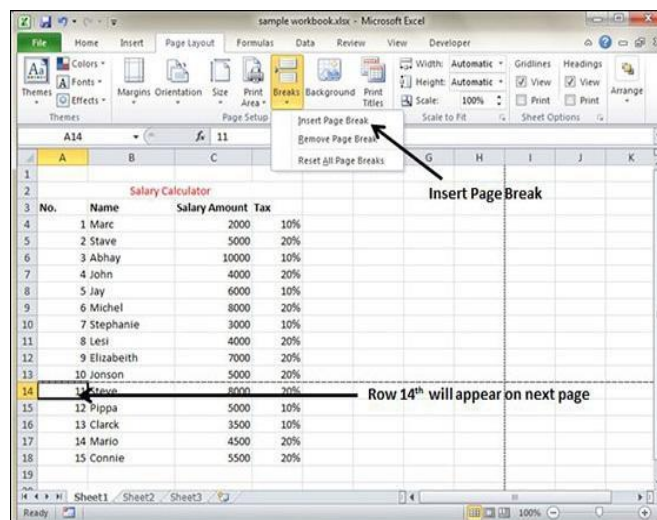
Insert vertical Page break – In this case, make sure to place the pointer in row 1. Choose Page Setting Layout » Page Setup » Breaks » Insert Page Break to create the page break.
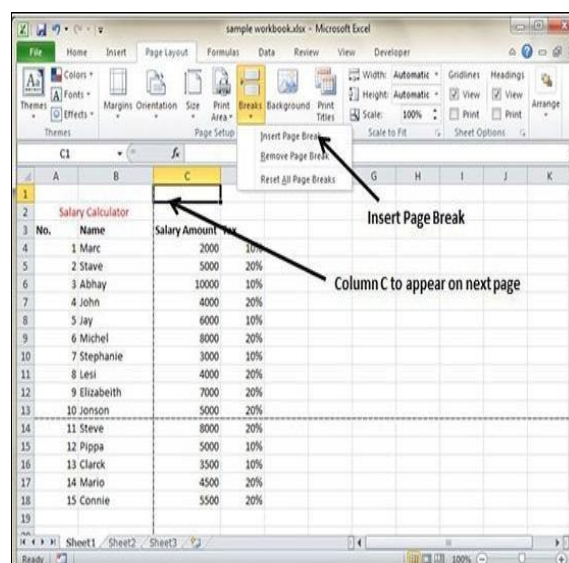
4.1.3 Setting Formula

The Excel + Operator

	A	B
1	= 2 + 7 + 1	
2		
3		

The simplest type of Excel addition formula is made up of the = sign, followed by two or more numbers, with the + operator in between them.

For example, to add together the numbers 2, 7 and 1, type the following into any Excel cell:
= 2 + 7 + 1
which returns the result **10**.

	A	B
1	= B1 + B2 + B3	2
2		7
3		1

As with all Excel formulas, instead of typing the numbers directly into your addition formula, you can use references to cells containing numbers.

The Excel addition formula in cell A1 of the spreadsheet on the right adds together the contents of cells B1, B2 and B3 (which contain the values 2, 7 and 1). Again, the formula returns the value **10**.

The Excel Sum Function

Instead of using the + operator, you can use the Excel Sum Function to perform addition in Excel. The syntax of this function is:

=SUM(number1, [number2], ...)

where number1, [number2], etc. are one or more numbers (or references to cells containing numbers) that you want to add together.

	A	B
1	=SUM(B1, B2, B3)	2
2		7
3		1

An example of the Excel Sum function is shown in cell A1 of the spreadsheet on the right.

In this example, the Sum function is used to add together the three values in cells B1, B2 and B3 (i.e. the values 2, 7 and 1). Again, the function returns the value **10**.

Supplying a Range of Cells to the Sum Function

You can also supply one or more ranges of cells to the Excel Sum function (rather than typing in each individual value or cell reference).

For example, in the above example spreadsheet, in order to find the sum of the values in cells B1-B3, you could simply type the formula:

=SUM(B1:B3)

This is much quicker than typing multiple cell references, particularly if you have a large set of values that you want to add together.

The Excel - Operator

	A	B
1	= 11 - 2 - 5	
2		
3		

The simplest type of Excel subtraction formula consists of the = sign, followed by two or more numbers, with the - operator in between them.

For example, to subtract the numbers 2 and 5 from 11, type the following into any Excel cell:

= 11 - 2 - 5

which returns the value **4**.

	A	B
1	= B1 - B2 - B3	11
2		2
3		5

As with all Excel formulas, instead of typing the numbers directly into your subtraction formula, you can use references to cells containing numbers.

The Excel subtraction formula in cell A1 of the spreadsheet on the right subtracts the values in cells B2 and B3 (i.e. the values 2 and 5) from the value in cell B1 (i.e. the value 11).

Again, the formula returns the value **4**.

Using the Excel * Operator

	A	B
1	= 4 * 3 * 10	
2		
3		

The simplest way to perform multiplication in Excel is to type in the = sign, followed by two or more numbers, separated by the * operator.

For example, to multiply the numbers 4, 3 and 10, type the following into any Excel cell:

= 4 * 3 * 10

which returns the result **120**.

	A	B
1	= B1 * B2 * B3	4
2		3
3		10

As with all Excel formulas, instead of typing numbers directly into the formula, you can use references to cells containing numbers in your multiplication formula.

An example of how perform multiplication in Excel, using cell references, is shown in cell A1 of the above spreadsheet on the right. This formula multiplies the numbers in cells B1, B2 and B3 (i.e. the values 4, 3 and 10), and again, returns the value **120**.

Using the Excel Product Function

Instead of using the * operator, as shown above, you can use the built-in Excel Product Function to perform a multiplication in Excel. The syntax of the Excel Product function is:

=PRODUCT(number1, [number2], ...)

where number1, [number2], etc. are one or more numeric values (or references to cells containing numeric values) that you want to multiply together.

	A	B
1	=PRODUCT(B1, B2, B3)	4
2		3
3		10

An example of the Excel Product function is shown in cell A1 of the spreadsheet on the right.

In this example, the Product function is used to multiply the three values in cells B1, B2 and B3 (i.e. the values 4, 3 and 10).

Once again, the product of the three numbers is calculated to be **120**.

Supplying a Range of Cells to the Product Function

You can also supply one or more ranges of cells to the Excel Product function (rather than typing in each individual value or cell reference).

For example, in the above example spreadsheet, in order to find the product of the values in cells B1-B3, you could simply type the formula:

=PRODUCT(B1:B3)

This is much quicker than typing multiple cell references, particularly if you have a large set of values that you want to find the product of.

Using the Excel / Operator

	A	B
1	= 15 / 4	
2		
3		

The simplest way to divide in Excel is to use the / operator.

For example, to divide the number 15 by 4, type the following into any Excel cell:

= 15 / 4

which returns the result **3.75**.

As with all Excel formulas, instead of typing numbers directly into the division formula, you can use references to cells containing numeric values.

	A	B
1	= B1 / B2	15
2		4
3		

An example of how to divide in Excel, using cell references, is shown in cell A1 of the spreadsheet on the right. This division formula divides the value in cell B1 (the number 15) by the value in cell B2 (the number 4).

Again, the formula returns the value **3.75**.

Exponentiation

The Excel EXP function calculates the value of the mathematical constant e, raised to the power of a given number.

The syntax of the function is:

EXP(number)

where the number argument is the real number that you want to raise e to the power of.

Exponents in Excel

Example	Formula	Value
POWER() function 2^3	=POWER(2,3)	8
Nested Power function $(2^3)^4$	=POWER(POWER(2,3),4)	4096
Nested Power function $(2)^{32}$	=POWER(2,POWER(3,2))	512
shorthand notation "^" 2^3	=2^3	8
shorthand notation "^" $(2^3)^4$	=(2^3)^4	4096
shorthand notation $(2)^{32}$	=2^(3^2)	512

Using other Formulae

AVERAGE

The AVERAGE function should remind you of simple averages of data, such as the average number of shareholders in a given shareholding pool.
=AVERAGE(number1, [number2], …)

Example:
=AVERAGE(B2:B11) – Shows a simple average, also similar to (SUM(B2:B11)/10)

COUNT

The COUNT function counts all cells in a given range that contain only numeric values.
=COUNT(value1, [value2], …)

Example:
COUNT(A:A) – Counts all values that are numerical in A column. However, you must adjust the range inside the formula to count rows.

COUNT(A1:C1) – Now it can count rows.

IF

The IF function is often used when you want to sort your data according to a given logic. The best part of the IF formula is that you can embed formulas and functions in it.
=IF(logical_test, [value_if_true], [value_if_false])

Example:
=IF(C2<D3,"TRUE","FALSE") – Checks if the value at C3 is less than the value at D3. If the logic is true, let the cell value be TRUE, otherwise, FALSE

=IF(SUM(C1:C10) > SUM(D1:D10), SUM(C1:C10), SUM(D1:D10)) – An example of a complex IF statement. First, it sums C1 to C10 and D1 to D10, then it compares the sum. If the sum of C1 to C10 is greater than the sum of D1 to D10, then it makes the value of a cell equal to the sum of C1 to C10.

TRIM

The TRIM function makes sure your functions do not return errors due to extra spaces in your data. It ensures that all empty spaces are eliminated. Unlike other functions that can operate on a range of cells, TRIM only operates on a single cell. Therefore, it comes with the downside of adding duplicated data to your spreadsheet.
=TRIM(text)

Example:
TRIM(A2) – Removes empty spaces in the value in cell A2.
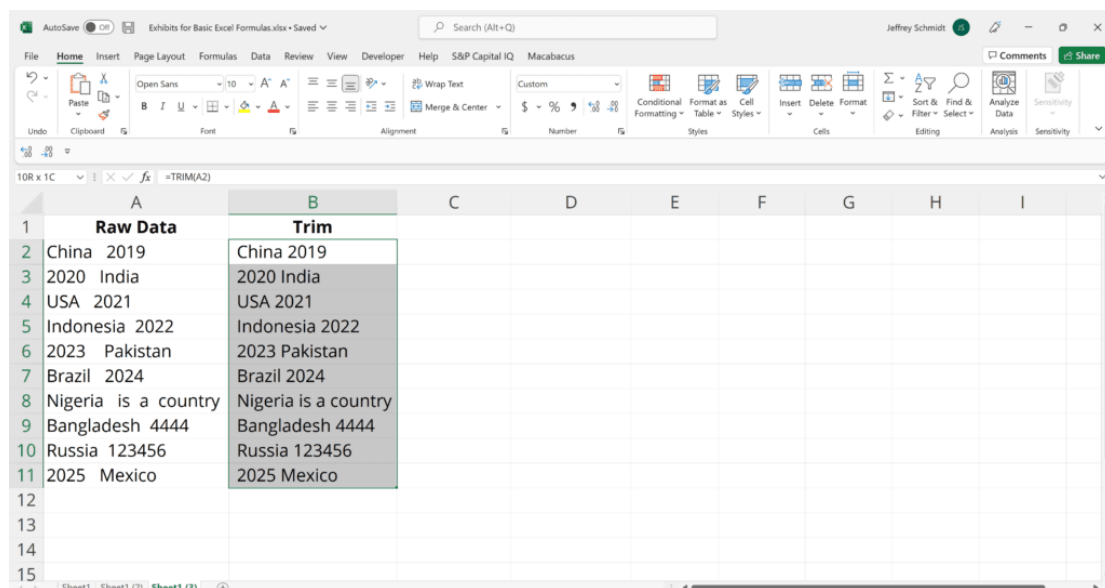
MAX & MIN

The MAX and MIN functions help in finding the maximum number and the minimum number in a range of values.
=MIN(number1, [number2], …)

Example:
=MIN(B2:C11) – Finds the minimum number between column B from B2 and column C from C2 to row 11 in both columns B and C.

=MAX(number1, [number2], ...)

Example:
=MAX(B2:C11) – Similarly, it finds the maximum number between column B from B2 and column C from C2 to row 11 in both columns B and C.

4.1.4 Formatting Spreadsheets

Labelling of columns and rows

To change the column headings to letters, select the File tab in the toolbar at the top of the screen and then click on Options at the bottom of the menu. When the Excel Options window appears, click on the Formulas option on the left. Then uncheck the option called "R1C1 reference style" and click on the OK button.

Formatting Cells

In MS Excel, you can apply formatting to the cell or range of cells by Right Click » Format cells » Select the tab. Various tabs are available as shown below
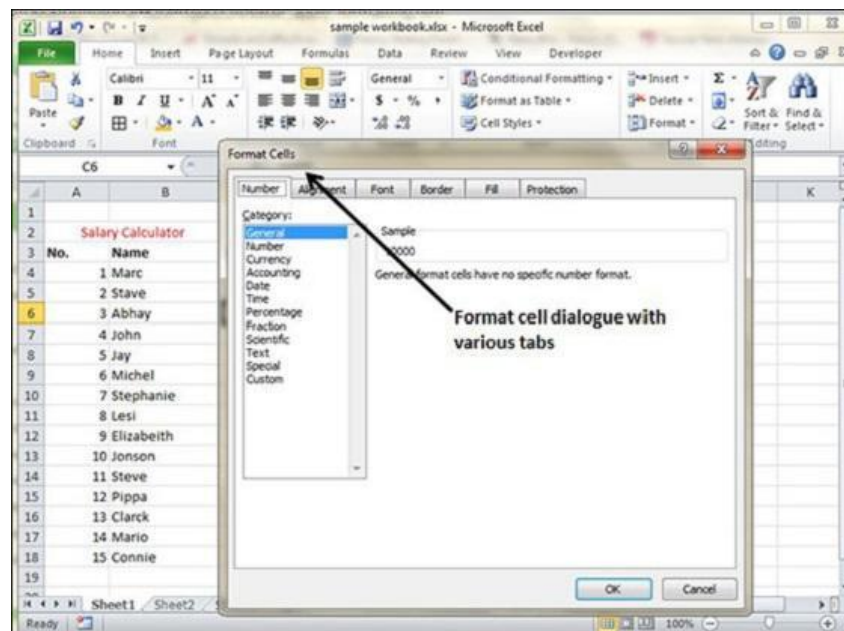
- Number – You can set the Format of the cell depending on the cell content. Find tutorial on this at MS Excel - Setting Cell Type.
- Alignment – You can set the alignment of text on this tab. Find tutorial on this at MS Excel - Text Alignments.
- Font – You can set the Font of text on this tab. Find tutorial on this at MS Excel - Setting Fonts.
- Border – You can set border of cell with this tab. Find tutorial on this at MS Excel - Borders and Shades.
- Fill – You can set fill of cell with this tab. Find tutorial on this at MS Excel - Borders and Shades.
- Protection – You can set cell protection option with this tab.

Formatting Row

1.   Select the row or rows that you want to change.
2.   On the Home tab, in the Cells group, click Format.
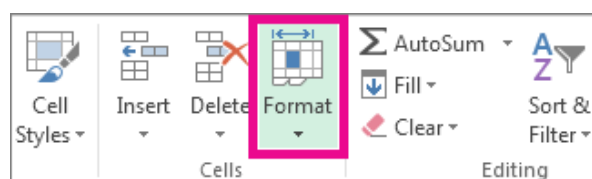
3.   Under Cell Size, click Row Height.
4.   In the Row height box, type the value that you want, and then click OK.

Change the row height to fit the contents
1.   Select the row or rows that you want to change.
2.   On the Home tab, in the Cells group, click Format.
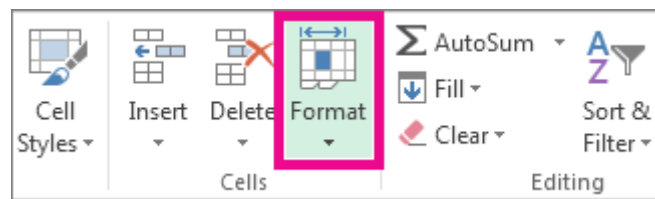
3.   Under Cell Size, click AutoFit Row Height.

Formatting Column

1.   Select the column or columns that you want to change.
2.   On the **Home** tab, in the **Cells** group, click **Format**.
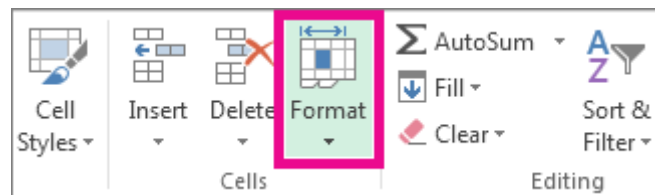
3.   Under **Cell Size**, click **Column Width**.
4.   In the **Column width** box, type the value that you want.
5.   Click **OK**.

Change the column width to automatically fit the contents (Autofit)
 1. Select the column or columns that you want to change.
 2. On the **Home** tab, in the **Cells** group, click **Format**.
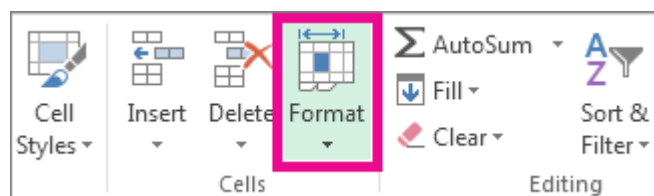
3. Under **Cell Size**, click **AutoFit Column Width**.

Formatting Sheet

●   To change the default column width for a worksheet, click its sheet tab.
●   To change the default column width for the entire workbook, right-click a sheet tab, and then click Select All Sheets on the shortcut menu.

1. On the Home tab, in the Cells group, click Format.
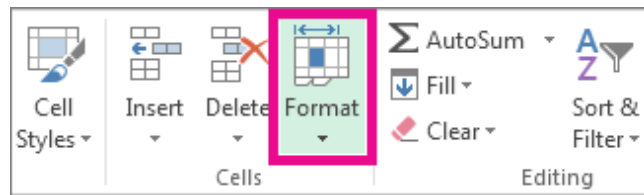
2. Under Cell Size, click Default Width.
3. In the Standard column width box, type a new measurement, and then click OK.

Category - Alignment

1. Horizontal Alignment – You can set horizontal alignment to Left, Centre, Right, etc.

- Left – Aligns the cell contents to the left side of the cell.
- Center – Centers the cell contents in the cell.
- Right – Aligns the cell contents to the right side of the cell.
- Fill – Repeats the contents of the cell until the cell's width is filled.
- Justify – Justifies the text to the left and right of the cell. This option is applicable only if the cell is formatted as wrapped text and uses more than one line.

2. Vertical Alignment – You can set Vertical alignment to top, Middle, bottom, etc.

- Top Aligns the cell contents to the top of the cell.
- Center - Centers the cell contents vertically in the cell.
- Bottom Aligns the cell contents to the bottom of the cell.
- Justify Justifies the text vertically in the cell; this option is applicable only if the cell is formatted as wrapped text and uses more than one line.

Font

When you enter data in a worksheet, Excel automatically uses the Calibri font style in size 11 but a different font style or size also can be changed
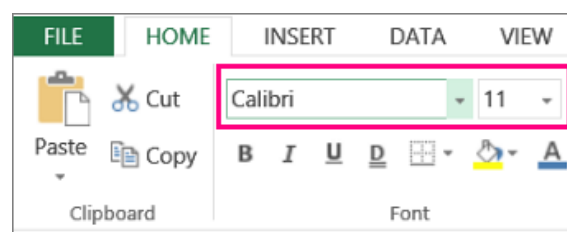
- Select the cell or cell range that has the text or number you want to format.
- Click the arrow next to Font and pick another font.
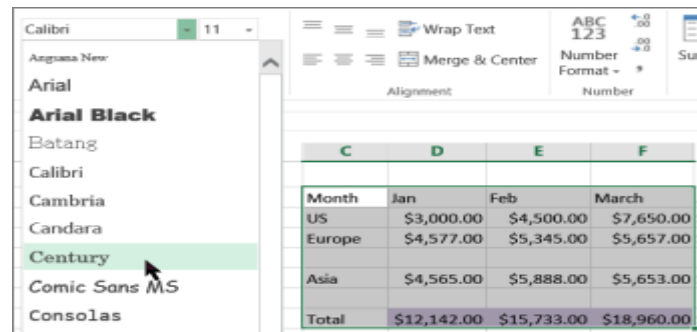
- To change font size, click the arrow next to the default Font Size and pick the size you want. In our example below, we've changed the font style to Century and size to 9.
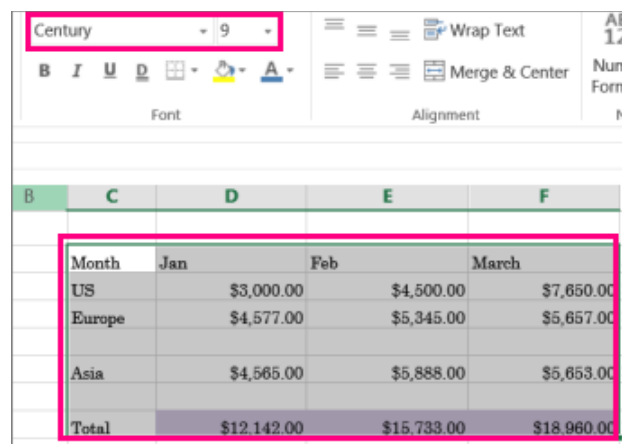
Apply Borders

MS Excel enables you to apply borders to the cells. For applying border, select the range of cells Right Click » Format cells » Border Tab » Select the Border Style.
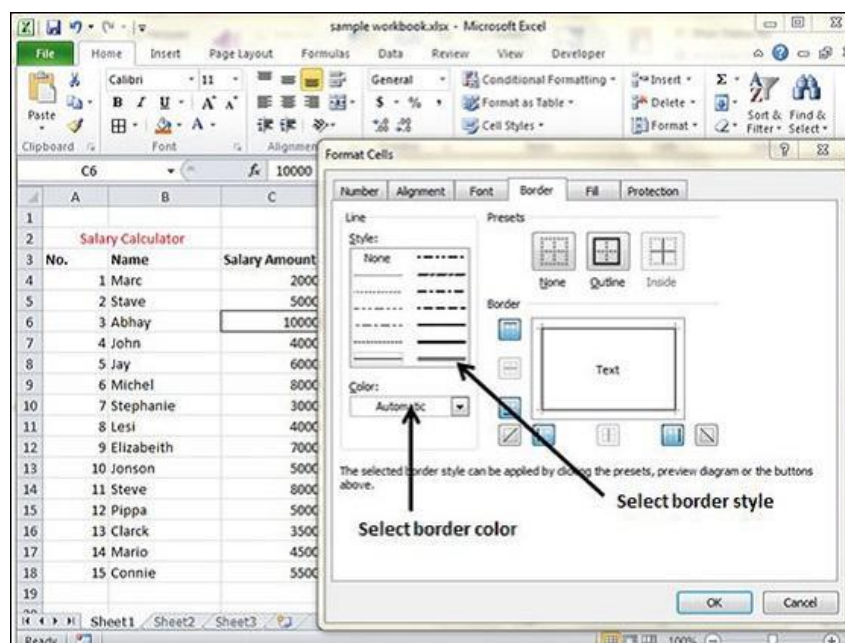
Then you can apply border by Home Tab » Font group » Apply Borders.
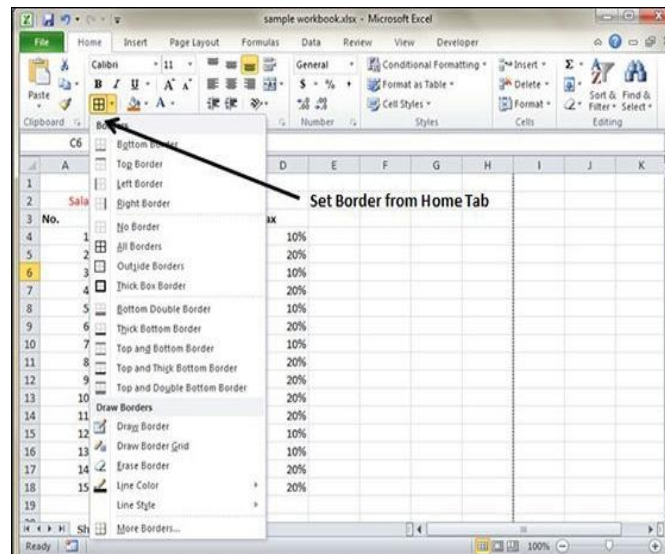
Apply Shading

You can add shading to the cell from the Home tab » Font Group » Select the Color.
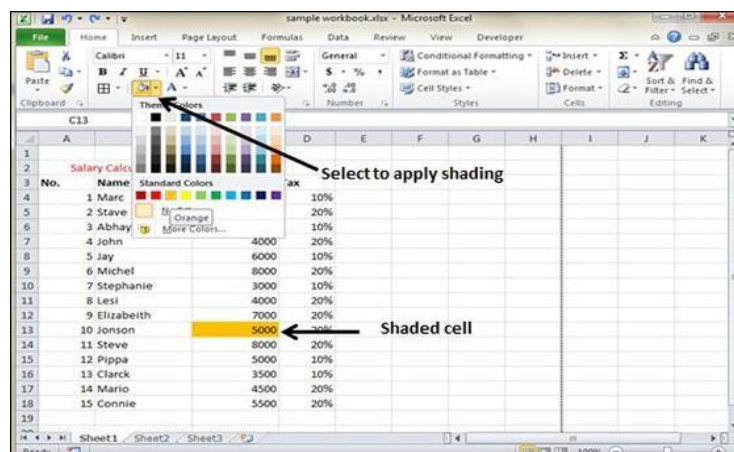
Hiding / Locking Cell

1. Select the column you want to protect.
2. Press **Ctrl+Shift+F**. Excel displays the Format Cells dialog box.
3. Make sure the Protection tab is displayed.
4. The Protection tab of the Format Cells dialog box. Make sure both the Locked and Hidden check boxes are selected. (It is the Hidden check box that controls whether the cell contents are visible in the formula bar or not.)
5. Click OK to dismiss the dialog box.
6. With the column still selected, display the Home tab of the ribbon.
7. Starting in the Cells group, click Format | Hide & Unhide | Hide Columns. Excel hides the column.
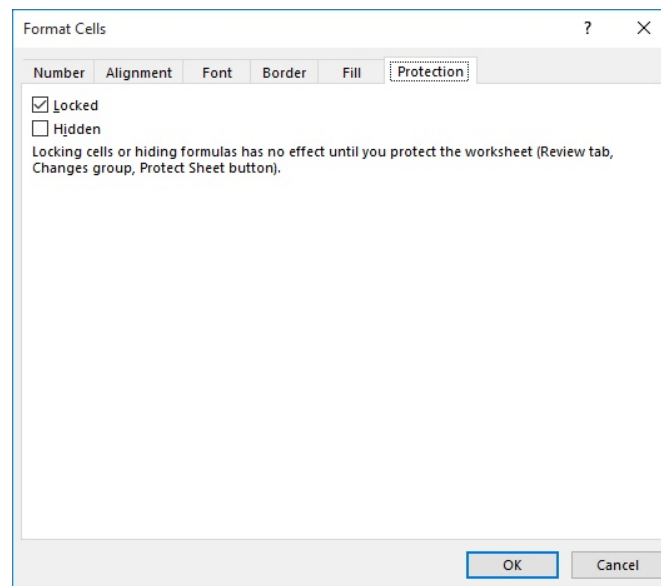
8. Again, starting in the Cells group, click Format | Protect Sheet. Excel displays the Protect Sheet dialog box.

9. Again, starting in the Cells group, click Format | Protect Sheet. Excel displays the Protect Sheet dialog box. (See Figure 2.)
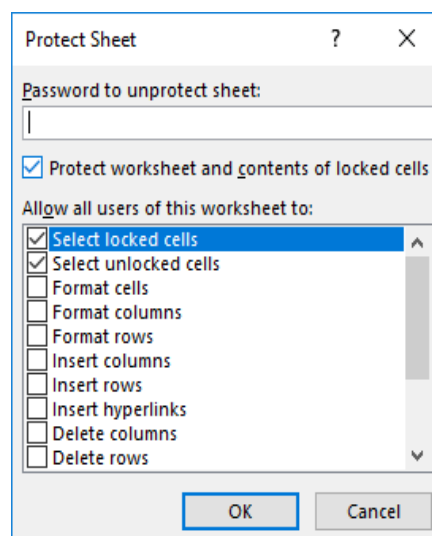
10. Enter a password to be used in protecting the worksheet.

11. Using the check boxes, select what type of protection you want applied to the worksheet. At a minimum you should choose Select Locked Cells and Select Unlocked Cells. (These two options are selected by default in a worksheet.)

12. Click OK to dismiss the dialog box. You are prompted to re-enter your password (the one from step 9), which you should do.

Anchoring Objects

Anchoring is **a Microsoft Excel feature that allows you to quickly copy formulas and apply them to cells of your choosing**. Some formulas are assigned to specific cells, and anchoring allows you to assign the formula to multiple cells at once.

Formatting Layout for Graphics, Clipart

You can change the appearance of your picture or clip art to enhance its visual impact. The format tab offers you various options for formatting pictures like contrast, changing color, line style, cropping, etc. The steps to format picture or clip art are given below;

- Select the picture or clip art that you want to format
- Format tab appears in the Ribbon
- Click the Format tab
- It displays four groups of related commands to modify or format picture or clip art

Apply cell borders

1. Select the cell or range of cells that you want to add a border to.

Tip:

- To quickly select the whole worksheet, click the **Select All** button.

2. On the **Home** tab, in the **Font** group, click the arrow next to **Borders**, and then click the border style that you want.

Tip: The **Borders** button displays the most recently used border style. You can click the **Borders** button (not the arrow) to apply that style.

Change text color and alignment

1. Select the cell or range of cells that contain (or will contain) the text that you want to format. You can also select one or more portions of the text within a cell and apply different text colors to those sections.

2. To change the color of text in the selected cells, on the **Home** tab, in the **Font** group, click the arrow next to **Font Color** $\underline{A}$, and then under **Theme Colors** or **Standard Colors**, click the color that you want to use.

Note: To apply a color other than the available theme colors and standard colors, click **More Colors**, and then define the color that you want to use on the **Standard** tab or **Custom** tab of the **Colors** dialog box.

3. To change the alignment of the text in the selected cells, on the **Home** tab, in the **Alignment** group, click the alignment option that you want.

For example, to change the horizontal alignment of cell contents, click Align Text Left , Center , or Align Text Right

Apply cell shading
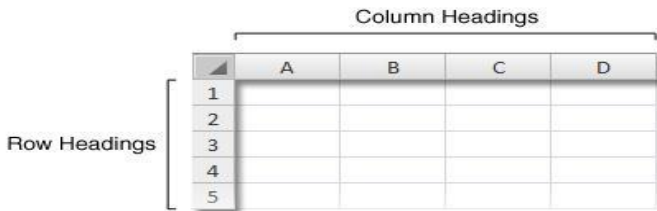
1. Select the cell or range of cells that you want to apply cell shading to.
2. On the Home tab, in the Font group, click the arrow next to Fill Color , and then under Theme Colors or Standard Colors, click the color that you want.

Worksheet Row and Column Headers

The column heading or column header used to identify each column in the worksheet. The column header is located above row 1 in the worksheet. The row heading or row header is the gray-colored column located to the left of column 1 in the worksheet containing the numbers (1, 2, 3, etc.) used to identify each row in the worksheet. Taken together, the column letters and the row numbers in the two headings create cell references which identify individual cells that are located at the intersection point between a column and row in a worksheet.

To print the column and/or row headings for the current worksheet in Excel:

1. Click **Page Layout** tab of the ribbon.
2. Click on the **Print** checkbox in the **Sheet Options** group to activate the feature.

Follow these steps to print the column and row headings for a worksheet:

1   Click the worksheet. If you want to do this for multiple worksheets, you can group them.
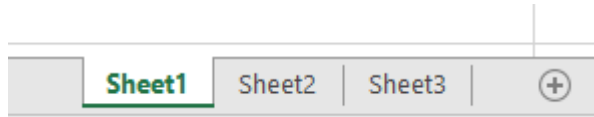
2   On the Ribbon, click the **Page Layout** tab.
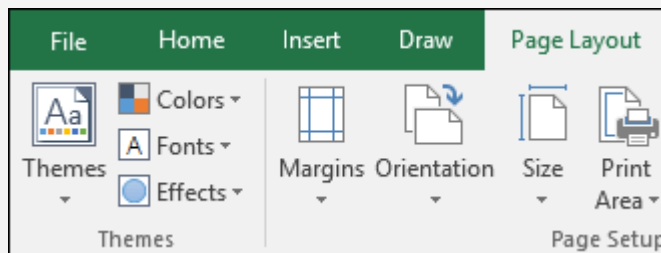
3   In the **Sheet Options** group, under **Headings**, select the **Print** check box.
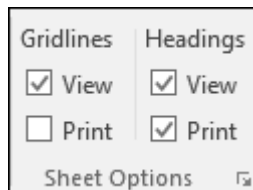
Note: You can also click the small expansion icon ⬜, and then under **Print,** select the **Row and column headings** check box .

To print the worksheet, press **CTRL+P** to open the **Print** dialog box, and then click **OK.**

Turning Row and Column Headings on or off in Excel

The row and column headings do not have to be displayed on a particular worksheet. Reasons for turning them off would be to improve the appearance of the worksheet or to gain extra screen space on large worksheets – possibly when taking screen captures. As with printing, the row and column headings must be turned on or off for each individual worksheet. To turn off the row and column headings in Excel:

1. Click on the **File** menu to open the drop-down list.
2. Click **Options** in the list to open the *Excel Options* dialog box.
3. In the left-hand panel of the dialog box, click on **Advanced**.
4. In the Display options for this worksheet section – located near the bottom of the right-hand pane of the dialog box – click on the checkbox next to the **Show row and column headers** option to remove the checkmark.

5. To turn off the row and column headings for additional worksheets in the current workbook, select the name of another worksheet from the drop-down box located next to the **Display** options for this worksheet heading and clear the checkmark in the **Show** row and column headers checkbox.
6. Click **OK** to close the dialog box and return to the worksheet.

Sheet Name

By default, Excel names worksheets Sheet1, Sheet2, Sheet3 and so on, but you can easily rename them.
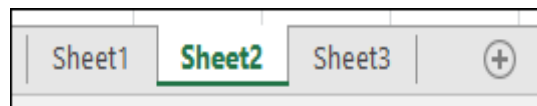
3 ways to rename a worksheet
● Double-click the sheet tab, and type the new name.
● Right-click the sheet tab, click Rename, and type the new name.
● Use the keyboard shortcut Alt+H > O > R, and type the new name.

Working with columns, rows, and cells

By default, every row and column of a new workbook is set to the same height and width. Excel allows you to modify column width and row height in different ways.

To modify column width

1. Position your mouse over the column line in the column heading so the white cross becomes a double arrow.
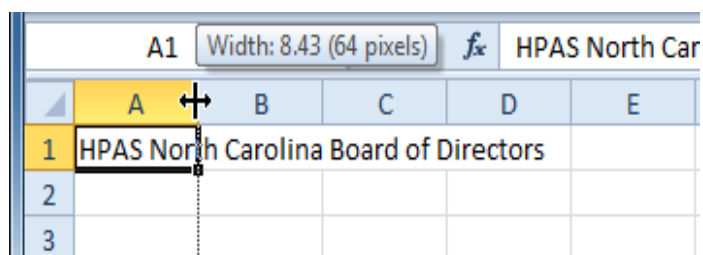
2. Click and drag the column to the right to increase column width or to the left to decrease column width.
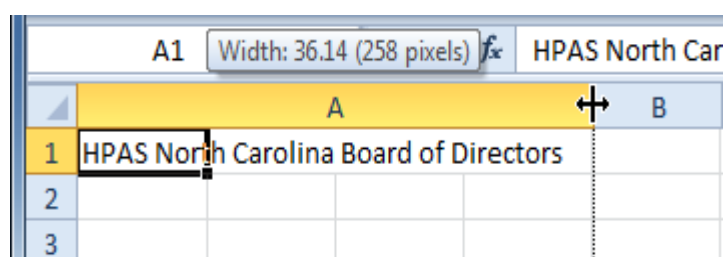
3. Release the mouse. The column width will be changed in your spreadsheet.
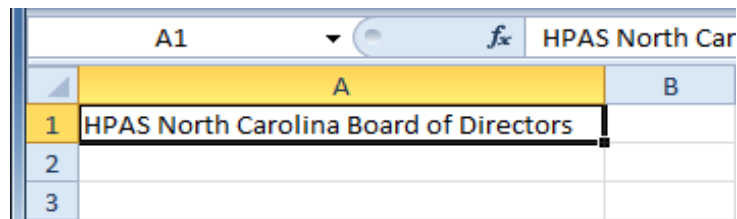
If you see pound signs (#######) in a cell, it means the column is not wide enough to display the cell content. Simply increase the column width to show the cell content.

To set column width with a specific measurement

1. Select the columns you want to modify.
2. Click the Format command on the Home tab. The format drop-down menu appears.
3. Select Column Width.
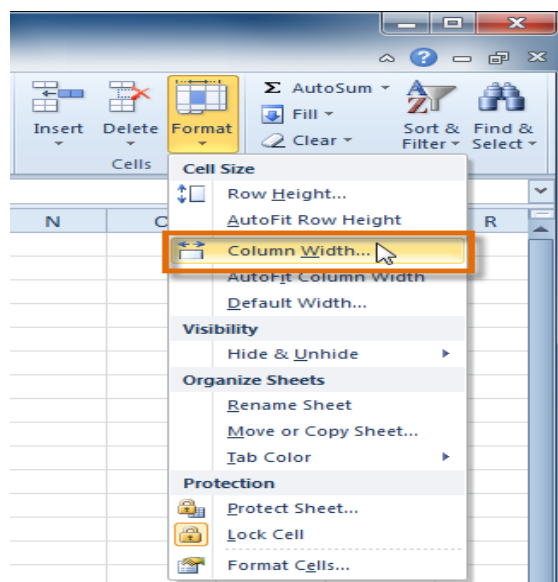
4. The Column Width dialog box appears. Enter a specific measurement.
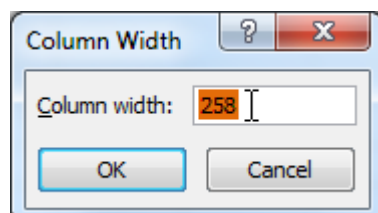
5. Click OK. The width of each selected column will be changed in your worksheet.

Select AutoFit Column Width from the format drop-down menu, and Excel will automatically adjust each selected column so all of the text will fit.

To modify row height

1. Position the cursor over the row line so the white cross ⊹ becomes a double arrow ✛.
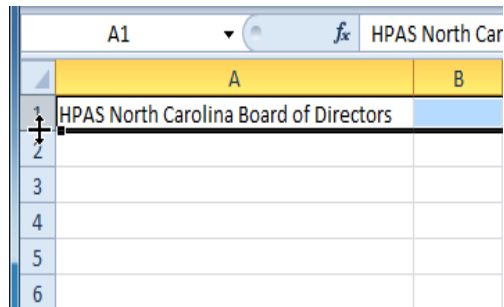
2. Click and drag the row downward to increase row height or upward to decrease height.
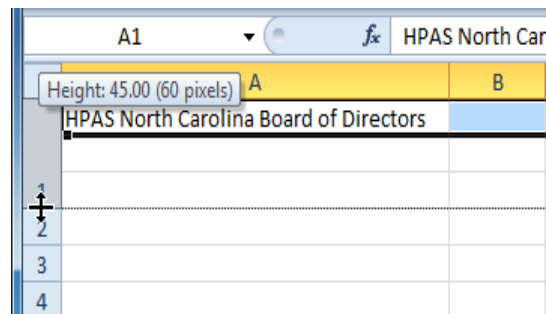
3. Release the mouse. The height of each selected row will be changed in your worksheet.
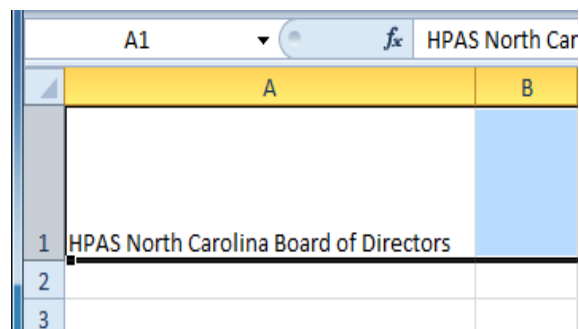
To set row height with a specific measurement

1. Select the rows you want to modify.
2. Click the Format command on the Home tab. The format drop-down menu appears.
3. Select Row Height.
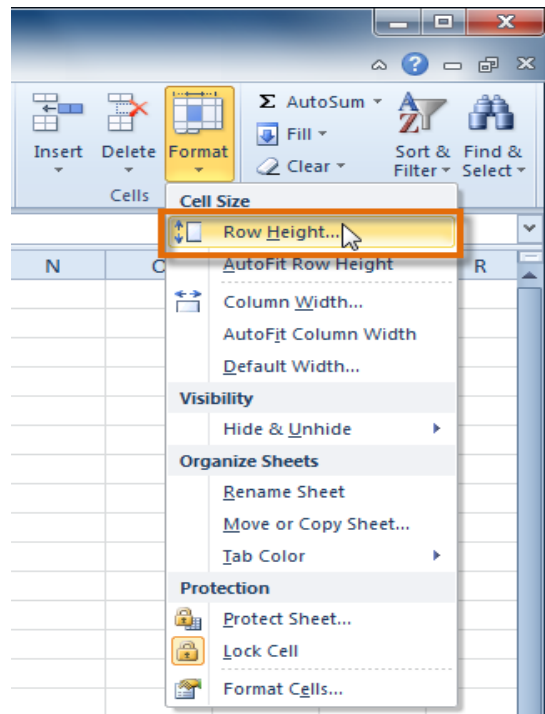
4. The Row Height dialog box appears. Enter a specific measurement.
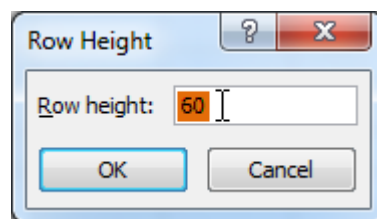
5. Click OK. The selected rows heights will be changed in your spreadsheet.

Select AutoFit Row Height from the format drop-down menu, and Excel will automatically adjust each selected row so all of the text will fit.

To insert rows

1. Select the row below where you want the new row to appear.

2. Click the Insert command on the Home tab.

3. The new row appears in your worksheet.

When inserting new rows, columns, or cells, you will see the Insert Options button ✎ by the inserted cells. This button allows you to choose how Excel formats them. By default, Excel formats inserted rows with the same formatting as the cells in the row above them. To access more options, hover your mouse over the Insert Options button and click the drop-down arrow that appears.

To insert columns

1. Select the column to the right of where you want the new column to appear. For example, if you want to insert a column between A and B, select column B.

2. Click the Insert command on the Home tab.

3. The new column appears in your worksheet.

By default, Excel formats inserted columns with the same formatting as the column to the left of them. To access more options, however your mouse over the Insert Options button and click the drop-down arrow that appears.

When inserting rows and columns, make sure to select the row or column by clicking its heading so all of the cells in that row or column are selected. If you select just a cell in the row or column, only a new cell will be inserted.

Visibility - Row, Column, Sheet, Security

Hide / Unhide - Column / Row

If the first row (row 1) or column (column A) is not displayed in the worksheet, it is a little tricky to unhide it because there is no easy way to select that row or column. You can select the entire worksheet, and then unhide rows or columns (Home tab, Cells group, Format button, Hide & Unhide command), but that displays all hidden rows and columns in your worksheet, which you may not want to do. Instead, you can use the Name box or the Go To command to select the first row and column.

- To select the first hidden row or column on the worksheet, do one of the following:
    - In the Name Box next to the formula bar, type A1, and then press ENTER.
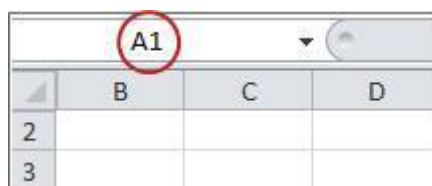
    - On the Home tab, in the Editing group, click Find & Select, and then click Go To. In the Reference box, type A1, and then click OK.

- On the Home tab, in the Cells group, click Format.
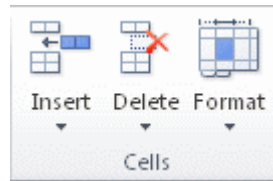
- Do one of the following:
- Under **Visibility**, click **Hide & Unhide**, and then click **Unhide Rows** or **Unhide Columns**.
- Under **Cell Size**, click **Row Height** or **Column Width**, and then in the **Row Height** or **Column Width** box, type the value that you want to use for the row height or column width.

Sheet

You can hide any worksheet to remove it from view. The data in hidden worksheets is not visible, but it can still be referenced from other worksheets and workbooks, and can easily unhide hidden worksheets as needed.

1. Select the worksheets that you want to hide.
2. On the Home tab, in the Cells group, click Format > Visibility > Hide & Unhide > Hide Sheet.
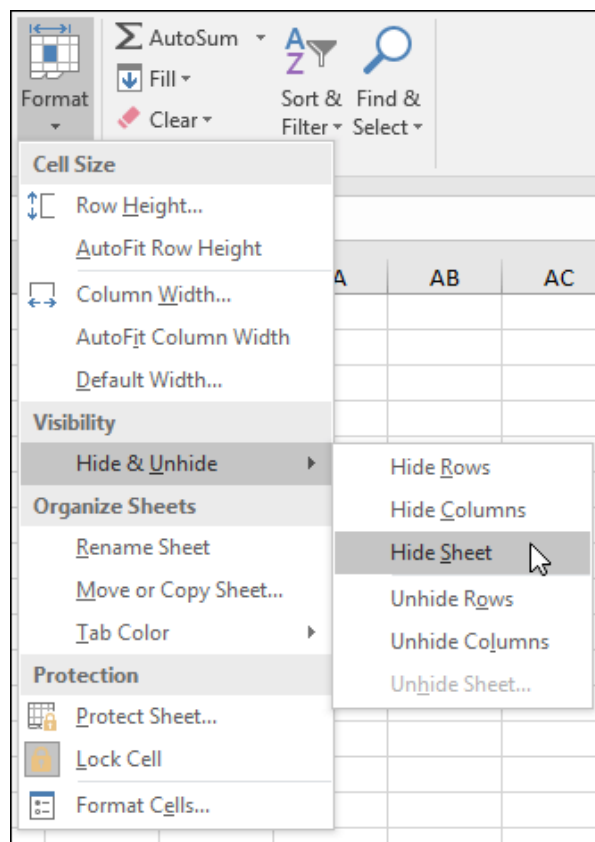
To unhide worksheets, follow the same steps, but select Unhide. You'll be presented with a dialog box listing which sheets are hidden, so select the ones you want to unhide.
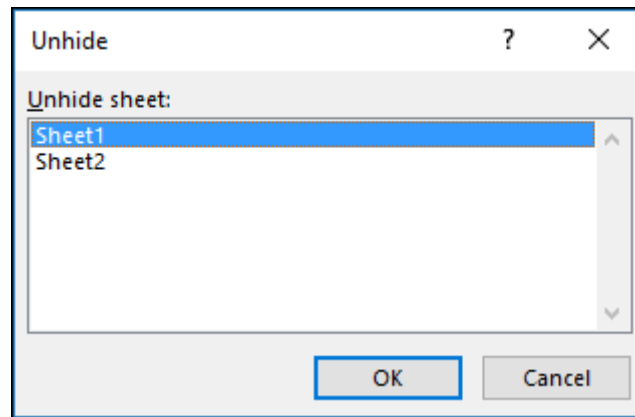
Security

With sheet protection, you can control how a user can work within worksheets. You can specify what exactly a user can do within a sheet, thereby making sure that none of the important data in your worksheet are affected. For example, you might want a user to only add rows and columns, or only sort and use AutoFilter. Once sheet protection is enabled, you can protect other elements such as cells, ranges, formulas, and ActiveX or Form controls. To prevent other users from accidentally or deliberately changing, moving, or deleting data in a worksheet, you can lock the cells on your Excel worksheet and then protect the sheet with a password. Say you own the team status report worksheet, where you want team members to add data in specific cells only and not be able to modify anything else. With worksheet protection, you can make only certain parts of the sheet editable and users will not be able to modify data in any other region in the sheet.

Sheet formatting and style

A cell style is a defined set of formatting characteristics, such as fonts and font sizes, number formats, cell borders, and cell shading. To prevent anyone from making changes to specific cells, you can also use a cell style that locks cells. Excel has several predefined cell styles that you can apply.

Sheet Background Color

You can highlight data in cells by using Fill Color to add or change the background color or pattern of cells. Here's how:

1. Select the cells you want to highlight.
2. Click Home > the arrow next to Fill Color , or press Alt+H, H.

3. Under Theme Colors or Standard Colors, pick the color you want.
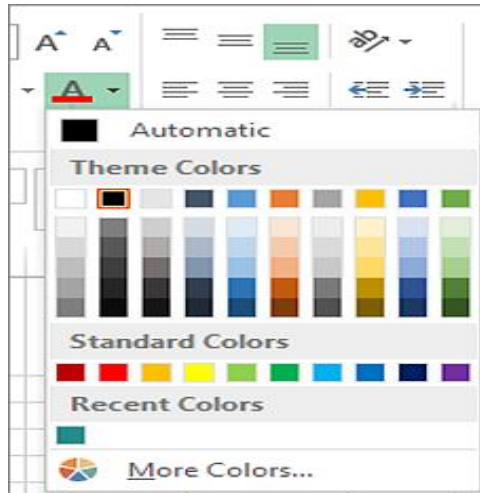
To use a custom color, click **More Colors**, and then in the **Colors** dialog box select the color you want.

To apply the most recently selected color, you can just click **Fill Color**. You'll also find up to 10 most recently selected custom colors under **Recent Colors**.

Apply a pattern or fill effects

When you want something more than a just a solid color fill, try applying a pattern or fill effects.

1. Select the cell or range of cells you want to format.
2. Click **Home** > **Format Cells** dialog launcher, or press Ctrl+Shift+F.
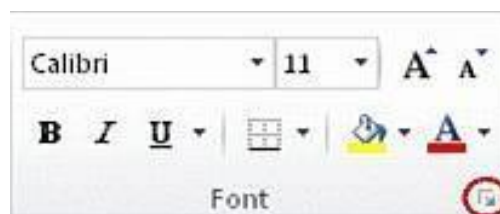
3. On the **Fill** tab, under **Background Color**, pick the color you want.
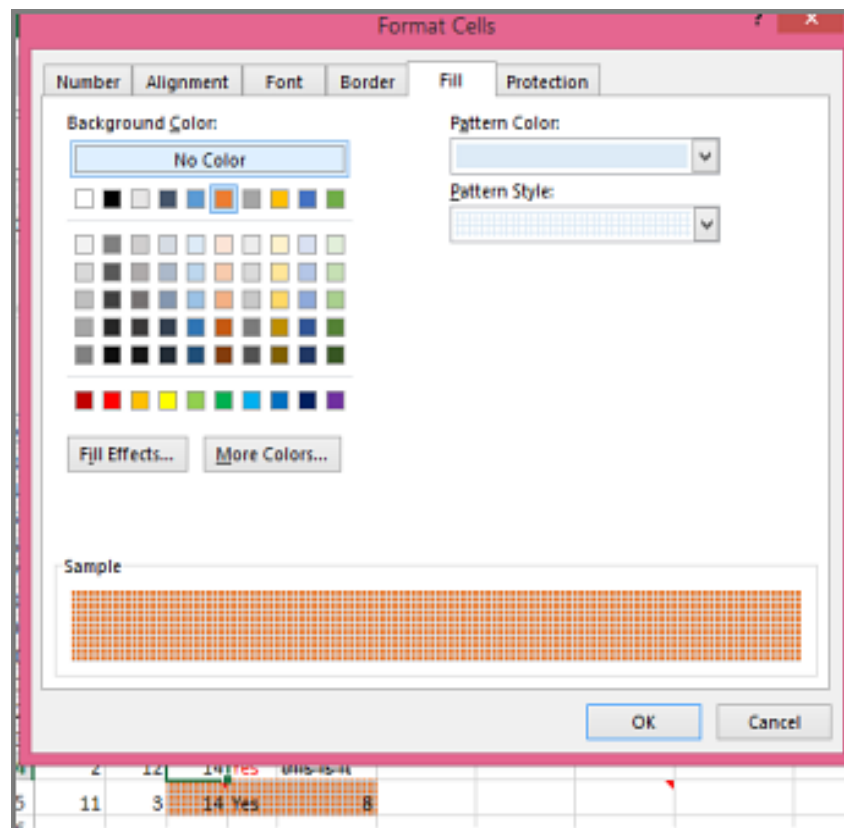
4. To use a pattern with two colors, pick a color in the **Pattern Color** box, and then pick a pattern in the **Pattern Style** box.

To use a pattern with special effects, click **Fill Effects**, and then pick the options you want.

Borders and shading

Applying Borders and Shading to Tables

1. Select the cells, rows, or columns you want to format. To apply the borders and shading to an entire table, you can select the entire table or simply position the insertion point cursor inside the table without a selecting any rows, columns, or cells.

2. Click Table from the menu bar and select Borders and Shading.

3. Click the Borders tab.

4. Select the line style.

5. Select a line color from the Color drop-down menu.

6. In the Border box, click Box to apply the border to all four sides. Or, click in the preview area to apply the border to selected sides. To remove a border from a side, click it again. You can apply different style borders to each side.

7. Click the Shading tab.

8. Select the fill percent.

9. Select the foreground color from the ForeGround drop-down menu.

10. Select the background color from the Background drop-down menu.

11. Click OK to apply the borders and shading settings.

Shortcut Keys

Close a workbook.	Ctrl+W
Open a workbook.	Ctrl+O
Go to the **Home** tab.	Alt+H
Save a workbook.	Ctrl+S
Copy selection.	Ctrl+C
Paste selection.	Ctrl+V
Undo recent action.	Ctrl+Z
Remove cell contents.	Delete
Choose a fill color.	Alt+H, H
Cut selection.	Ctrl+X
Go to the **Insert** tab.	Alt+N
Apply bold formatting.	Ctrl+B
Center align cell contents.	Alt+H, A, C
Go to the **Page Layout** tab.	Alt+P
Go to the **Data** tab.	Alt+A
Go to the **View** tab.	Alt+W
Open the context menu.	Shift+F10 or Windows Menu key
Add borders.	Alt+H, B
Delete column.	Alt+H, D, C
Go to the **Formula** tab.	Alt+M
Hide the selected rows.	Ctrl+9
Hide the selected columns.	Ctrl+0

4.1.5 Working with Sheets

Sorting in MS Excel

1. Select a single cell in the column you want to sort.
2. On the Data tab, in the Sort & Filter group, click. to perform an ascending sort (from A to Z, or smallest number to largest).
3. Click. to perform a descending sort (from Z to A, or largest number to smallest).

Sorting data in MS Excel rearranges the rows based on the contents of a particular column. You may want to sort a table to put names in alphabetical order. Or, maybe you want to sort data by Amount from smallest to largest or largest to smallest.

To Sort the data follow the steps mentioned below:
- Select the Column by which you want to sort data.
- Choose Data Tab » Sort Below dialog appears.
- If you want to sort data based on a selected column, Choose Continue with the selection or if you want sorting based on other columns, choose Expand Selection.
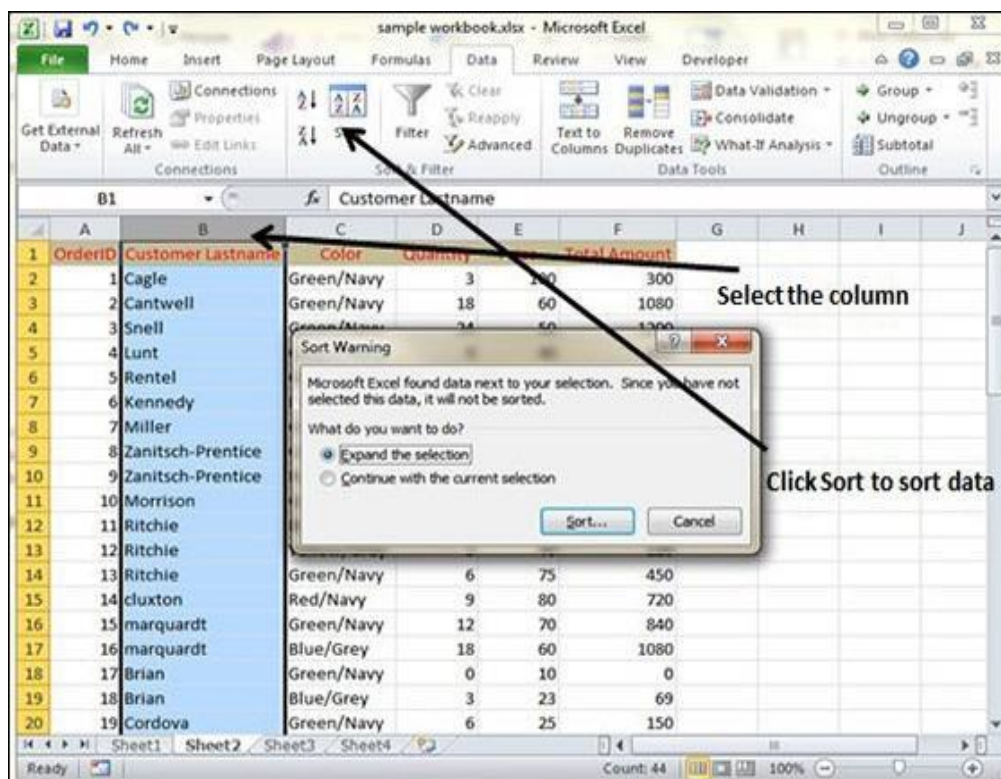
- You can Sort based on the below Conditions.
  - o Values – Alphabetically or numerically.
  - o Cell Color – Based on Color of Cell.
  - o Font Color – Based on Font color.
  - o Cell Icon – Based on Cell Icon

- Clicking Ok will sort the data.
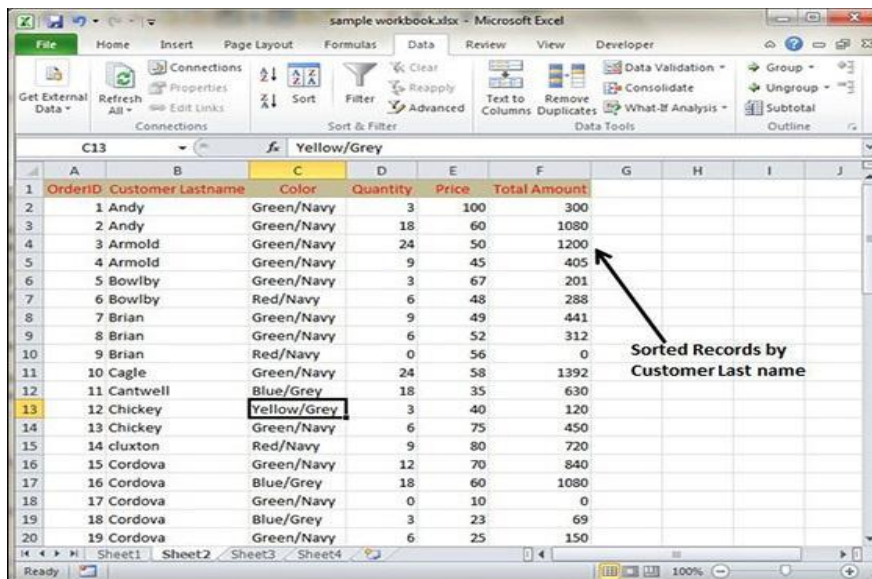
Sorting option is also available from the Home Tab. Choose Home Tab » Sort & Filter. You can see the same dialog to sort records.
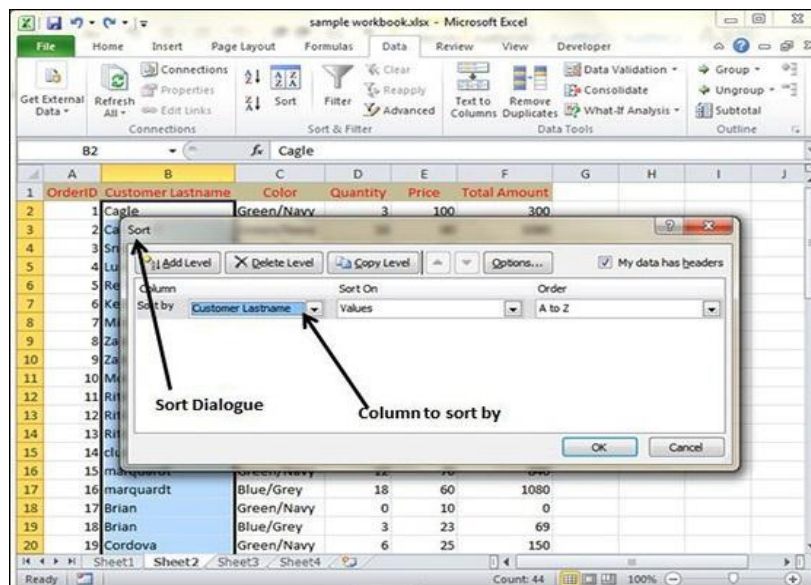
Filtering in MS Excel

Filtering data in MS Excel refers to displaying only the rows that meet certain conditions. (The other rows gets hidden.)

Using the store data, if you are interested in seeing data where Shoe Size is 36, then you can set filter to do this. Follow the below mentioned steps to do this.

- Place a cursor on the Header Row.
- Choose Data Tab » Filter to set filter.

- Click the drop-down arrow in the Area Row Header and remove the check mark from Select All, which unselects everything.
- Then select the check mark for Size 36 which will filter the data and displays data of Shoe Size 36.
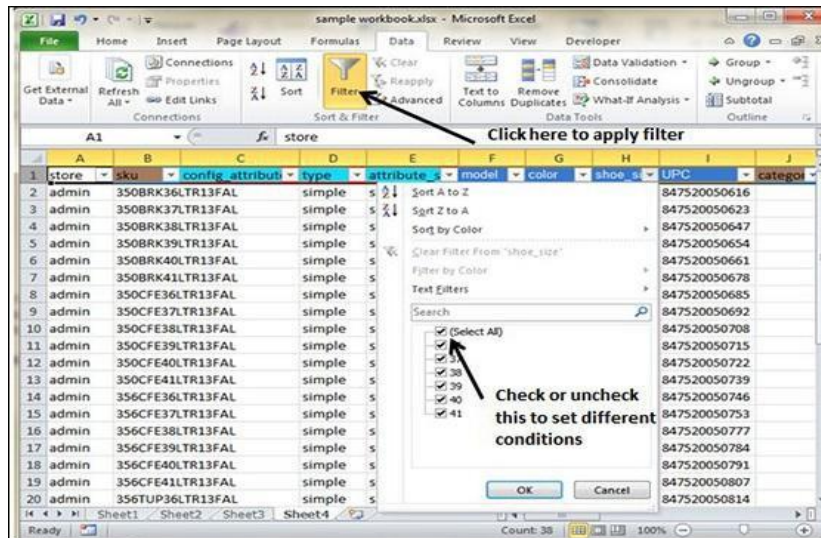
- Some of the row numbers are missing; these rows contain the filtered (hidden) data.
- There is drop-down arrow in the Area column now shows a different graphic — an icon that indicates the column is filtered.
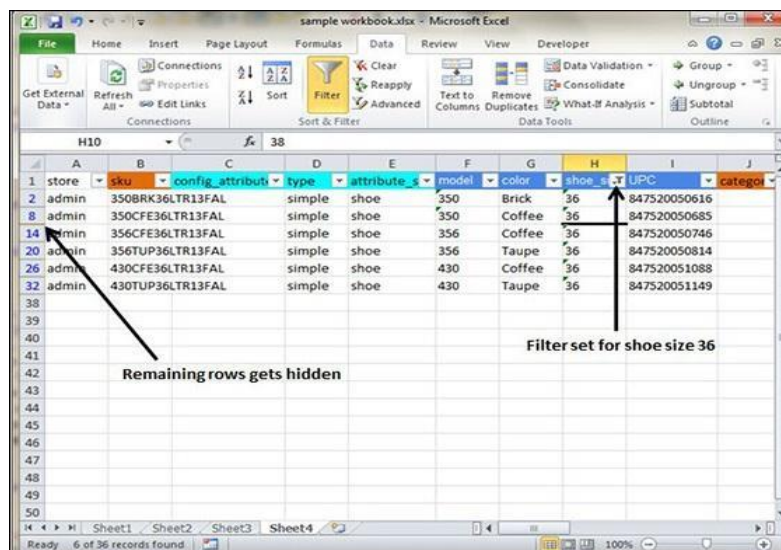
Data Validation

MS Excel data validation feature allows you to set up certain rules that dictate what can be entered into a cell. For example, you may want to limit data entry in a particular cell to whole numbers between 0 and 10. If the user makes an invalid entry, you can display a custom message as shown below.
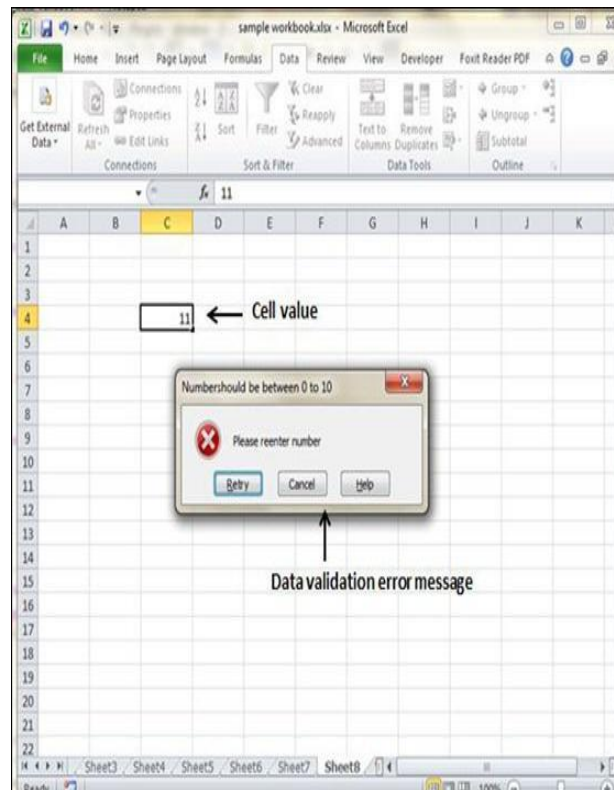
Validation Criteria

To specify the type of data allowable in a cell or range, follow the steps below, which shows all the three tabs of the Data Validation dialog box.

- Select the cell or range.
- Choose Data » Data Tools » Data Validation. Excel displays its Data Validation dialog box having 3 tabs settings, Input Message and Error alert.

Consolidate data in Excel

Data consolidation is a very interesting and useful feature of Excel. It helps the user to gather the data together from different worksheets and collect them in a master workbook. In this way, it allows the users to take the data together. Data in a single table is easy to update.

Consolidate is an Excel function that let the users to collect the data from different locations and summarize it into one Excel table. The main trouble with the data consolidation method is that it is a bit tricky to work with data consolidation.

Creating subtotals

The **Subtotal** command allows you to automatically **create groups** and use common functions like SUM, COUNT, and AVERAGE to help **summarize** your data.

Data must be correctly **sorted** before using the Subtotal command, so you may want to review our lesson on Sorting Data to learn more.

To create a subtotal:

1. First, **sort** your worksheet by the data you want to subtotal.

	A	B	C	D	E
1	**Homeroom #**	**First Name**	**Last Name**	**Payment Method**	**T-Shirt Size**
2	105	Melissa	White	Debit Card	Small
3	105	Esther	Yaron	Pending	Small
4	135	Anisa	Naser	Check Bounced	Small
5	220-A	Brigid	Ellison	Cash	Small
6	220-A	Christopher	Peyton-Gomez	Check	Small
7	220-B	Michael	Lazar	Cash	Small
8	220-B	Malik	Reynolds	Cash	Small
9	220-B	Wendy	Shaw	Cash	Small
10	105	Nathan	Albee	Check	Medium
11	105	Christiana	Chen	Check Bounced	Medium
12	105	Sidney	Kelly	Check	Medium
13	110	Matt	Benson	Money Order	Medium
14	110	Gabriel	Del Toro	Cash	Medium

2. Select the **Data** tab, then click the **Subtotal** command.
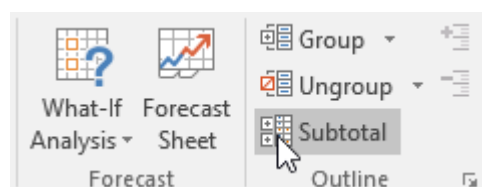
3. The **Subtotal** dialog box will appear. Click the drop-down arrow for the **At each change in:** field to select the **column** you want to subtotal.

4. Click the drop-down arrow for the **Use function:** field to select the **function** you want to use.
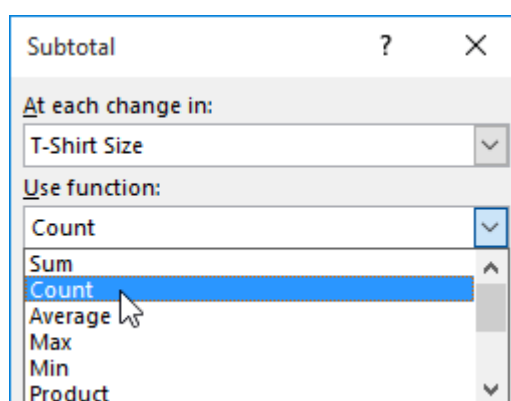
5. In the **Add subtotal to:** field, select the **column** where you want the **calculated subtotal** to appear. click **OK**.
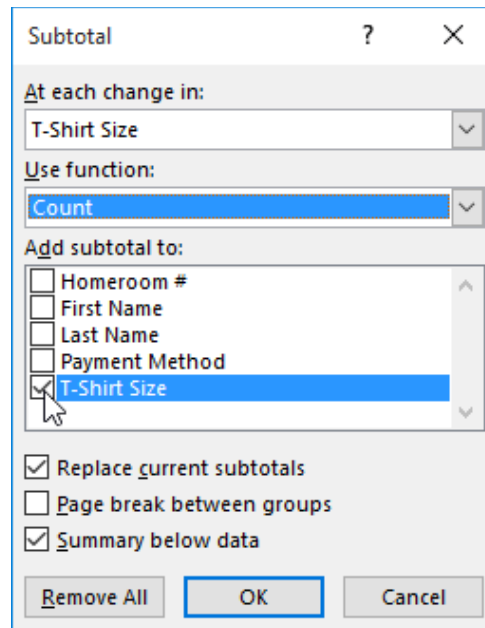
6. The worksheet will be **outlined** into **groups**, and the **subtotal** will be listed below each group.

4.1.6 Creating Charts (Drawing Charts)

Creating Charts with Insert Chart

To create charts using the Insert Chart tab, follow the steps given below.

Step 1 – Select the data.
Step 2 – Click the Insert tab on the Ribbon.
Step 3 – Click the Insert Column Chart on the Ribbon.
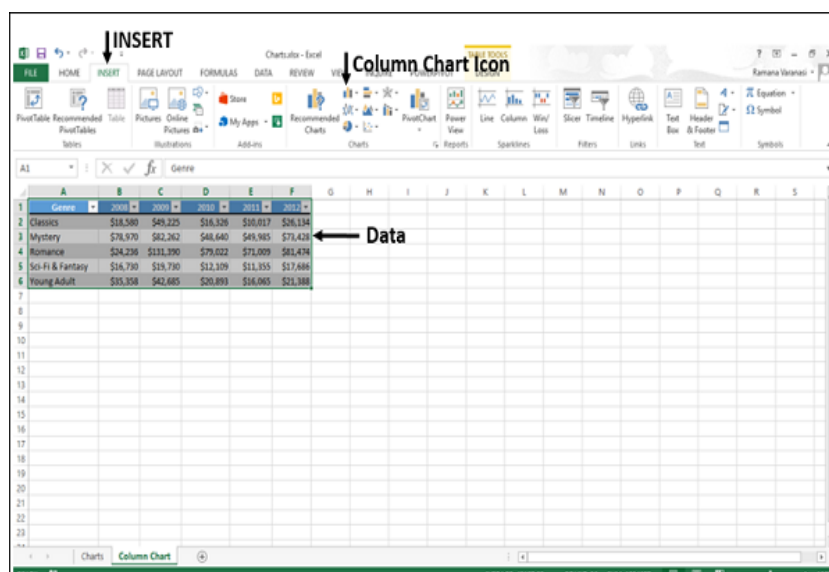
The 2-D column, 3-D Column chart options are displayed. Further, More Column Charts... option is also displayed.
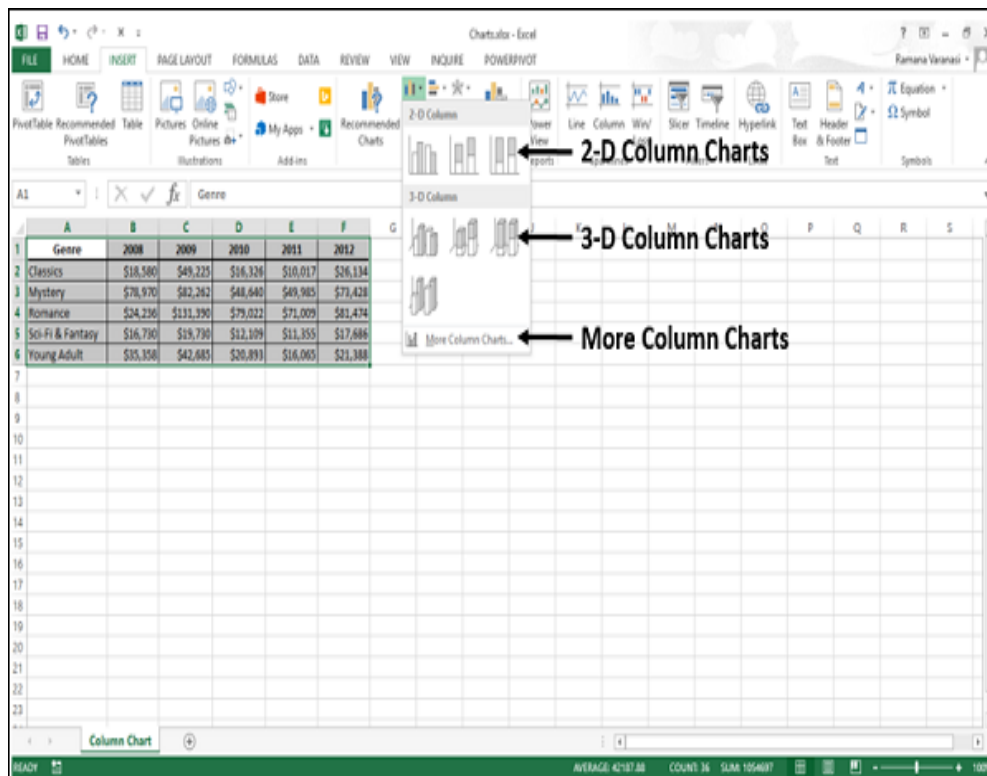
Step 4 – Move through the Column Chart options to see the previews.

Step 5 – Click Clustered Column. The chart will be displayed in your worksheet.
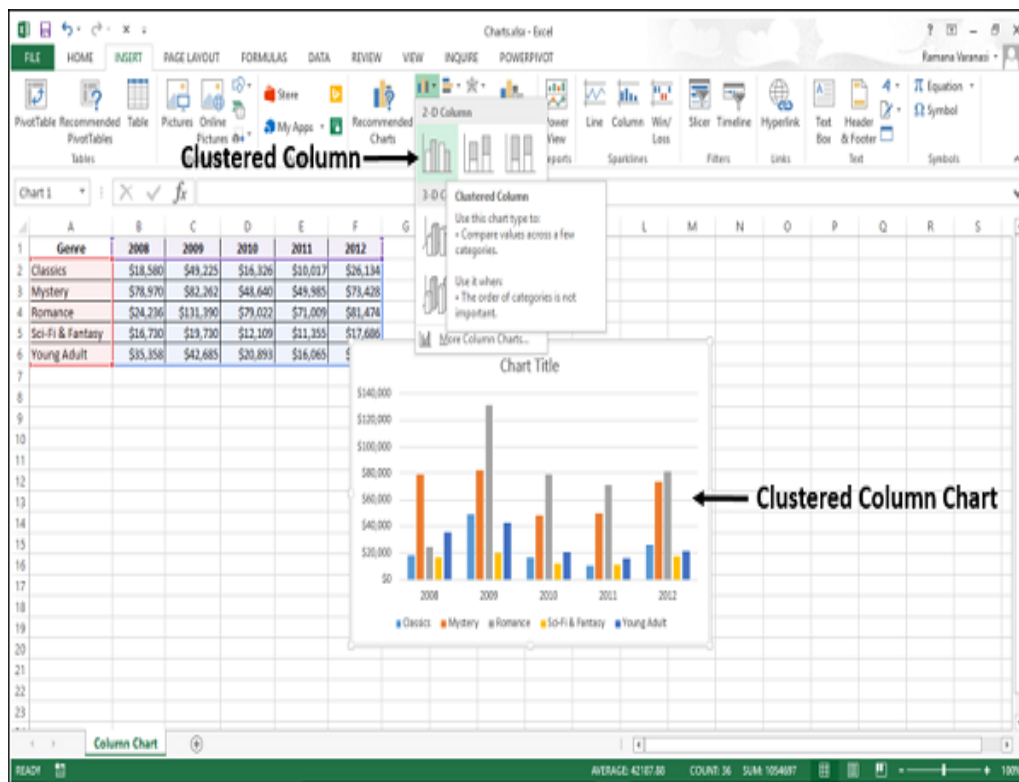
Step 6 – Give a meaningful title to the chart by editing Chart Title.
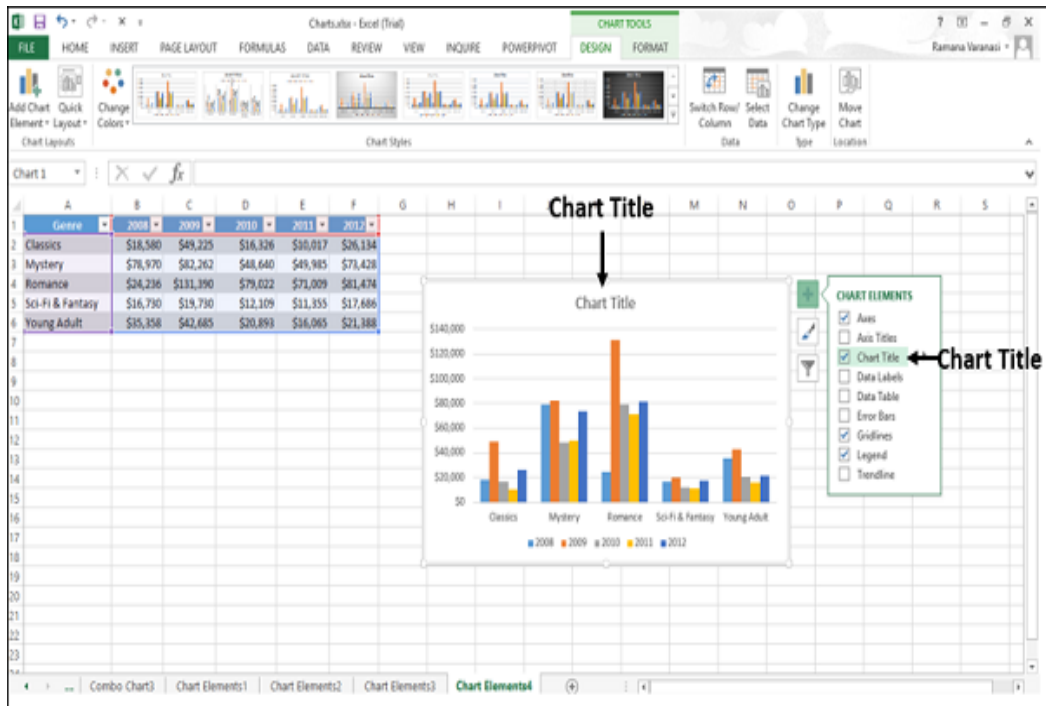
4.1.7 Printing

To print a worksheet in Excel, execute the following steps.

1. On the File tab, click Print.

2. To preview the other pages that will be printed, click 'Next Page' or 'Previous Page' at the bottom of the window.
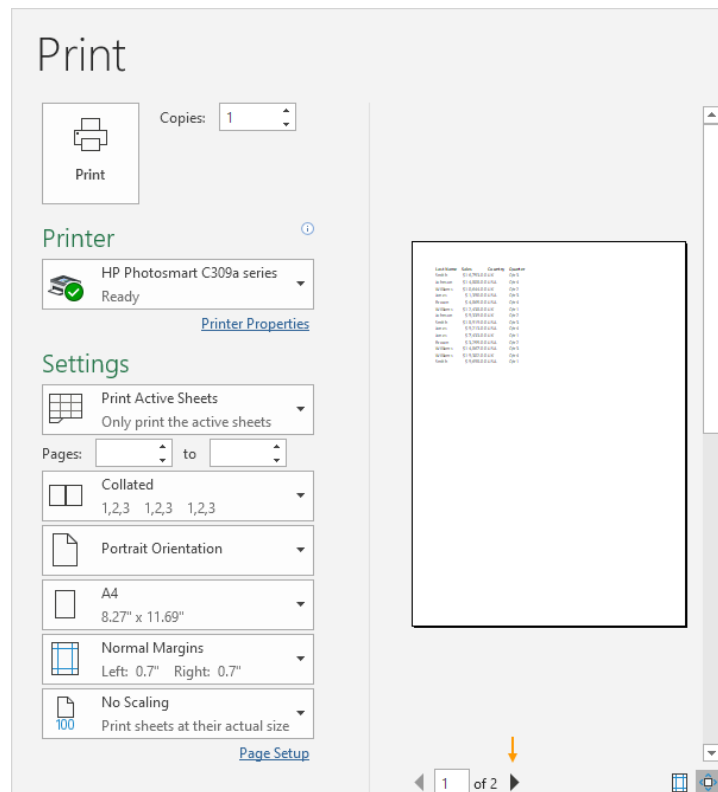
4.1.8 Using Tools

Errors checking

Errors are quite common. You will not find a single person who does not make any errors in Excel. When the errors are part and parcel of Excel, one must know how to find those errors and resolve those issues.

When using Excel routinely, we may encounter many errors flagged if the error handler is enabled. Otherwise, we may get potential calculation errors. So if you are new to error handling in Excel, this article is a perfect guide for you.
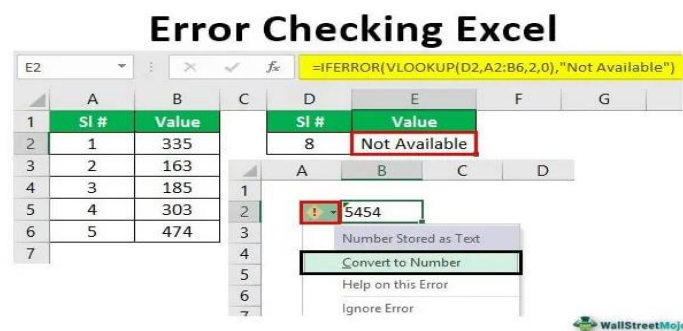
Spell Check Basis

Let us see how to access the spell check

- To access the spell checker, Choose Review ⇨ Sp   ss F7.
- To check the spelling in just a particular range, select the range before you activate the spell checker.
- If the spell checker finds any words it does not recognize as correct, it displays the Spelling dialogue with suggested options.
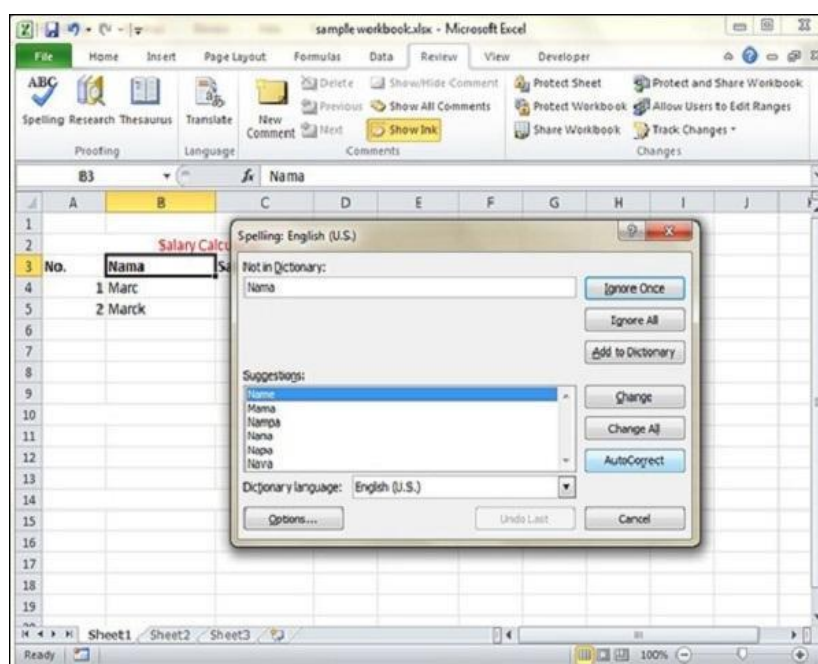
Exploring Options

Let us see the various options available in spell check dialogue.

- Ignore Once – Ignores the word and continues the spell check.
- Ignore All – Ignores the word and all subsequent occurrences of it.
- Add to Dictionary – Adds the word to the dictionary.
- Change – Changes the word to the selected word in the Suggestions list.
- Change All – Changes the word to the selected word in the Suggestions list and changes all subsequent occurrences of it without asking.
- AutoCorrect – Adds the misspelled word and its correct spelling (which you select from the list) to the AutoCorrect list.

Formula Auditing

The formula function in Excel is one of the most useful things any business owner or employee can use, especially when large volumes of data need to be evaluated. Sometimes you are given completed worksheets that you need to do extra analysis on. It is sometimes difficult to see where all of the functions in the file are and where they are coming from. When this happens, knowing how to use the Formula Audit toolbar is essential.
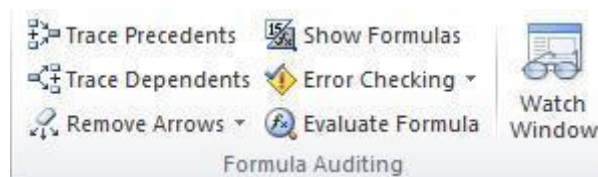
Formula Audits can be done several different ways. If you click on the Excel ribbon tab called **Formulas**, you can see the section labeled **Formula Auditing**. You may have to customize the ribbon to see this option. Below are the various ways that you can audit a formula.

Creating & Using Templates in MS Excel

Template is essentially a model that serves as the basis for something. An Excel template is a workbook that's used to create other workbooks.

Viewing Available Templates

To view the Excel templates, choose File » New to display the available templates screen in Backstage View. You can select a template stored on your hard drive, or a template from Microsoft Office Online. If you choose a template from Microsoft Office Online, you must be connected to the Internet to download it. The Office Online Templates section contains a number of icons, which represents various categories of templates. Click an icon, and you'll see the available templates. When you select a template thumbnail, you can see a preview in the right panel.

Pivot table

A PivotTable is a powerful tool to calculate, summarize, and analyze data that lets you see comparisons, patterns, and trends in your data. PivotTables work a little bit differently depending on what platform you are using to run Excel.

Steps to Create Pivot table

1. Select the cells you want to create a PivotTable from.
   Note: Your data should be organized in columns with a single header row.
2. Select **Insert > PivotTable**.
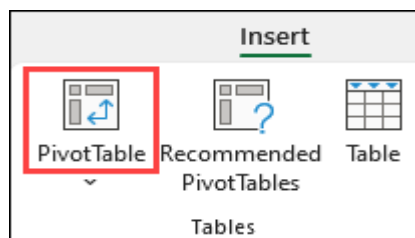
3. This will create a PivotTable based on an existing table or range.
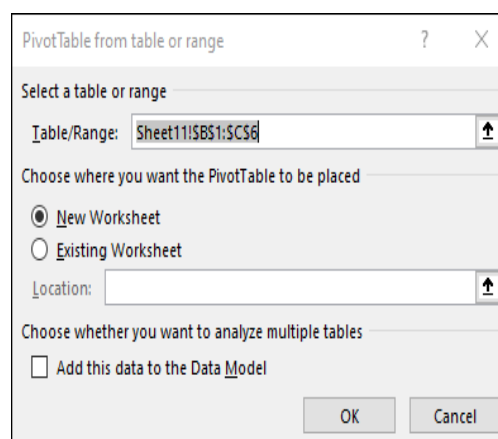
4. Choose where you want the PivotTable report to be placed. Select **New Worksheet** to place the PivotTable in a new worksheet or **Existing Worksheet** and select where you want the new PivotTable to appear.

5. Click **OK**

Tracking Changes

When you highlight changes as you work, Excel marks any revisions (such as changes, insertions, and deletions) with a highlighting color.

- Click Review > Track Changes, and then click Highlight Changes.
- In the Highlight Changes dialog box, select the Track changes while editing check box.

Security

To prevent others from accessing data in your Excel files, protect your Excel file with a password.

1. Select File > Info.

2. Select the Protect Workbook box and choose Encrypt with Password.

3. Enter a password in the Password box, and then select OK.

4. Confirm the password in the Reenter Password box, and then select OK.
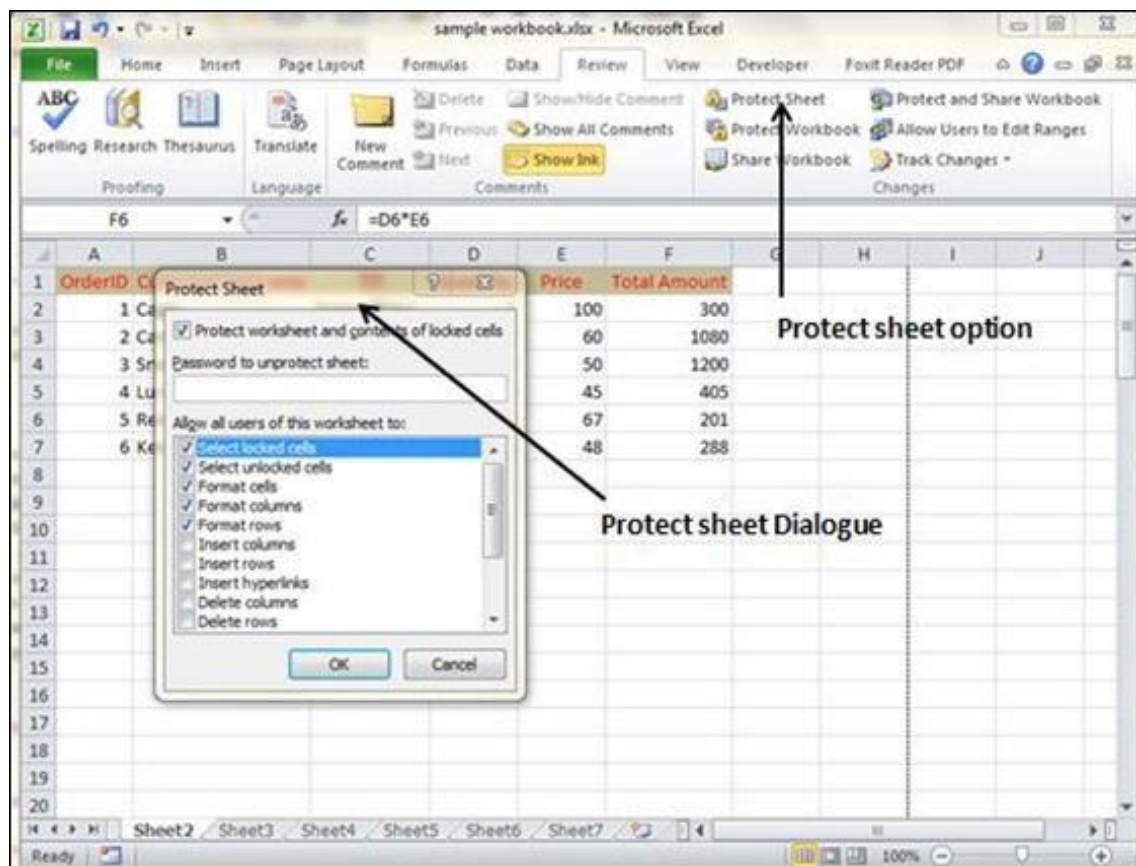
Customization

- In the right part of the Customize the Ribbon window, select the tab to which you'd like to add a new group.
- Click the New Group button.
- To rename your custom group, select it, click the Rename
- Click OK to save and view your changes.

4.2 Open Office - Calc

4.2.1 Introduction

4.2.1.1 Introduction to Spreadsheets

Calc is the spreadsheet component of OpenOffice.org (OOo). You can enter data, usually numerical data, in a spreadsheet and then manipulate this data to produce certain results. Alternatively you can enter data and then use Calc in a 'What If...' manner by changing some of the data and observing the results without having to retype the entire workbook or sheet. A major advantage of electronic spreadsheets is that the data is easier to alter. If the correct functions and formulas have been used, the program will apply these changes automatically.

4.2.1.2 Overview of a Worksheet

Calc works with elements called workbooks. Workbooks consist of a number of individual worksheets, each containing a block of cells arranged in rows and columns. These cells hold the individual elements; text, numbers, formulas etc., which make up the data to be displayed and manipulated. Each workbook can have many worksheets and each worksheet can have many individual cells.

1. Title Bar

At the top of the window is the "Title Bar". It is used to show the name of the file and name of the application. In OpenOffice calc, the default name for the first unsaved worksheet is "Untitled1". When you save the file, Untitled will change to the name in which you saved.

2. Control Buttons

In the right corner of title bar, (1) minimize, (2) maximize / restore and (3) close control buttons are available.

3. Menu Bar

Below the title bar is the menu bar. Most of the menus are very similar to what you learnt in OpenOffice Writer.

File - menu contains the commands of all file management tasks like, Create a new file, Open an existing file, Close the current file, Save a file, Save a file in another name, print file, Export file etc.

Edit - menu contains the editing commands like, cut, copy, paste, Undo, Redo, Fill etc., Most of the menu items are similar to Writer Edit menu. But, for Calc, some special editing options are available under this menu.

View - menu contains the commands which are used to modify the environment of calc.

Insert – menu contains commands for inserting various calc elements such as cells, columns, rows, functions, charts etc.,

Format – menu contains the commands of various text and cell formatting features.

Tools – menu contains various tools and functions such as spell check, protect document, insert pictures, macros, etc.,

Data – menu contains the commands to manipulate data in a spreadsheet such as sort, filter, subtotal, validity etc.,

Window – menu shows display options such as New Window, Close Windows, Split and Freeze.

Help – menu lists in-built help features available with OpenOffice.

4. Tools Bar

Under the menu bar, there are three toolbars available by default. They are:

(1) Standard Toolbar

(2) Formatting Toolbar

(3) Formula bar

OpenOffice Calc Tool bar

Standard Toolbar – contains frequently used menu such as File, Edit, Data etc., commands as icons such as New Open Save, Send, Print, Print Preview, Cut, Copy, Paste, Sorting, Inserting chart etc.,

Formatting Toolbar – contains frequently used text and cell formatting commands as such as changing font style, font size, font colour, alignments, cell formatting etc.,

Formula bar – This is a very important element in a spreadsheet. It contains Name box, Function Wizard, Sum button, Function button and Input line (Refer Figure 9.4).

Calc Formula bar
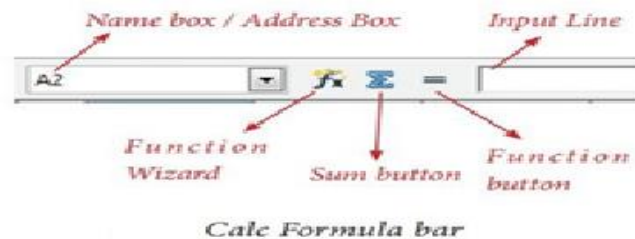
Name box : It display the current cell address

Function Wizard : It is used to insert function

Sum button : It is used to quickly insert sum function.

Input Line : This is used to show the contents of the current cell. It always shows actually what you typed in a cell. It is also used to edit the contents.

5. Scroll bar

Spreadsheet window also has two sets of scroll bars (1) Vertical Scrollbar and (2) Horizontal Scrollbar (Refer Figure 9.5)

Vertical Scroll bar: It is used to move the screen up and down.
Horizontal Scroll bar: It is used move the screen left and right.
Scroll buttons: used to move the screen to the relative distance.

Calc Scrolling bar
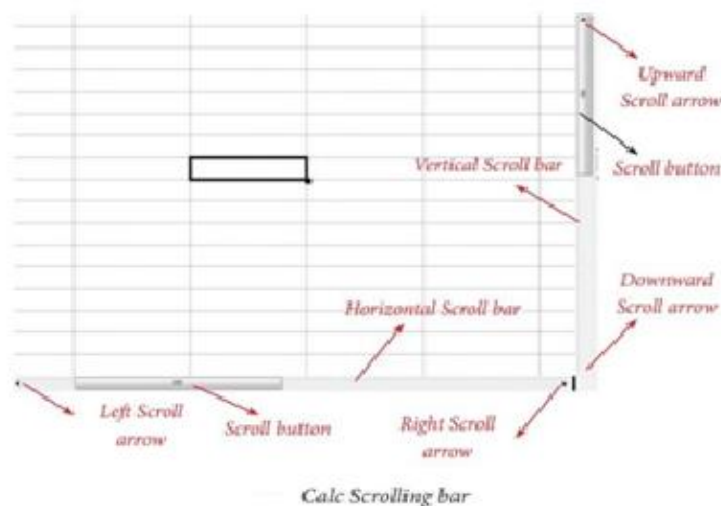
6. Row, Column, Cell and Cell Pointer

Below the formula bar contains the worksheet of work area which consit of grid cells The worksheet has number of rows and columns, where each column is labelled as A, B, C, D ..... AA, AB, AC ..... and the rows are numbered from 1, 2, 3 ....

Calc Rows, Columns, Cells
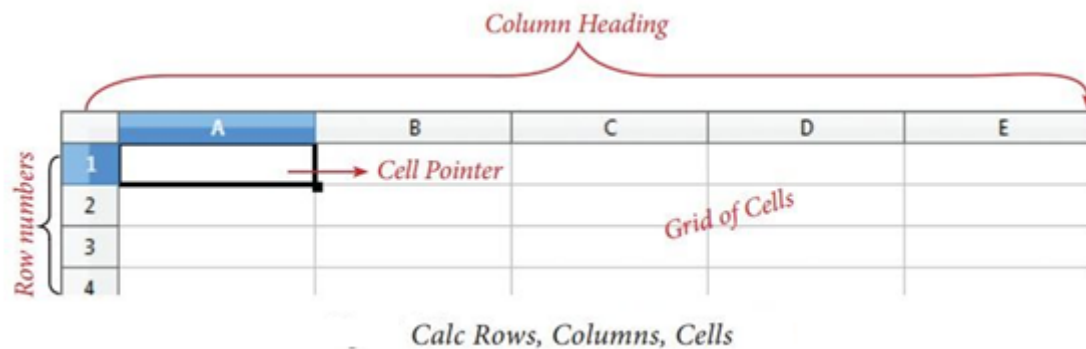
Cell

Intersection of each row and column makes a box which is called as "Cell". Each cell has a unique address.

Cell address is the combination of column heading and row number. For example, the intersection of column B and row 4 makes a cell B4. (Figure 9.7) . Every cell is thus identified by its unique cell address.

7. Worksheet tabs

Calc Sheet Tab
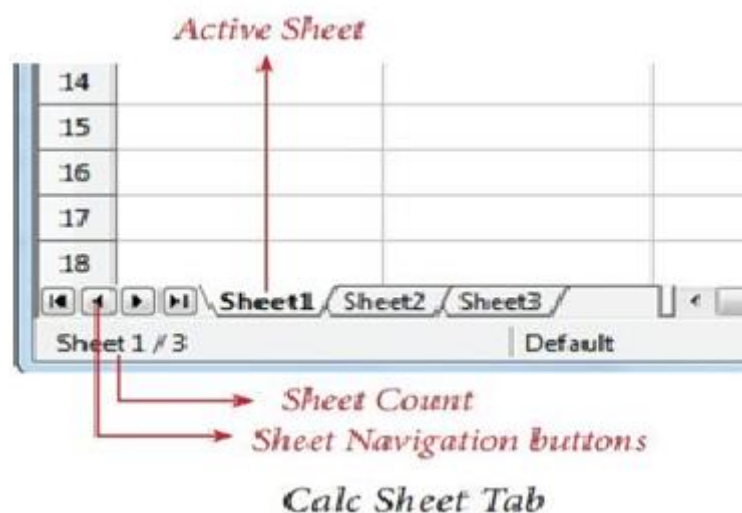
At the bottom of the grid of cells are the sheet tabs. By default there are 3 sheets "Sheet1", "Sheet2" and "Sheet3", When you open a new worksheet, sheet1 is the default active sheet. Active sheet tab will appear in white colour. If you click on another sheet, it will become active and its colour will turn white. Multiple sheets can also be

selected by clicking the sheet and press the **Ctrl** button **(Ctrl + Click)**. Selected sheets will turn to white colour.

8. Status bar

Below the sheet tabs and horizontal scrolling bar is the "Status Bar". It shows the current status of the worksheet.

Sheets count: Displays current serial number of the sheet / total number of sheets available.

Page Style: Displays the page style of the current sheet. To make changes, just double-click on "Default" and it will show you the "Page Style" dialog box, which is used to change the margin, orientation, paper size, inserting header, footer, border style etc.,

Selection Mode: Displays the selection mode of the current sheet. There are three modes available to select the cells of a worksheet. They are, Standard (STD), Extend (EXT) and Add (ADD).

Unsaved Changes: An asterisk (*) symbol indicates the changes made in the worksheet but not yet saved. If you have saved your changes, it will disappear.

Calc Status bar
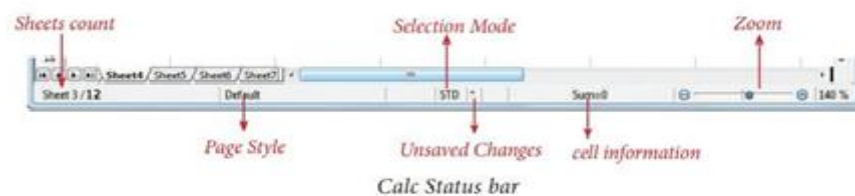
4.2.1.3 Creating Worksheet and Workbooks

A single page in a file prepared with an electronic spreadsheet tool is referred to as a worksheet. A Calc file with one or more worksheets is referred to as a workbook.

To create a new workbook and worksheet

- Start□All programs□openoffice□calc or double click on the openoffice icon on the desktop and select the spread sheet
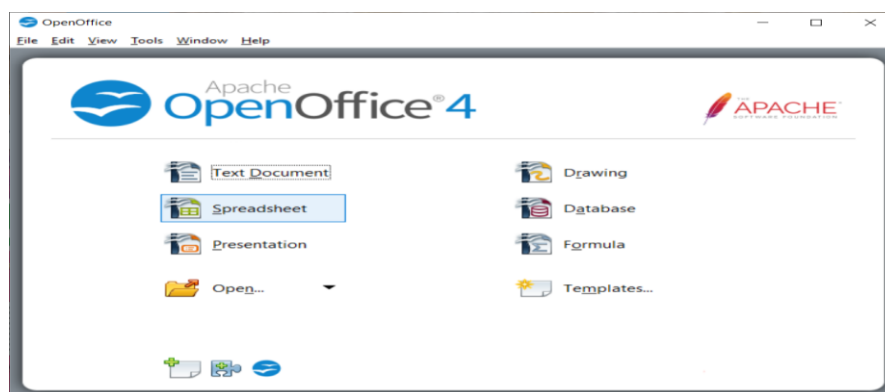
A worksheet is a grid of cells
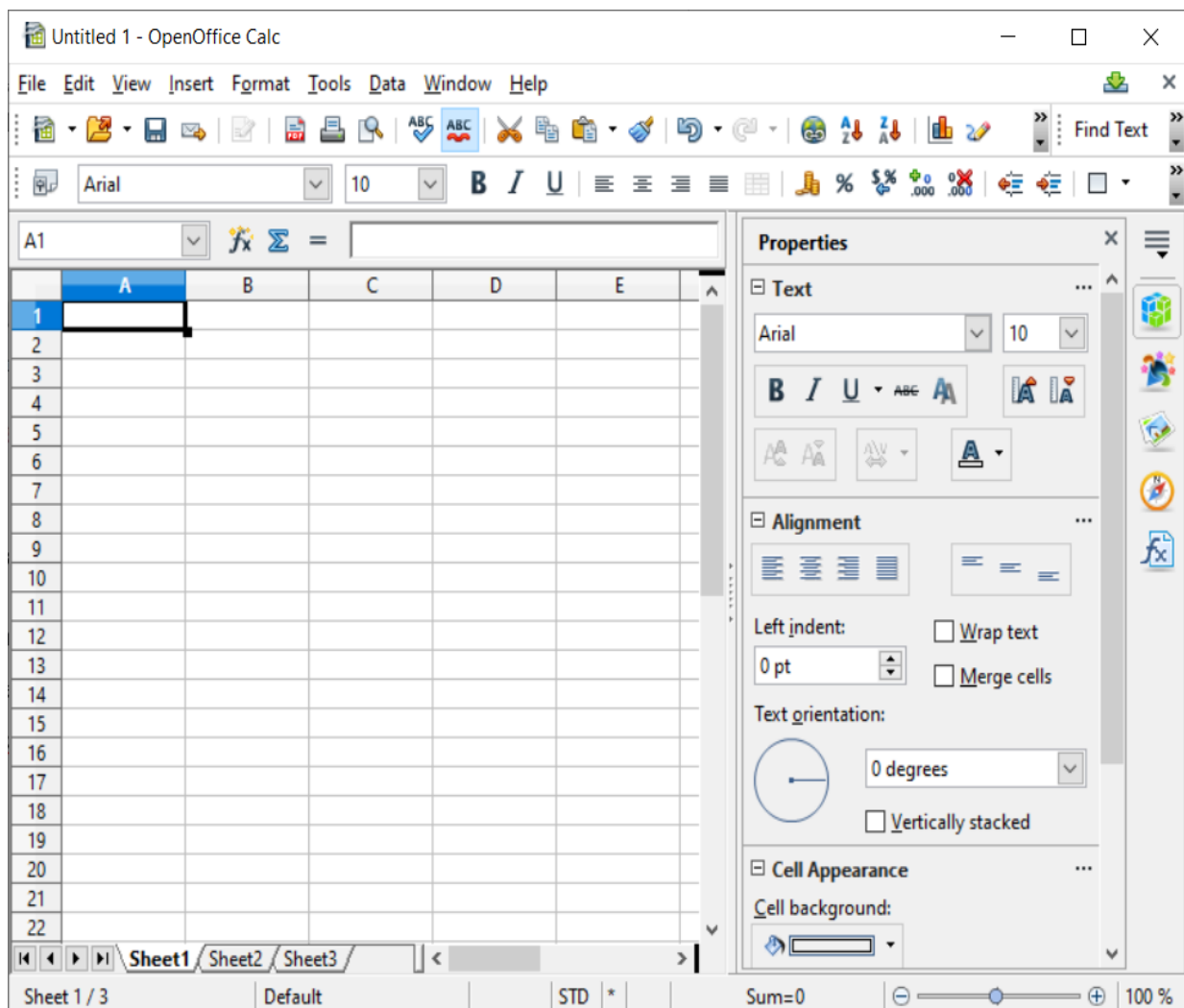
4.2.1.4 Organizing files, Managing files and workbooks

Saving Worksheet

The process of saving a worksheet is very similar to saving a document. Steps to save a worksheet are as follows:

Step 1: File → Save (or) **Ctrl + S** (or) Click **"Save"** icon on the standard tool bar.

Step 2: If the spreadsheet has not been saved previously, the Save As dialog box will appear.

Step 3: Type the name in "File Name" list box. OpenOffice Calc Spreadsheets are stored with extension **.ods** by default.

Step 4: Click **"Save"** button.

After clicking the save button, the given file name is displayed in the title bar
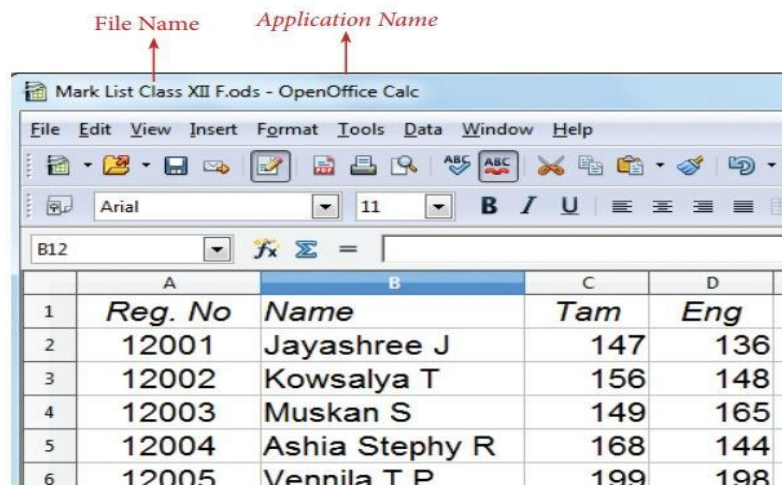
Closing a Worksheet

After saving the worksheet; it remains open. So, you can continue to working with the spreadsheet. When the work is finished, you should save using **File → Save** (or) Click **"Save"** icon (or) **Ctrl+S** and then to close the worksheet using **File → Close** command (or) Press **Ctrl + W**.

Opening an existing worksheet

1. Using Open dialog box

To reopen an existing worksheet, the **File → Open** command (or) "Open" icon (or) **Ctrl + O** can be used. An Open dialog box appears that is similar to **"Save As"** dialog box.

The name of the file to be opened can be chosen from the list or folder in which worksheet has been saved.
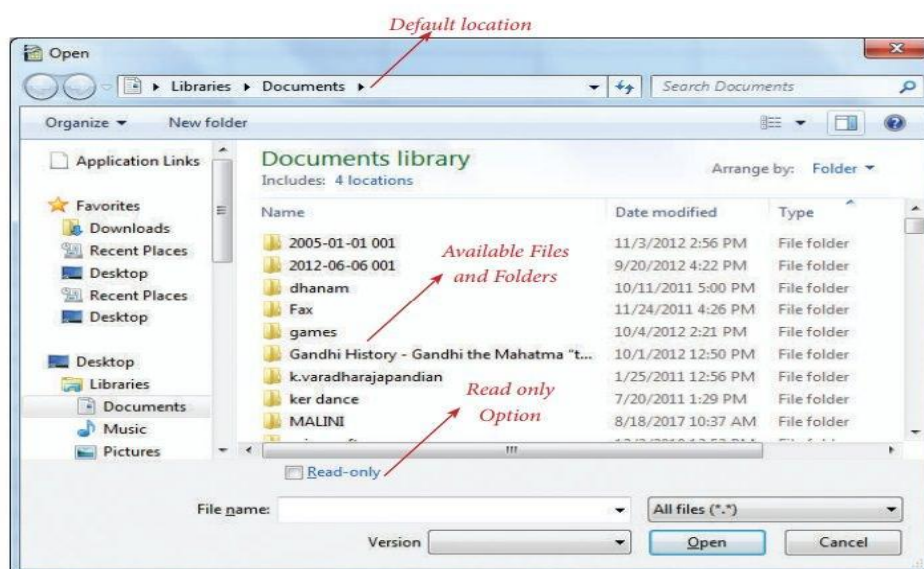
2. Using Recent documents

OpenOffice keeps a list of recently opened files. **File → Recent Documents** option can be used to open an existing worksheet from the list
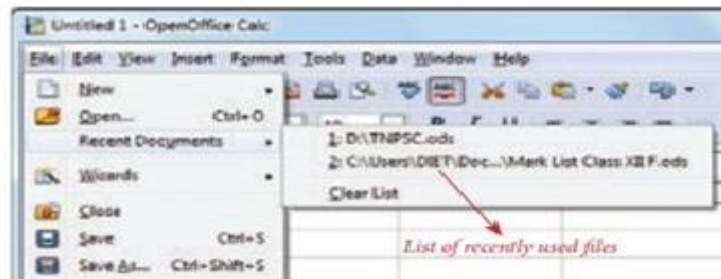
List of Recent Documents

4.2.1.5 Functions & Formulas
Creating Formulae

Operators

Operators are symbols for doing some mathematical, statistical and logical calculations. Combination of values, operators and cell references is called as "Expression". Calc supports a variety of operators which are categorized as:

1. Arithmetic Operators

Arithmetic operators are symbols for performing simple arithmetic operations such as addition, subtraction, multiplication, division etc., These operators return a numerical result.

Operator	Name	Value in Column B	Value in Column C	Formula in Column D	Result in Column D Operator
+	Addition	98	25	= B3 + C3	123
-	Subtraction	125	25	= B3 – C3	100
*	Multiplication	25	5	= B3 * C3	125
/	Division	90	10	= B3 / C3	9
^	Exponent	25	2	= B3 ^ C3	625
%	Percent	600		= B3 * 35%	72
Percentage (%) operator shows percentage of the content.					

Table 9.1 List of Arithmetic Operators

2. Relational Operators

Relational operators are symbols used for comparing two values such as greater than, less than, equal to etc. The relational operators are also called as *"Comparative operators".* These operators return either a True or a False.

Operator	Name	Value in Column B	Value in Column C	Formula in Column D	Result in Column D
>	Greater than	98	100	=B3>C3	FALSE
>=	Greater than or equal to	85	72	=B3>=C3	TRUE
<	Less than	54	24	=B3<C3	FALSE
<=	Less than or equal to	55	55	=B3<=C3	TRUE
=	Equal to	12	12	=B3=C3	TRUE
<>	Not equal to	54	45	=B3<>C3	TRUE

Table 9.2 List of Relational Operators of cells.

3. Range Reference Operator

Colon (:) is the range reference operator. It is used to group a range of cells. An expression using a range operator has the following syntax:

reference left : reference right

where reference left is the starting cell address of a linear group of cells or upper left corner address of a rectangular group Reference right is the last cell address of a linear group or lower right corner address of a rectangular group of cell.

4. Text Operator

In Calc, "&" is a text operator which is used to combine two or more text. Joining two different texts is also known as "Text Concatenation" **(Refer Figure 9.21)**. An expression using the text operator has the following syntax:

text reference1 & text reference2
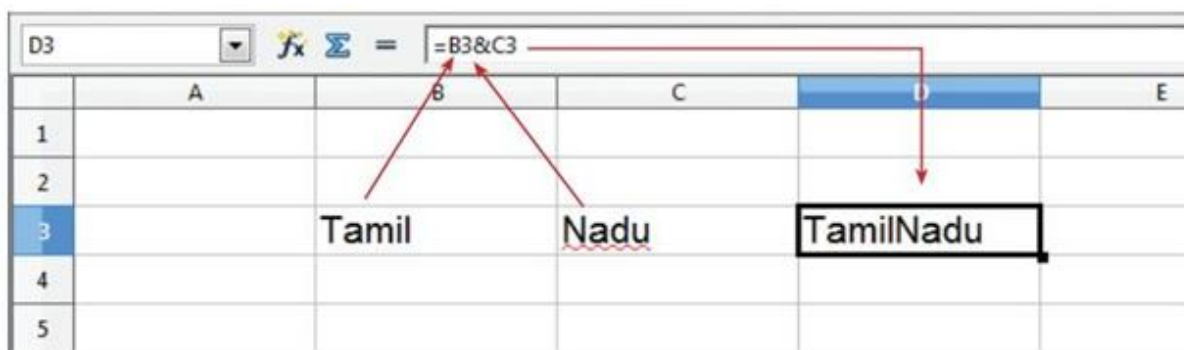
Text operator

When arithmetic operators are used in a formula, Calc calculates the results using the rule of precedence followed in Mathematics. The order is:

I. Exponentiation (^)

II. Negation (-)

III. Multiplication and Division (*, /)

IV. Addition and Subtraction (+, -)

Construction of formula

To construct a formula, follow the steps below:
- Cell pointer should be in the cell in which you want to display the result.
- Formula should begin with an = sign.
- In a formula, use only cell reference (cell address) instead of the actual values within the cells.
- While constructing a formula, *BODMAS rule* should be kept in mind.

Functions

- Enter the data and select a cell
- Click the **Insert menu □ Functions** or **Ctrl + F2.** The ' Insert Function ' dialog box appears
- Select a Function from a Category
- Select the range A1:B1 in the function arguments
- Click OK
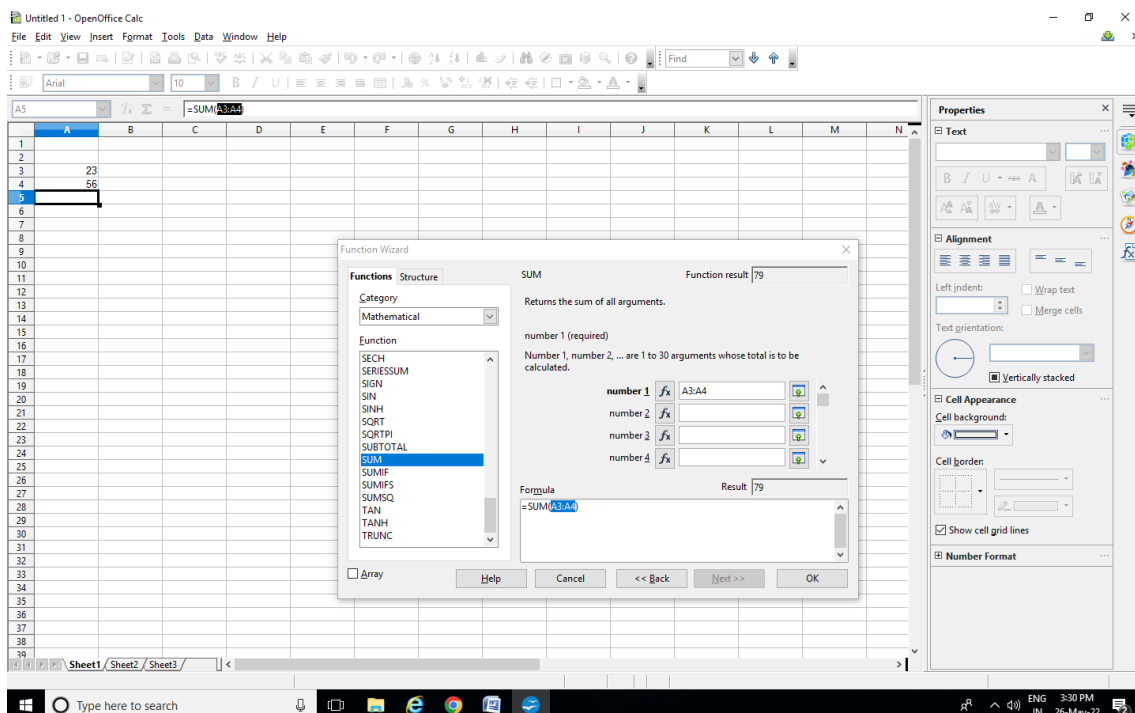
4.2.1.6 Working with Multiple Sheets

To insert a new worksheet

- Click **Insert menu ☐ Sheet**, Insert Sheet dialog box appears
- Select the options for **position and sheet or file**
- Click **OK**
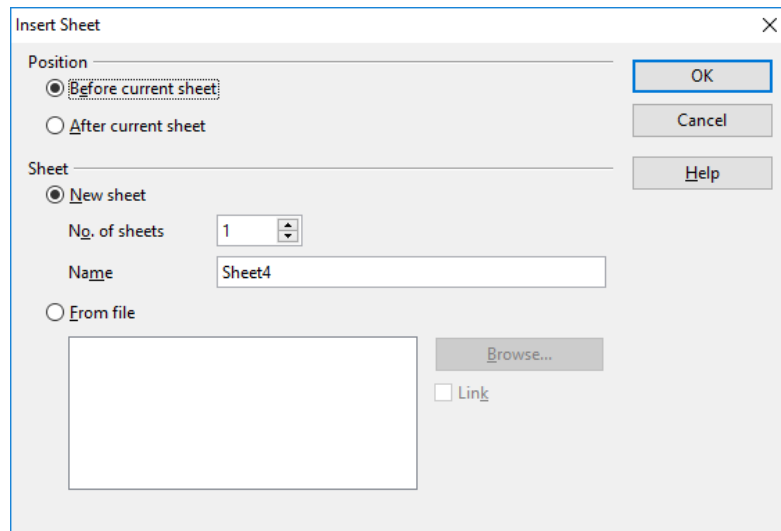
To copy or move a worksheet

- Right click on the worksheet you want to copy/move
- Select **Move/Copy** sheet option
- In the dialog box, choose where the sheet will appear in the **Insert Before**
- If you want to copy , check the box, **copy** and click **OK**
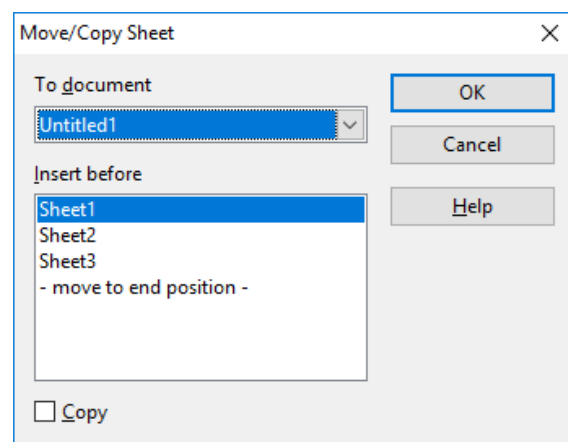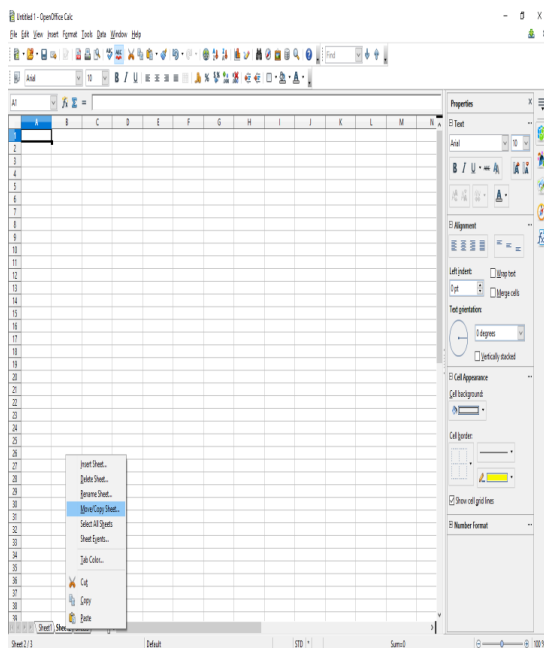
To rename a worksheet

- Right-click the worksheet you want to rename
- Then select **rename sheet** option
- In the appearing dialog box type the **name** and click **ok**.
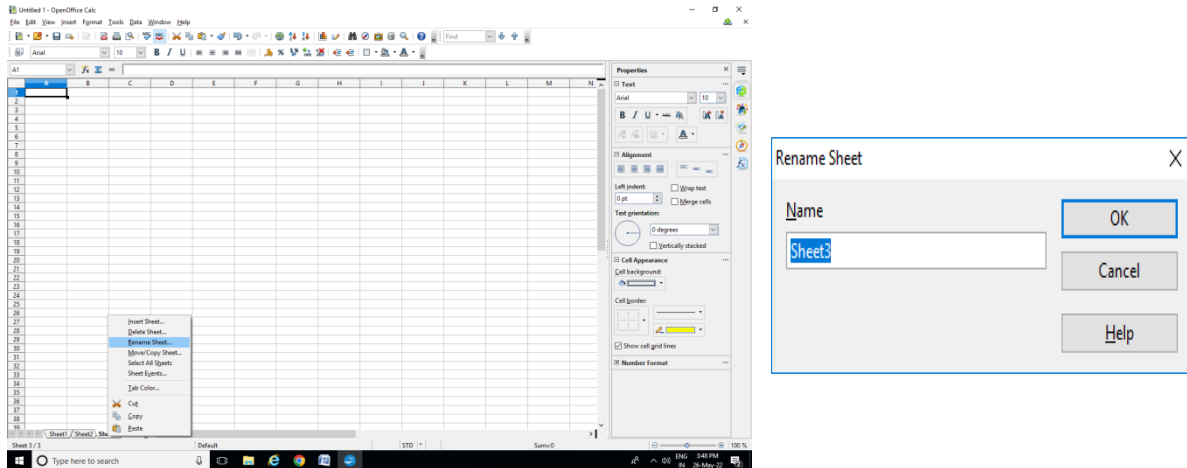
To delete a worksheet

- Right click on the worksheet to be deleted
- Then select **Delete Sheet** option, and then select **yes**.
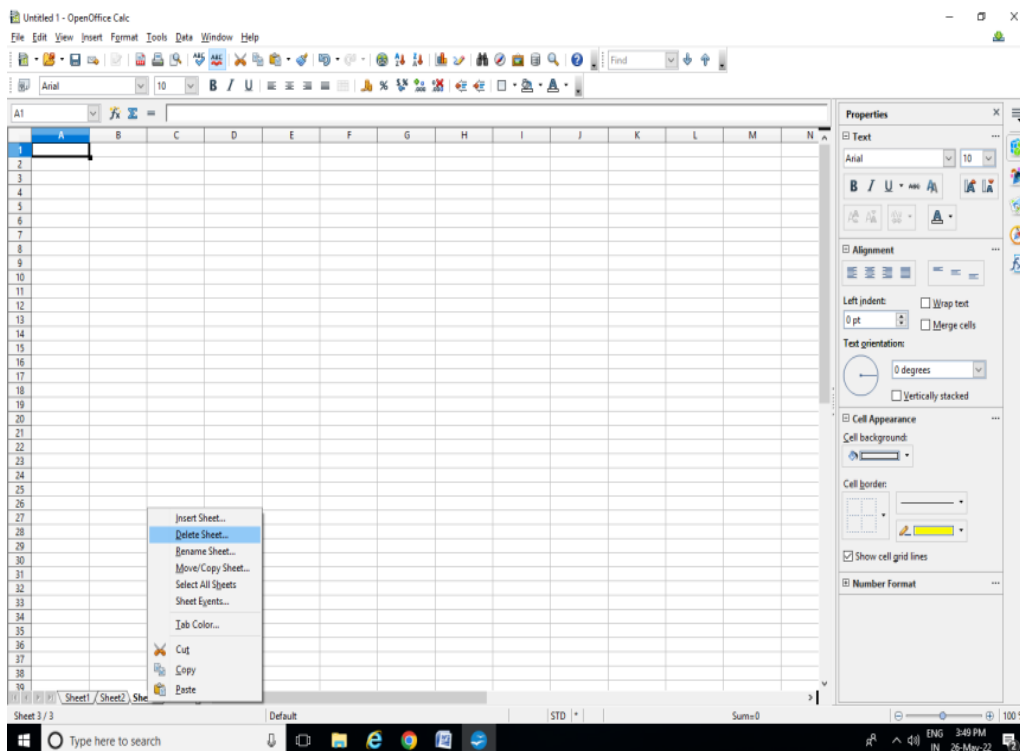
4.2.1.7 Creating Charts & Printing Charts

- Open OpenOffice Calc and enter data
- Click the Insert menu □ Chart
- Cart and Chart wizard will appear
- Choose Chart type (Column, Bar , Pie,...) Click Next
- Select the data range, then click Next
- Customise the Data range
- Add chart title , x-axis, y-axis
- Choose Left/Right/Top/Bottom from Display Legend Radio Button
- Then Click Finish Button
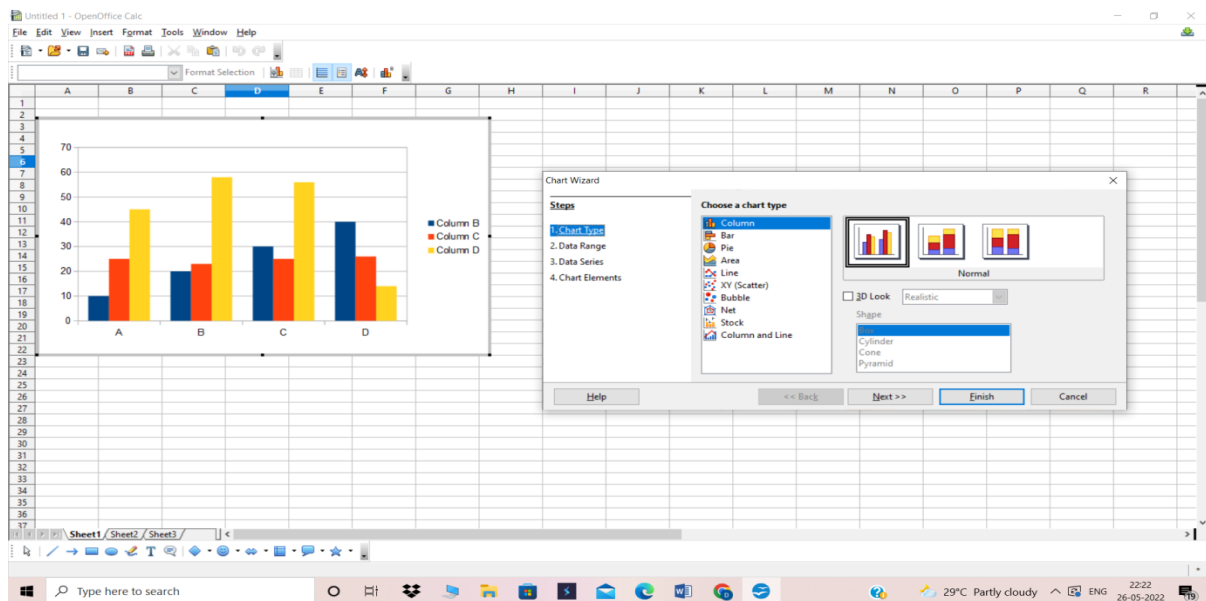
Printing Chart

- Select format□Page from the main menu
- Select the sheet tab
- Specify which details to print
- Click charts check box, then click ok button
- Then click File Menu□Print
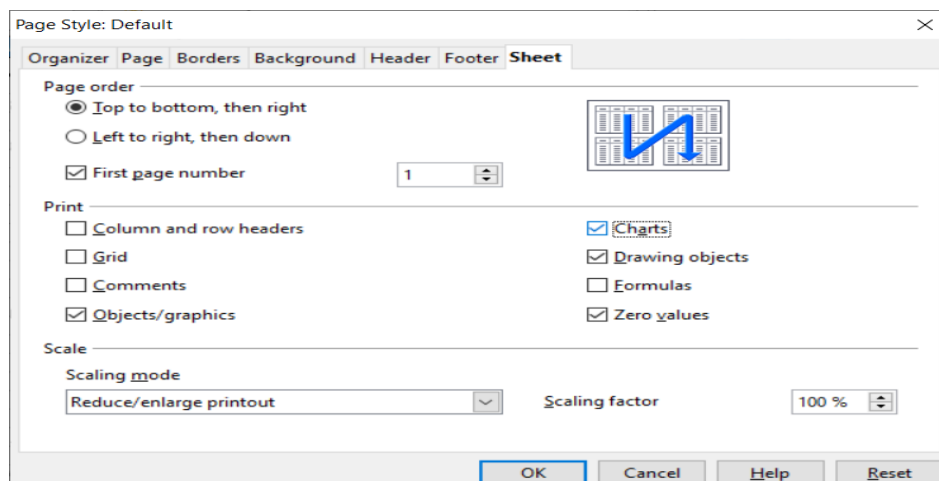
4.2.1.8 Operating with MS excel documents, which are already created and saved in MS Excel

- Launch OpenOffice Calc and open the Excel sheet you want to transfer to the OpenOffice format.
- Click "File" at the top of the Calc window, followed by "Save As" from the menu to open the Save As dialog box.
- Select "ODF Template" in the "Save As Type" drop-down menu.
- Click "Save" to transfer the Excel worksheet to the OpenOffice format.

*****
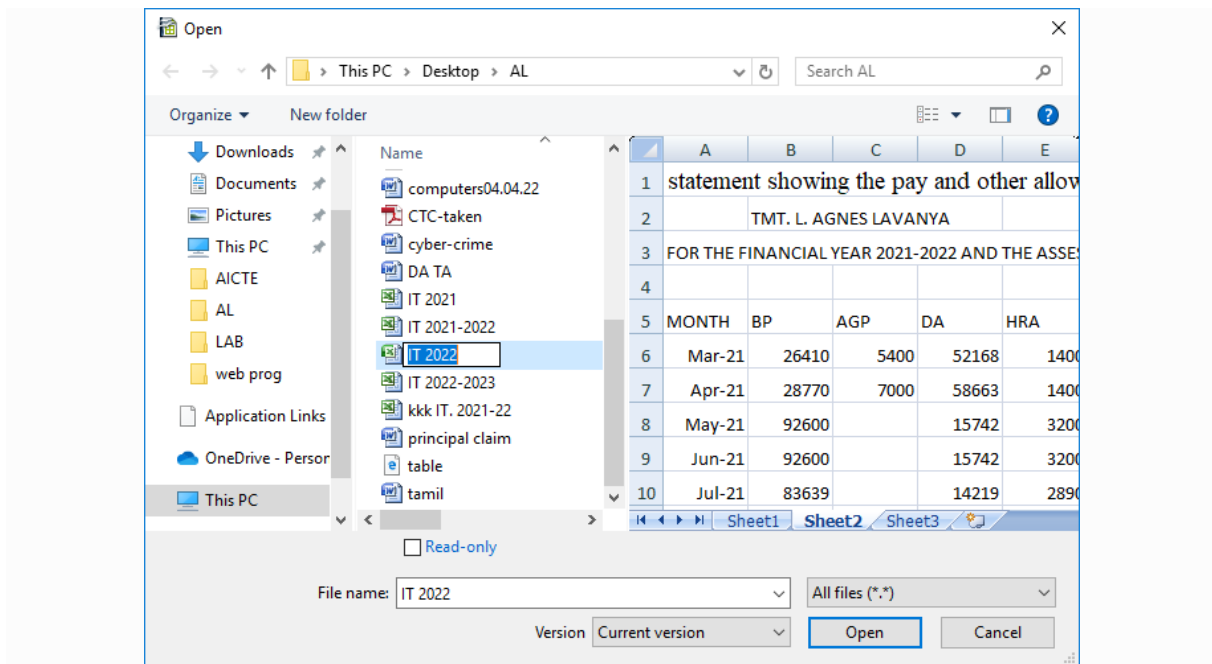
UNIT – 5

OFFICE APPLICATIONS - III

Introduction to MS Office – MS Access and Open Office - Base

5.1 MS Office - MS Access

5.1.1 Introduction

Microsoft Access is a database management system that enables to store, retrieve, sort, summarize and report results speedily and effectively. It can combine data from various files through creating relationships, and can make data entry more efficient and accurate.

A **database** is a collection of data that is stored in a computer system. Databases in Access 2010 are composed of four objects: **tables**, **queries**, **forms**, and **reports**. Together, these objects allows to enter, store, analyze, and compile the data however needed.
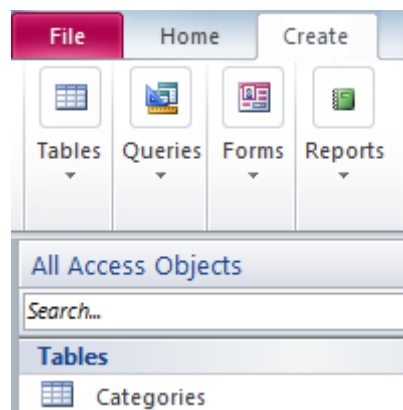
Tables

All data are stored in **tables.** Tables are organized into vertical **columns** and horizontal **rows**.

Queries

Queries are a way of **searching** for and **compiling** data from one or more tables.
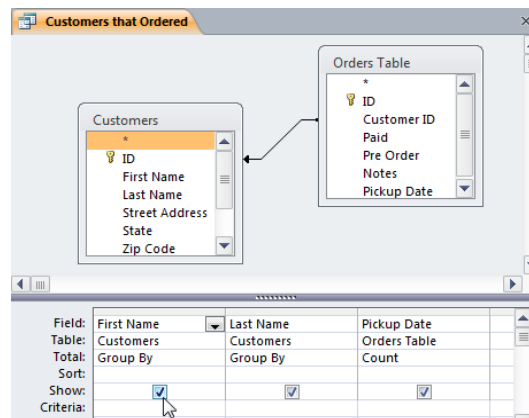
Forms

The reason forms are used so often is that they are an easy way to guide people into entering data correctly.

Reports

Reports offer the ability to **present** the data **in print**, the ability to create a report from any **table** or **query**.

5.1.2 Planning a database

Database planning means the software is capable of managing and consolidating all the data generated.

A properly designed database provides access to up-to-date, accurate information. Because a correct design is essential to achieving the goals in working with a database. The design process consists of the following steps:

- **Determine the purpose of database**

  This helps to prepare for the remaining steps.

- **Find and organize the information required**

  Gather all of the types of information you might want to record in the database, such as product name and order number.

- **Divide the information into tables**

  Divide your information items into major entities or subjects, such as Products or Orders. Each subject then becomes a table.

- **Turn information items into columns**

  Decide what information you want to store in each table. Each item becomes a field, and is displayed as a column in the table. For example, an Employees table might include fields such as Last Name and Hire Date.

- **Specify primary keys**

  Choose each table's primary key. The primary key is a column that is used to uniquely identify each row. An example might be Product ID or Order ID.

- **Set up the table relationships**

  Look at each table and decide how the data in one table is related to the data in other tables. Add fields to tables or create new tables to clarify the relationships, as necessary.

- **Refine your design**

  Analyze design for errors. Create the tables and add a few records of sample data. See if you can get the results you want from your tables. Make adjustments to the design, as needed.

- **Apply the normalization rules**

  Apply the data normalization rules to see if your tables are structured correctly. Make adjustments to the tables, as needed.

5.1.3 Starting Access

When you start Access 2010, you see the Microsoft Office Backstage view, where you can get information about the current database, create a new database, open an existing database, and view featured content from Office.com.
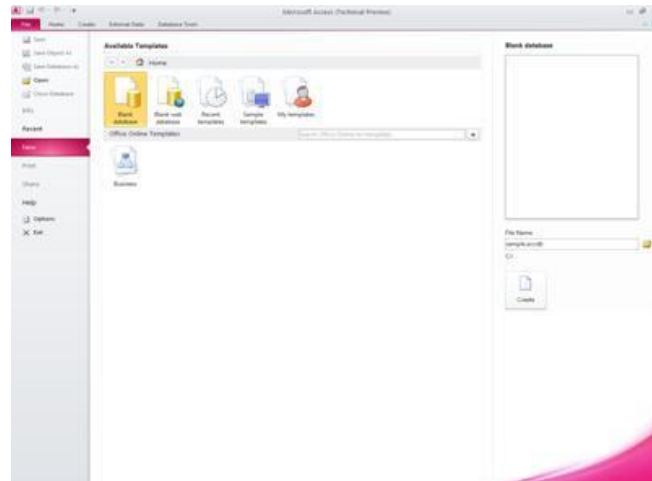
Backstage view also contains many other commands that you can use to adjust, maintain, or share your databases. Commands in Backstage view generally apply to entire databases, not to objects inside a database. You can get to Backstage view at any time by clicking the **File** tab.

5.1.4 Access Screen

Access environment, includes the **Ribbon, Backstage view, Navigation pane, Document Tabs bar** and **Record Navigation bar**.
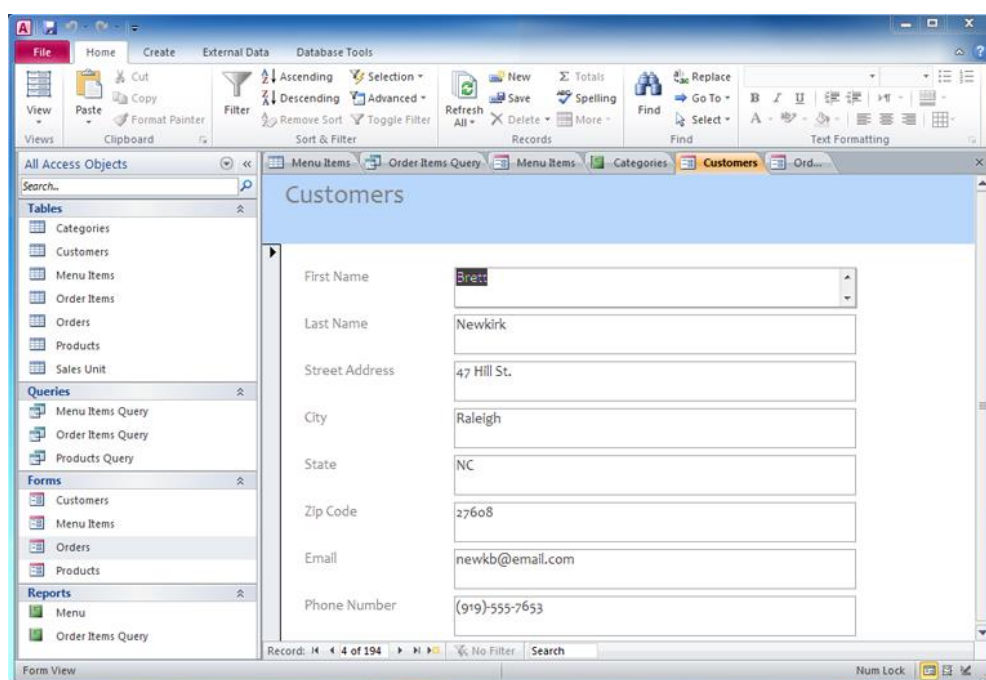
5.1.5 Creating a New Database

To create a new database, do the following

1.   Start Access.
2.   On the **New** tab in Backstage view, click **Blank Database**.
3.   On the right, type a name for your database in the **File Name** box.

To change the location in which you create the file, click **Browse** next to the **File Name** box, browse to and select the new location, and then click **OK**.

4.   Click **Create**.

5.1.6 Creating Tables

Create a new table in a new database
1.   Click **File** > **New**, and then select **Blank desktop database**.

2.   In the **File Name** box, type a file name for the new database.

3.   To browse to a different location and save the database, click the folder icon.

4.   Click **Create**.

The new database opens, and a new table named Table1 is created and opens in Datasheet view.

Create a new table in an existing database

1.   Click **File** > **Open**, and click the database if it is listed under **Recent**. If not, select one of the browse options to locate the database.

2.   In the **Open** dialog box, select the database that you want to open, and then click **Open**.

3.   On the **Create** tab, in the **Tables** group, click **Table**.

A new table is inserted in the database and the table opens in Datasheet view.

Add a field by entering data
When you create a new table or open an existing table in Datasheet view, you can add a field to the table by entering data in the **Add New Field** column of the datasheet . Access automatically assigns a data type for the field, based on the value that you enter. If no other data type is implied by your input, Access sets the data type to Text but you can change the data type.

To enter data in the Add New Field column

1.   Create or open a table in Datasheet view by right-clicking the table that you want in the   Navigation Pane and then clicking **Datasheet view** from the shortcut menu.

2.   In the **Add New Field** column, enter the name of the field that you want to create. Use a   descriptive name so that the field will be easier to identify.

3.   Enter data in the new field.

5.1.7 Working with Forms

Start the Form Wizard
1.   On the **Create** tab, in the **Forms** group, click **Form Wizard.**

2.   Follow the directions on the pages of the Form Wizard.

3.   On the last page of the wizard, click **Finish.**

    1. On the **Create** tab in the **Forms** group, click **Form Wizard**. The wizard starts.
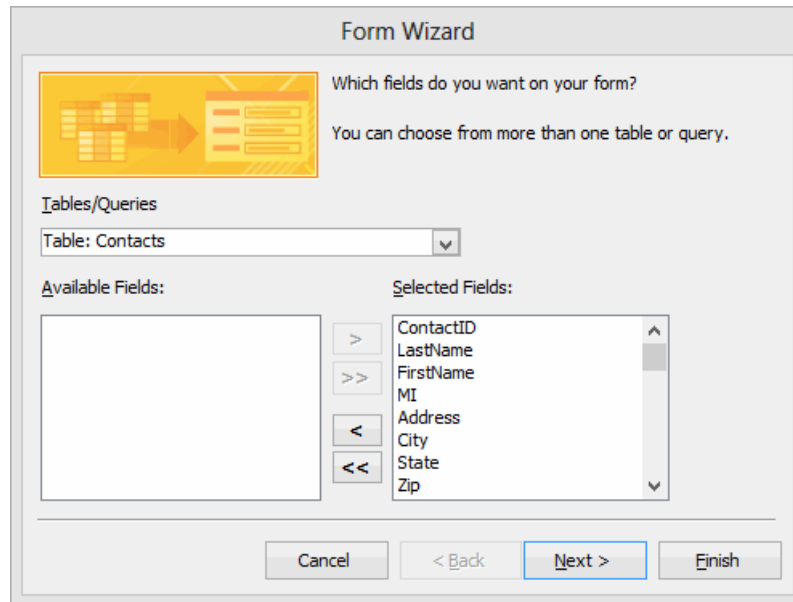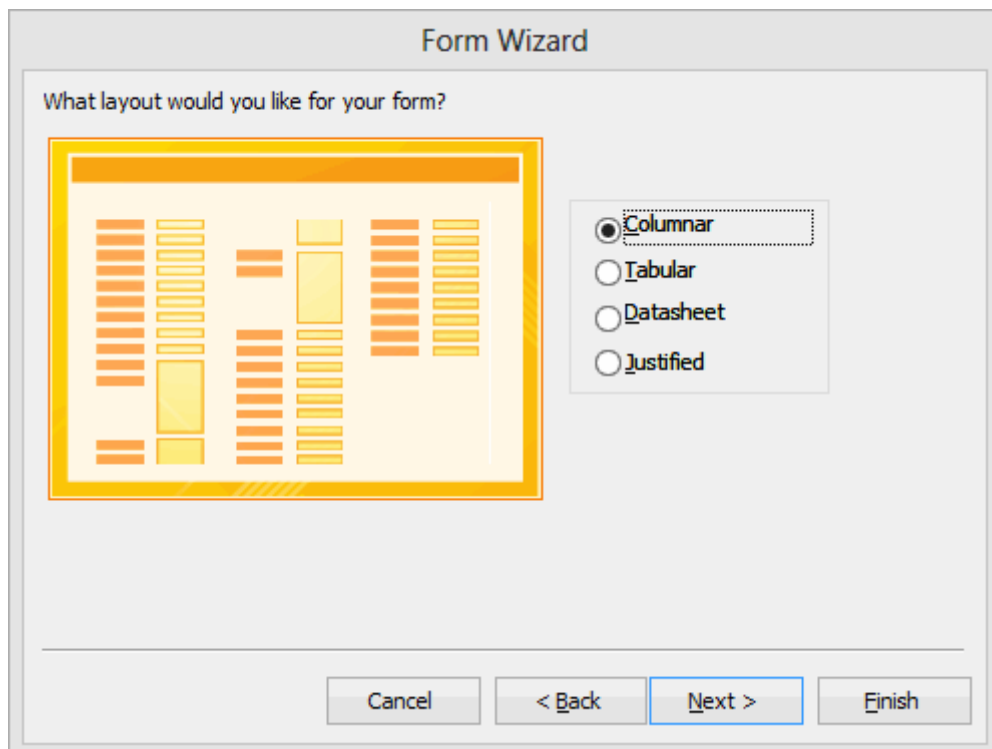
2. From the **Tables/Queries** drop-down list, select the table (or query) to base the form on. The fields for the selected table load in the **Available Fields** list box.

3. Move the fields to include on the form from the **Available Fields** list box to the **Selected Fields** list box. To do so, double-click a field name to move it or highlight the field name and click **>**. To move all fields at once, click **>>**.

4. Click **Next >**

5. Select the layout for the form. Your options are "Columnar", "Tabular", "Datasheet", and "Justified".

6. Click **Next >**.

7. Enter a title for the form.

8. Select an option for the view you want to open the form in. Your options are:

Open the form to view or enter information (opens in Form view).

Modify the form's design (opens in Design view).

9. Click **Finish**. The form loads in the view you selected.

Form view
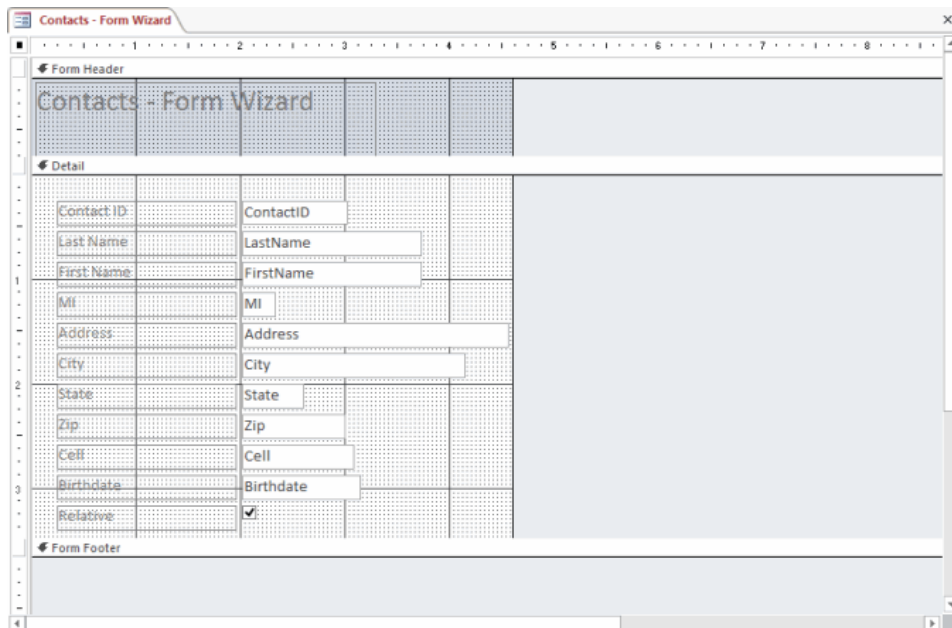
Design view

5.1.8 Creating Queries

Create a select query

Create a query to focus on specific data.

1. Select Create > Query Wizard .
2. Select Simple Query and then OK.
3. Select the table that contains the field, add the Available Fields, you want to Selected Fields, and select Next.
4. Choose whether you want to open the query in Datasheet view or modify the query in Design view, and then select Finish.
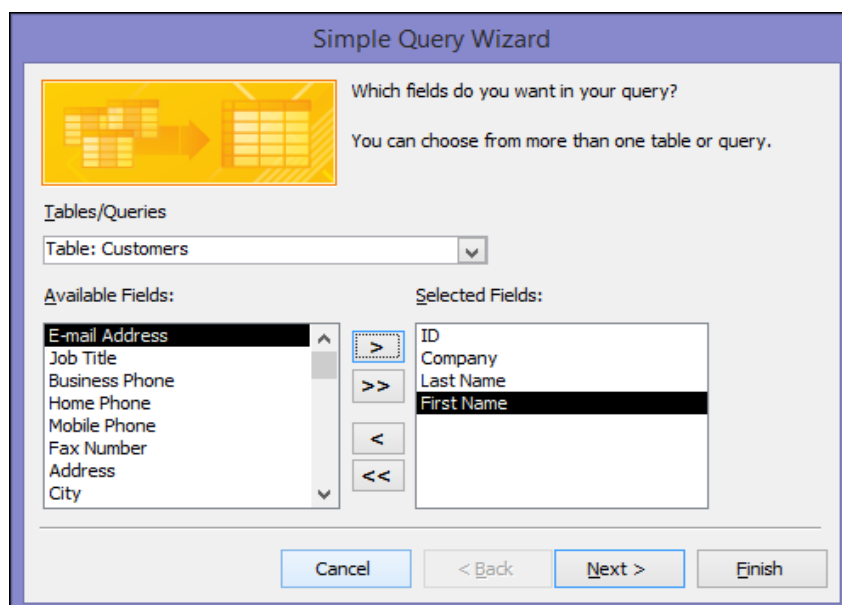
1. If you did not add any number fields (fields that contain numeric data), skip ahead to step 6. If you added any number fields, the wizard asks whether you want the query to return details or summary data.
   Do one of the following:

   a. If you want to see individual records, click **Detail**, and then click **Next**. Skip ahead to step 6.
   b. If you want to see summarized numeric data, such as averages, click **Summary**, and then click **Summary Options**.
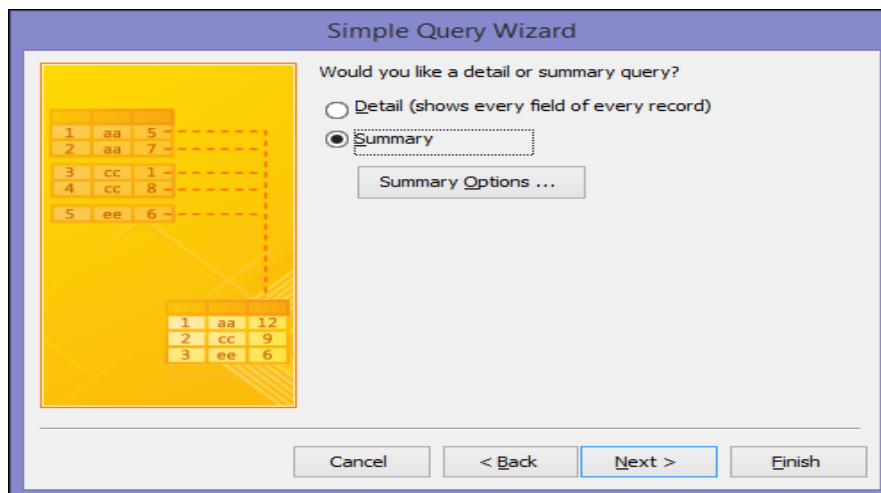
2. In the **Summary Options** dialog box, specify which fields you want to summarize, and how you want to summarize the data. Only number fields are listed.

   For each number field, choose one of the following functions:

   a. **Sum**   The query returns the sum of all the values of the field.
   b. **Avg**   The query returns the average of the values of the field.
   c. **Min**   The query returns the smallest value of the field.
   d. **Max**   The query returns the largest value of the field.
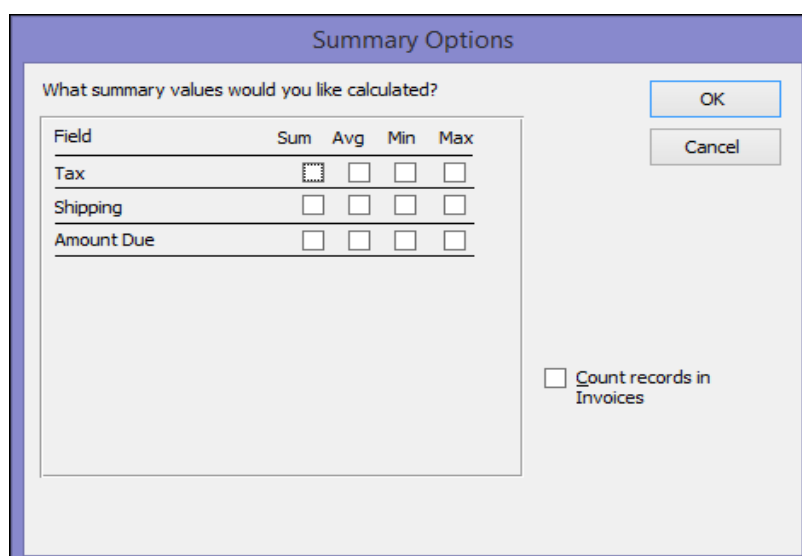
3. If you want the query results to include a count of the records in a data source, select the appropriate **Count records in data source name** check box.

4. Click **OK** to close the **Summary Options** dialog box.

5. If you did not add a date/time field to the query, skip ahead to step 6. If you added a date-time field to the query, the Query Wizard asks you how you would like to group the date values. For example, suppose you added a number field ("Price") and a date/time field ("Transaction_Time") to your query, and then specified in the **Summary Options** dialog box that you want to see the average value of the number field "Price". Because you included a date/time field, you could calculate summary values for each unique date/time value, for each day, for each month, for each quarter, or for each year.
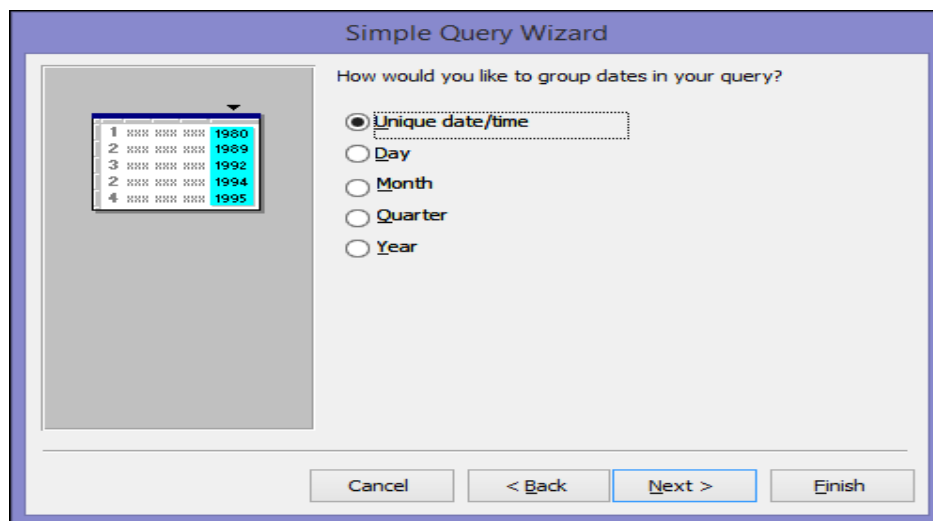
Select the time period that you want to use to group the date/time values, and then click **Next**.

6. On the last page of the wizard, give the query a title, specify whether you want to open or modify the query, and then click **Finish**.

If you choose to open the query, the query displays the selected data in Datasheet view. If you choose to modify the query, the query opens in Design view.

Create a query by working in Design view

1. On the **Create** tab, in the **Other** group, click **Query Design**.
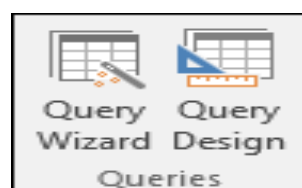
2. Double-click each data source that you want to use or select each data source and then click **Add**.
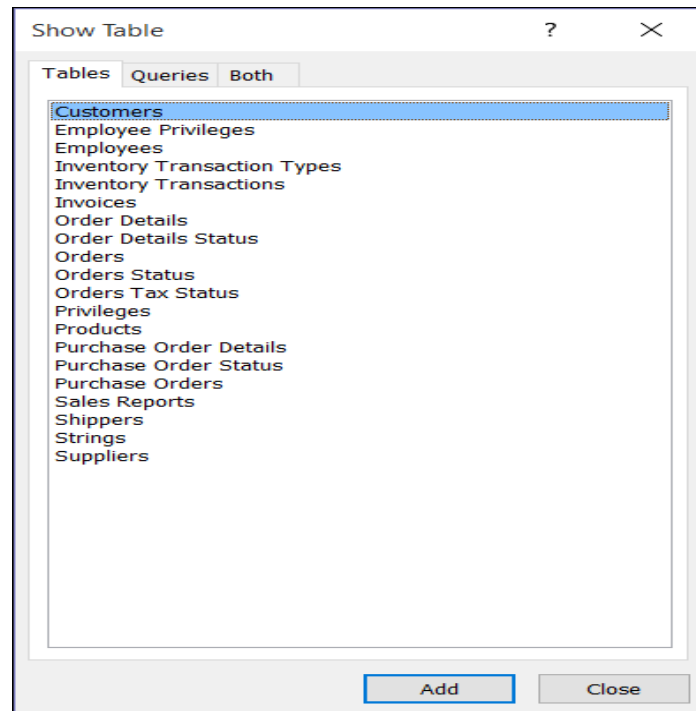
Add a join

▪ To add a join, drag a field from one data source to a corresponding field on another data source. Access displays a line between the two fields to show that a join has been created.

Change a join

1. Double-click the join you want to change.
The **Join Properties** dialog box appears.

2. In the **Join Properties** dialog box, review the three options.

3. Click the option that you want to use, and then click **OK.**
After the joins are ready, you add output fields — fields that have data that you want in the query results.

To add a field, drag the field from a data source in the upper pane of the query design window down to the **Field** row of the design grid, in the bottom pane of the query design window.

When you add a field this way, Access automatically fills in the **Table** row of the design grid to reflect the data source of the field.

Summarize data
This step is optional.

You might want to summarize data, especially if your data is numeric. For example, you might want to see the average price, or total sales.

To summarize data in a query, you use the **Total** row. By default, the **Total** row is not displayed in Design view.

1. With the query open in Design view, on the Design tab, in the Show/Hide group, click **Totals.**

Access displays the **Total** row in the query design grid.

2. For each field that you want to summarize, choose the function to use from the list in the **Total** row. The functions that are available depend on the data type of the field.

View the results

To see the query results, on the Design tab, click **Run.** Access displays the results of your query in Datasheet view.

To make further changes to the query, click **Home** > **View** > **Design View** to switch back to Design view.

Change your fields, expressions, or criteria and rerun the query until it returns the data that you want.

5.1.9 Finding Information in Databases

When you enter text in the **Search** box, the first matching value is highlighted in real time as you enter each character. You can use this feature to quickly search for a record with a matching value.

You can also search for a specific record in a table or form by using the **Find** option.
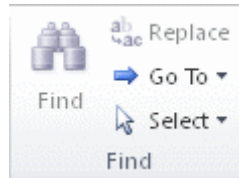
This is an effective choice for locating a specific record when the record that you want to locate satisfies specific criteria, such as search terms, and comparison operators, such as "equals" or "contains".

1.　　　Open the table or form, and then click the field that you want to search.
2.　　　On the **Home tab,** in the **Find** group, click **Find.**

5.1.10 Creating Reports

1. On the **Create** tab in the **Reports** group, click **Report Wizard.** The wizard starts.
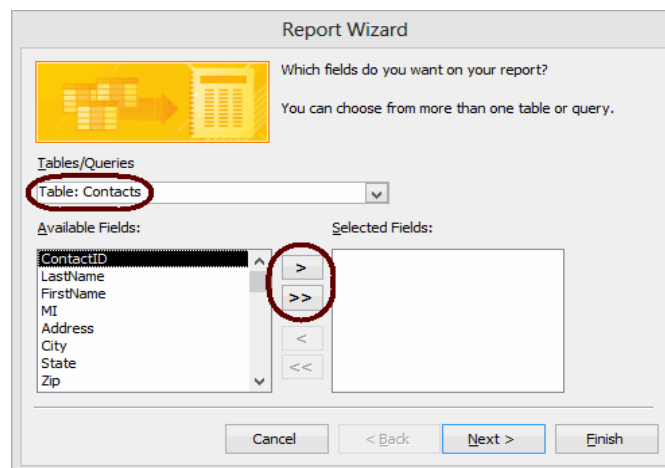
2. From the **Tables/Queries** drop-down list, select the table (or query) to base the report on. The fields for the selected table load in the **Available Fields** list box.
3. Move the fields to include on the report from the **Available Fields** list box to the **Selected Fields** list box. To do so, double-click a field name to move it or highlight the field name and click **>**. To move all fields at once, click **>>**.
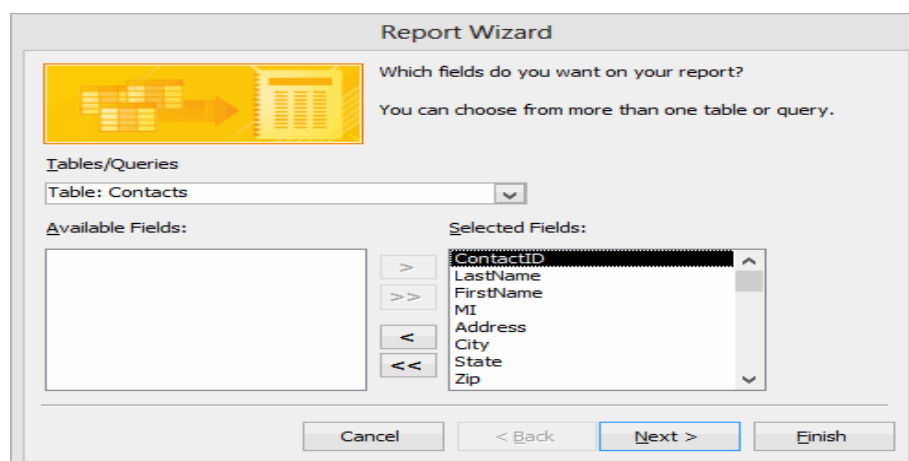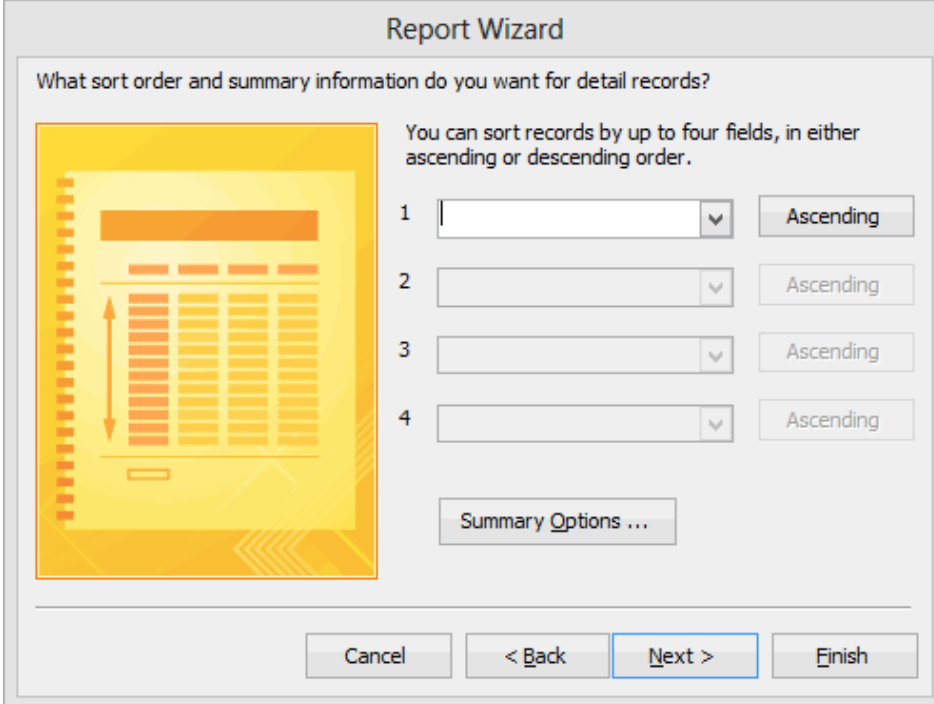
4. Click **Next**
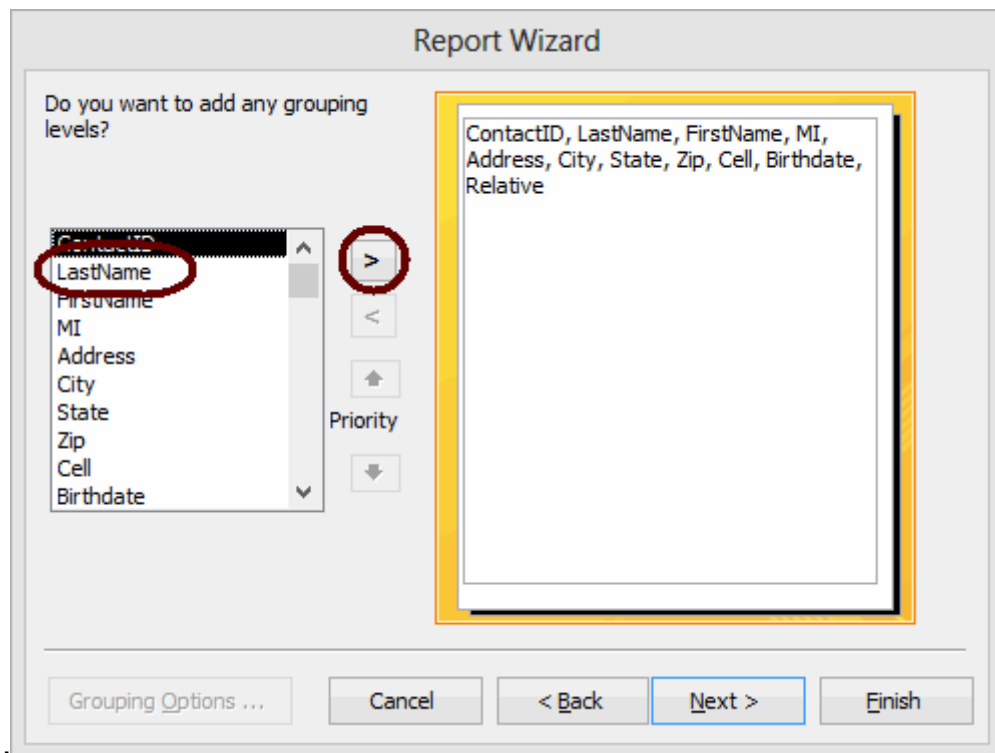
5. To group records on the report by a particular field, highlight the field in the list box and click **>**.
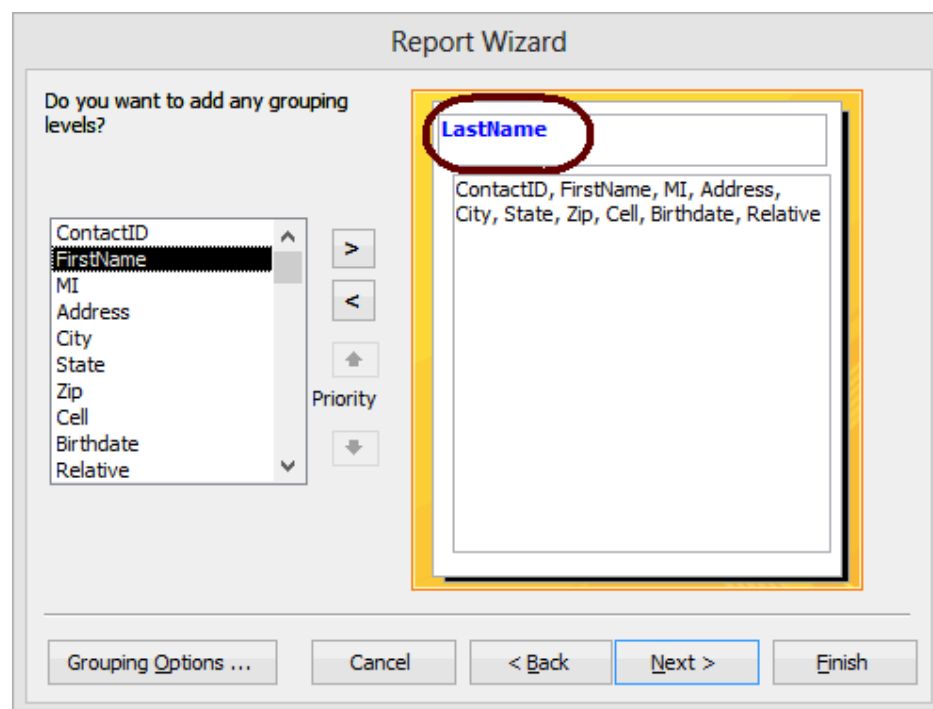
6. Add more grouping levels if desired. You can use the arrows to change the order of the grouping levels if needed.

7. When you finish defining how you want records grouped, click **Next >**.
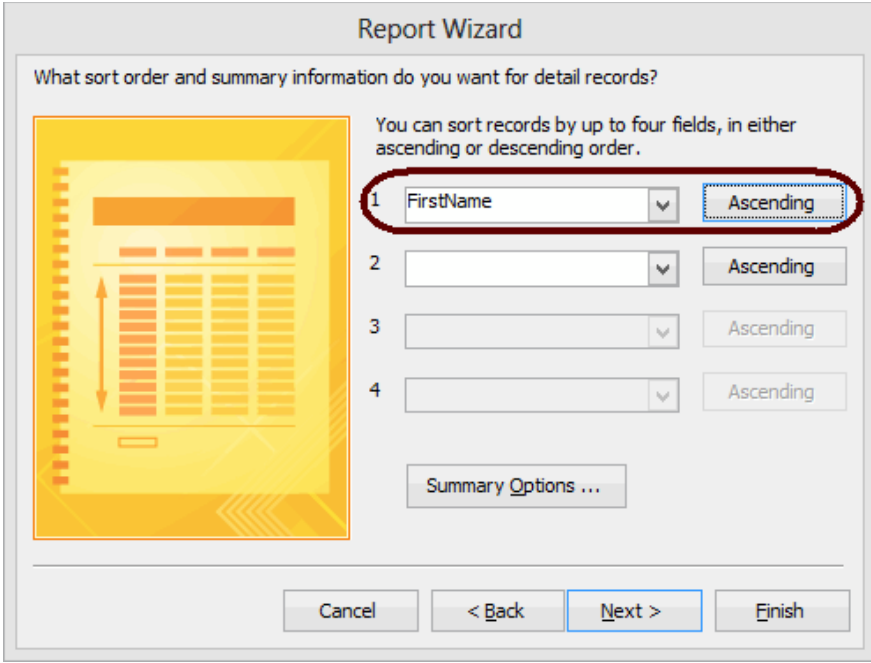
8. In the first drop-down list, select the field to sort records by. By default, records will be sorted in ascending order by the field you select. If you want to sort in descending order, click the **Ascending** button to change its label to "Descending".

9. You can specify up to four levels of sorting. When you finish specifying sorting options, click **Next >**.

10. In the **Layout** field, select the format of the report. Your options are "Stepped", "Block", and "Outline".

11. In the **Orientation** field, select whether to lay out the report in portrait or landscape mode.

12. If you want all fields to fit on a single page, ensure the **Adjust the field width so all fields fit on a page** check box is marked.

13. Click **Next >**.

14. Enter a title for the report.

15. Select an option for the view you want to open the report in. Your options are:
    - **Preview the report** (opens in Print Preview mode).
    - **Modify the report's design** (opens in Design view).

16. Click Finish. The report loads in the view you selected.

Print Preview

Design view

Once the wizard has done its job, future changes to the Sorting and Grouping are made in the **Group, Sort, and Total area: Design > Group & Sort**. You may change the order of, remove, or edit any existing items. You may also add a group and a sort as well.
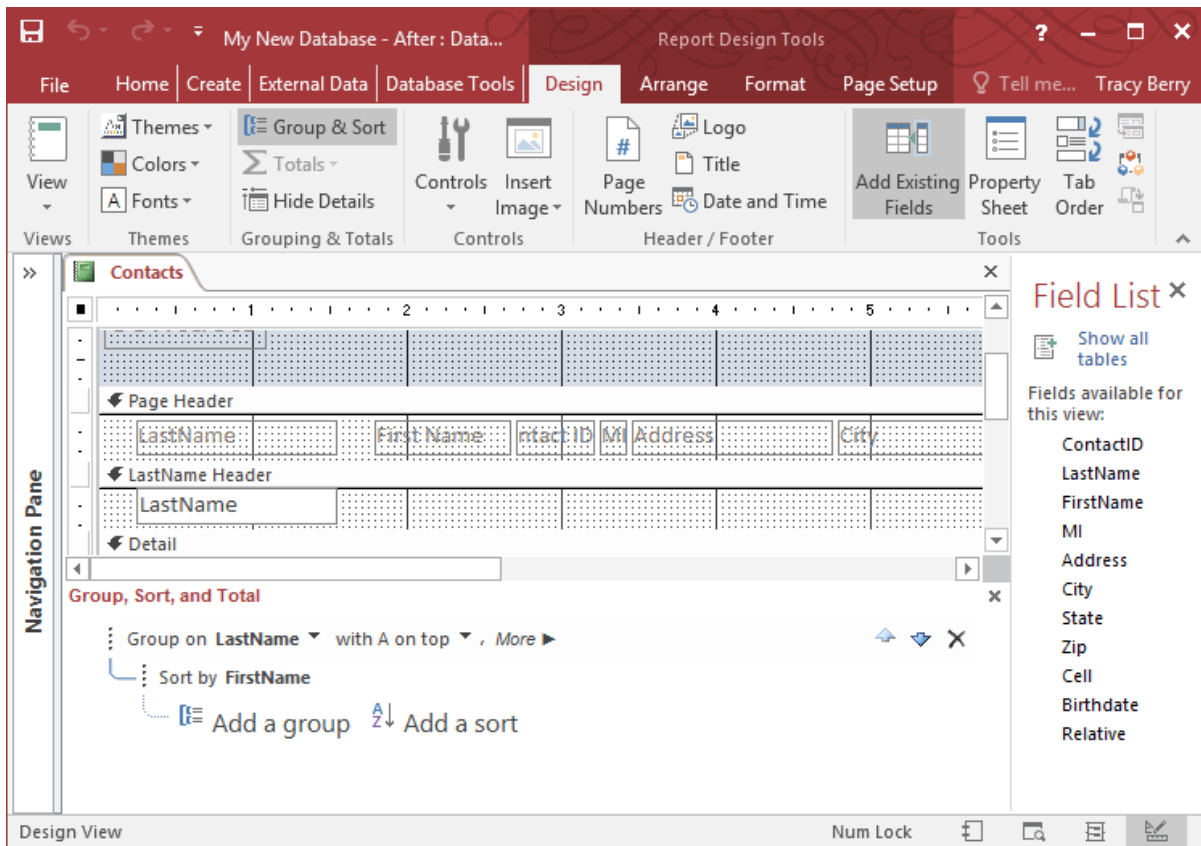
5.1.11 Types of Reports

- Columnar
- Tabular
- justified
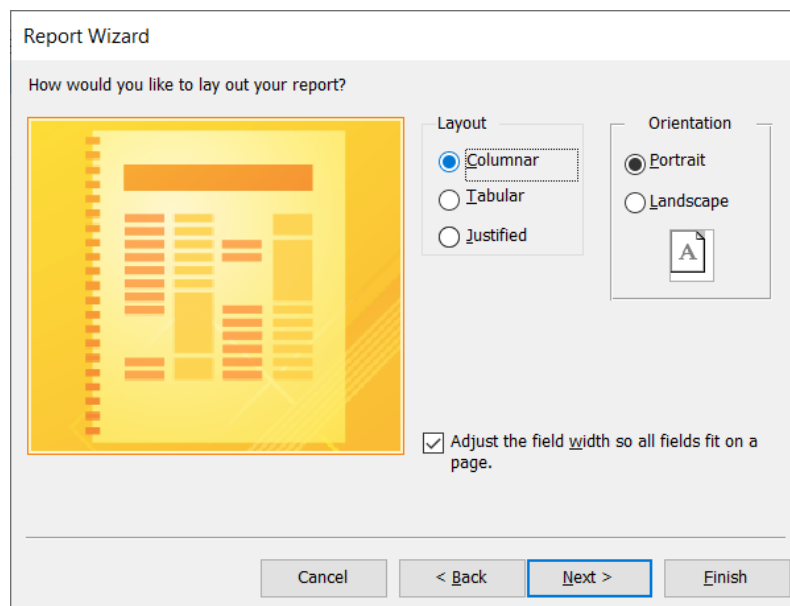
5.1.12 Printing and Print Preview

Use the Print Preview option to check how the printed version of your report will appear.

You can open a report in Print Preview by using one of the following methods:

▪   To preview a report that is not already open, in the Navigation Pane, right-click the report that you want to preview, and then click **Print Preview.**

Or

▪   Click **File** > **Print**, and then click **Print Preview.**

or

▪   If the report is open, right-click the document tab for the report, and then click **Print Preview.**

Print a report

1.   In the Navigation Pane, select the report that you want to print.
2.   Click **File** and then click **Print.**
3.   On the **Print** area of the File options, click the **Print** option to open the **Print** dialog box.
4.   Change the page format setup or other print options or printer selection as needed, and   then click **OK** to print your report.

5.1.13 Importing data from other databases viz. MS Excel etc.

1. On the **External Data** tab, in the **Import & Link** group, click the command for the type of file that you are importing from.
   For example, if you are importing data from an Excel worksheet, click **Excel.** If you don't see the correct program type, click **More.**

2. In the **Get External Data** dialog box, either click **Browse** to browse to the source data file, or type the full path of the source data file in the **File name** box.

3. Click the option that you want under **Specify how and where you want to store the data in the current database.** You can create a new table by using the imported data, or create a linked table that maintains a link to the data source.

4. Click **OK.**
   Depending on your choice, the **Link Objects** dialog box or the **Import Objects** dialog box opens.

5. Use the dialog box to finish the process. The exact procedure you follow depends on the import or link option that you choose.

6. On the last page of the wizard, click **Finish**.
   If you chose to import, Access asks whether you want to save the details of the import operation that you just completed.

7. If you think that you will be performing this same import operation again, click **Save import steps**, and then enter the details.
   You can then easily reproduce the import operation by clicking **Saved Imports** in the **Import** group on the **External Data** tab, clicking the import specification, and then clicking **Run**.

8. If you don't want to save the details of the operation, click **Close.**
   Access imports the data into a new table, and then displays the table under **Tables** in the Navigation Pane.

Import an Excel worksheet into Access

1. On the **File** tab, click **New**, and then click **Blank Database.**

2. Type a name for the new database in the **File Name** box, and then click **Create.** The new database opens, and Access creates a new empty table, Table1.

3. Close Table1.
   When asked if you want to save changes to the design of Table1, click **No.**

4. On the **External Data** tab, in the **Import & Link** group, click **Excel.**
5. In the **Get External Data** dialog box, click **Browse.**

6. Use the **File Open** dialog box to locate your file.

7. Select the file, and then click **Open.**

8. In the **Get External Data** dialog box, ensure that the **Import the source data into a new table in the current database** option is selected.

9. Click **OK.**
   The Import Spreadsheet Wizard starts, and asks you a few questions about your data.

10. Follow the instructions, clicking **Next** or **Back** to navigate through the pages. On the last page of the wizard, click **Finish.**

    Access imports the data into a new table, and then displays it under **All Tables** in the Navigation Panel.

5.2 Open Office – Base

5.2.1 Introduction

5.2.1.1 Database concepts

A database is a collection of data stored together to serve multiple applications as possible. A database should be a repository of data needed for an organization's data processing.

The data are stored in an object called table. The table includes rows and columns. Each row indicates an entity, and the columns are the attributes.

Base is a fully featured desktop database management system, designed to meet the needs of a broad array of users. In a database, table stores information for a group of things we call fields. For example, a table might hold an address book, a stock list, a phone book or a price list. A database can have from one to several tables.

5.2.1.2 Creating a New Database

To create a new database, click the arrow next to the **New** icon. In the drop-down menu, select **Database**. This opens the Database Wizard. You can also open the Database Wizard using **File > New > Database**.
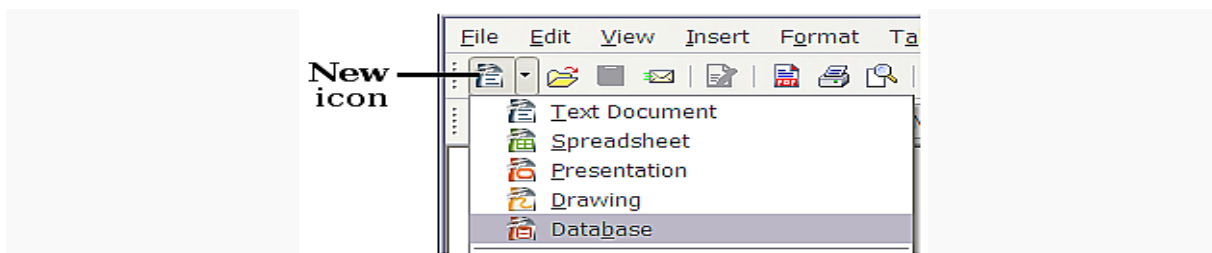
The first step of the Database Wizard has one question with two choices: **Create a new database** or **Connect to an existing database**. For this example, select **Create a new database** and then click **Next**.

The second step has two questions with two choices each. The default choice for the first question is **Yes, register the database for me** and the default choice for the second question is **Open the database for editing**. Make sure these choices are selected and click **Finish**. Enter the database name and click save.

5.2.1.3 Creating Tables

- Open openoffice base
- Create a new database

  Now database window will open

- Click the *Tables* icon in the *Database* list, or use *Alt+a*. The three tasks that you can perform on a table are in the *Task* list
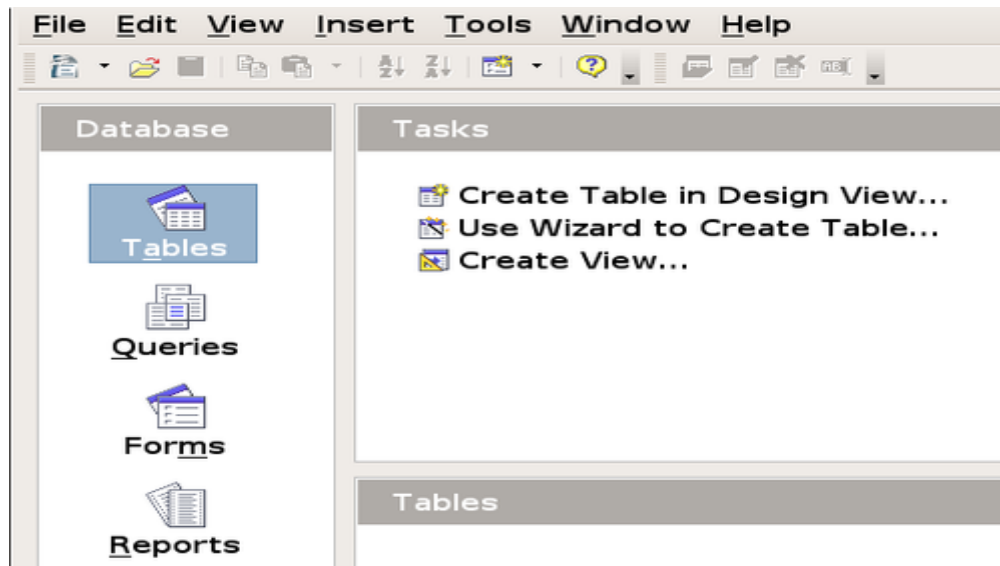
- Click create table using design view
- Add the fields to the table.
- Enter the fieldname and field type
- Mark the primary key
- Save the table, enter the table name and click OK
- Now the table appears in the table pane. for example create a table student
- Now click on the student table
- Insert data and close the active window
- Now the table created.

5.2.1.4 Working with Forms

- Open your database and create table
- Click the **Form icon** in the database list, and click **Use Wizard** to create a form
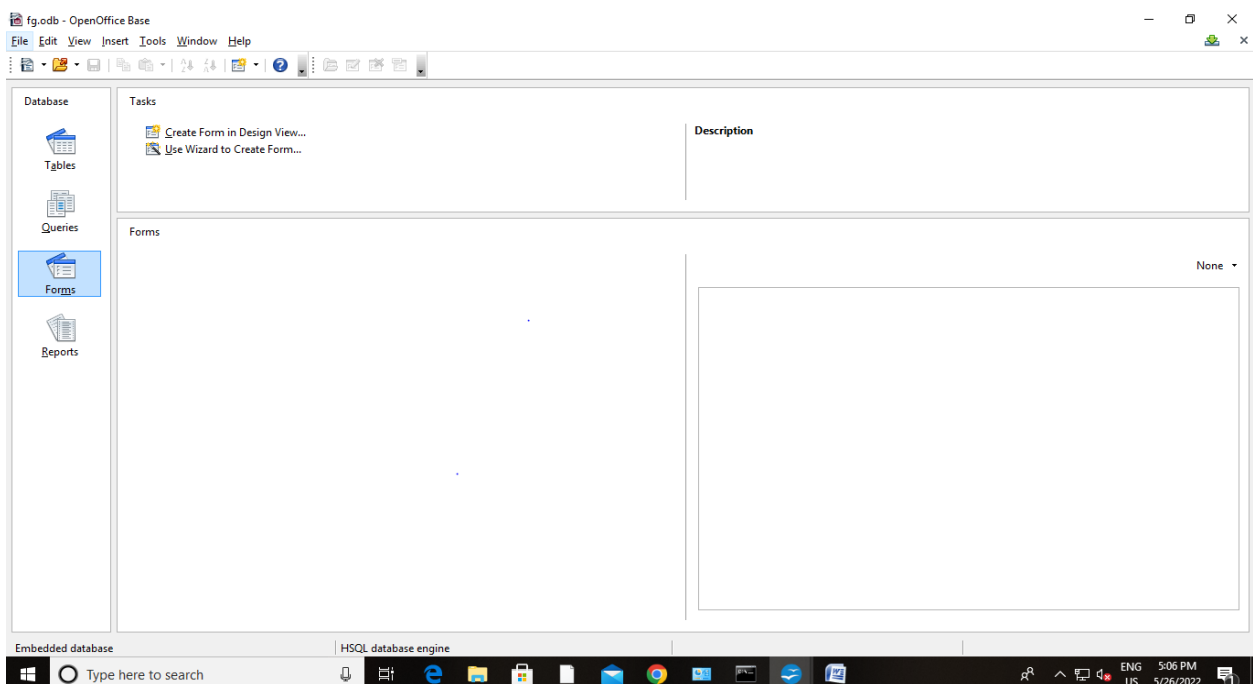
- Form wizard opens, select the table from **Tables/Queries** and select fields.
- Click **Arrange controls** on your form

- **Set data entry** mode and **Apply Style**, then next

Form Wizard   ✕

Steps

1. Field selection
2. Set up a subform
3. Add subform fields
4. Get joined fields
5. Arrange controls
6. Set data entry
7. Apply styles
8. Set name

Select the data entry mode

○ The form is to be used for entering new data only.
   Existing data will not be displayed

◉ The form is to display all data

   ☐ Do not allow modification of existing data

   ☐ Do not allow deletion of existing data

   ☐ Do not allow addition of new data

Help	< Back	Next >	Finish	Cancel

Form Wizard   ✕

Steps

1. Field selection
2. Set up a subform
3. Add subform fields
4. Get joined fields
5. Arrange controls
6. Set data entry
7. Apply styles
8. Set name

Apply the style of your form

Apply styles

Beige
Violet
Bright Blue
Light Gray
Dark
Orange
Ice Blue
Grey
Water
Red

Field border

○ No border

◉ 3D look

○ Flat

Help	< Back	Next >	Finish	Cancel

- **Set name** ,and name your form title, Click **Finish**
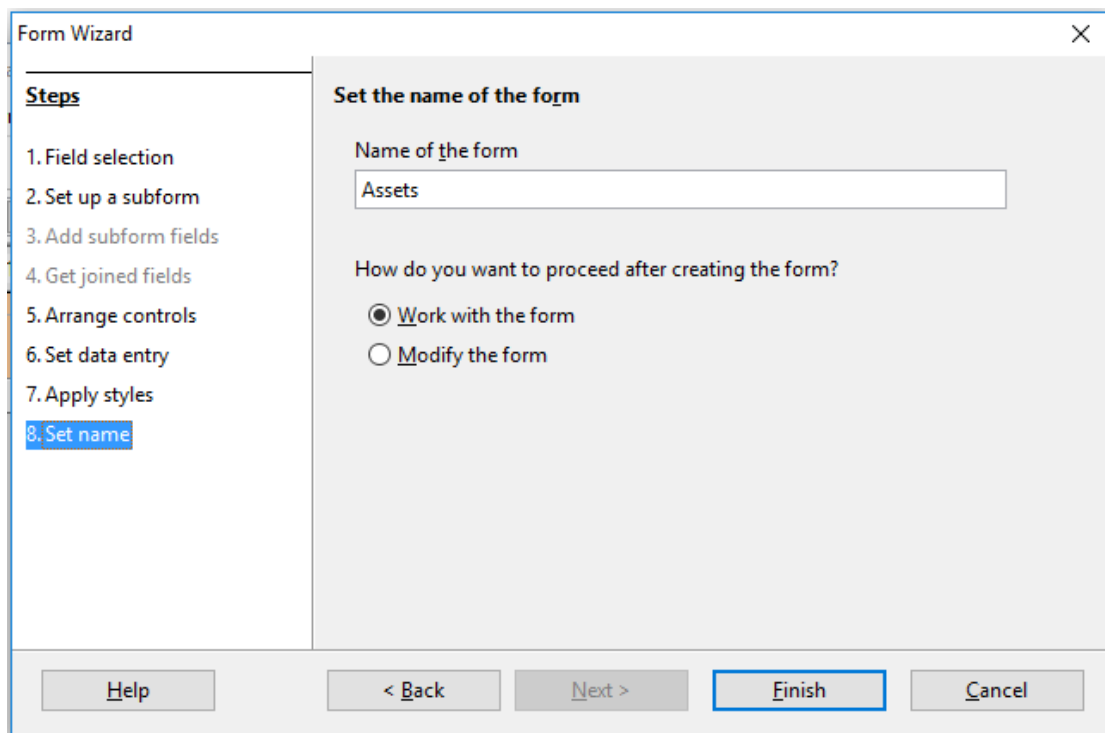
- The Form created
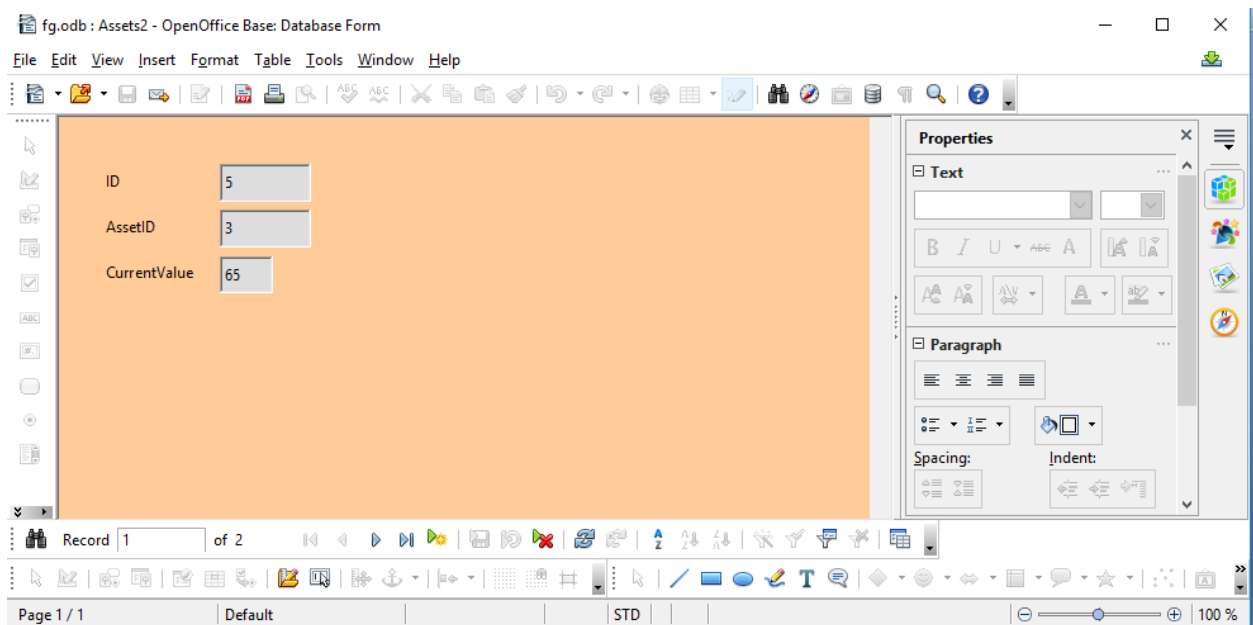
5.2.1.5 Creating Queries

Step 1: Open the first query in Design View.

Click **Create Query in Design View.**

Step 2: Add tables.
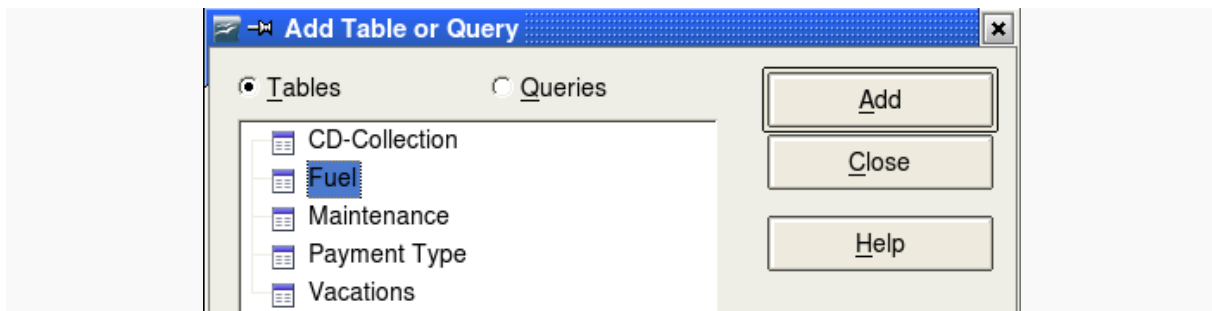
1. Click *Fuel* to highlight it.
2. Click **Add**.
3. Click **Close**.
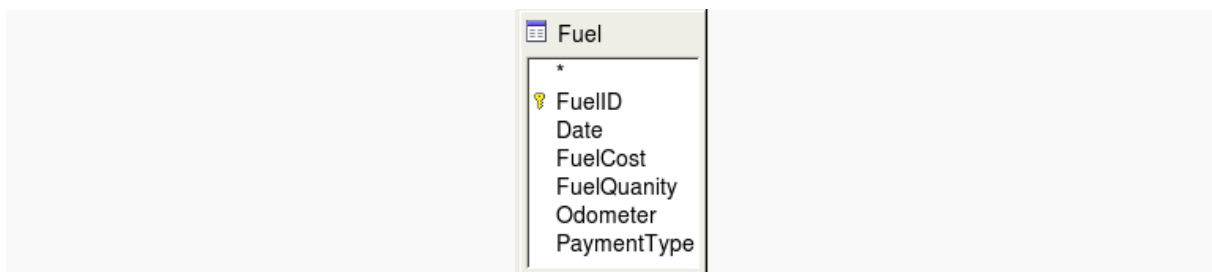
Step 3: Add fields to the table at the bottom.

1. Double-click the *FuelID* field in the Fuel table.
2. Double-click the Odometer field.
3. Double-click the FuelQuantity field.

The table at the bottom of the query window should now have three columns.

Field	FuelID		Odometer	FuelQuantity
Alias				
Table	Fuel		Fuel	Fuel
Sort				
Visible	☑		☑	☑
Function				
Criterion				

Step 4: Set the criterion for the query.

We want the query's FuelID to begin with the numeral 1.

1. Type *>0* in the Criterion cell under FuelID in the query table
2. Click the *Run Query* icon in the Query Design toolbar. This icon is circled in red below.
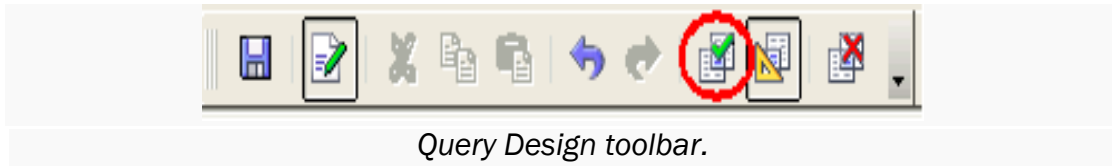
Query Design toolbar.

The figures below contain the Fuel table with entries and the query results based upon the Fuel table.

FuelID	Date	FuelCost	FuelQuantity	Odometer
0	Friday, M	$16.00	14.690	704.2
1	Friday, M	$7.00	6.430	778.7
2	Saturday	$20.00	19.570	1032.3
3	Saturday	$16.00	15.150	1239.4
4	Sunday, I			
\<AutoFie				

Fuel table

FuelID	Odometer	FuelQuantity
1	778.7	6.430
2	1032.3	19.570
3	1239.4	15.150
4		
\<AutoFie		

Query of the fuel table

Step 5: Save and close the query.

Since this query contains the ending odometer reading for our calculations, name it End-Reading when saving it. Then close the query.

Field	("End-Reading"."Odometer" - "Fuel"."Odometer") / "End-Reading"."FuelQuantity"
Alias	
Table	
Sort	
Visible	☒
Function	
Criterion	
Or	

Fuel economy calculation field.

5.2.1.6 Finding Information in Databases

- Open existing database, double click and open table
- Click find record icon or Ctrl+F
- Enter data and search

5.2.1.7 Creating Reports

Reports provide information found in the database in a useful way. In this they are similar to queries. Reports are generated from the database's tables or queries. They can contain all of the fields of the table or query or just a selected group of fields.

1. Create a new report.
    a. Click the *Reports* icon in the Database list in the Automobile - OpenOffice.org window.
    b. In the Tasks list, click **Use Wizard to Create Report**. The Report Wizard window opens.
2. Select the fields.
    a. Select Table: Vacations in the Tables or Queries dropdown list.
    b. Use the **>** to move these fields from the *Available fields* list to the *Fields in report* list: Date, Motel, Tolls, Miscellaneous, Breakfast, Lunch, Supper, and SnackCost. Click **Next**.
3. Label the fields: answering the question How do you want to label the fields. Shorten Miscellaneous to Misc. Click **Next**.
4. Since we are grouping by the date, use the **>** button to move the *Date* field to the Grouping list. Click **Next**.

Adding fields to a report
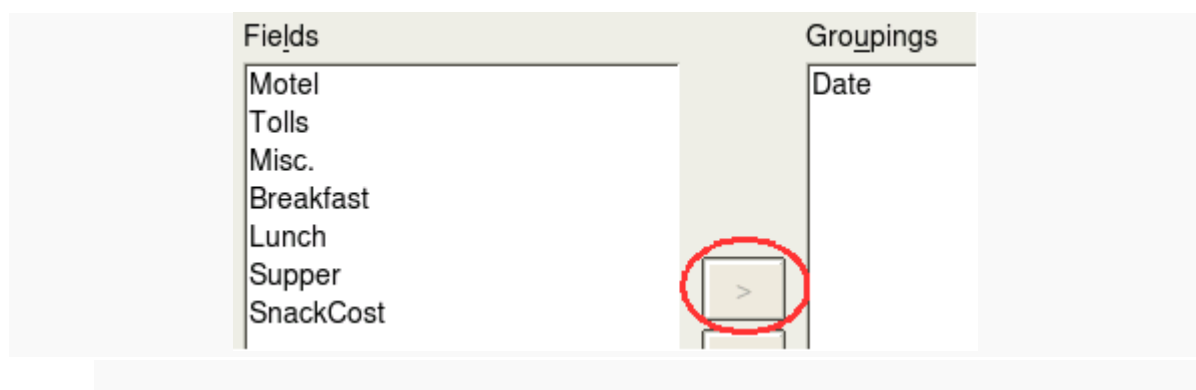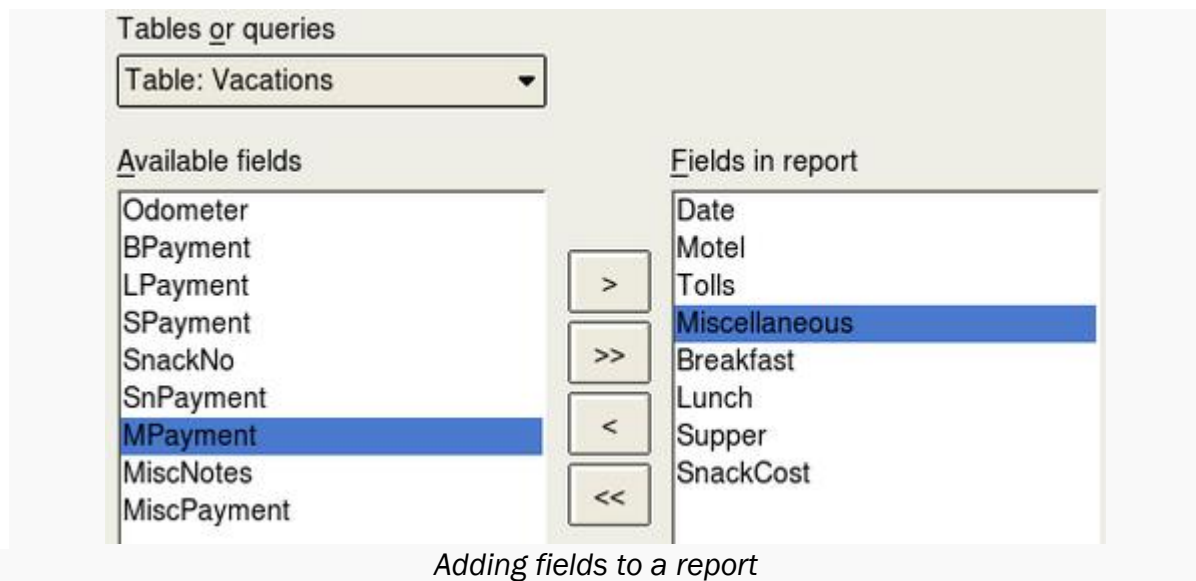
5. Sort options. We do not want to do any additional sorting. Click **Next.**
6. Choose layout. We will be using the default settings for the layout. Click **Next.**
7. Create report.

- Label the report: Vacation Expenses.
- Select Static report.
Click **Finished.**

5.2.1.8 Types of Reports

- Static report
- Dynamic report

Static reports contain the data in the selected fields at the time the report was created. Dynamic reports can be updated to show the latest data.

Dynamic reports update only the data that is changed or added to a table or query. It does not show any modifications made to a table or query.

5.2.1.9 Printing and Printing Preview

- To print preview, double click and open the report
- To print preview, click file menu, click page preview
- To print, click file menu and print
- Select the printer, choose name and copies
- Then click print

5.2.1.10 Operating with other databases (MS access etc.)

OpenOffice.org (OOo) is able to read and write from a wide variety of databases, as long as they support one of the standard interface specifications such as ODBC or JDBC. Microsoft Access (Ms-Access) supports ODBC.

The process has simple steps:

1. Create an *ODBC Data Source* for each database you want to use (you only need to do this once per database)
2. Create an *ODBC Data Source* within OpenOffice.org for each database (you only need to do this once)

Creating an ODBC Data Source for the MS-Access database

Within MS-Windows, choose *Start -> Settings -> Control Panel* and double-click the *ODBC Data Sources* icon to run the *ODBC Data Source Administrator:*
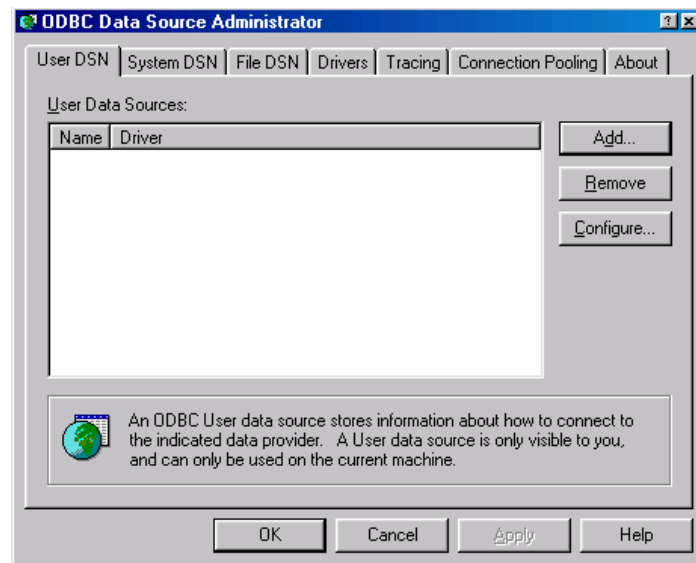
Click on the **Add** button to display the *Create New Data Source* dialogue box:
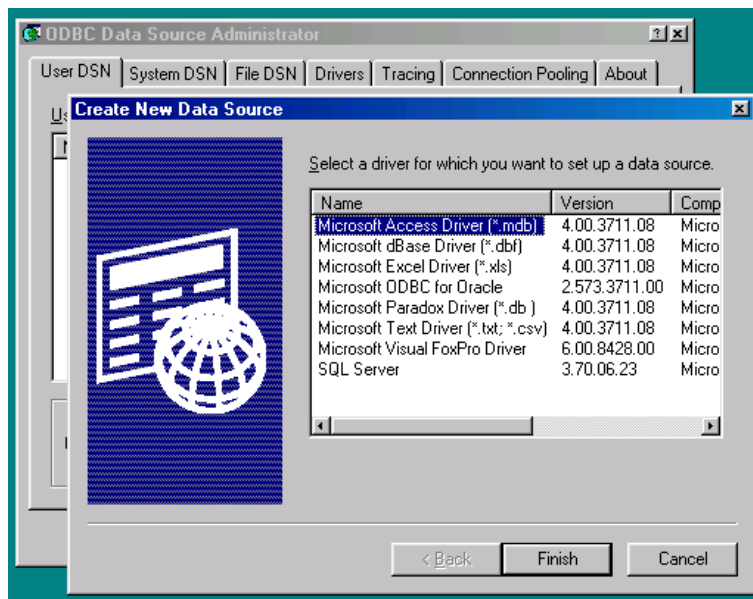
Select the *Microsoft Access Driver* and press the **Finish** button. This will display the *ODBC Microsoft Access Setup* dialogue box:
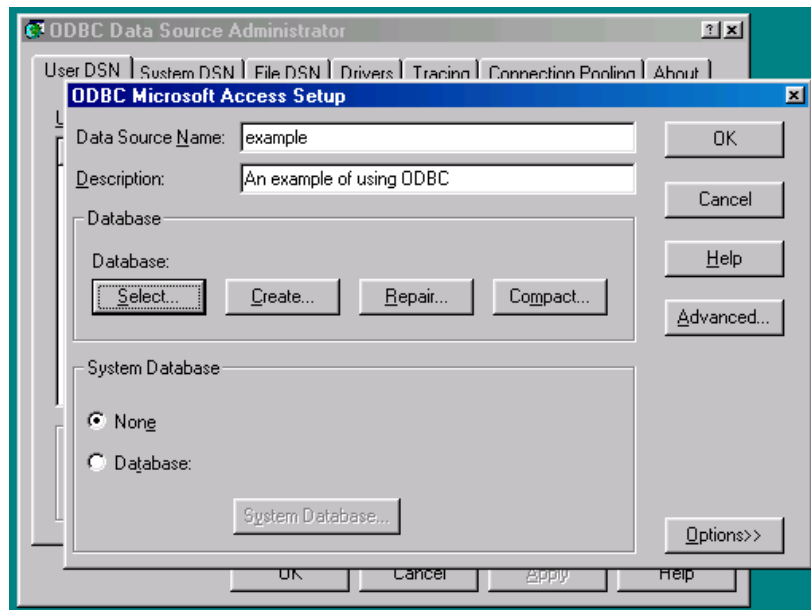
Give the new data source a name (e.g. the same name as your MS-Access database) and a description. Use the **Select** button to select your MS-Access database file (*.dbf) and press **OK**.

You should now see the ODBC Data Source you have created listed in the *ODBC Data Source Administrator*:
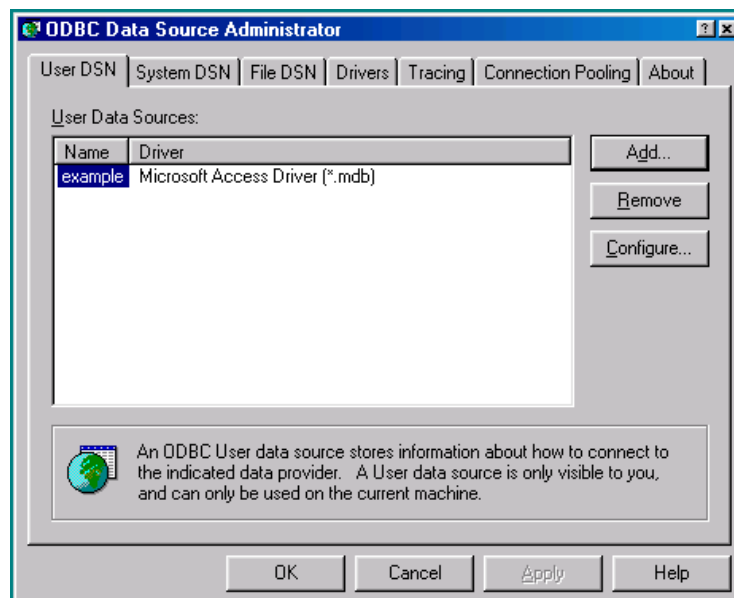
Click **OK** to close the Administrator. Note that every database you want to use in OOo will need to have its own ODBC Data Source defined here.

Creating a Data Source within OOo

From within an OOo application, select Tools -> Data Sources... You will notice that OOo comes with one pre-installed Data Source called *Bibliography*. Ignore this, and press the *New Data Source* button.
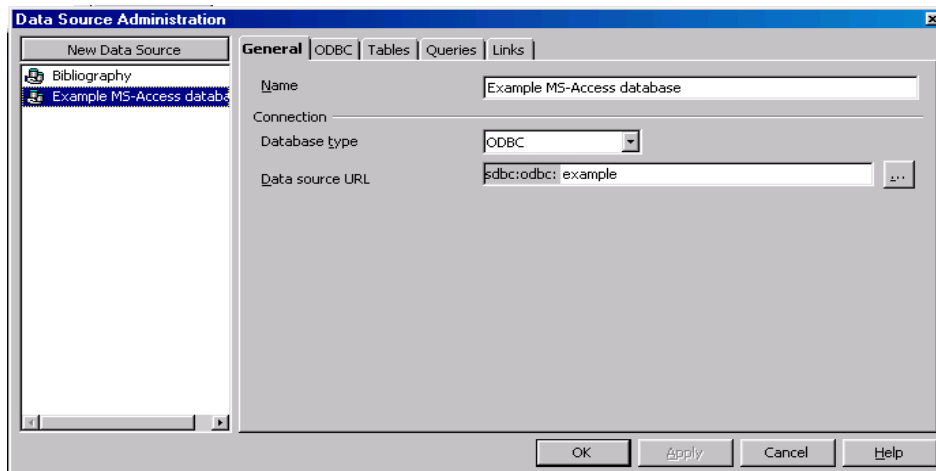
Select Database Type *ODBC*, and press the select button [...] and choose the ODBC Data Source you have just created. Give it a name, press the **Apply** button, and press **OK** to close the Data Source Administration tool.

Using the Data Source within OOo

There are other FAQs which describe using the database features within OOo. However, as a quick preview, select *View -> Data Sources* (or press **F4**). You are now ready to use your MS-Access database within OOo applications:

✱ ✱ ✱ ✱ ✱
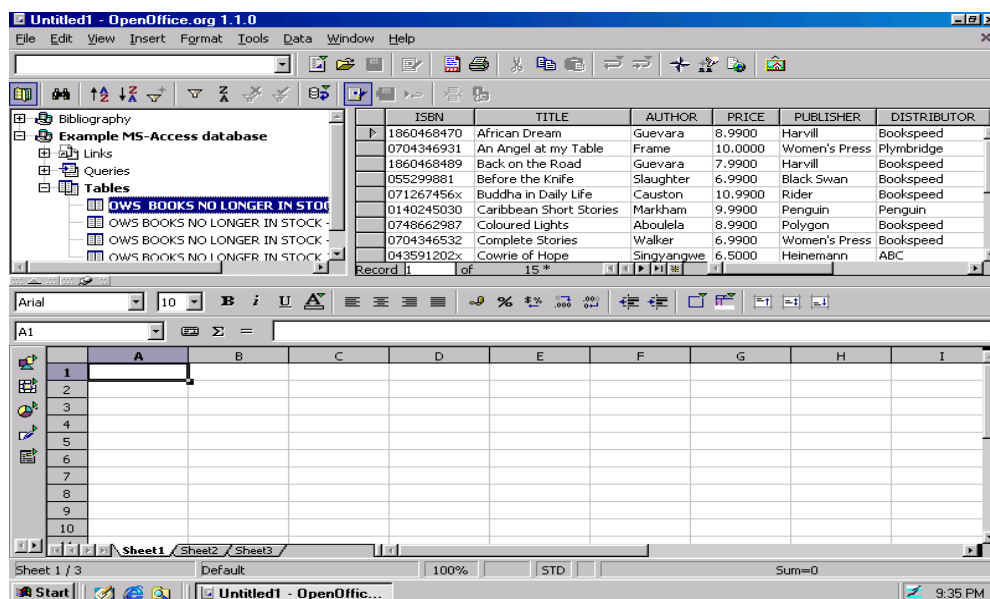
UNIT – 6

OFFICE APPLICATIONS - IV

Introduction to MS Office Power Point and Open Office Impress

6.1 MS Office - MS Power Point

6.1.1 MS Power Point

6.1.1.1 Introduction to presentation

Power Point (PPT) is a powerful, easy-to-use presentation graphics software program which allows you to create professional-looking electronic slide shows. PPT is used to present information in an organized manner to an individual or group. Using clip art, sound clips, movie clips, graphs, organization charts, imported Web screens, and many other features, you can easily create a presentation that will impress your audience and convey your message clearly and professionally.
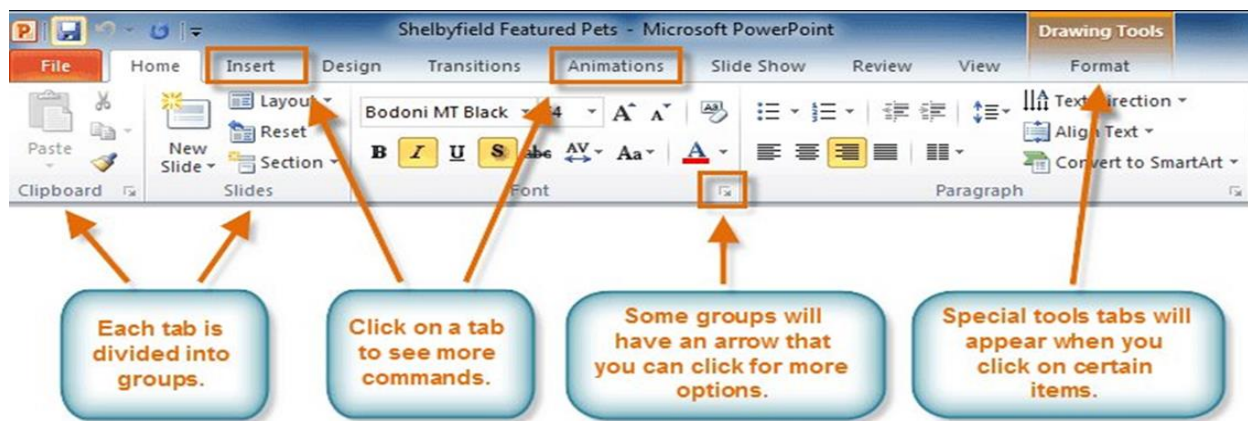
Information can be displayed using an electronic presentation application. This information is usually presented as a slide show — the data is displayed on a slide that may be viewed on a computer monitor or projected onto a screen using an LCD projector. A presentation might consist of multiple slides that are exhibited one after the other. The presentation tool in MS Office is MS PowerPoint. Microsoft PowerPoint is a popular presentation application, although there are alternatives such as Corel Presentations OpenOffice.org, Impress, etc.

Three major components of a presentation program are:

(i) An editor that allows text to be input and formatted

(ii) a means for inserting visual pictures, audio, and video

(iii) and a slide-show system to display the final content.

6.1.1.2 Opening new presentation

When beginning a new project in PowerPoint, you'll often want to start with a new blank presentation.

Select the File tab to go to Backstage view.
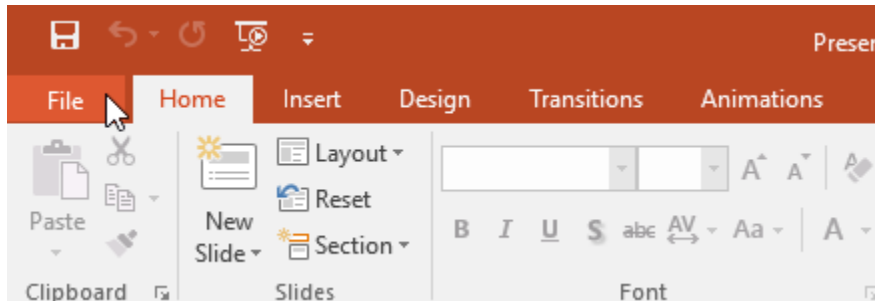
Select New on the left side of the window, and then click Blank Presentation.
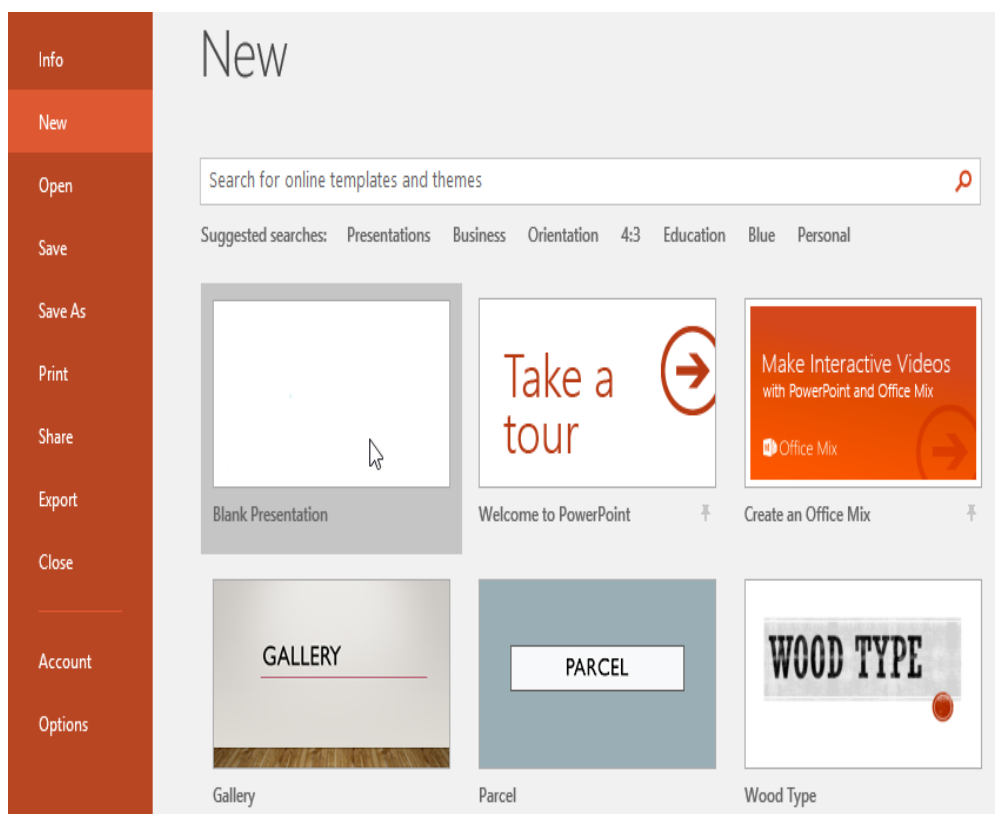
A new presentation will appear.

### 6.1.1.3 Different presentation templates

A template is a predesigned presentation you can use to create a new slide show quickly. Templates often include custom formatting and designs, so they can save you a lot of time and effort when starting a new project.

Click the File tab to access Backstage view, then select New.

You can click a suggested search to find templates or use the search bar to find something more specific. In our example, we'll search for the keyword chalkboard.
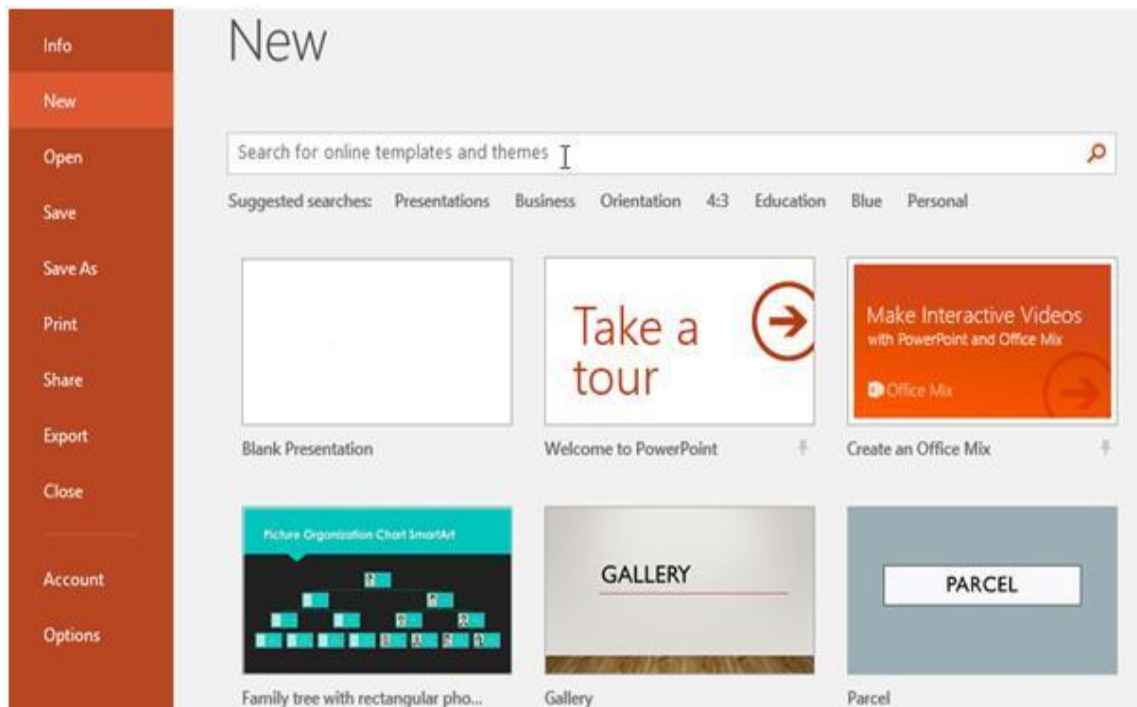
Select a template to review it.
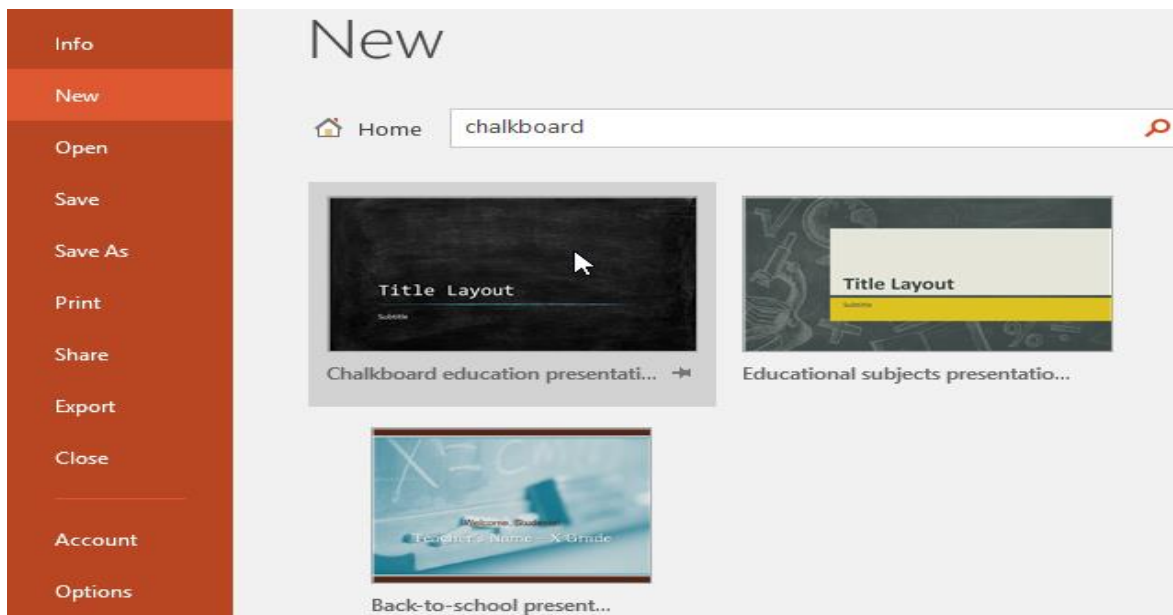
A preview of the template will appear, along with additional information on how the template can be used.

Click Create to use the selected template.

6.1.1.4 Setting backgrounds

Step 1 – In the **Design** ribbon, under the **Background** group, click the **Background Styles** command.
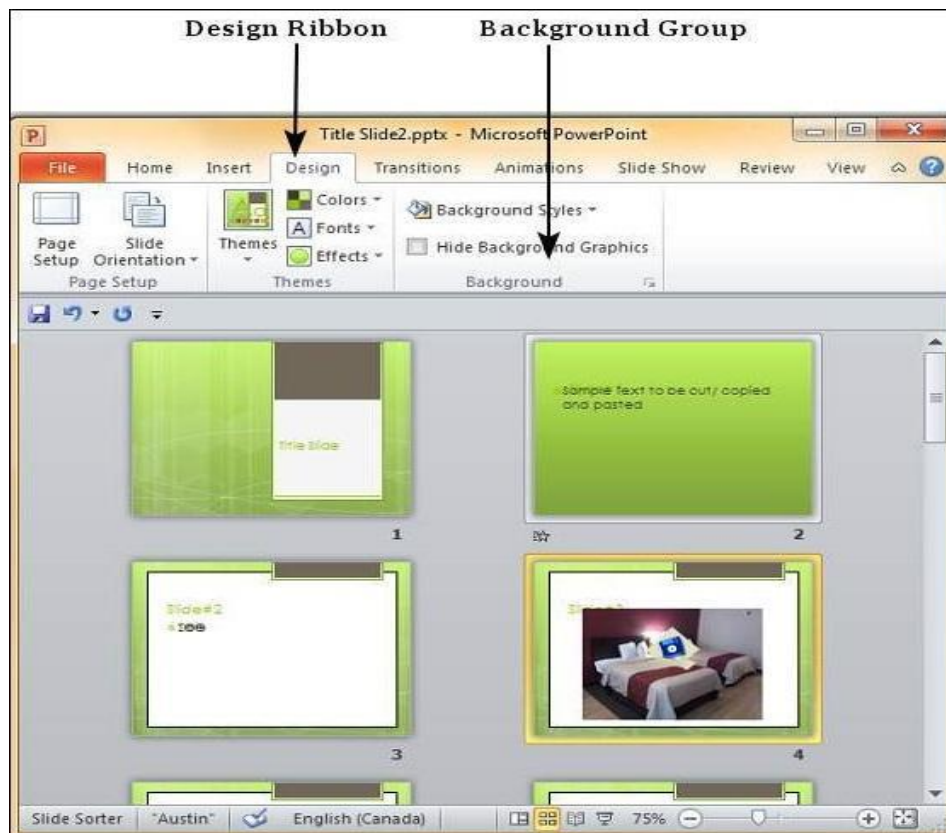
Step 2 – Select one of the background styles that suits your requirements.
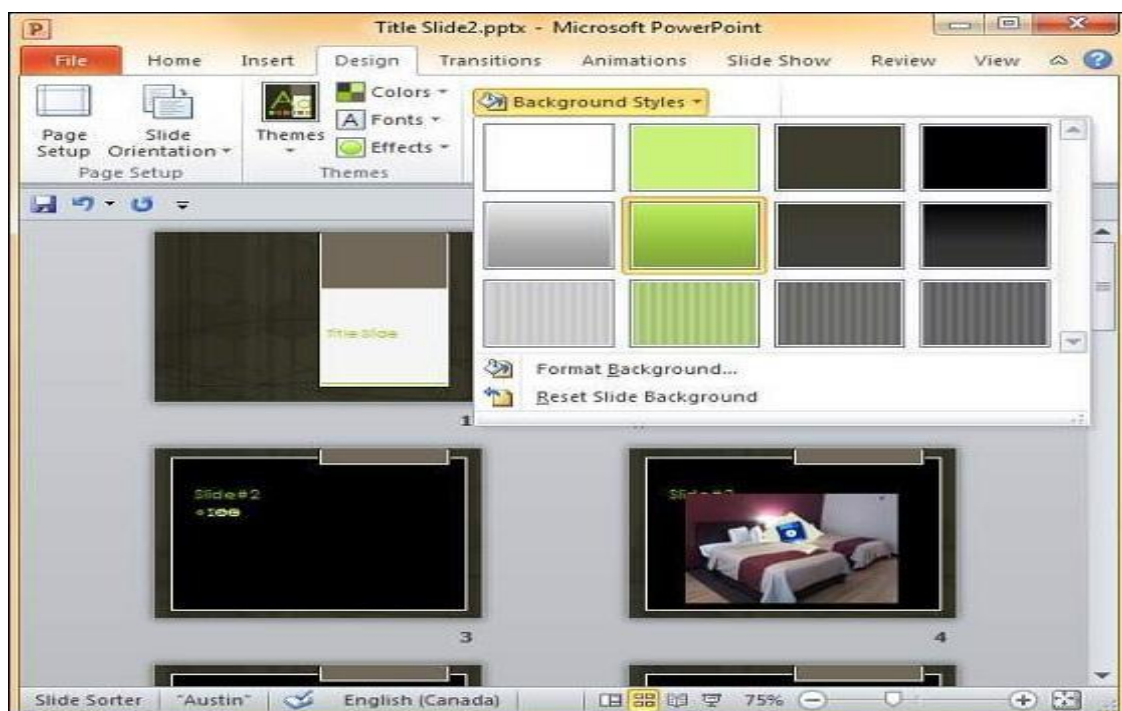
Step 3 – To edit the background for a specific slide, right-click on the desired background slide and select "**Apply to Selected Slides**".
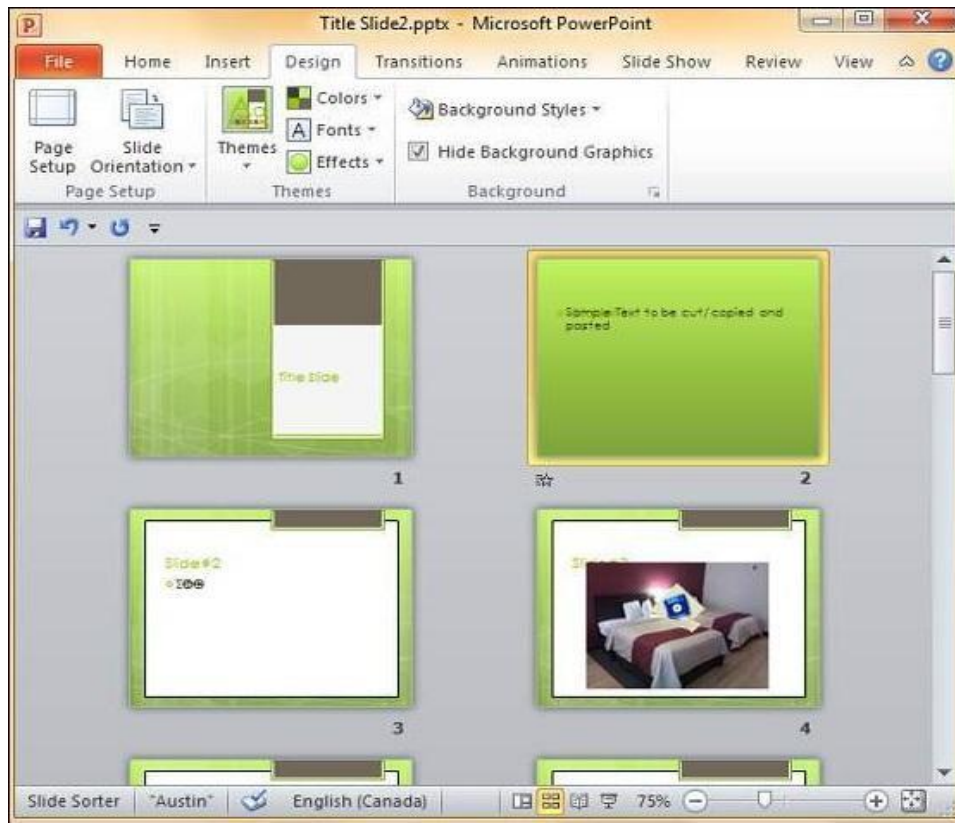
Step 4 – Selected slide(s) now have the new background.

The graphics in the slide background can distract you from the actual content, in such cases you can hide the graphics and retain a plain background till you finish working on the content. To do this, select the slide and check the "**Hide Background Graphics**" checkbox.
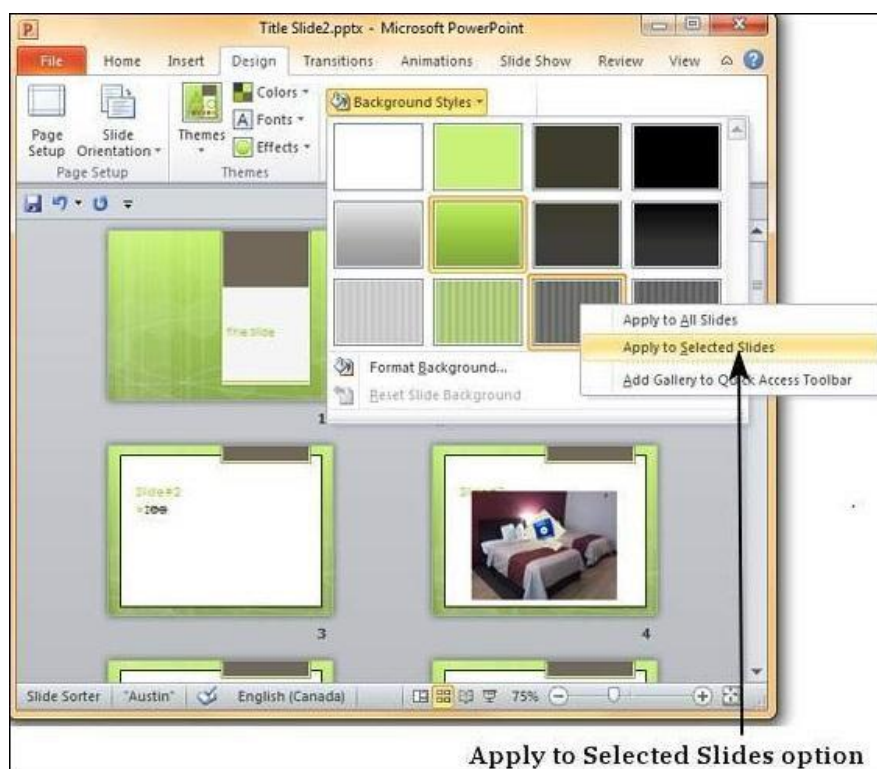
Apply to Selected Slides option

6.1.1.5 Selecting presentation layouts

By default, the Title Slide layout that has been assigned to the new slide, while clicking new slide. PowerPoint gives nine different layouts to choose from, and can even create own custom layouts also.

Change the Slide Layout

1. Select the slide that you want to change the layout for.
2. Select Home > Layout.
3. Select the layout that you want.

The layouts contain placeholders for text, videos, pictures, charts, shapes, clip art, a background, and more.
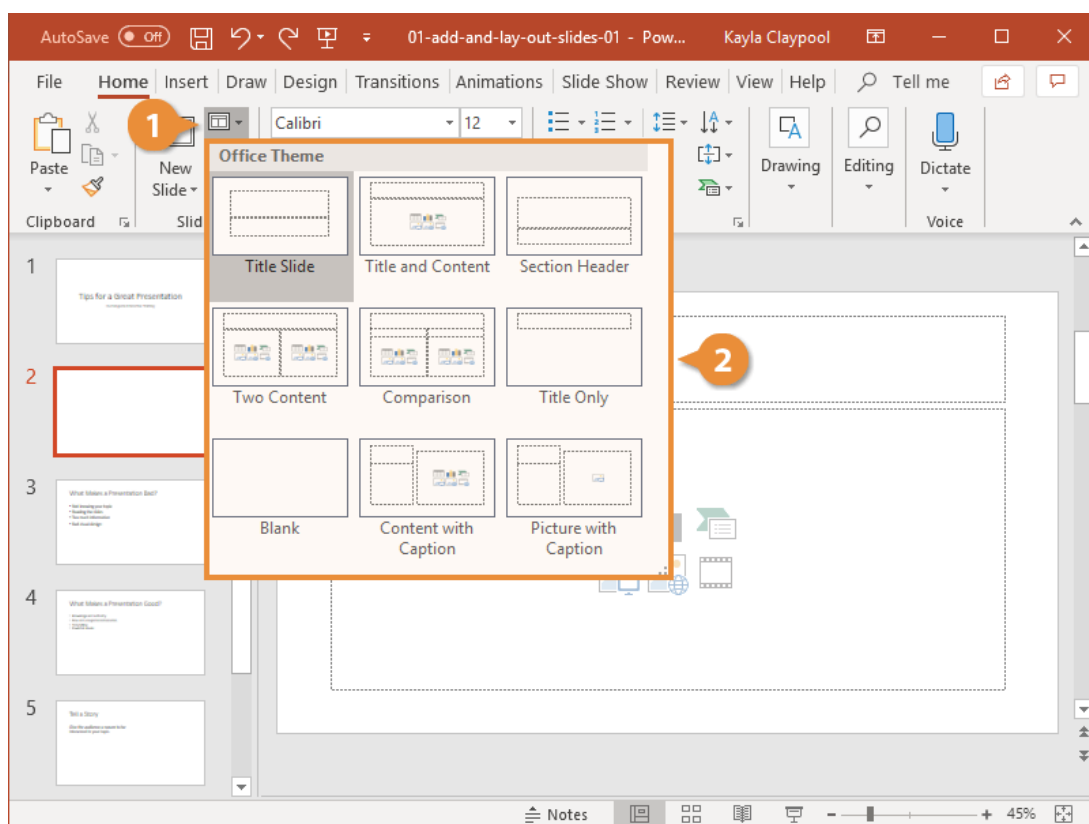
6.1.2 Creating a presentation

Slides contain **placeholders**, which are areas on the slide that are enclosed by dotted borders. Placeholders can contain many different items, including text, pictures, and charts. Some placeholders have **placeholder text**, or text you can replace. They also have **thumbnail-sized icons** that represent specific commands such as **Insert Picture**, **Insert Chart**, and **Insert ClipArt**. In PowerPoint, hover over each icon to see the type of content you can insert in a placeholder.
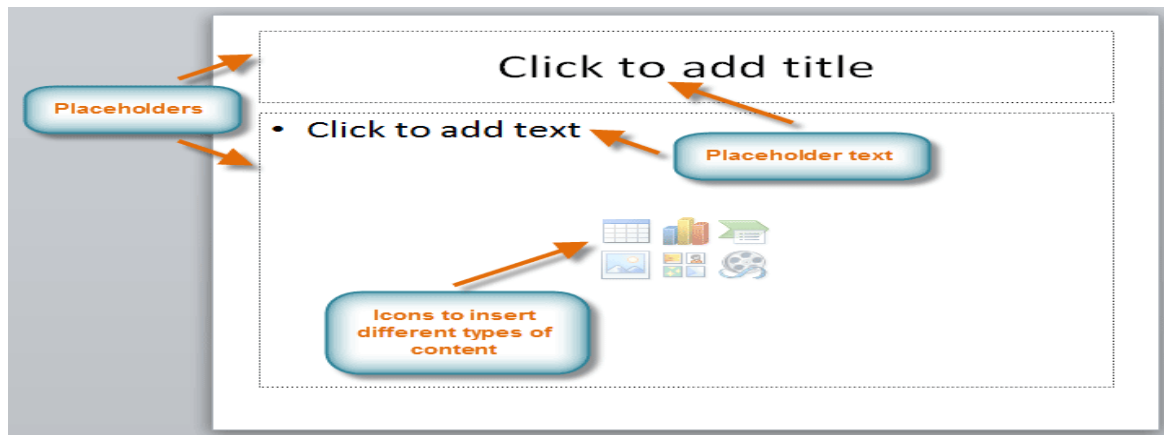
6.1.2.1 Setting presentation styles

Placeholders are arranged in different **layouts** that can be **applied to existing slides** or chosen when you **insert a new slide**. A slide layout **arranges** your content using different types of placeholders, depending on what information you might want to include in your presentation.
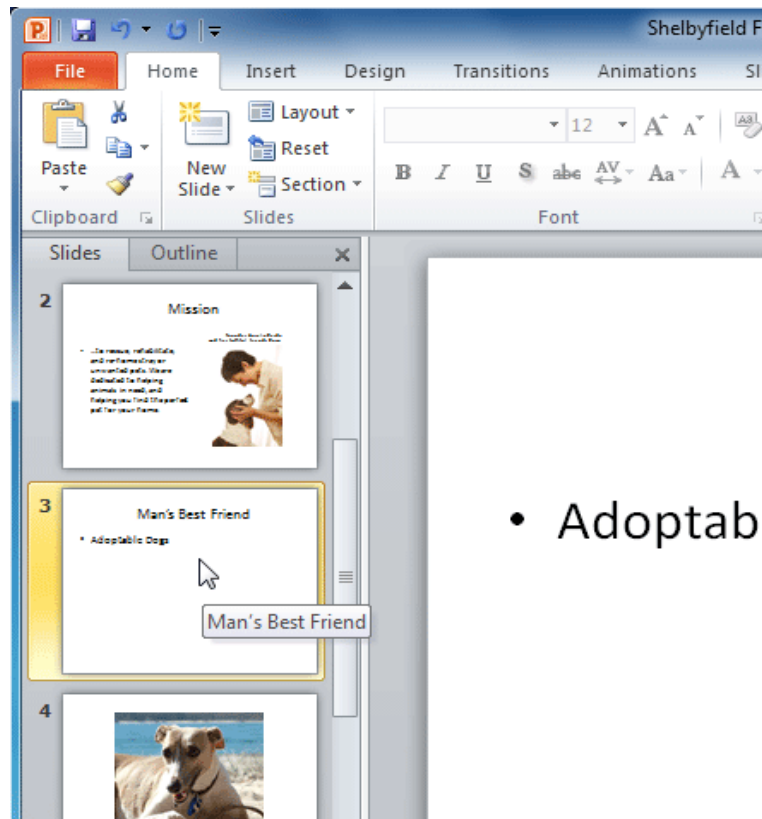
In the example above, the layout is called **Title and Content** and includes title and content placeholders. While each layout has a descriptive name, you can also tell from the image of the layout how the placeholders will be arranged.
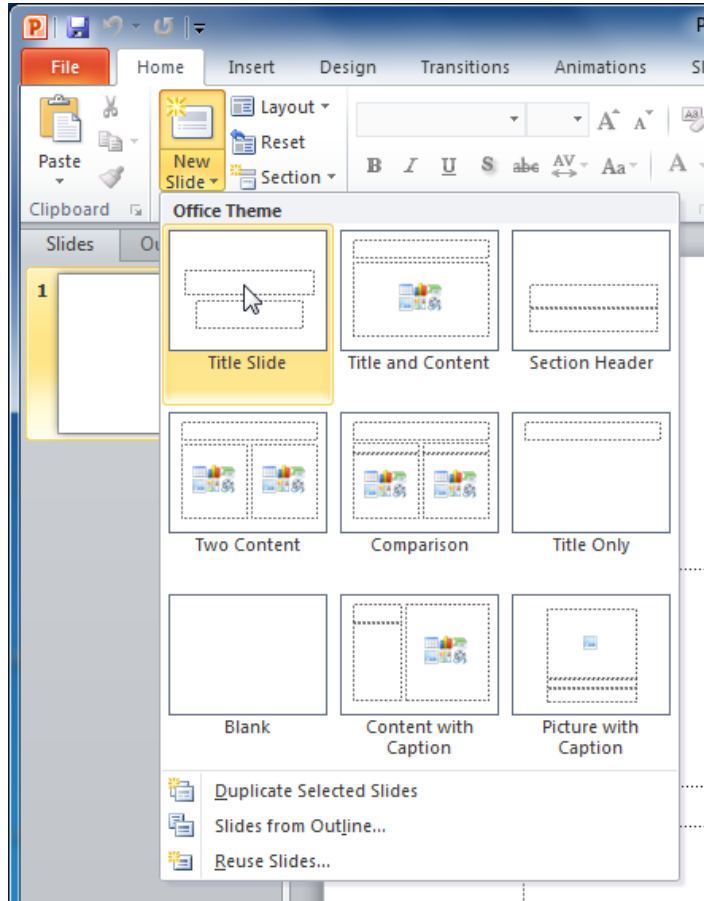
Customizing slide layouts

To change the layout of an existing slide:

1. Select the slide you want to change.

2. Click the **Layout** command in the **Slides** group on the **Home** tab. A menu will appear with your options.
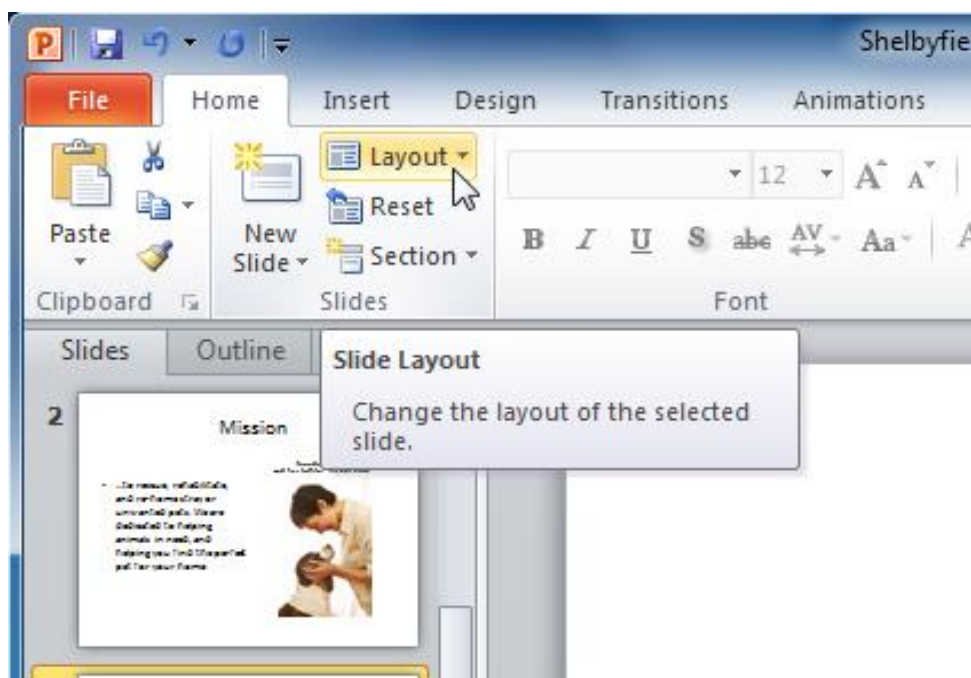
3. Choose a layout from the menu. The slide will change in the presentation.
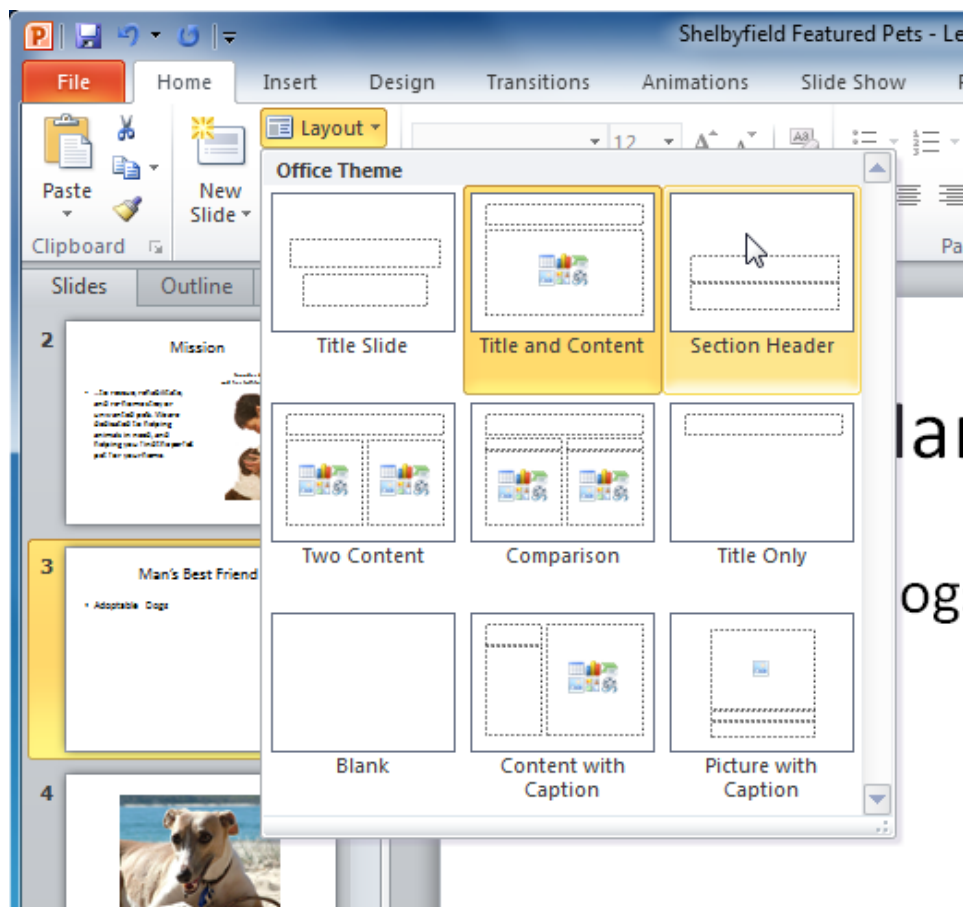
To delete a placeholder

You can easily customize your layout by deleting unwanted or extra placeholders from any slide.

1. Position your mouse on the dotted border of the placeholder so it changes to a cross with arrows
2. Click the border to select it.
3. Press Backspace or Delete on your keyboard. The placeholder will be removed from the slide.
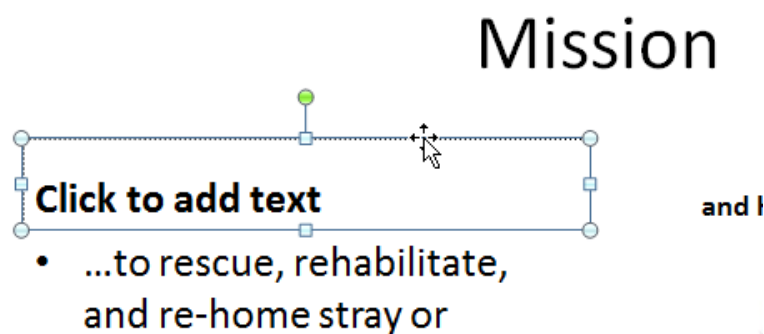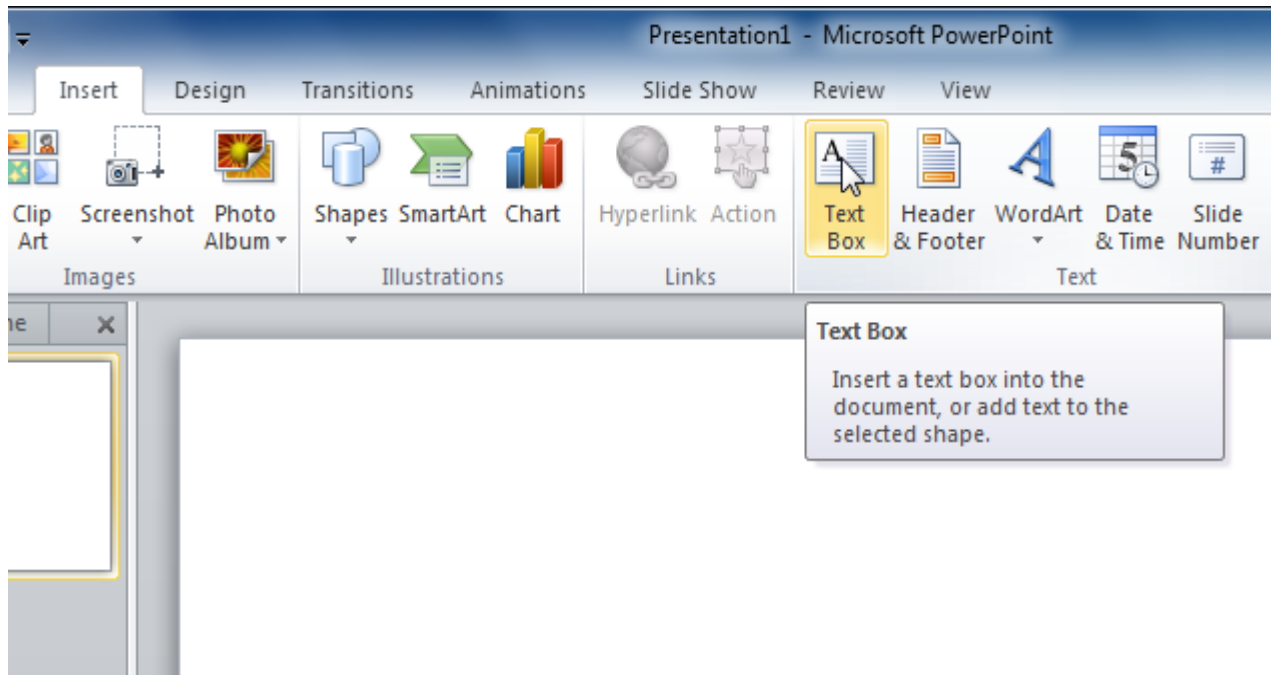
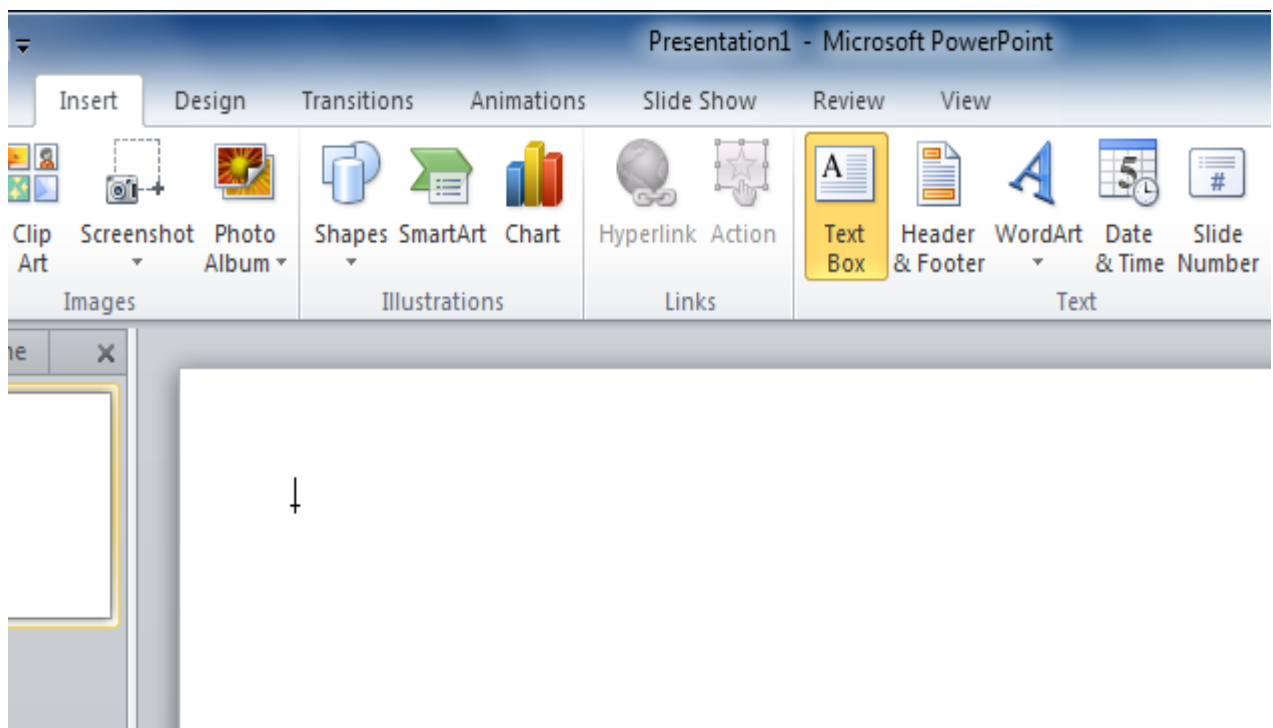### 6.1.2.2 Adding text to the presentation

To add a text box

Text boxes allow you to add to your current layout, so you can place text wherever you want on your slide.
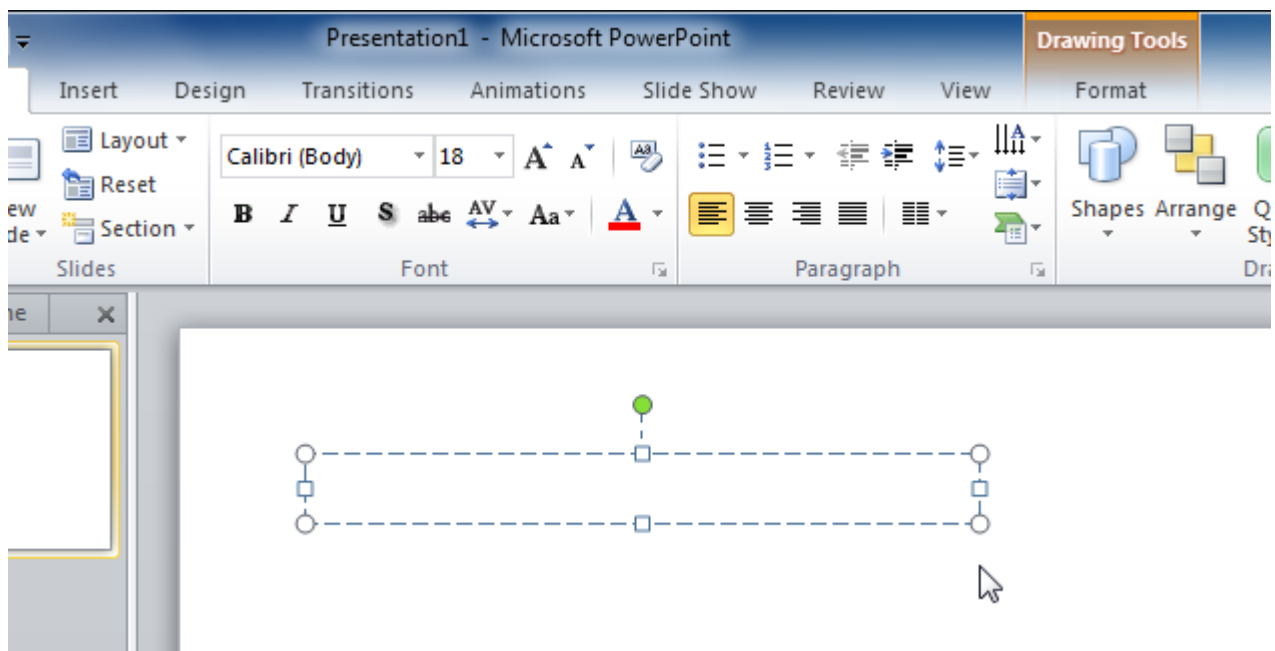
1. From the **Insert** tab, click the **Text Box** command.

2. Your cursor will turn into an **upside-down cross**.

3. Click, hold, and **drag** your mouse to draw a text box. A text box will appear.


To use a blank slide

For more control over your content, you may prefer a blank slide—a slide without placeholders—over one of the existing layouts. Blank slides can be customized by adding your own text boxes, pictures, charts, and more.

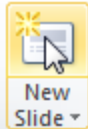- Select **Blank** from the menu of layout options.

Working with slides

To insert a new slide

1. From the **Home** tab, click the bottom half of the **New Slide** command to open the menu of slide layout options.
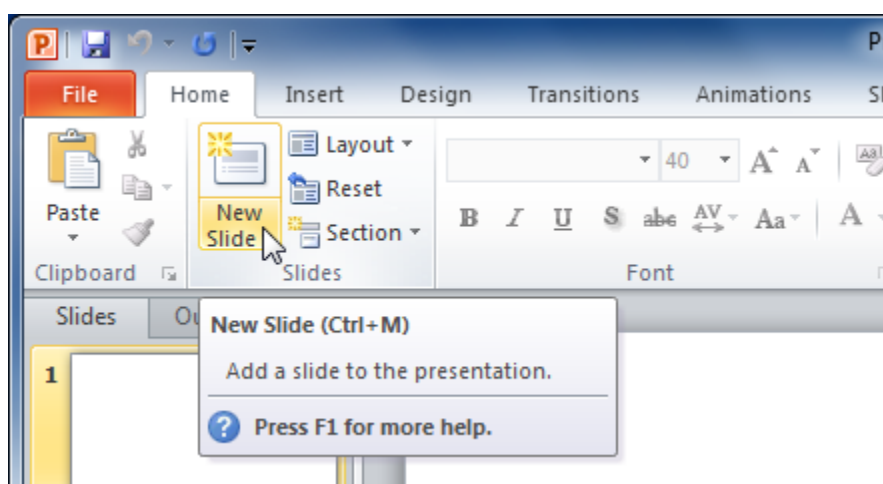
2. Select the slide you want to insert.

A new slide will be added your presentation.

To instantly add a slide that uses the same layout as the one you have selected, click the top half of the **New Slide** command.

6.1.3 Formatting a presentation

One of the most powerful tools in Microsoft Office is the application of formatting feature. This feature basically lets you define the right format once and apply the same to a series of objects in the rest of the presentation or any other file. While working with large presentations or just working on slides for a long time, if you ever need to make a change in the style and want it applied across multiple content this is the tool to use.
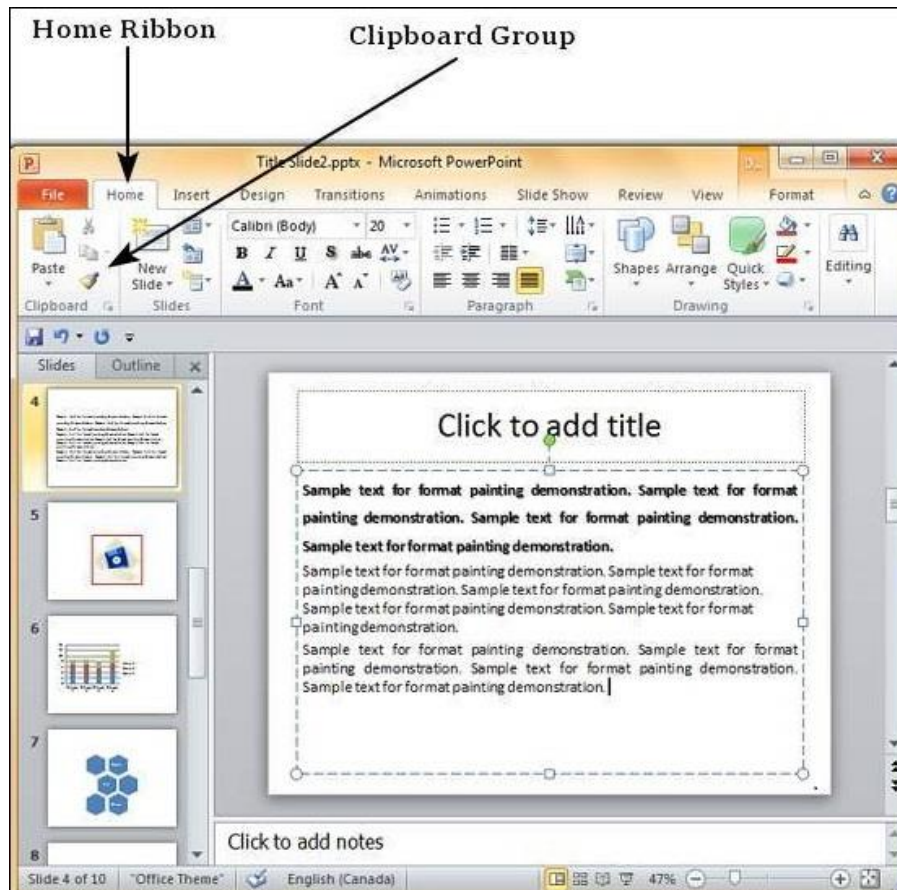
The following are the steps to apply formatting to your presentation –
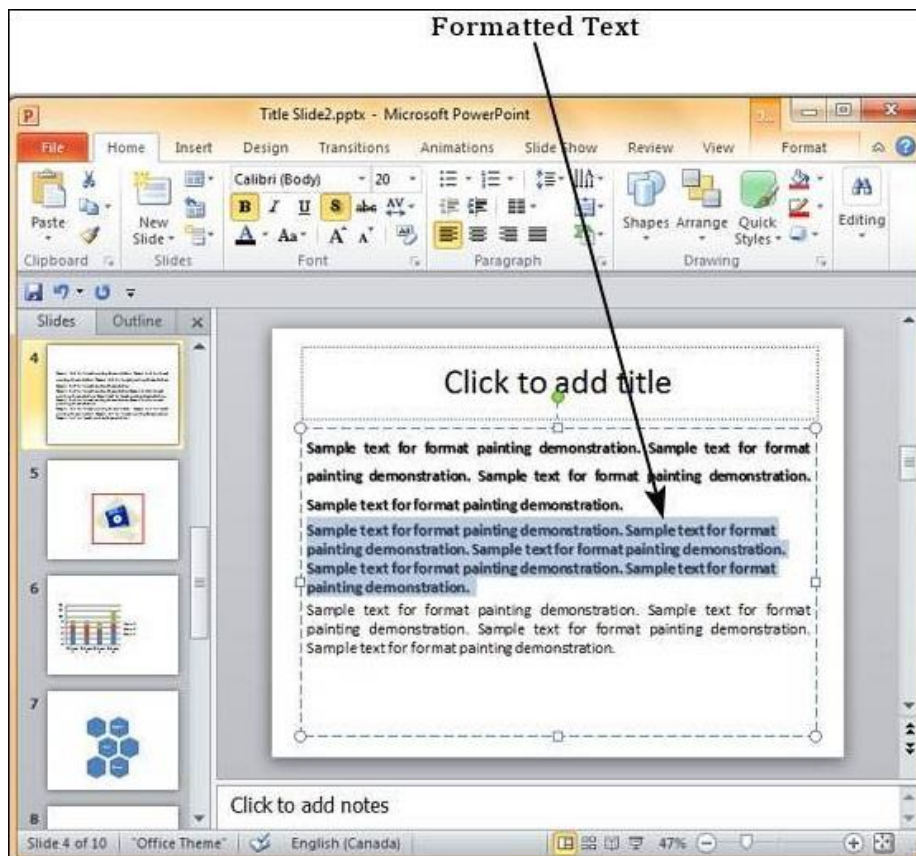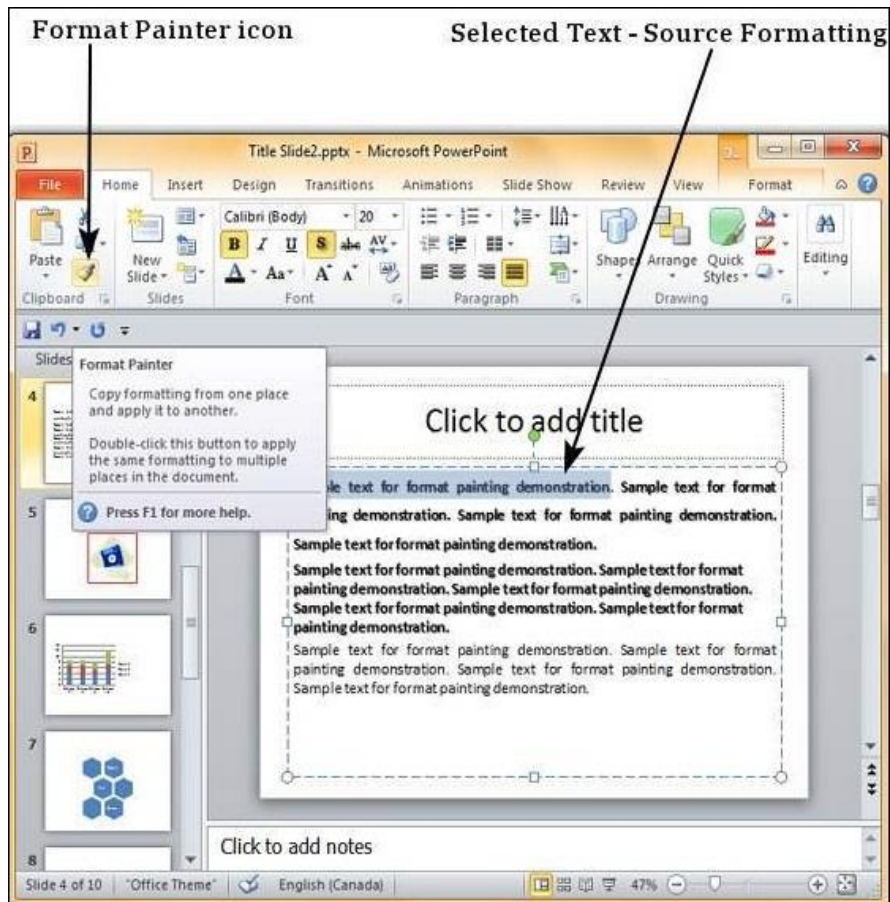
Step 1 – Select the content you want to copy the formatting from.

Step 2 – Go to the **Clipboard** group under the **Home** ribbon.

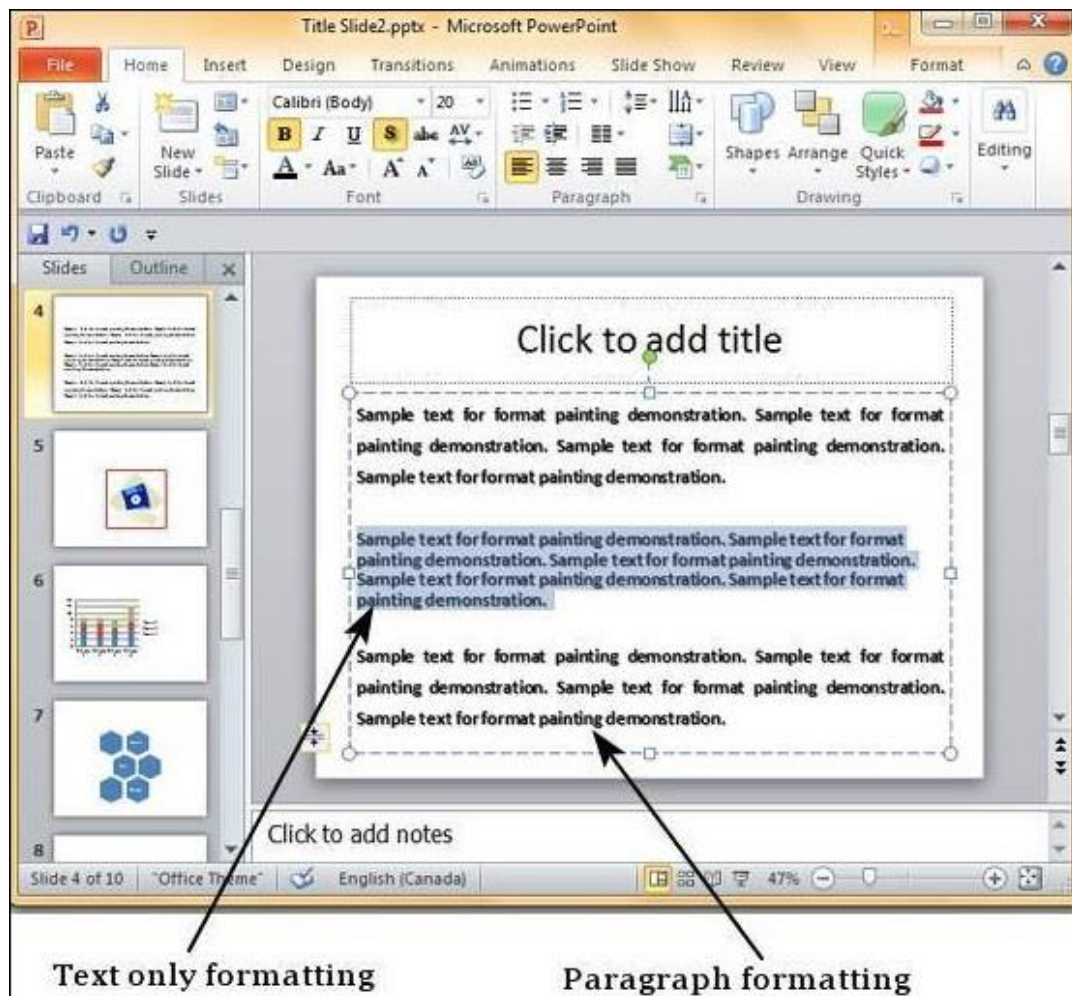**Step 3** – Click on the **Format Painter** icon.

Step 4 – Select the content you want to format.

Here are some key aspects about the Format Painter −

- If you click on the Format Painter icon just once, the formatting will be copied just once.

- If you click on the Format Painter icon twice quickly, you can copy the formatting multiple times.

Text only formatting   **Paragraph formatting**

- If you want to copy just the text formatting and not the paragraph features, ensure that you select just the sample text and not the entire paragraph.

- If you want to copy paragraph and font formatting, you must select the entire paragraph.

6.1.3.1 Adding style

These features can be accessed from the **Home** ribbon under the **Font** group.
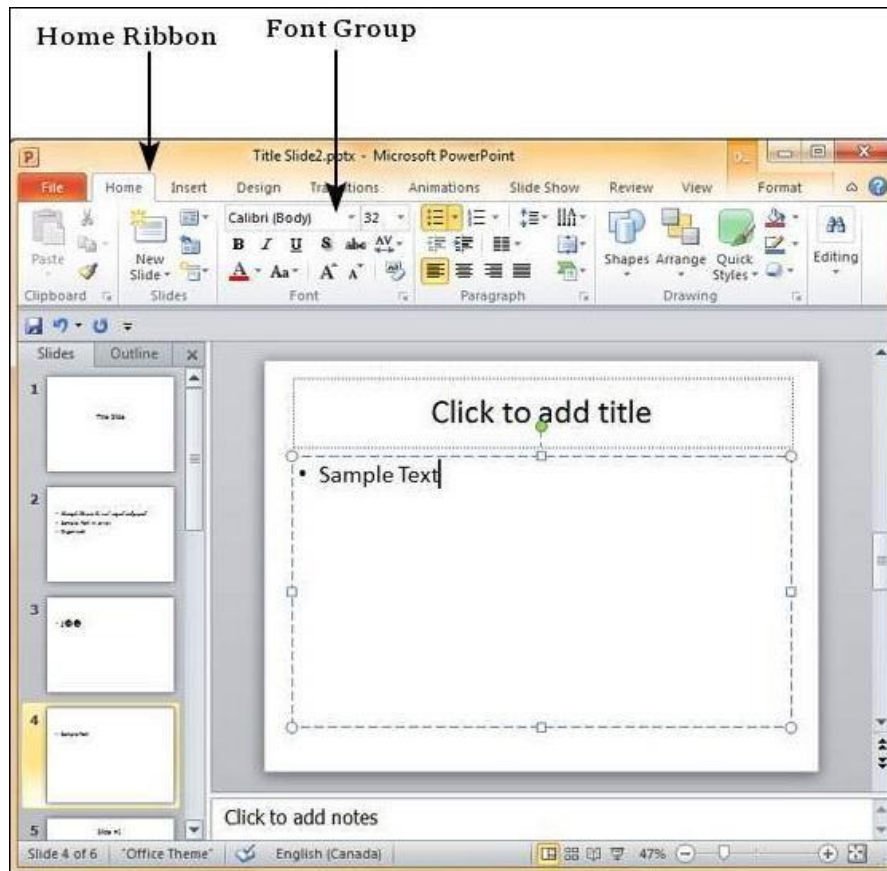
Given below are the various font decoration features and their functions in PowerPoint.

S.No	Icon & Description
1	**B** Makes the font face bold
2	*I* Makes the font face italics (slanted font)
3	U̲ Underlines the font face
4	S Adds shadow to the font face
5	a̶b̶c̶ Strikes through the font face
6	AV Adjusts the character spacing for the font. Predefined settings are very tight, tight, normal, loose and very loose. There is a user defined space setting available too.

Besides these, there are some other font decoration features that can be accessed from the **Font** dialog. To open the **Font** dialog, right-click on the selected text and select Font.
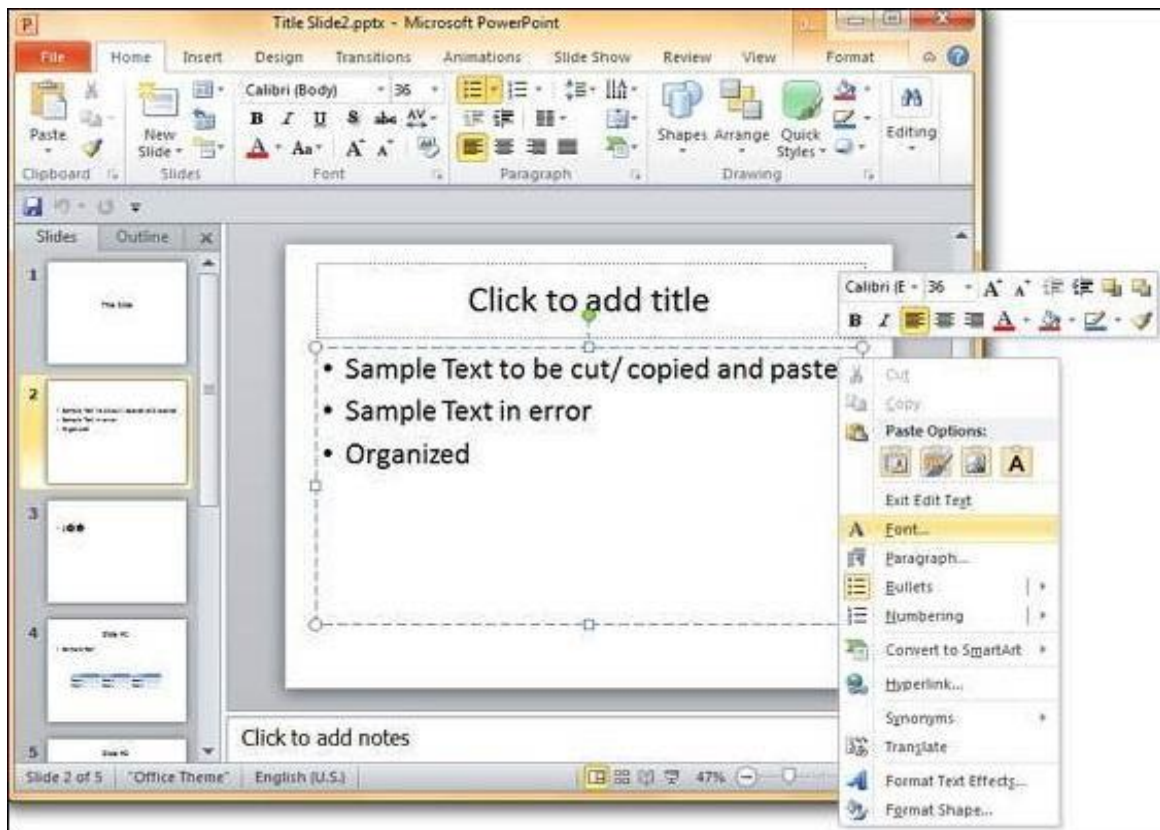
The table below describes the additional text decoration features in the **Font** dialog.
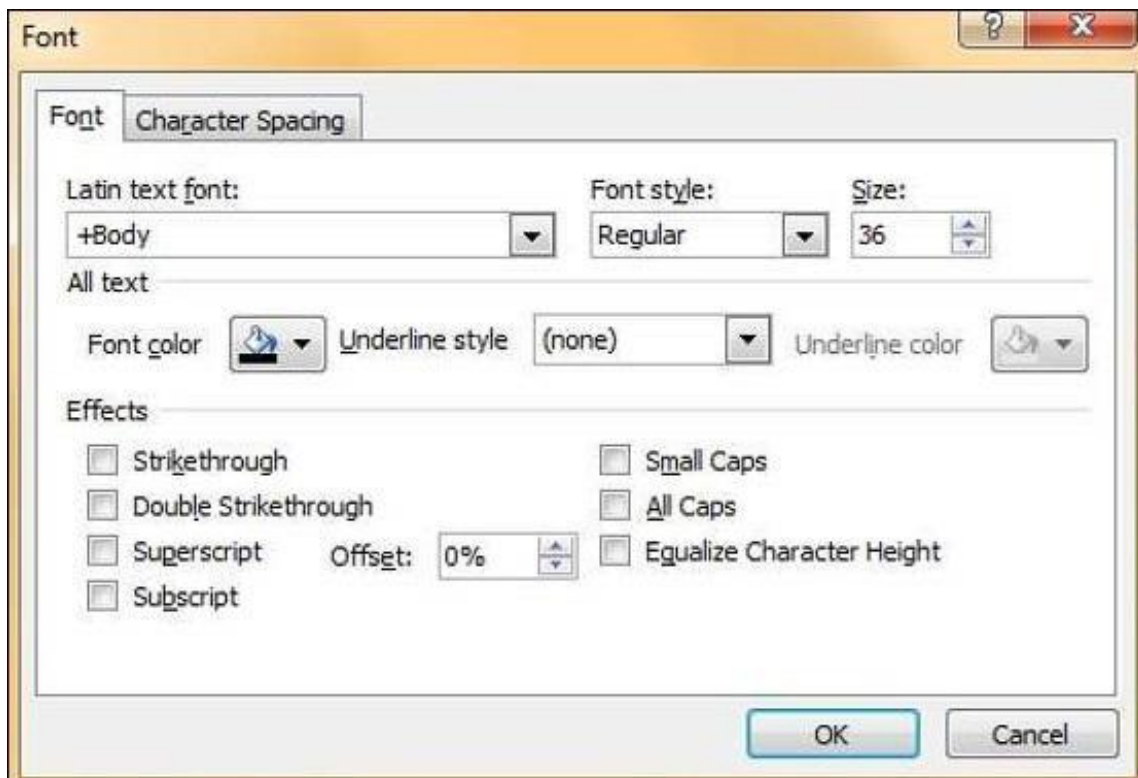
S. No	Icon & Description
1	Double Strikethrough - Adds two strike lines over the text
2	Superscript - Raises the text above the normal text. For example, the use of "nd" in 2nd
3	Subscript - Shrinks the below the normal text. For example, the '2' in H_2O the chemical formula of water
4	Small Caps - Changes the entire text to small caps
5	All Caps - Changes the entire text to capital letters
6	Equalize Character height - Adjusts the characters so that all are of the same height regardless of the caps setting

6.1.3.2 Colour

Step 1 – Select the text the color of which needs to be changed.

Step 2 – Go to the **Font** group under the **Home** ribbon.
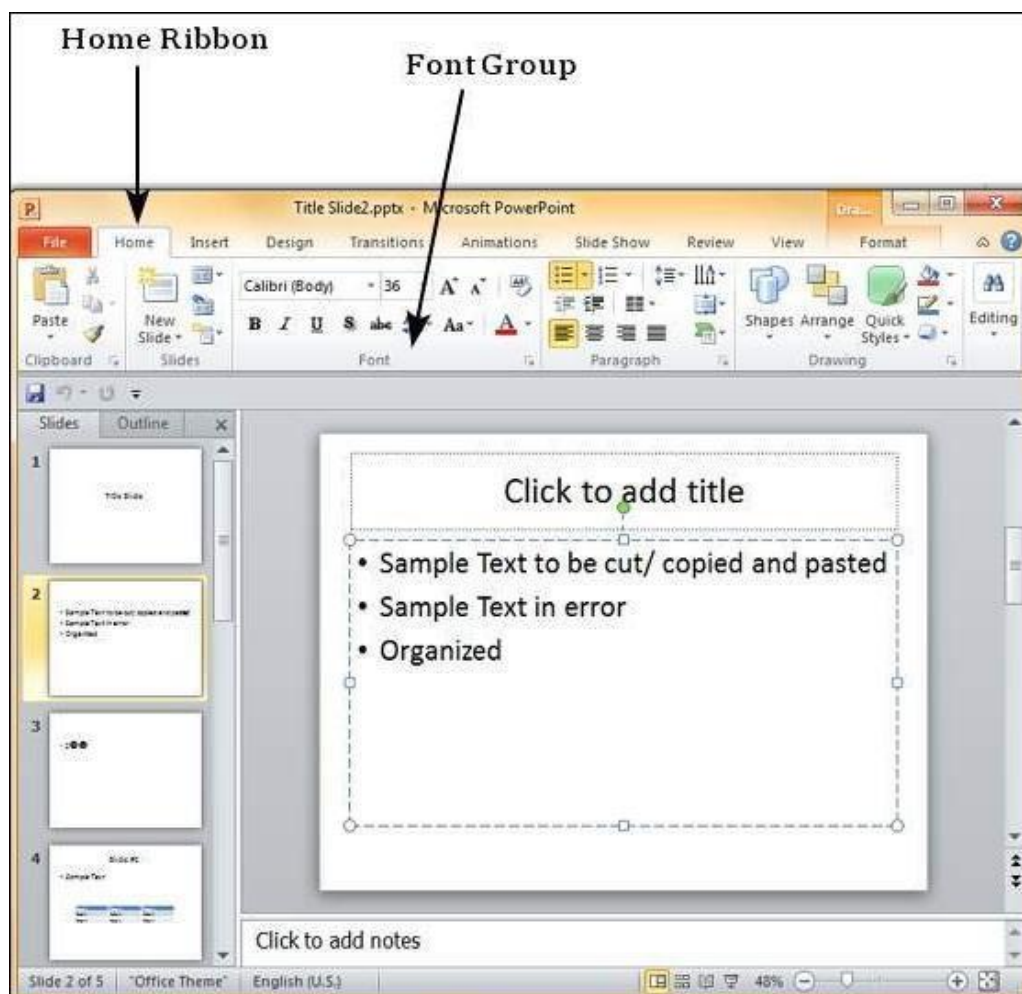
Step 3 – From the **Font Color** dropdown, select the color you want to use for your text.
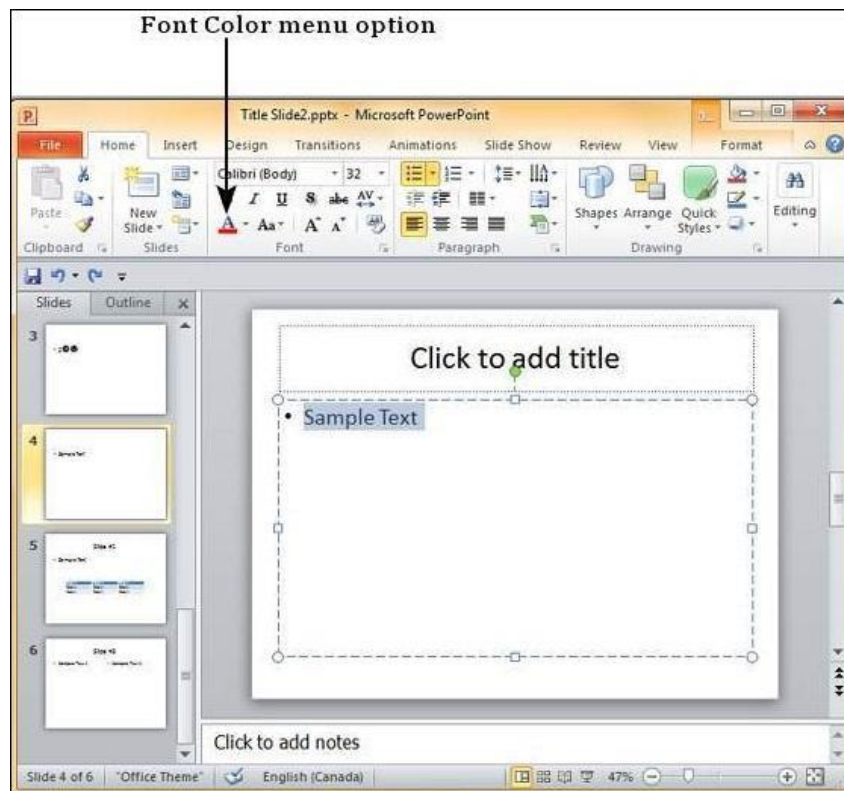
Step 4 – Click on your choice to change the font color for the selected portion of text.
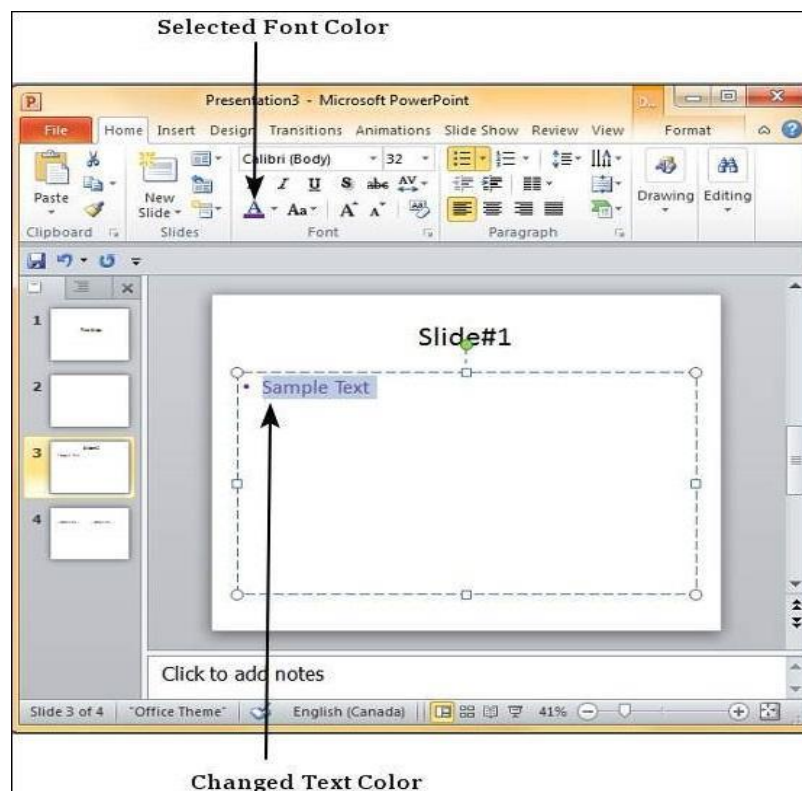
If you want to choose from a wider range of colors than what's shown in the dropdown you can click on "**More Colors...**"
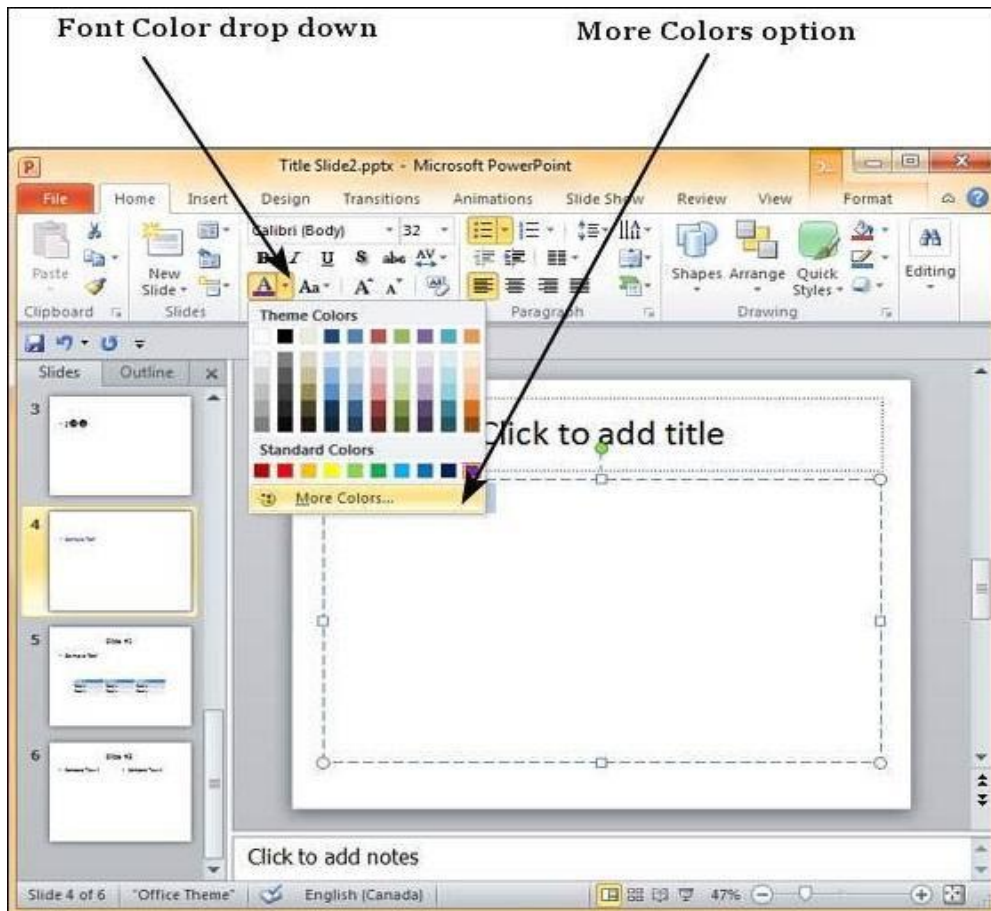
Here you can pick from a standard color palette for a greater choice of predefined colors or create your own from the custom color palette.

Standard Color Palette
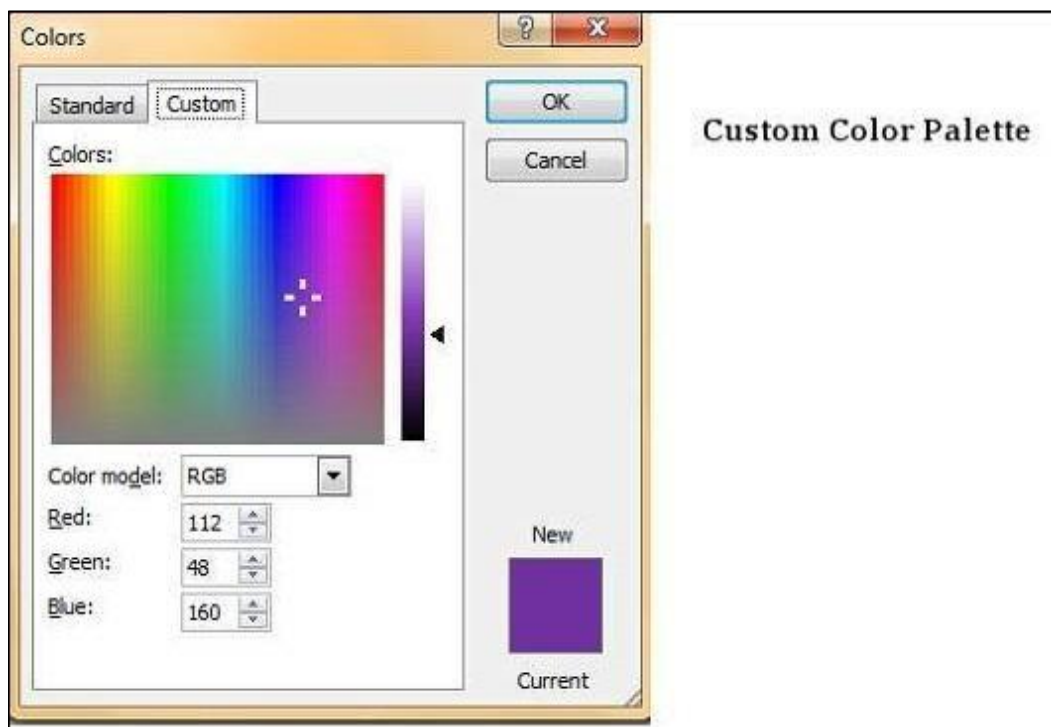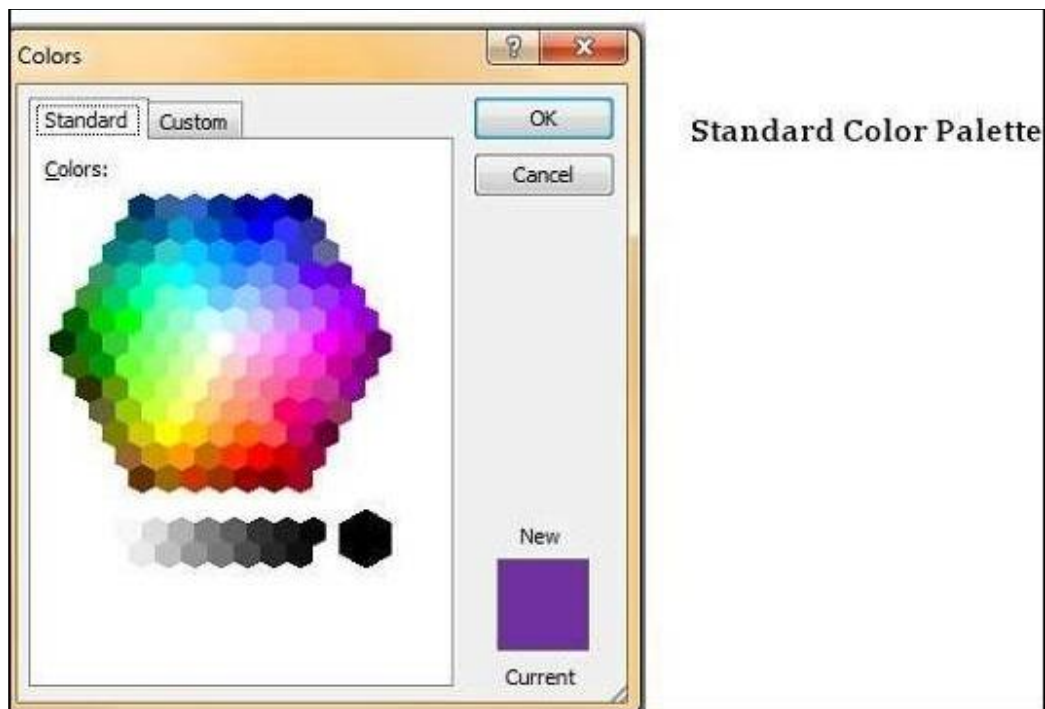
6.1.3.3 Gradient fills

The simplest way is to click the shape to select it, and then click the **Format** tab that appears:

- For shapes, text boxes, and WordArt, the **Format** tab appears under **Drawing Tools.**
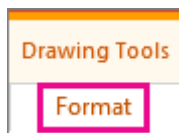
- For chart shapes, the Format tab appears under **Chart Tools.**
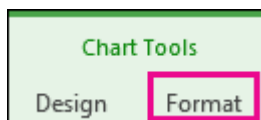
- For SmartArt shapes, the **Format** tab appears under **SmartArt Tools.**
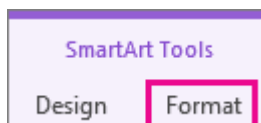
On the **Format** tab, click **Shape Fill**, click **Gradient**, and select the one you want.
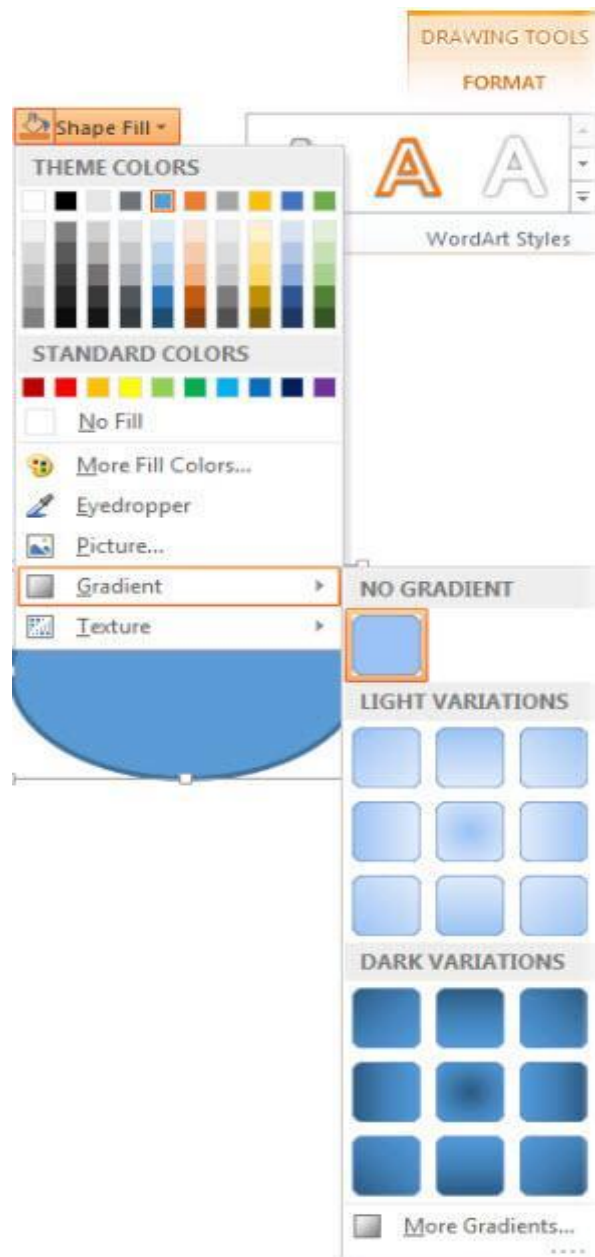
6.1.3.4 Arranging objects

Step 1 – Select a set of shapes or objects together. To select the objects, press the **Ctrl** key and select each object individually. If the objects are together, you can also click and drag the cursor to select them; however with the click and drag everything that falls within the selected area will be selected.

Selected Objects & Shapes
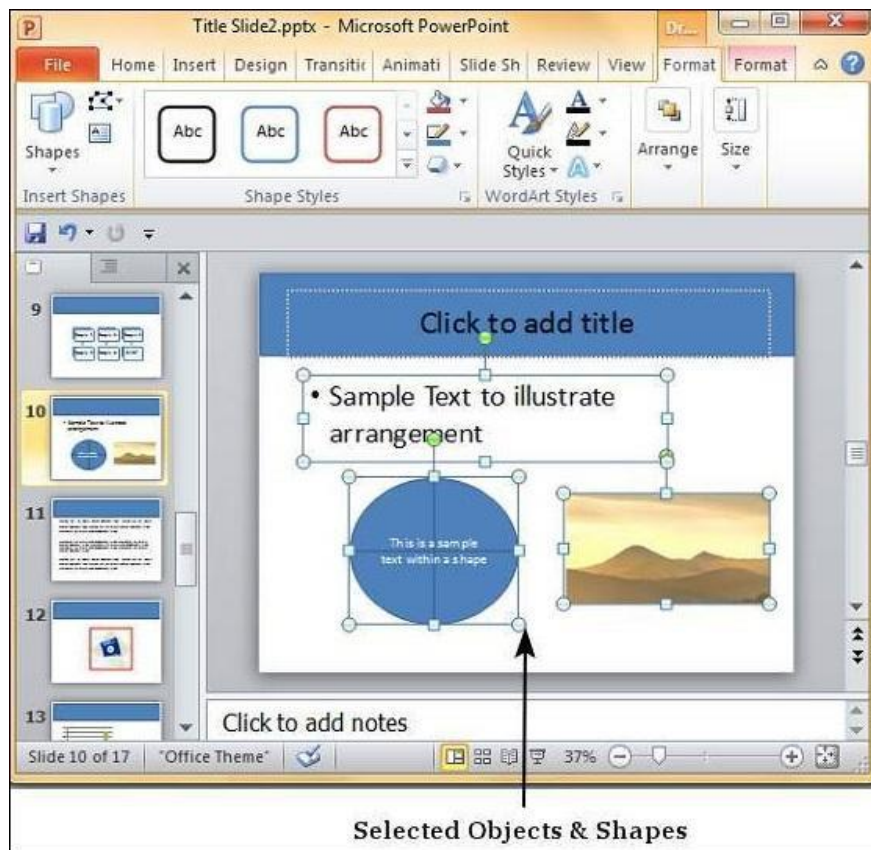
Step 2 − Go to the **Arrange** Group under the **Format** ribbon.
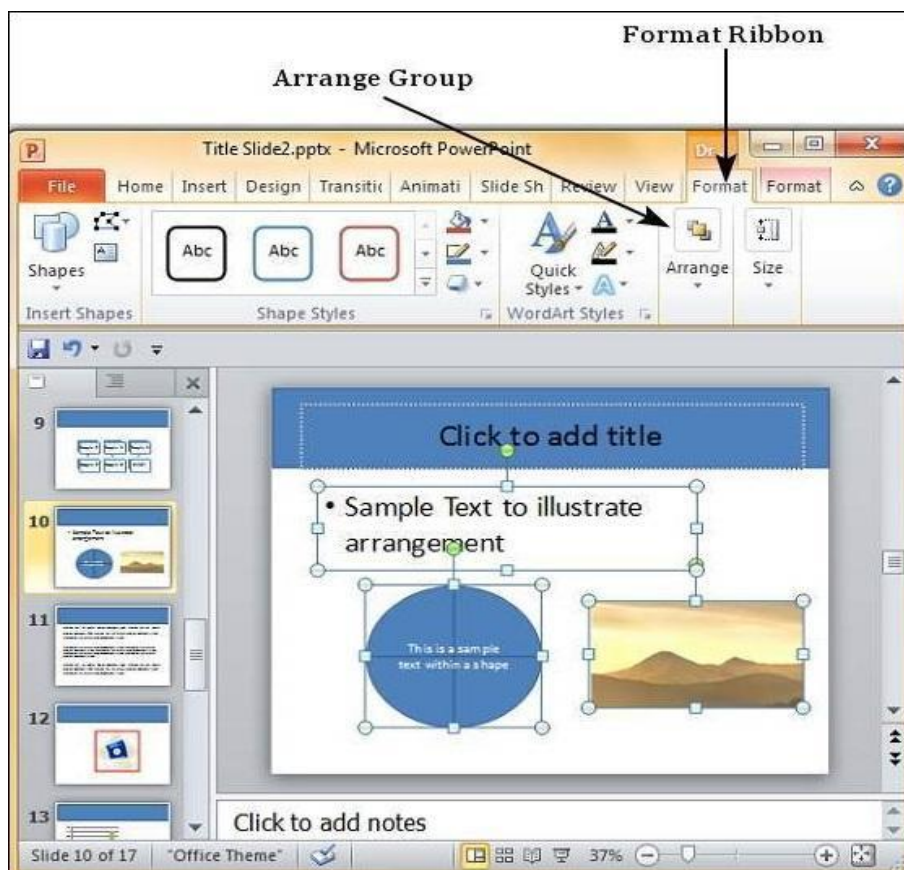
Step 3 – Click on **Group** under the **Group** menu item - this will group the objects and shapes into a single object.

Group Menu   Group Option
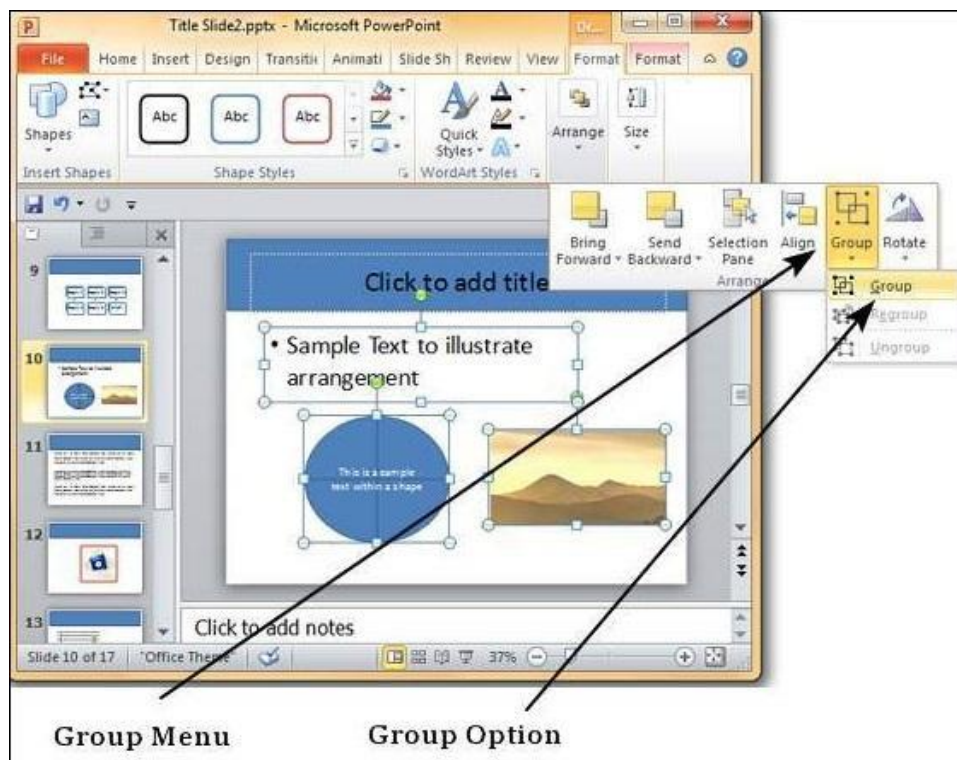
Step 4 – Apply the common changes you want to make to these objects.

Aligned group to the bottom of the slide
while retaining their individual positions
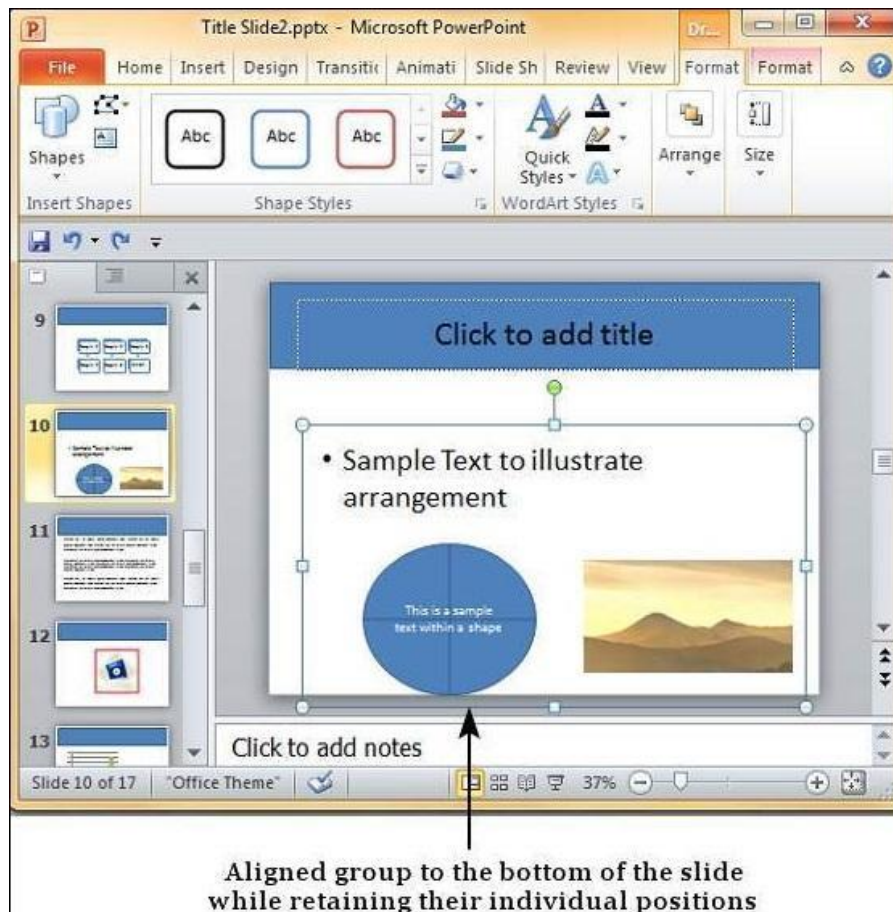
Step 5 – Even though the objects are grouped, you can still edit them individually if need be.

Changed text box content within the group
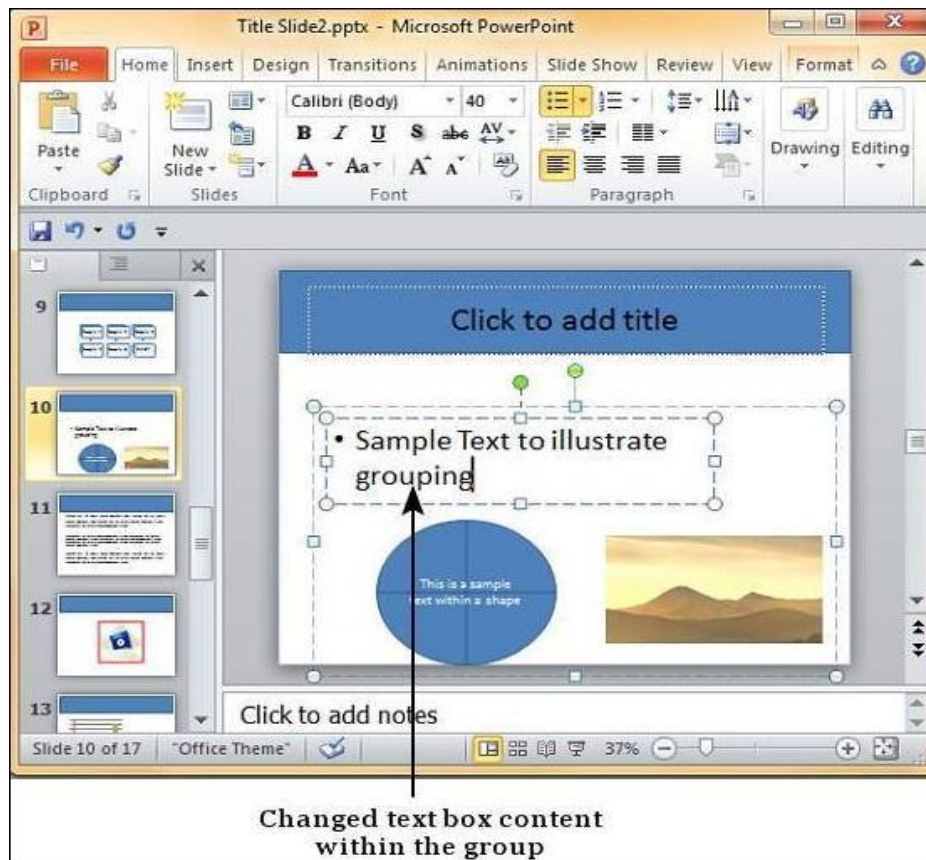
Step 6 – If you want to edit the shapes or objects individually, go back to the **Group** menu item and select **Ungroup.**

Group Menu   Ungroup option
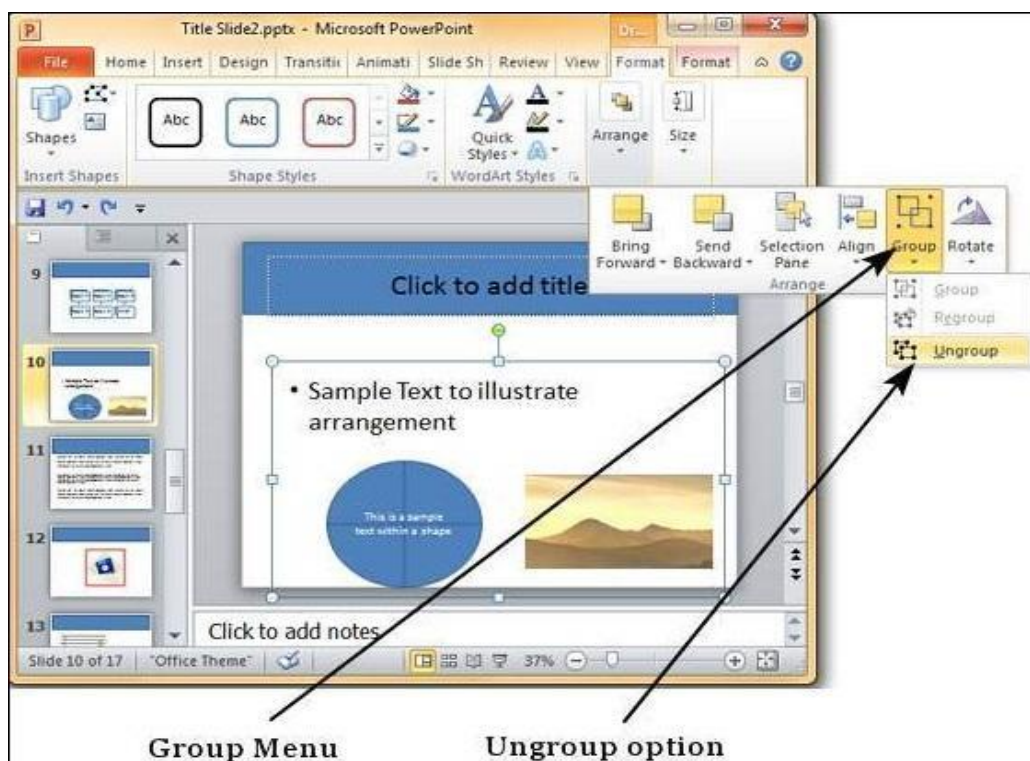
Step 7 – After making changes, if you want to regroup the objects as per original grouping, you select one of the objects and use the **Regroup** option under the **Group** menu.

Original group object selected   Group Menu   Regroup option
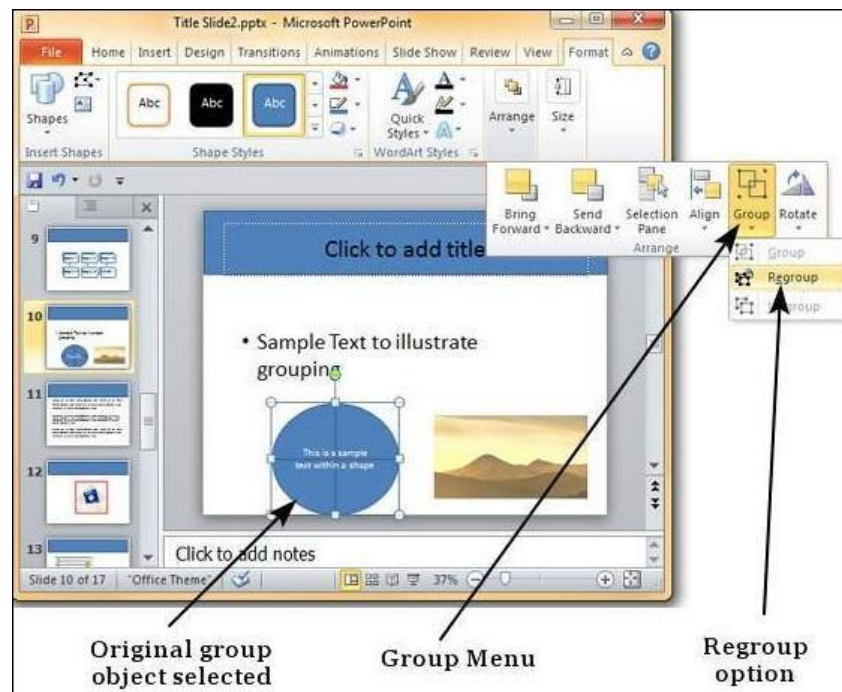
6.1.3.5 Adding Header & Footer

Step 1 – In the **Insert** ribbon, click on the **Header & Footer** menu item.
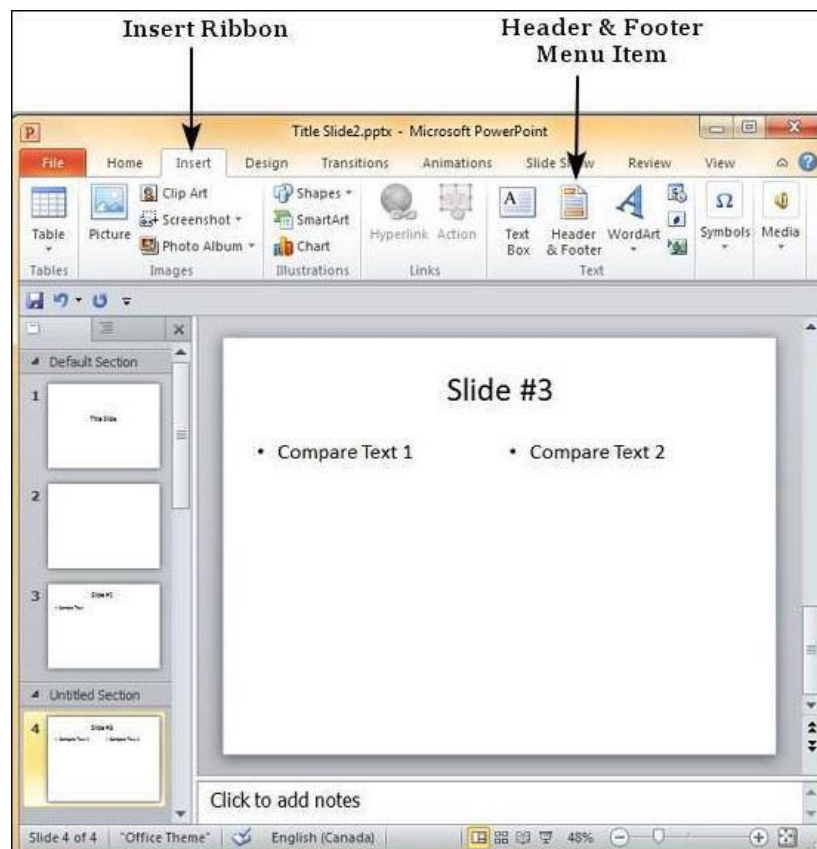
Step 2 − The **Header and Footer** dialog has two tabs — the **Slide tab** and the **Notes and Handouts** tab.

Step 3 − You can add details to the slide footer from the **Slide** tab.
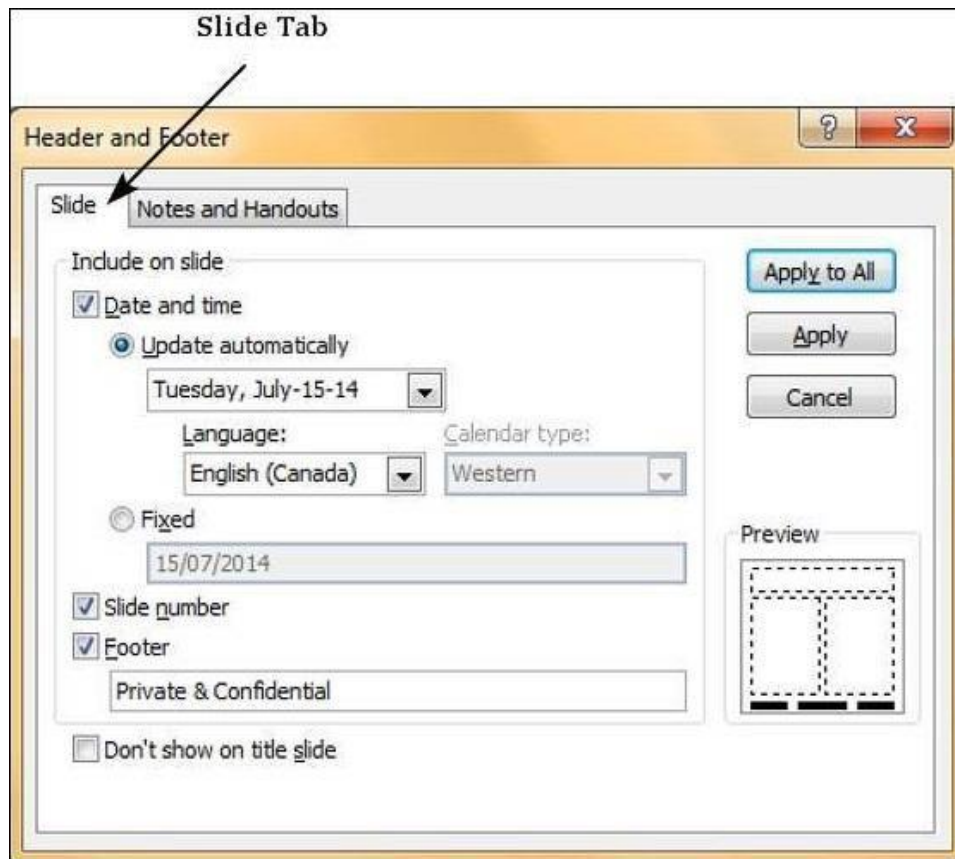
S.No	Slide Footer Options & Description
1	**Date and time** Add date and time to the footer Specify the format of the date and time entered Set up the footer to update automatically or use a fixed number
2	**Slide Number** Insert Slide number in the footer
3	**Footer** Add designated text to the footer - a good example of this is the confidentiality clause or copyright clause
4	**Don't show on title slide** Decide on whether the footer information should be displayed on the title slide or not

Step 4 – You can add the details to the handouts from the **Notes and Handouts** tab.
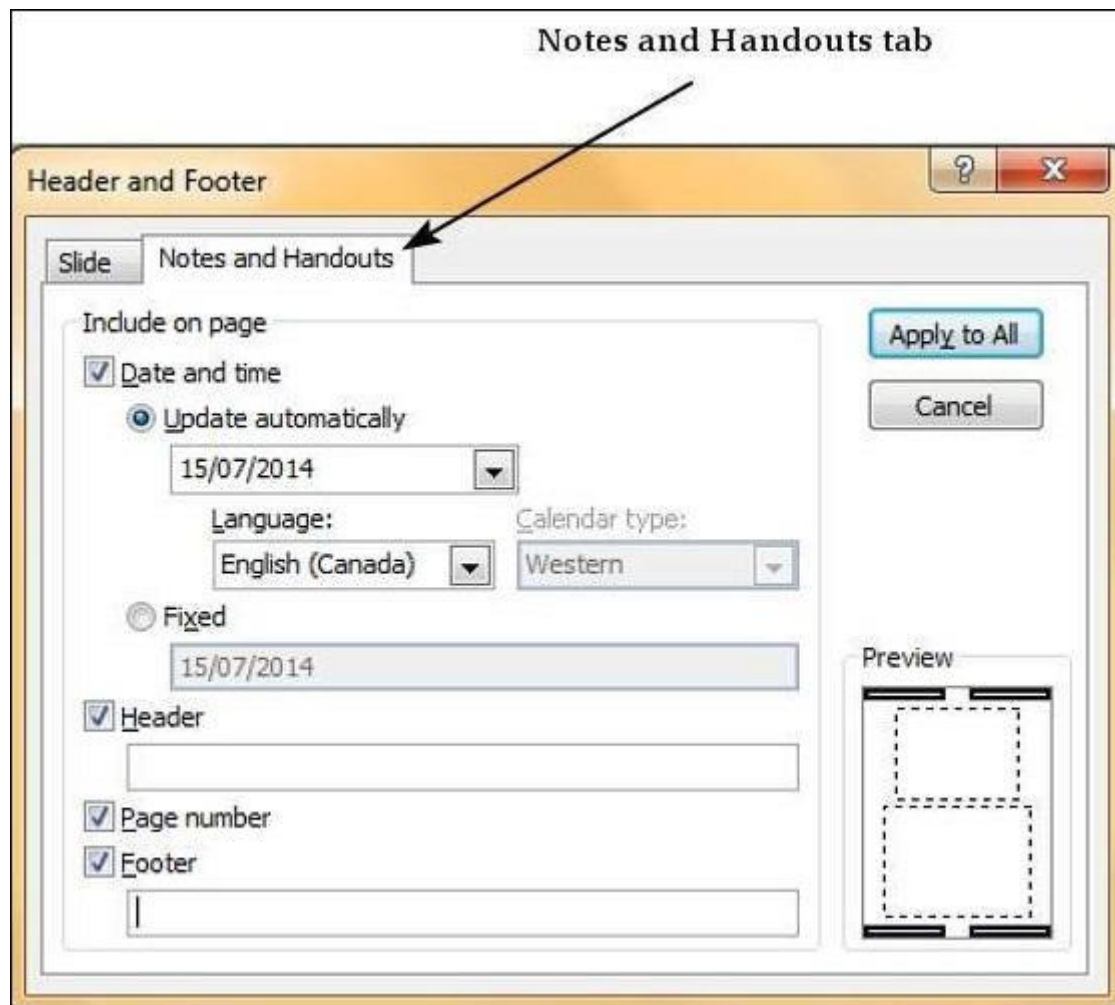
Sl.No	Notes and Handouts Options & Description
1	**Date and time** Add date and time to the footer Specify the format of the date and time entered Set up the footer to update automatically or use a fixed number
2	**Header** Add the header information for every page on the handout
3	**Page Number** Insert page number in the footer
4	**Footer** Add designated text to the footer - a good example of this is the confidentiality clause or copyright clause

When you check any of the header and footer checkboxes in either tabs, you can see the location where the detail is inserted in the preview section.
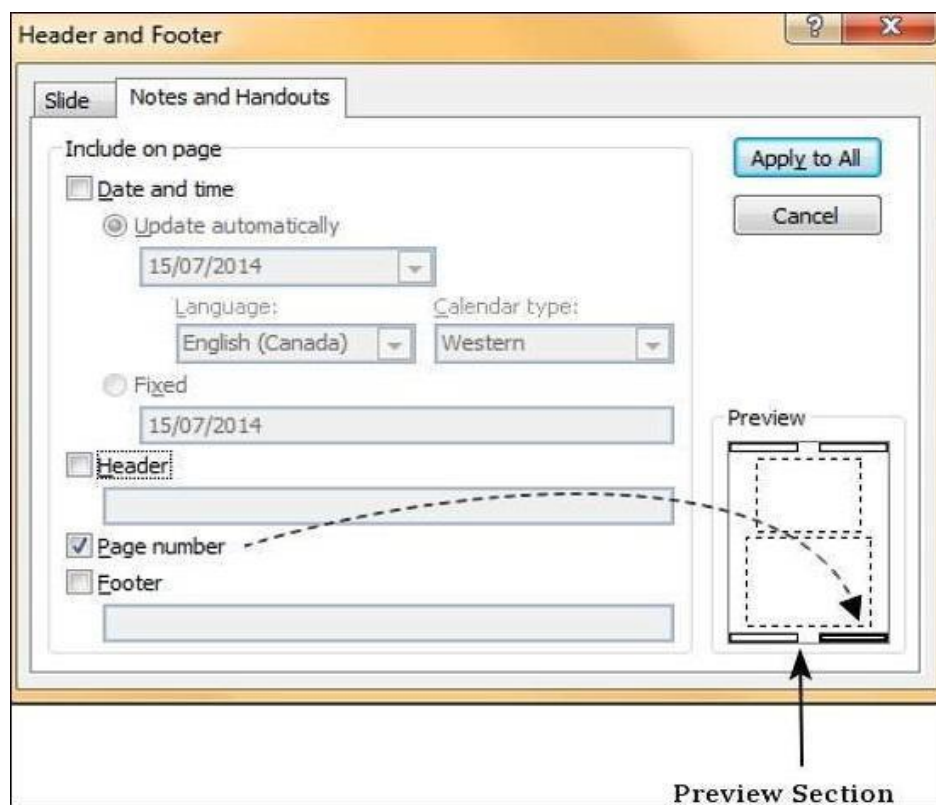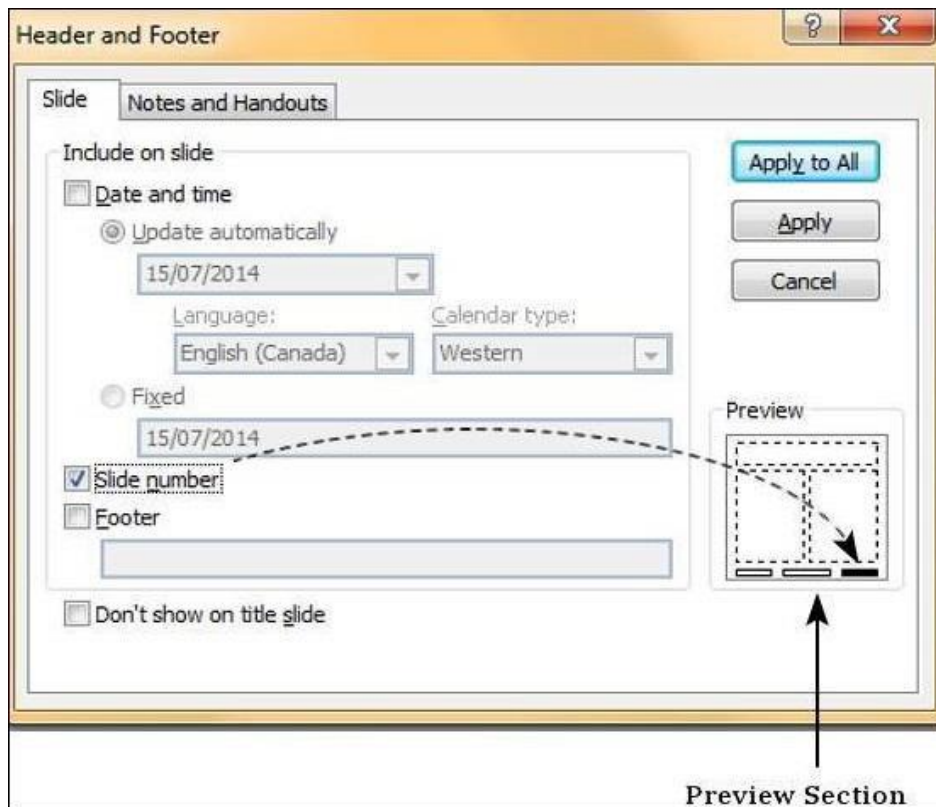
6.1.3.6 Slide background

The steps to apply backgrounds in PowerPoint.

Step 1 – In the **Design** ribbon, under the **Background** group, click the **Background Styles** command.
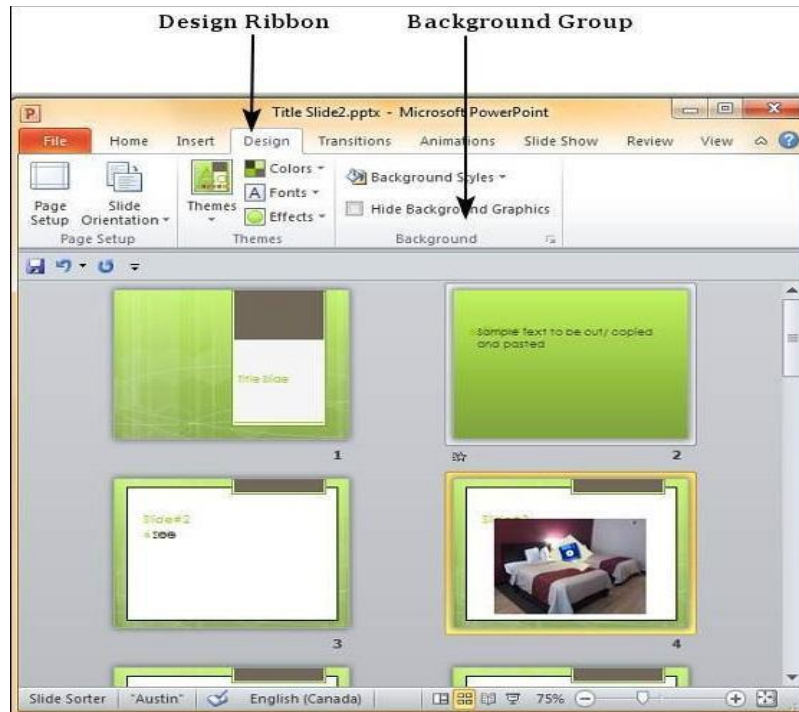
Step 2 – Select one of the background styles that suits your requirements.
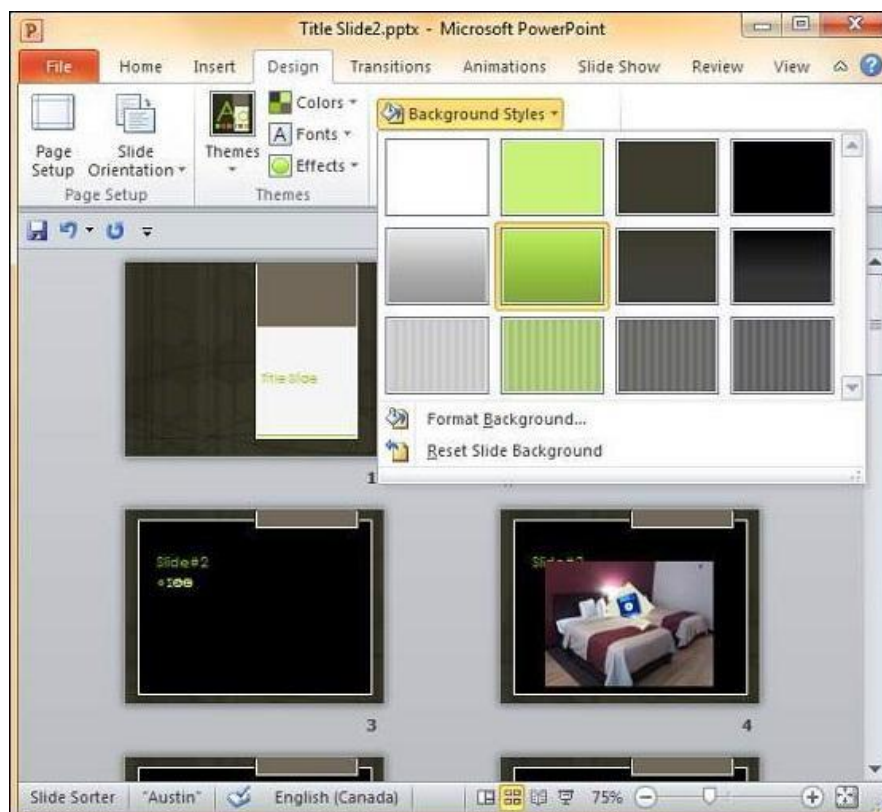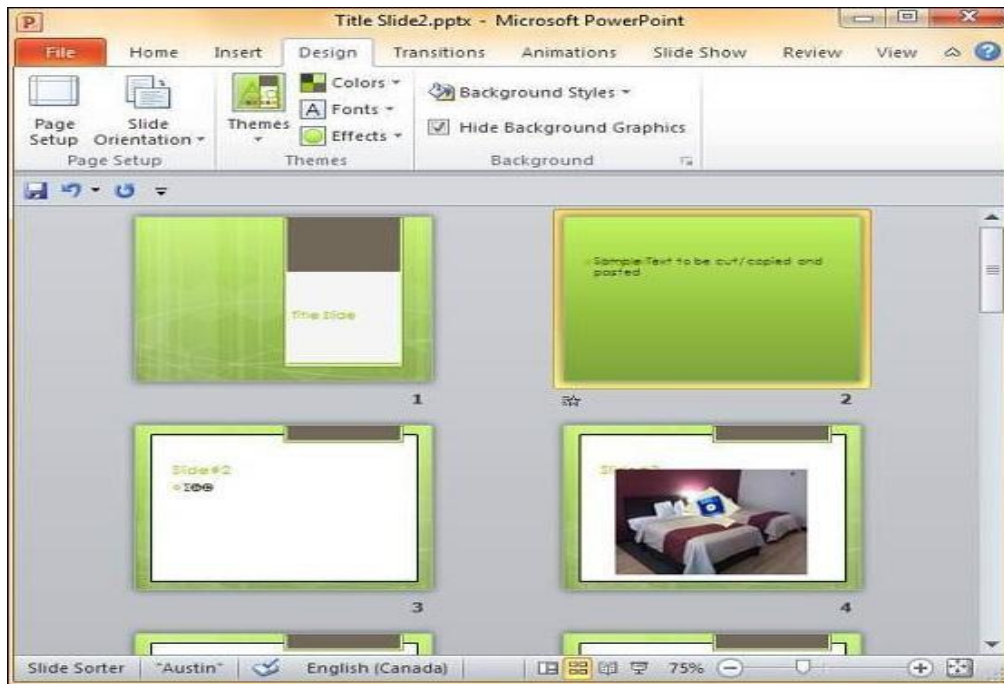
Step 3 – To edit the background for a specific slide, right-click on the desired background slide and select "**Apply to Selected Slides**".
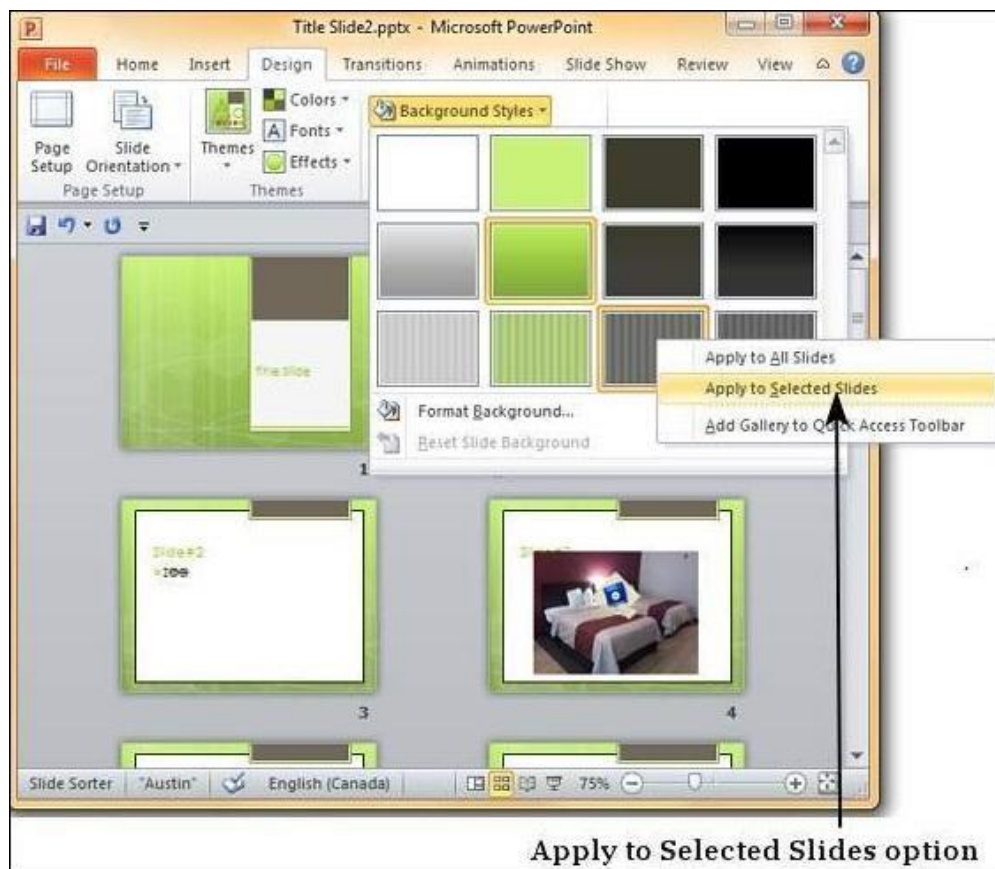
Apply to Selected Slides option

Step 4 – Selected slide(s) now have the new background.
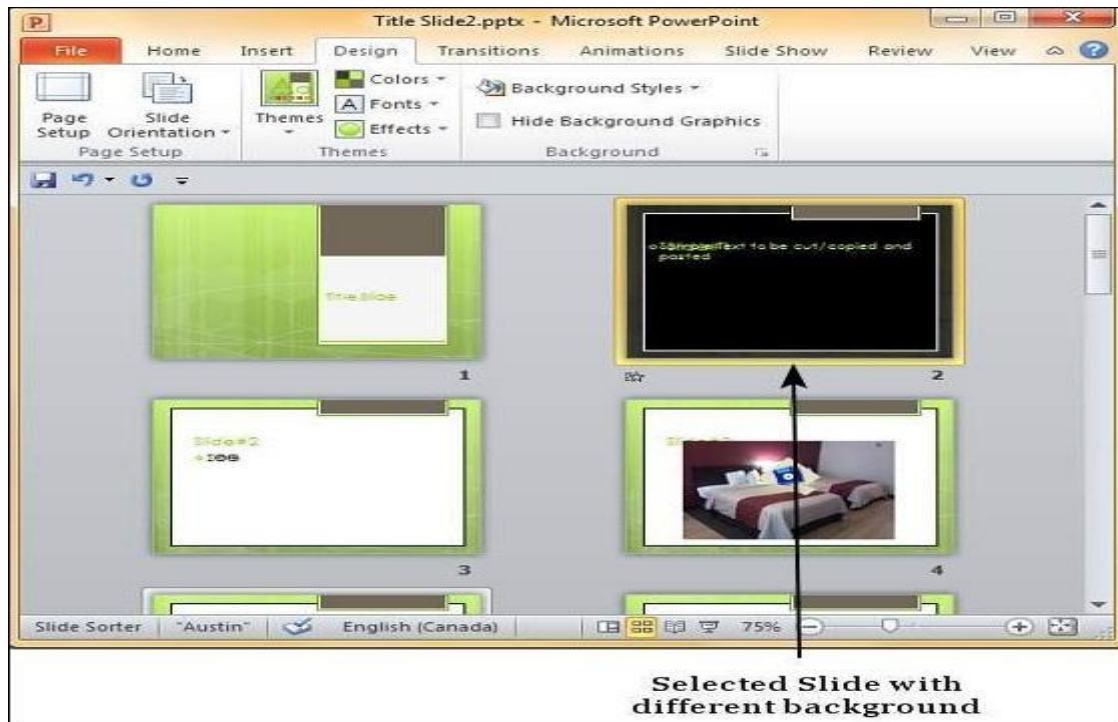
Selected Slide with
different background

The graphics in the slide background can distract you from the actual content, in such cases you can hide the graphics and retain a plain background till you finish working on the content. To do this, select the slide and check the "**Hide Background Graphics**" checkbox.

Hidden Background
Graphics Checkbox

Slide with background
graphics

Slide without
background graphics
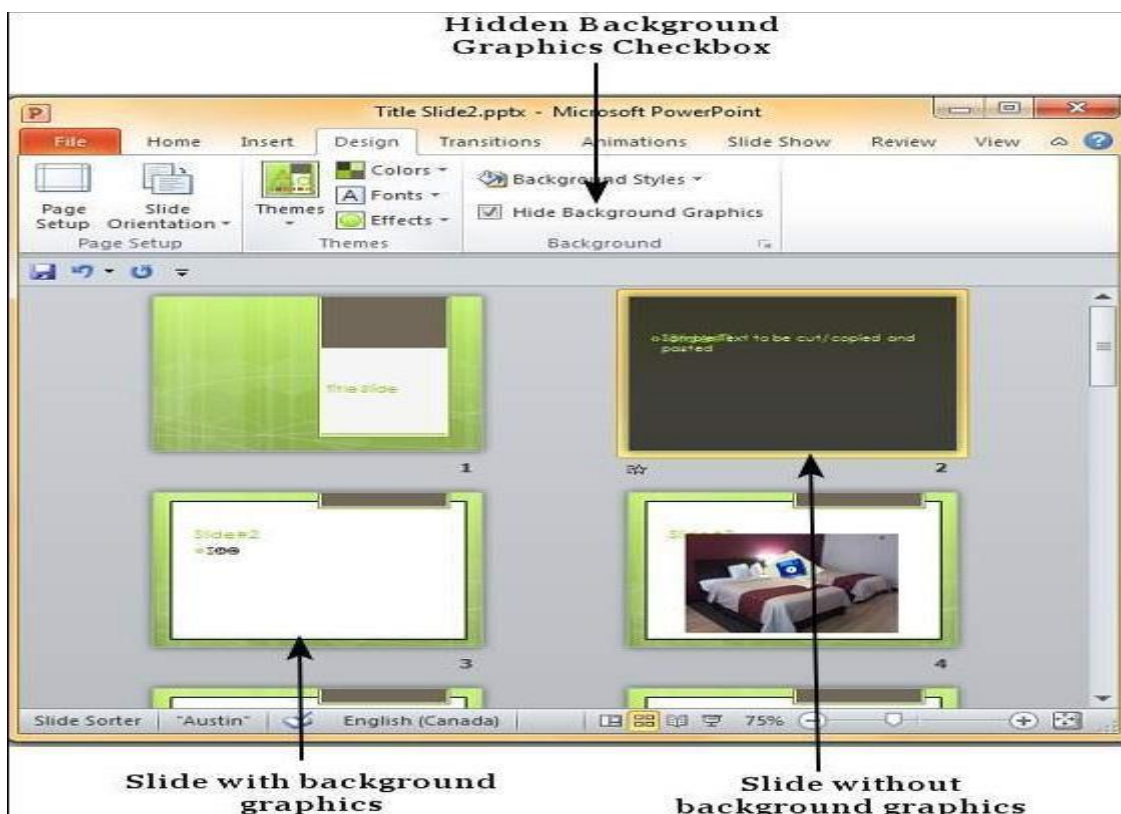
6.1.3.7 Slide layout

Arrange slide content with different slide layouts to suit your taste and preference, or to improve the clarity and readability of the content.

1. Select the slide that you want to change the layout for.
2. Select **Home** > **Layout**.
3. Select the layout that you want.

The layouts contain placeholders for text, videos, pictures, charts, shapes, clip art, a background, and more. The layouts also contain the formatting for those objects, like theme colors, fonts, and effects.

Note: Select **Home** > **Reset** if you made layout changes you don't like, and want to revert to the original layout. Using **Reset** doesn't delete any content you've added.

Change the *orientation* of your slides

A separate Help article describes how to switch between portrait and landscape orientations:
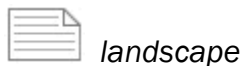
landscape

portrait

6.1.4 Adding Graphics to the presentation

PowerPoint supports multiple content types including images or pictures. With regards to pictures PowerPoint classifies them into two categories –

- Picture – Images and photos that are available on your computer or hard drive
- Clip Art – Online picture collection that you can search from the clip art sidebar

Although their sources are different, both these types can be added and edited in similar fashion. Given below are the steps to add picture to a slide.

6.1.4.1 Inserting pictures

Step 1 – Go to the Images group in the Insert ribbon.

Step 2 – Click on Picture to open the Insert Picture dialog and add a picture to the slide.
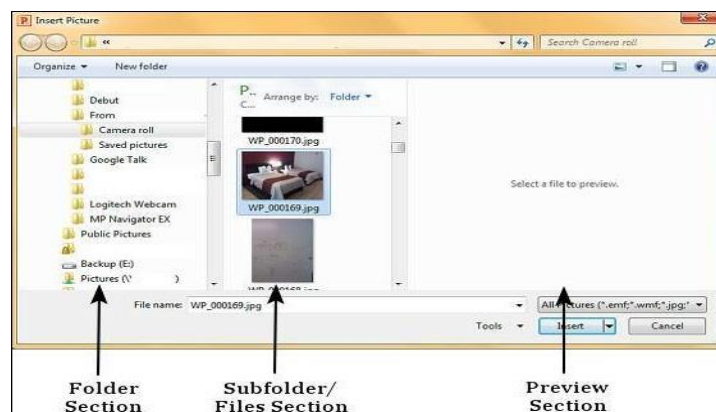
Step 3 – In this dialog, you have three sections: to the left corner, you have folders that can be browsed, the section in the center shows the subfolders and files in the selected folder and to the right, you can have a preview of the selected image.

Step 4 – Select the image you want and click Open to add the picture to the slide.
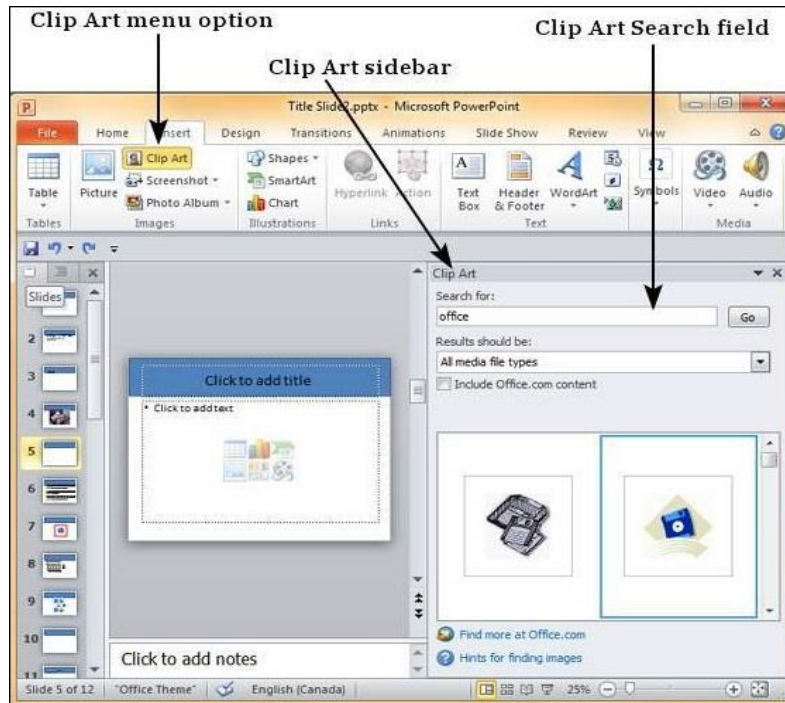
Step 5 – Once you have the clipart you want to use, double-click on the image to add it to the slide.
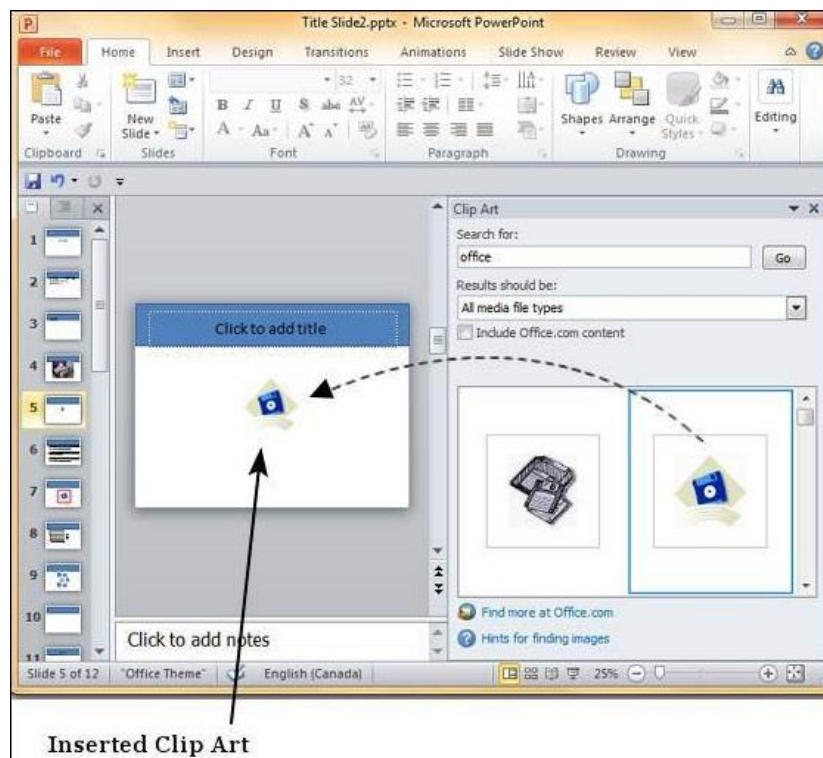
6.1.4.2 Inserting movies

PowerPoint allows presentations to be saved as video files that can be posted on video sharing platform like YouTube or just played on any other media.

Given below are the steps to save a presentation as a video file.

Step 1 – Go to the **Backstage** view under the **File** tab.
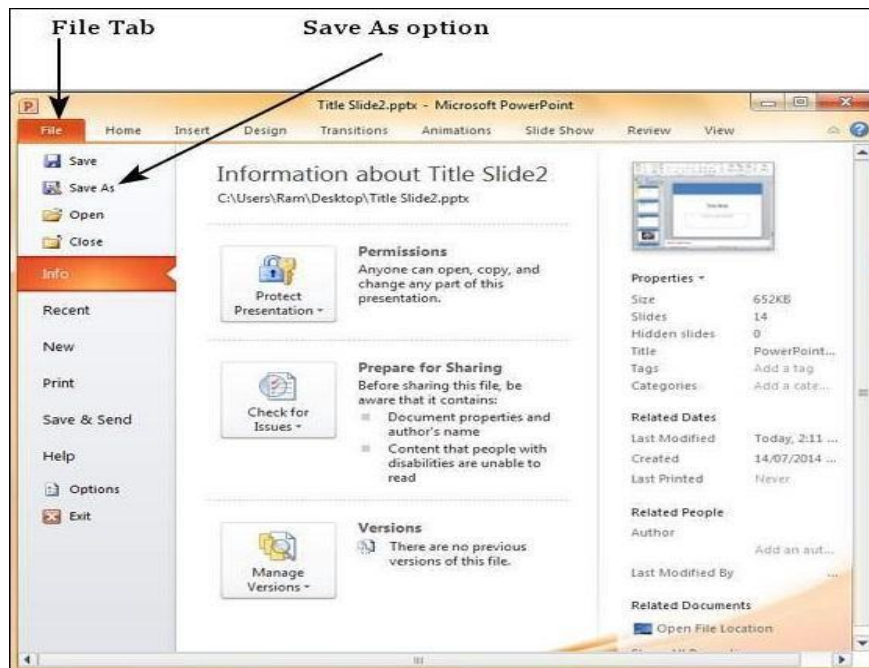
Step 2 – Click on **Save As** to open the Save As dialog.

Step 3 – Select the file type as **.wmv** from the list of supported file types.
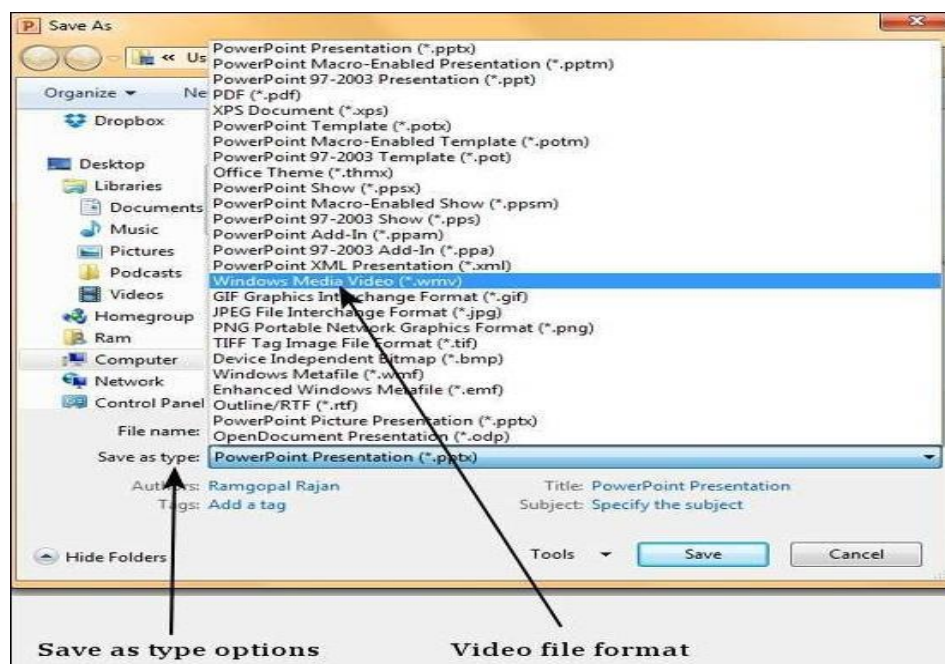
Step 4 – Add a proper name to the file and click Save.
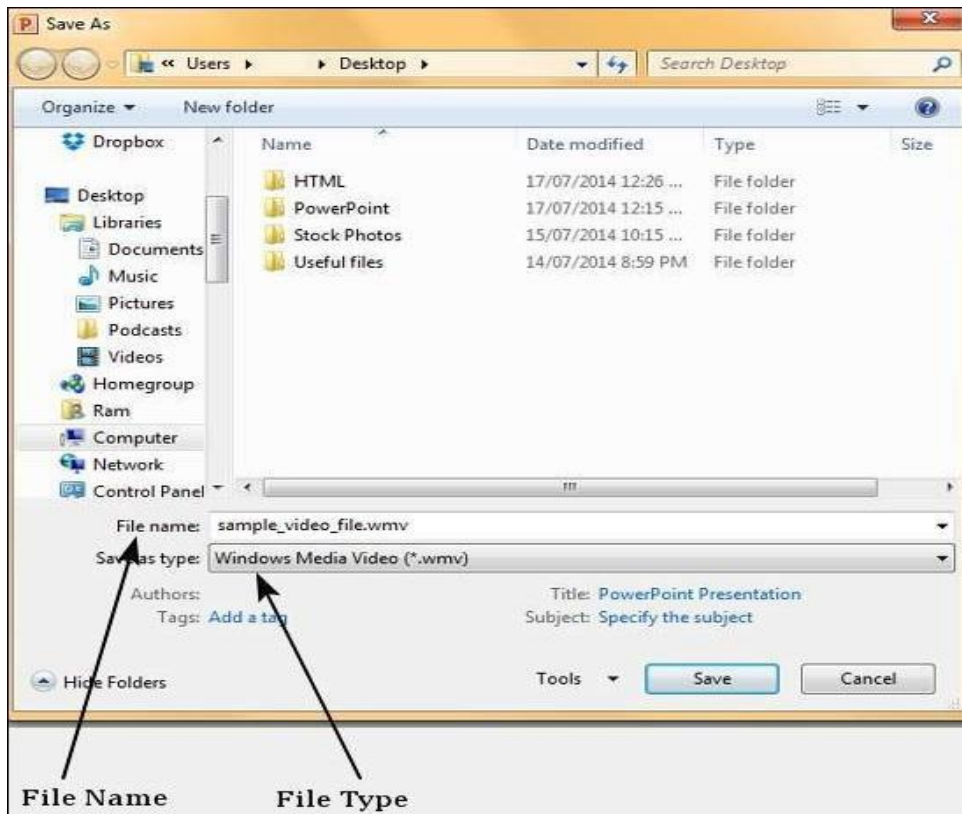
Step 5 – The video creation is not an instant process like other file types as PowerPoint needs to create the video file. You can track the progress of video creation at the bottom of your presentation window.
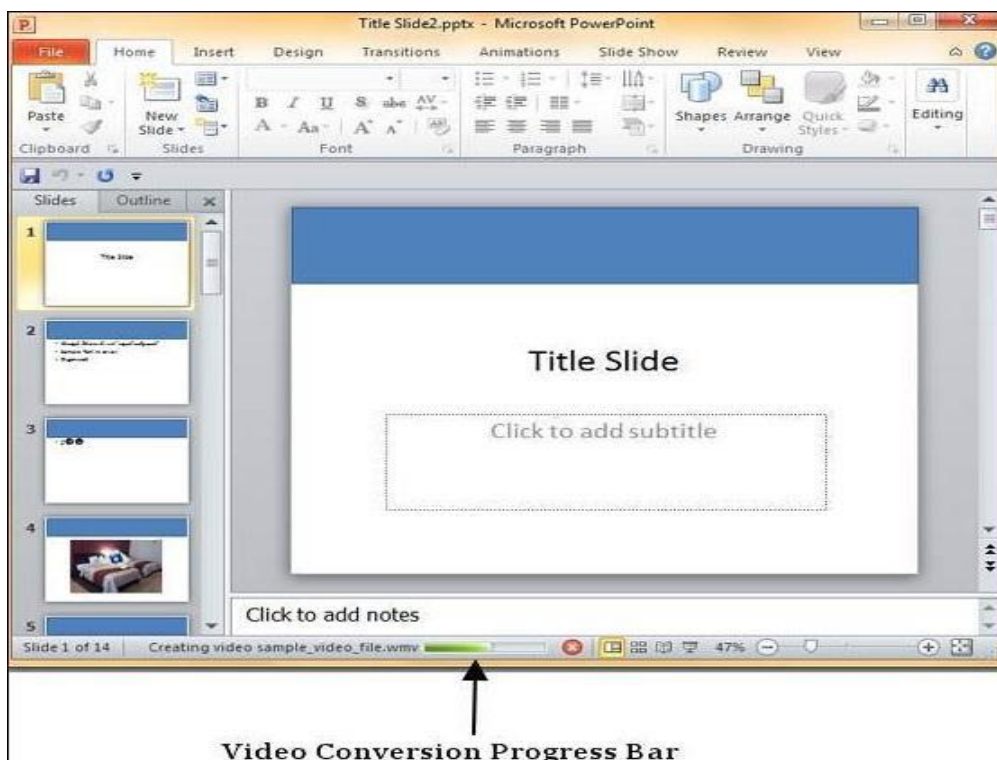
Step 6 – Once the creation is complete, the video file is created in the specified location.
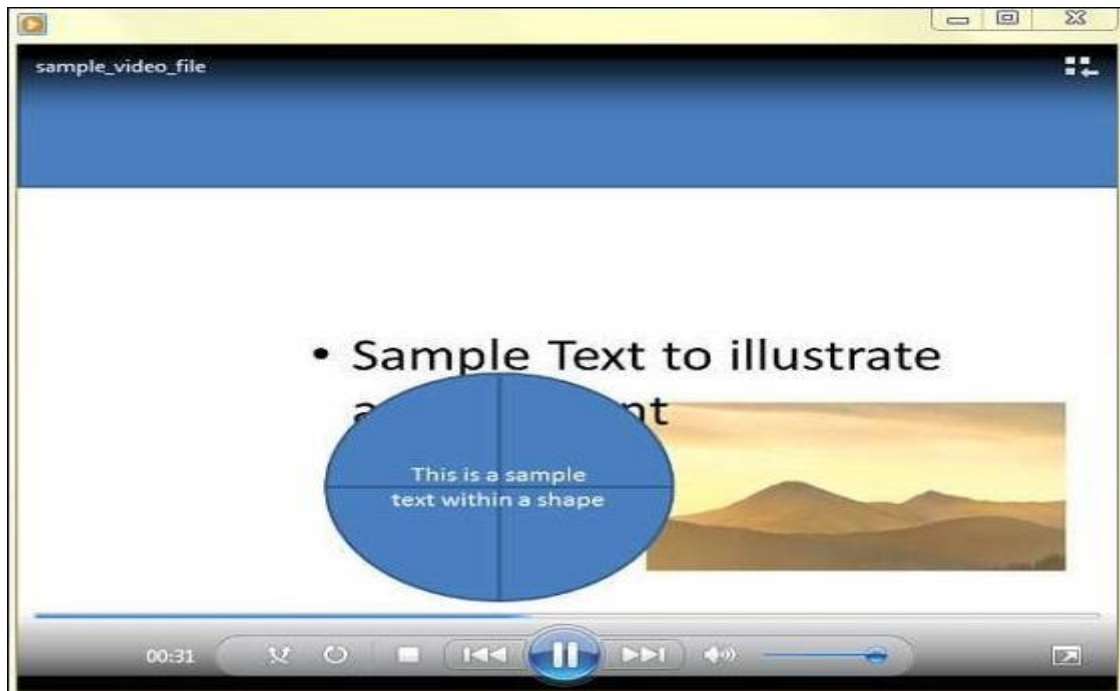
6.1.4.3 Inserting tables

- Place the cursor on the slide where you want to insert the table
- Click the Insert tab, it will display Tables group on the left
- Click the Table button, it will display four options to insert the table:

1) Highlight the Number of Rows and Columns

You will see small boxes on top, select the boxes corresponding to number of rows and column that you want in your table.

See the image:
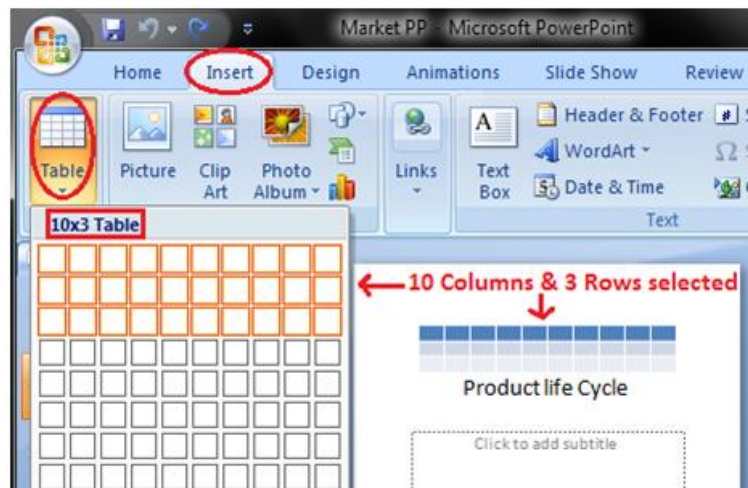
2) Insert Table

Click the Insert Table option and enter the number of rows and columns then click ok.

See the image:
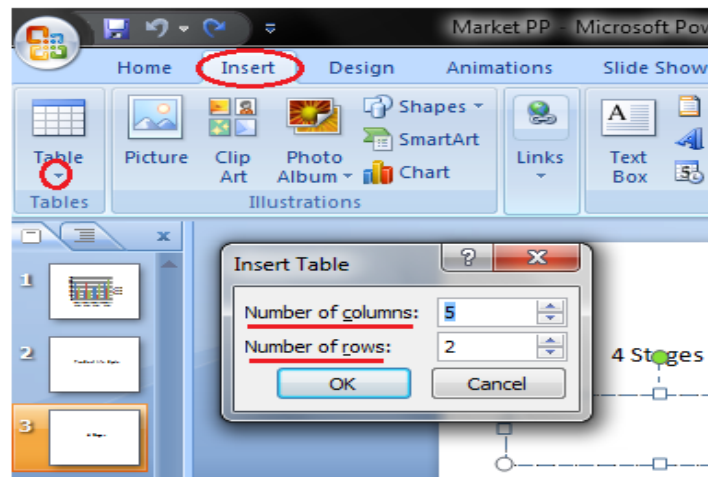
3) Draw Table

Click the Draw Table option and place the cursor on slide. Cursor changes into a pencil. Click and drag the pencil to draw a table border.

See the image:
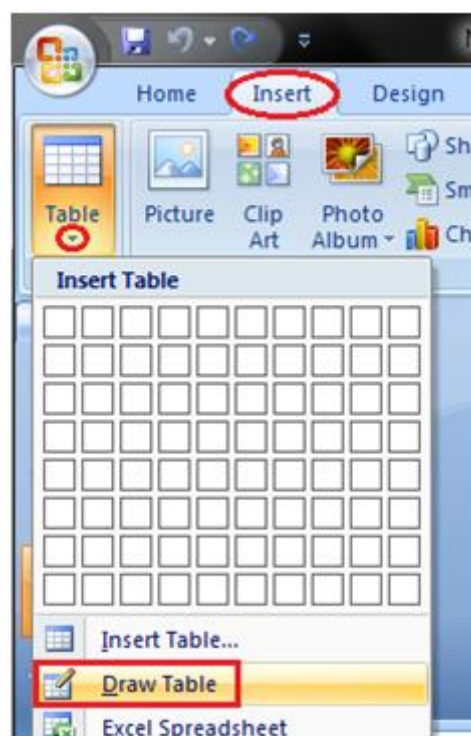
4) Excel Spreadsheet:

Click the Excel Spreadsheet option. Worksheet will appear in the slide, drag it to get the desired number of rows and columns.

See the image:
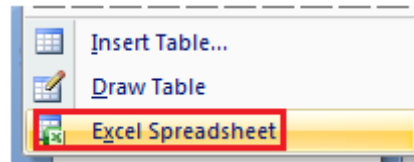
6.1.4.4 Drawing pictures using draw
Create a Drawing

1. Click the **Draw** tab.
2. Click the **Draw with Touch** button.

The mouse cursor changes to a drawing tool, and you can draw a shape by clicking and drawing on the page.

3. Draw a shape using the mouse or touchscreen.
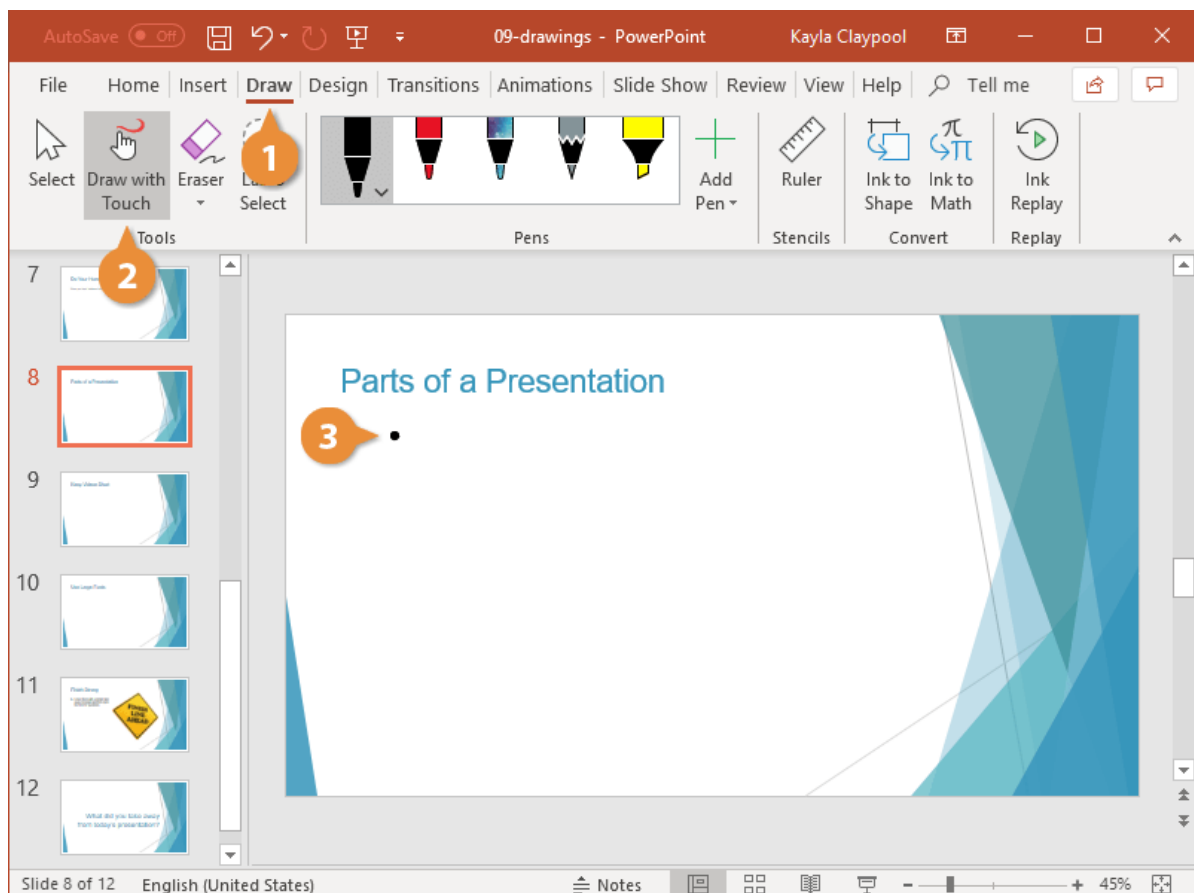
Change Pen Type

While drawing, you also have a number of pen effects to choose from in the Pens gallery.

1. Select a pen from the gallery.
2. Click the active pen in the gallery.
3. Modify the pen's properties.
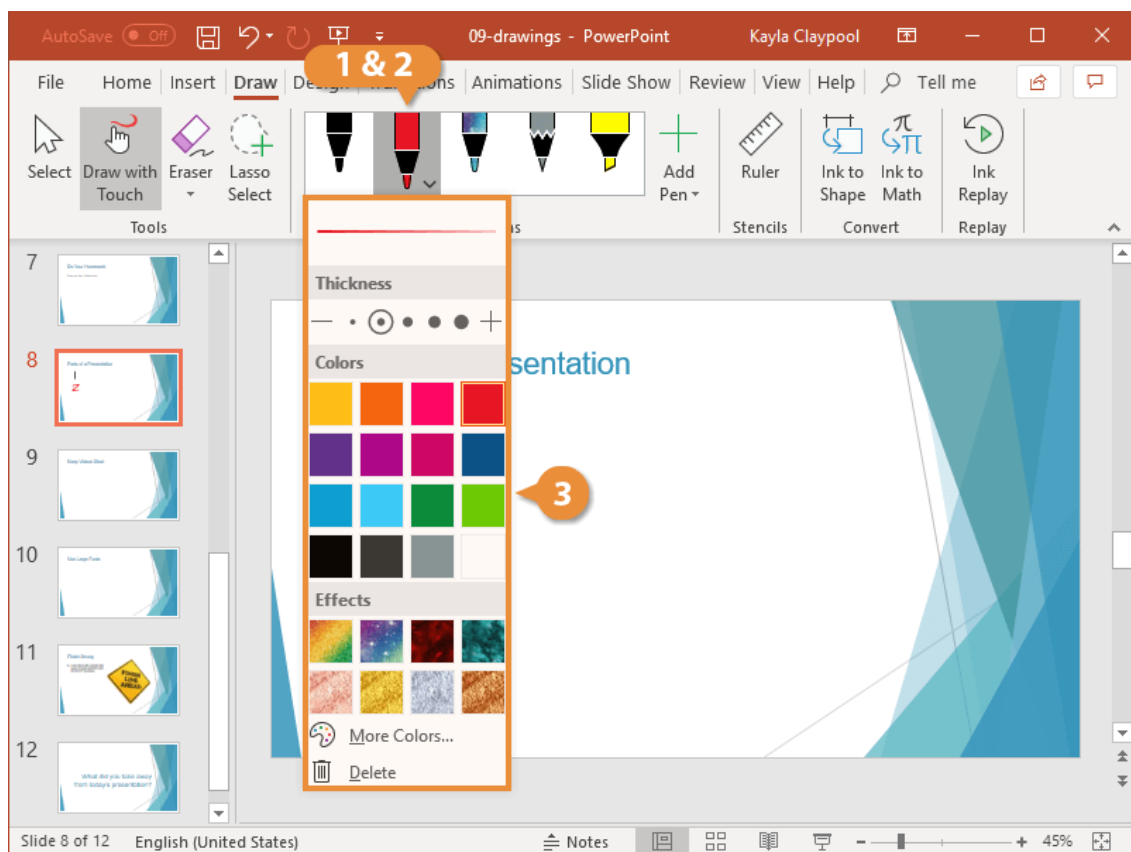
You can also create new pens by clicking the Add Pen button, with the same thickness and color options you have when modifying a pen.

Erase a Drawing

If you've added a drawing that you don't want to keep, you can erase drawings that you've made.

1. Click the **Eraser** button.
2. Click a drawing.
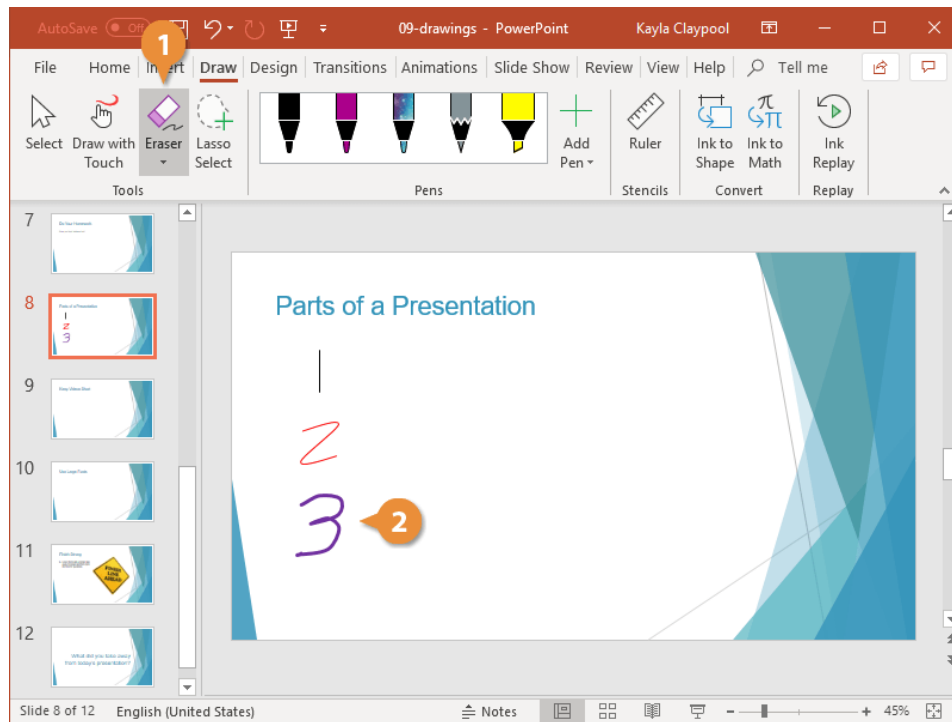
The drawing is erased. If you're finished erasing drawings, click the **Eraser** button again to turn it off.

1. Click the **Eraser** button again.
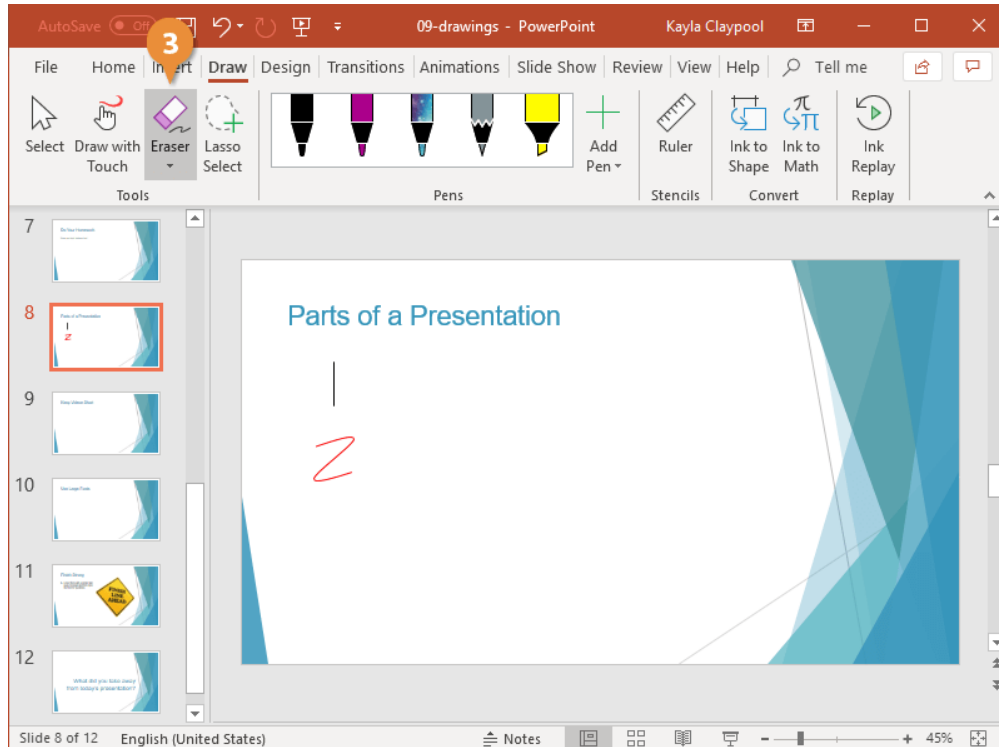
The eraser is turned off, and you can go back to editing your presentation or making more drawings.

6.1.5 Adding Effects to the Presentation

PowerPoint offers animation support which can be used effectively to add some motion in a monotonous presentation and make it more interesting. Animation can be applied to any object on the slide and the motions can the automated, timed or trigger.

6.1.5.1 Setting animation & transition effect
Animations

The following steps will help you add and preview animations in the slide.

Step 1 − Go to the Animation ribbon and click on the Animation Pane to display the animation sidebar.
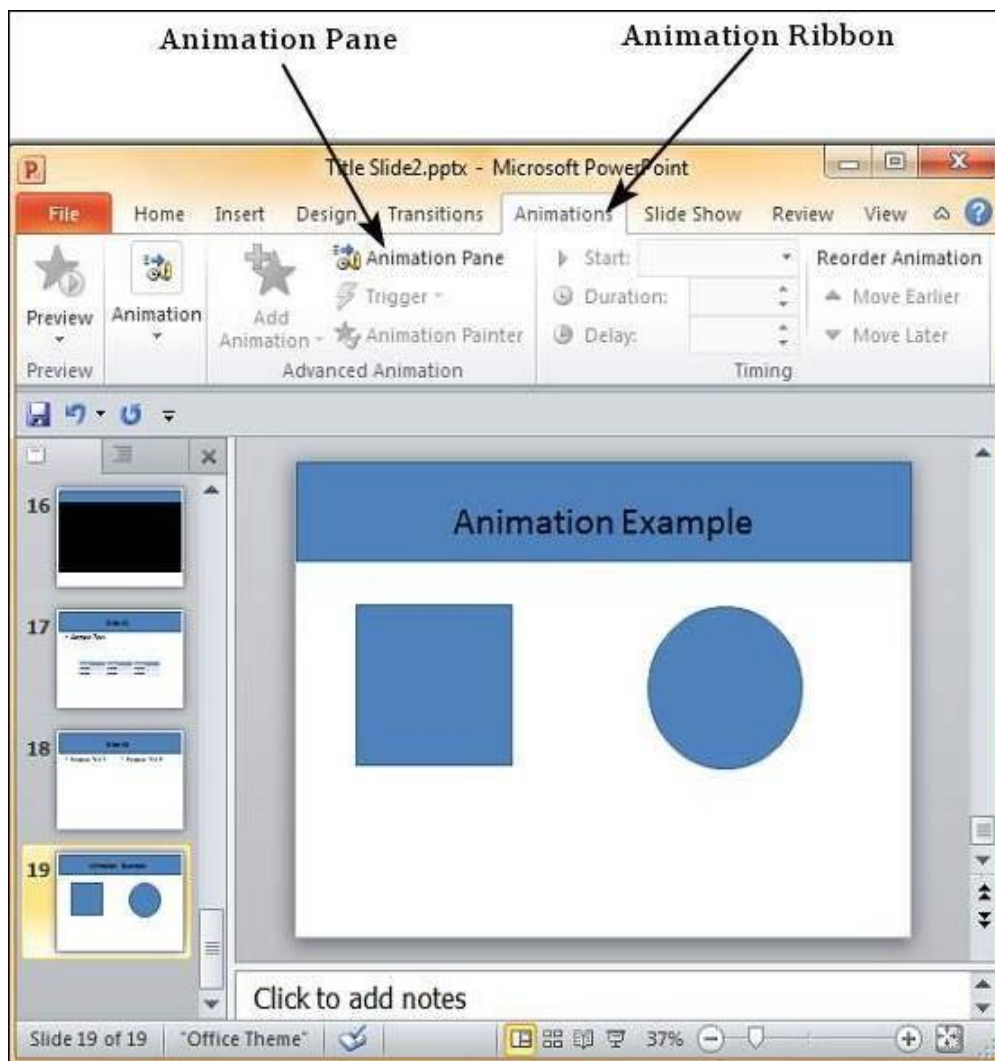
Step 2 – Select one of the objects in the slide and click on the Add Animation menu option.
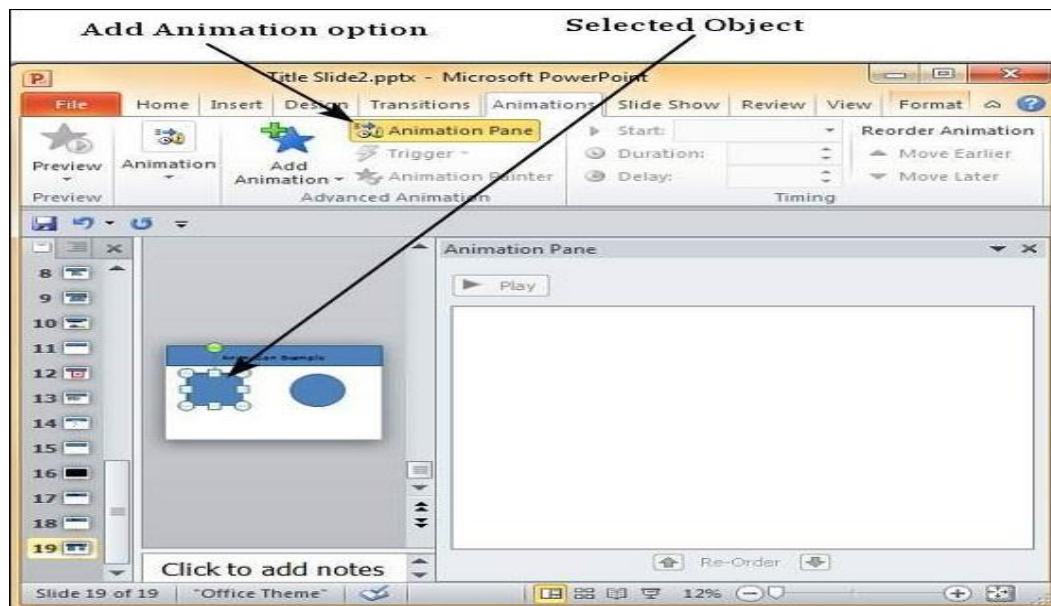
Step 3 – Choose from one of the Animation options.

- Entrance will cause the object to appear in the screen.
- Emphasis will cause the object to emphasis without appearing or leaving the screen.
- Exit will cause the object to disappear from the screen.
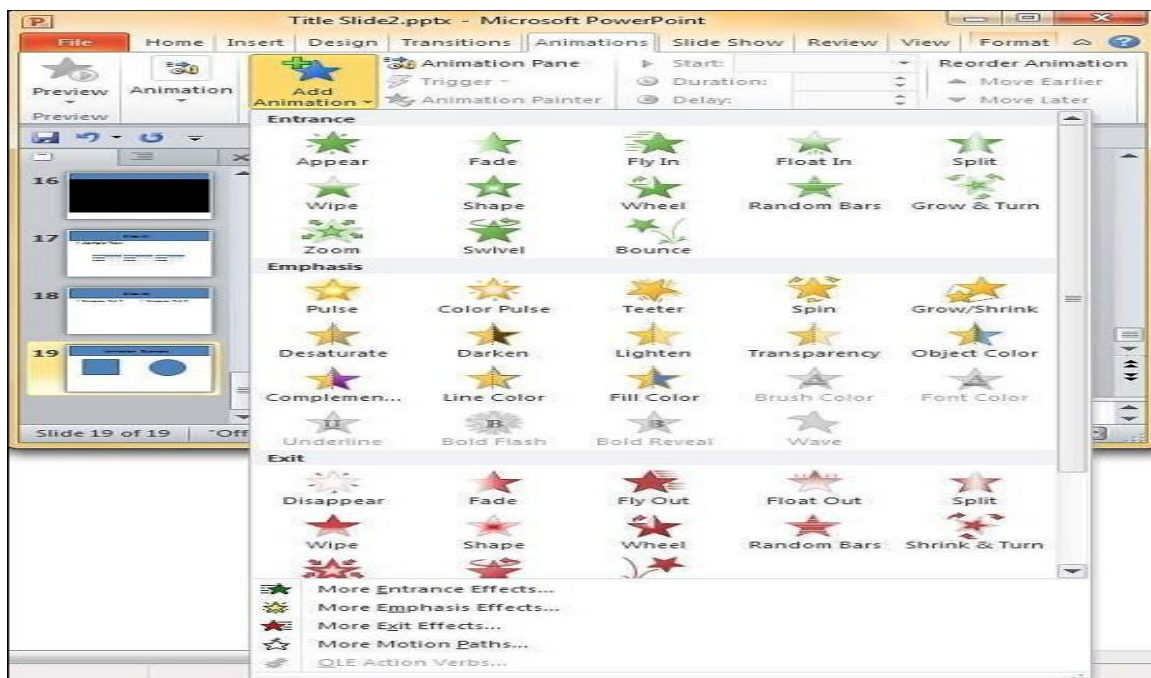
Step 4 - Once you add the animation for an object, it will show up in the Animation pane.
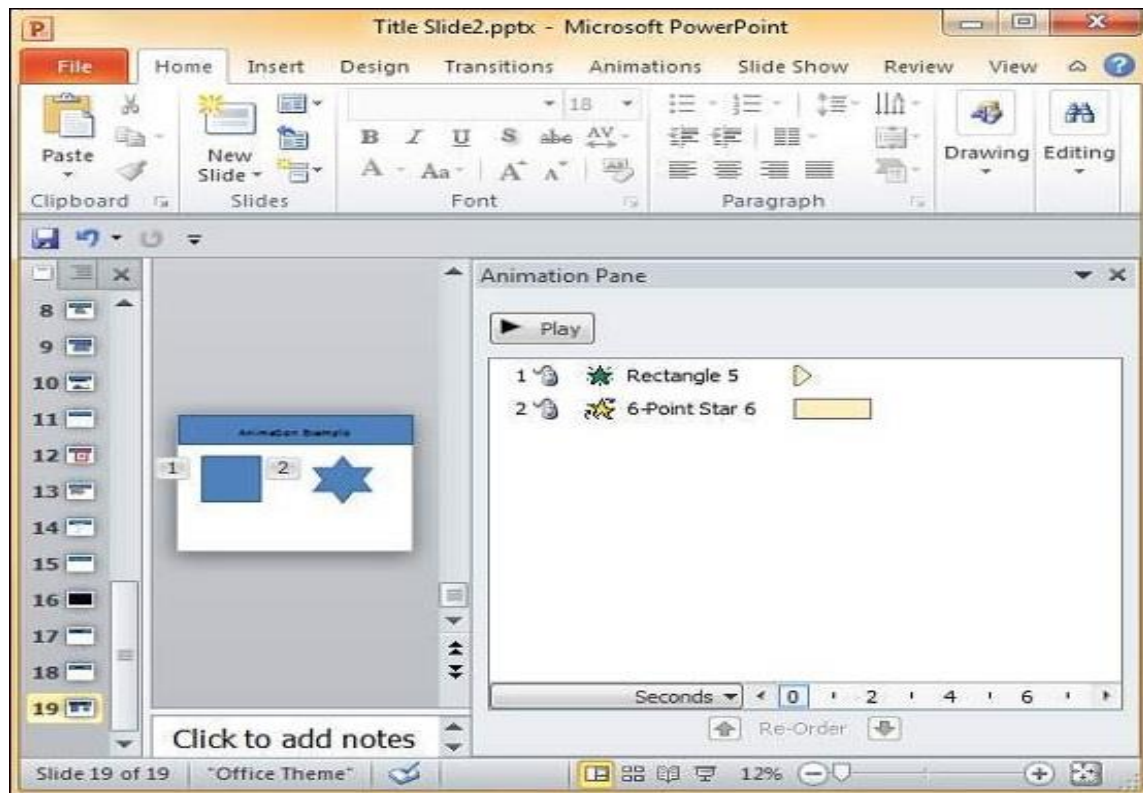
Step 5 – By default, all the animations are initiated by a click, but you can change this. To change the trigger, right-click on the animation object on the pane and choose an alternate trigger.
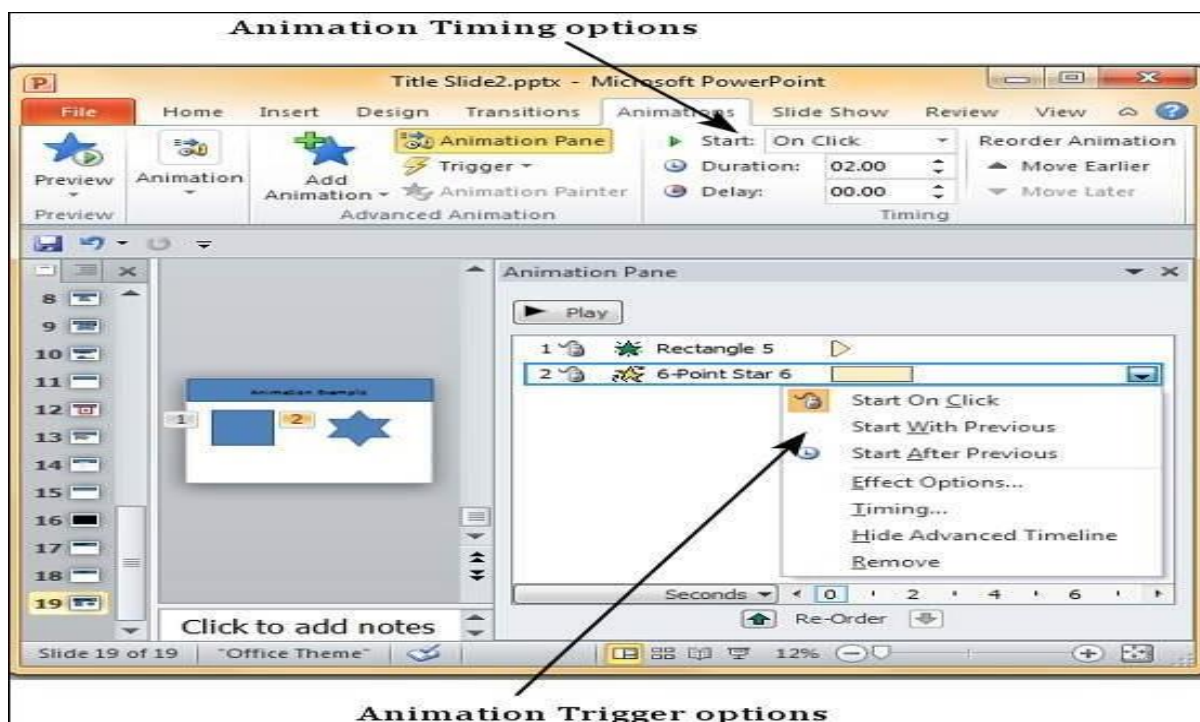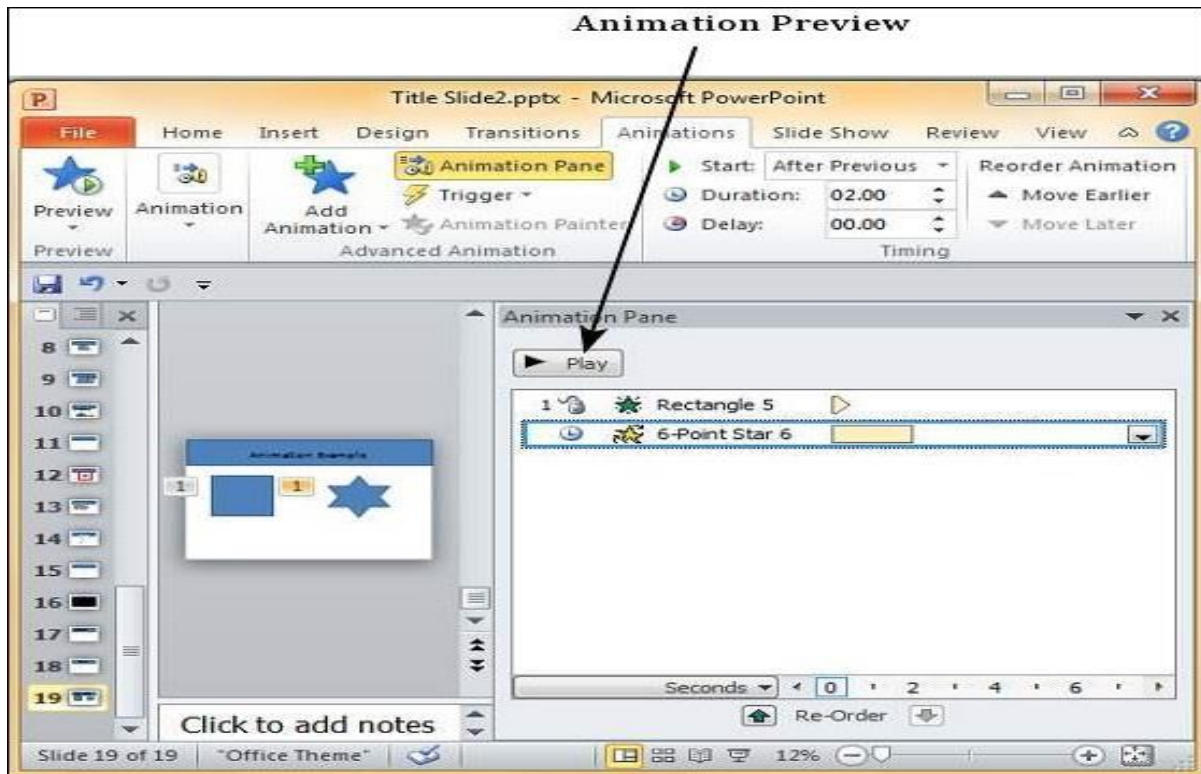
- Start On Click will cause the animation to start when you click the mouse.

- Start With Previous will cause the animation to begin with the previous animation; if this is the first object, it will begin as soon as you reach the slide during the slide show.

- Start After Previous will cause the animation to begin after the previous animation ends.

Step 6 – From the timing section, you can also manipulate the animation timings.

Step 7 – To preview the animation settings, just click Play on the animation pane.

Transitions

Apply a Transition

1. Select the slide that you want to apply a transition to. To select multiple slides, hold down Ctrl as you select each slide.
2. Click the Transitions tab.
3. Click the Slide Transitions More button.
4. Select the transition you want to use.
5. The transition is applied to just the selected slide. To apply the transition to all slides in the presentation, click the Apply to All button on the Transitions tab. To test the transition after it's applied, click the Preview button.
6. To remove a transition, select None in the Slide Transitions gallery.
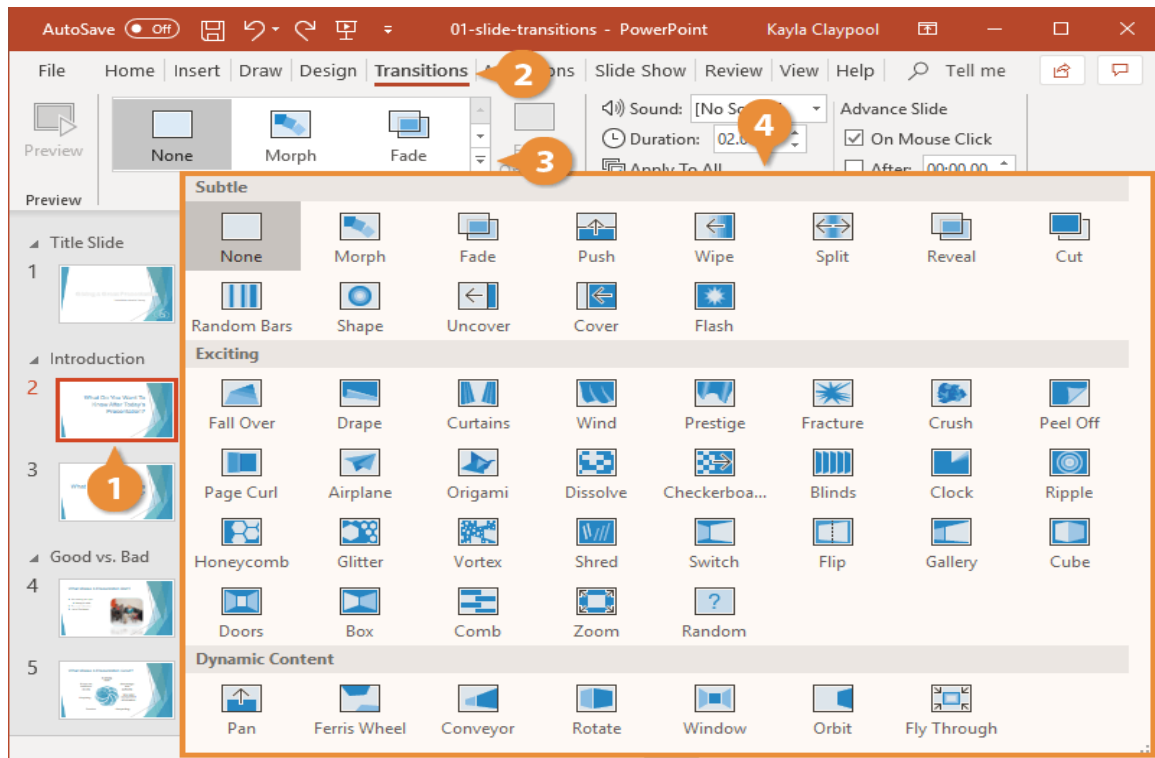
Modify a Transition

A transition effect can be customized, including adjusting its speed or duration and adding sound.

1. Click the Effect Options button.
2. Select an effect option.
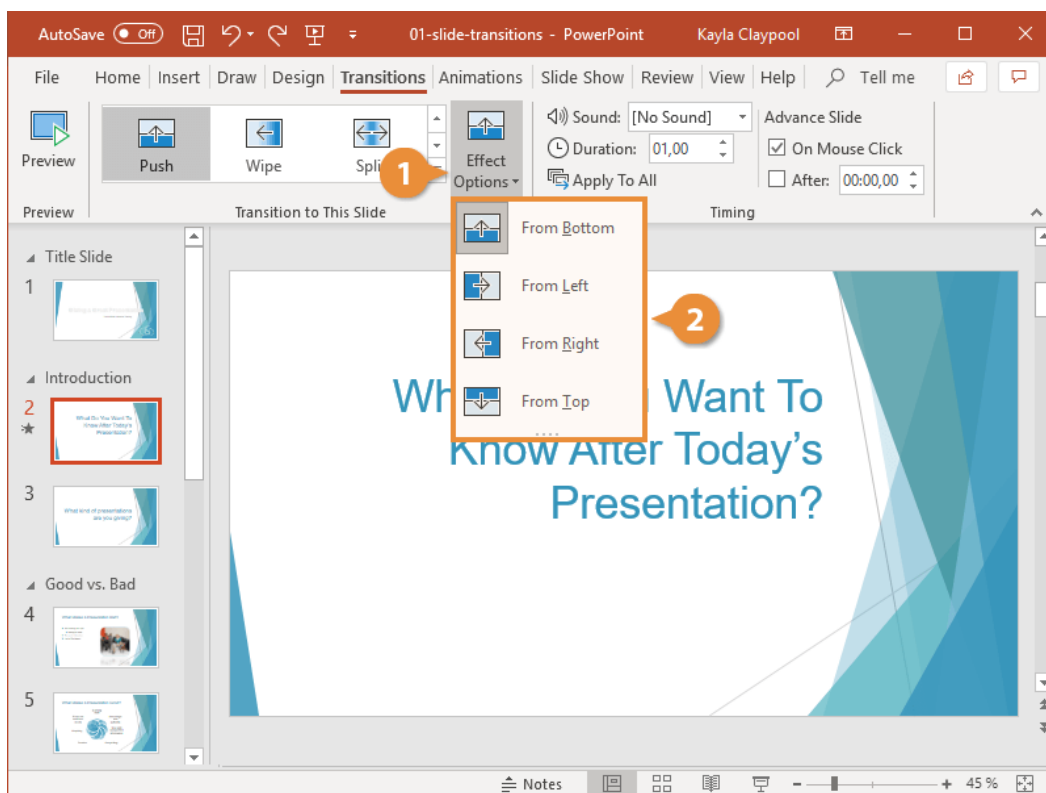
3. Select additional modification options in the Timing group:
   - Sound: Pick a sound to play in unison with the slide transition.
   - Duration: Specify the length of the transition.
   - Apply To All: Apply the current slide's transition, effects, and timing settings to the entire presentation.
   - On Mouse Click: Select this option to have the slide advance when the mouse is clicked.
   - After: Select this option to have the slide advance after the amount of time you specify.
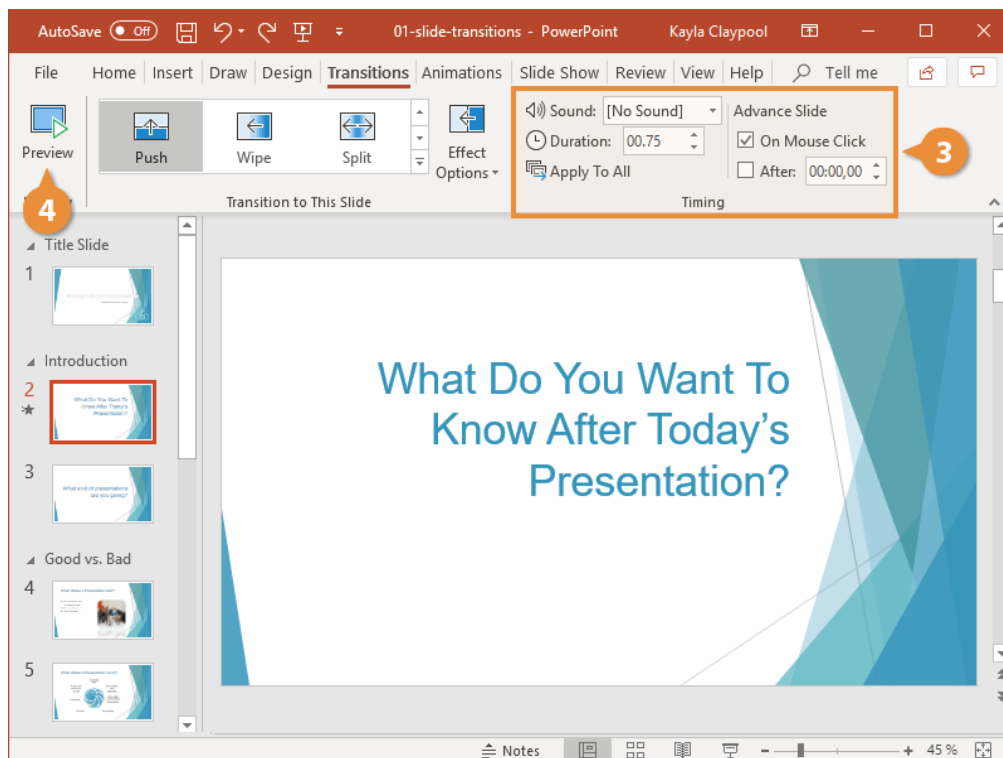
4. Click Preview to see how your transition looks with the modifications applied.

6.1.6 Printing handouts

Print your presentation

1. Select **File** > **Print**.
2. For **Printer**, select the printer you want to print to.
3. For **Settings**, select the options you want:
   - **Print All Slides**: To print each slide on a single sheet or change to just print a range of slides.
   - **Slides**: From the drop-down, choose to print all slides, selected slides, or the current slide. Or, in the **Slides** box, type which slide numbers to print, separated by a comma.

- **Print Layout:** Choose to print just the slides, just the speaker notes, an outline, or handouts. The number of slides per page is also an option, an effective way to save paper.

  The Outline prints only the text in the slides, without images. The Notes of a presentation show the slide and the related speaker notes below it. If you choose to print Handouts, you can print several slides on one page using a variety of layouts, some with space for note-taking.

- **Color:** Choose whether you want color, grayscale, or pure black and white.
- **Edit Header & Footer:** Select to edit the header and footer before printing.
4. For **Copies**, select how many copies you want to print.
5. Select **Print.**

6.1.6.1 Generating standalone presentation viewer

- First open the Presentation, which you wish to convert into a standalone program. Click Save As -> and choose 'PowerPoint Show (.PPS)' from the dropdown of format selection.
- Then run the file and choose **Package for CD,** if you would like to set up Autorun.
- When up for final presentation, export the .PPT as .PPS to easily run the slideshow without accessing the toolbars and edit area.

Using Software

- There are literally hundreds of tools which offer Free PowerPoint to EXE conversion services.
- One of the best tools is VaySoft. Just run the application and choose the Source PowerPoint Presentation file and the destination directory path for the converted file.
- Tick 'Generate Autorun for CD/DVD', if you wish to play it automatically when a CD or DVD loads up.
- You can tweak around with Logo Setup and PowerPoint viewer options.
- These tools make your presentation accessible to everyone without any PowerPoint viewer installed on your PC.

Benefits of Standalone Presentations

- You can directly launch the slideshow, without opening PowerPoint editor.
- The receivers do not need PowerPoint installed for viewing the presentation on their system.
- This makes portability a lot more flexible, because can share the presentation with anyone.
- Compress the files and images into a single executable file.
- However, one drawback is executable files are vulnerable to malicious virus and malware and a few users may be reluctant to download and run them.

6.2 Open Office Impress

6.2.1 Introduction

This easy-to-learn program, which features user-friendly functions and standard toolbars and menus, allows users to create a wide variety of slide layouts for visually attractive presentations. With Impress, users can create slides that contain many different elements, including: text, bulleted and numbered lists, tables, charts, clip art, and a wide array of graphic objects. It also comes complete with spell check, a thesaurus, pre-set text styles, attractive background styles, and a handy help menu.

To create professional presentations in a short period of time. It features instructions, screenshots, and helpful hints that guide users through the Impress environment while designing presentations

6.2.1.1 Creating Presentation

This section shows how to set up a new presentation.

Start AutoPilot presentation

After launching Impress, AutoPilot Presentation window number 1 will appear (see Figure 1). If it does not, then go to **File** > **AutoPilot** > **Presentation**.

1) Under **Type**, select one of the following options:

• Empty Presentation creates a presentation from scratch.

• From Template uses a template design already created as the base of a new presentation.

• Open Existing Presentation continues work on a previously created presentation.

2) Click **Next.**

Figure 1

Window number 2

AutoPilot Presentation window number 2 will appear (see Figure 2).

 1. Under Select a slide design, choose a design, or to leave it blank, select <Original>.

2. Under Select an output medium, select how the presentation will be used. Most often, the presentations are created for a screen.

3. Click Next.

Figure 2

Choose the desired option from the effect menu. This option Effect creates transitions between all the slides in the presentation.

1. To not have any transition effects, select No Effect. This option can be changed later, and each slide can have different transitions, if desired. For more information, see section 5–Transitions between slides.

2. Select the desired speed for the transition between the different slides in the presentation from the speed menu.

3. Click Create. A new presentation is created.

Figure 3

Modify Slide during Autopilot

The Modify Slide window will appear (see Figure 4). The **Select an AutoLayout** section contains a wide variety of slides to incorporate in a presentation. Click the different slides

in this box to see the all of the slides. There are slides with a title, a title and text, a chart, a title and clip art, or other combinations of these options. Notice that the bottom of this frame reflects the type of slide selected.

1) Type in a title for the slide in the area marked **Name.**
2) Select a slide layout from the **Select an AutoLayout** frame.
3) Click **OK.**
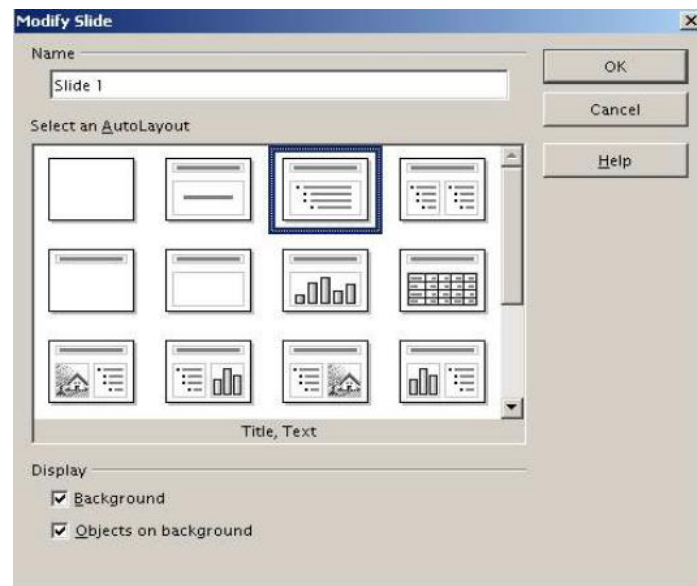
Modify slides

1) Select **Format** > **Modify Layout.** The Modify Slide window will appear (see Figure 7).
2) Modify the layout by choosing a new layout from the **Select an AutoLayout** section.
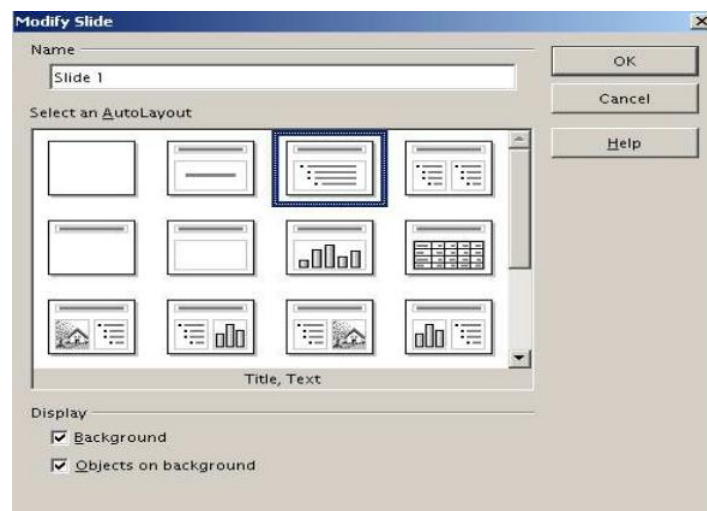
Delete slides
1) Go to the slide to delete.
2) Select **Edit** > **Delete Slide.**
3) Click **Yes.**

Rename slides

1) Select **Format** > **Modify Layout**.

The Modify Slide window will appear. Under **Name**, enter the new name of the slide.

Rearrange slides

Rearranging the slides is most easily done in the **Slides View**.

1) Select **View** > **Workspace** > **Slides View**. The slides will appear in miniature view from left to right, in their current order (see Figure 8).

2) Change the order of the slides by dragging and dropping them to the new location. A black line will appear between the slides. This shows where they will go.

6.2.1.2 Saving presentation files

1. Choose **File > Save As** from the menu bar.
2. Select the location where you want the PowerPoint file saved and type a name for the file.
3. Under *File type*, choose **Microsoft PowerPoint 97/2000/XP (.ppt)**.
4. Click **Save**. The message shown below will appear. Click **Yes** to confirm that you want to save the file in Microsoft PowerPoint format. You can select the checkbox to not show the message again.
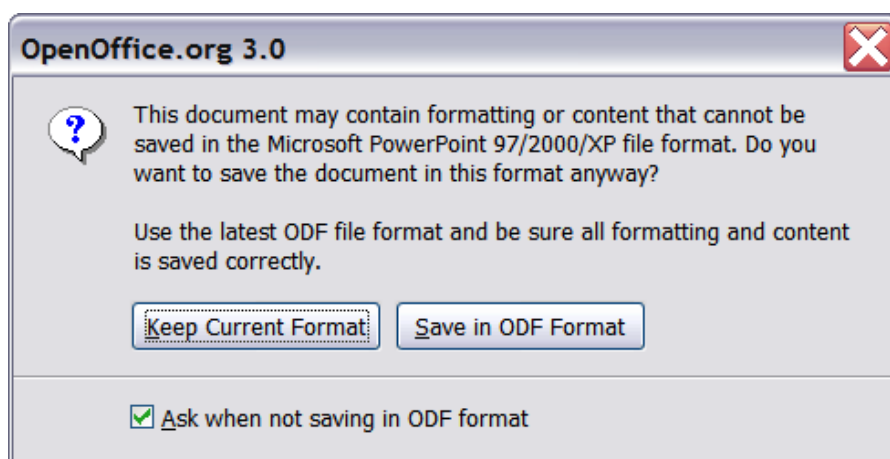
6. 2.1.3 Master templates & re-usability

Creating slide masters

You can create a new slide master in a similar way to modifying the default slide master.

To start, enable editing of slide masters by **View** > **Master** > **Slide Master**.

On the Master View toolbar, click the **New Master** icon (highlighted in the figure).
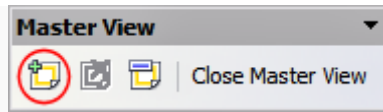
Master View toolbar

A second slide master appears in the Slides pane. Modify this slide master to suit your requirements. It is also recommended that you rename this new slide master. To do that, right-click on the slide in the Slides pane and select **Rename master** from the popup menu.

When you are done, close the Master View toolbar to return to normal slide editing mode.

Applying a slide master

In the Tasks Pane, be sure the Master Pages section is showing.

Available master pages (slides)

To apply one of the slide masters to *all slides* in your presentation, click on it in the list.

To apply a different slide master to one or more *selected slides*:

1. In the Slide Pane, select the slides you want to change.
2. In the Tasks Pane, right-click on the slide master you want to apply to the selected slides, and click **Apply to Selected Slides** on the pop-up menu.

6. 2.1.4 Slide transitions
Adding transitions

1. In the Sidebar, select the Slide Transition icon to open the Slide Transition section
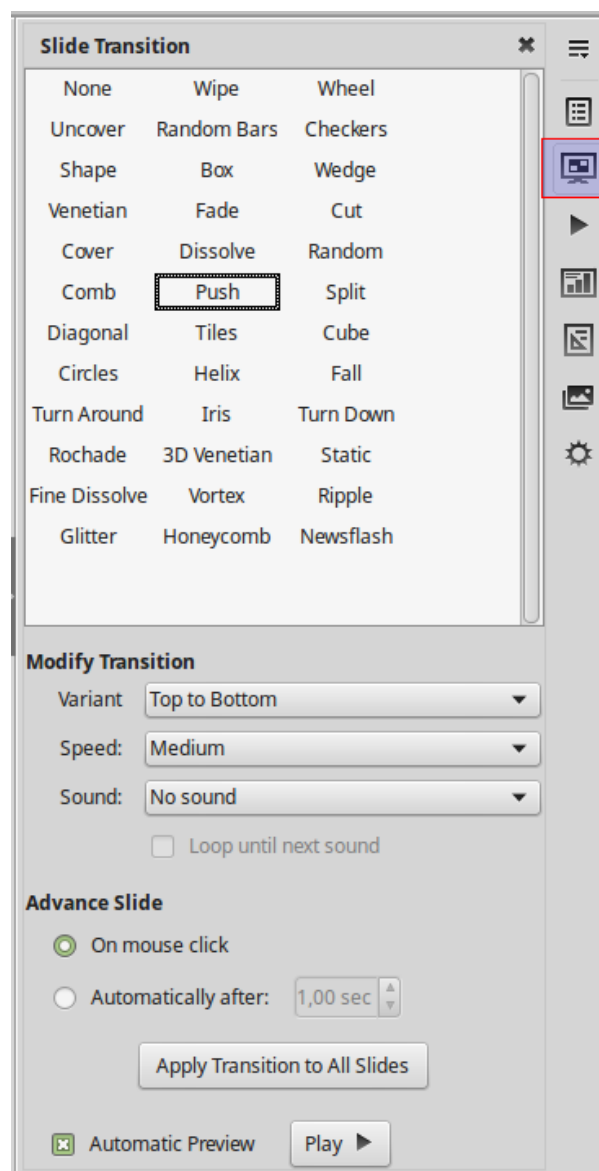
2. In the Slides Pane **select the slide** or slides to apply the transition
3. In the Sidebar select one of the available transitions. When you click in a transition you preview the effect in Impress workspace.

4. **Modify** the selected transition by changing the **speed** or adding a **sound**, in the Modify transition section. If you decide to play a sound during transitions, select a sound from the Sound list.
5. If a sound is selected, the **Loop until next sound** option becomes active. Select this option to play the sound repeatedly until another sound starts. If there are no subsequent sounds in your slide show, the selected sound will play continuously for the remainder of the show.
6. Select how to **advance** to the next slide: **manually** (On mouse click) or **automatically** (Automatically after). If you select an automatic advance, you can specify how long the slide remains visible before it automatically advances to the next slide.
7. If you want the transition to apply to all slides, click **Apply to All Slides.**

If the **Automatic preview** checkbox is marked, the effect of a selected transition is immediately displayed in the work area. You can replay the effect at any time by clicking **Play.**

While using many different transitions may be fun to do, it may not give your slide show a professional appearance.

Removing transitions

To remove a slide transition:

1. Select the slides from where you want to remove the transitions.
2. Select None transition in the Slide Transition pane.
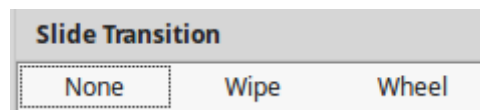
6.2.1.5 Making presentation CDs
Save your package to a CD

1. Insert a blank recordable CD (CD-R), a blank rewritable CD (CD-RW), or a CD-RW (that contains existing content that can be overwritten) in the disk drive.
2. In PowerPoint, click **File**, click **Export**, click **Package Presentation for CD**, and then click **Package for CD.**
3. In the **Package for CD** dialog box, type a name for your CD in the **Name the CD** box.
4. To add one or more presentations to package together, click **Add**, select the presentation, and then click **Add**. Repeat this step for each presentation that you want to add.

Tip: If you add more than one presentation, they'll play in the order in which they are listed in the **Files to be copied** list. Use the arrow buttons on the left side of the dialog box to re-order the list of presentations.

5. To include supplementary files such as TrueType fonts or linked files, click **Options**.
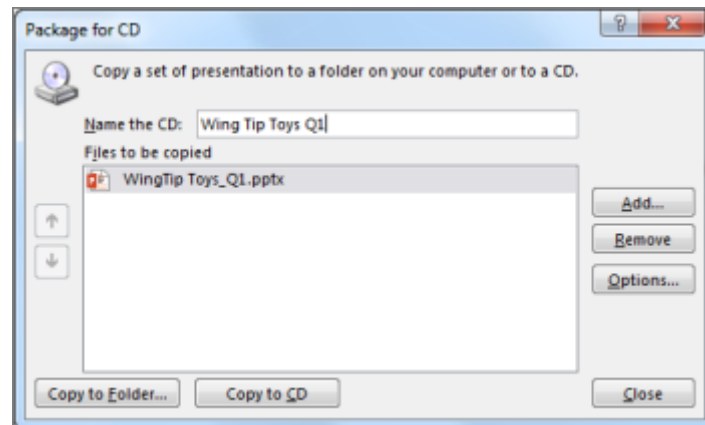
6. Under **Include these files**, select the applicable check boxes:

    To inspect your presentation for hidden data and personal information, select the **Inspect presentation for inappropriate or private information** check box.

7. Click **OK** to close the **Options** dialog box.
8. In the **Package for CD** dialog box, click **Copy to CD**.

6. 2.1.6 Printing Handouts

Handouts

In the Handout view you can check, how the documents for the listeners look like. If you prefer another sharing out of the slides, you can change the Layout in the Task pane on the right side. This selection is used after a mouse click for all pages of the handout.

Printing

If you want to print your presentation directly, you can click the Printer button (printer symbol) in the Standard bar. Special adjustments can be done in the menu File > Print.

Here you can define if all pages should be printed, or only individual pages.

When you click the Options button a dialog box will appear, where you can define, that notes or handouts should be printed too.

6. 2.1.7 Operating with MS power Point files / slides

Use File > Save As to save your presentation as one of the file types listed below.

The default file format in PowerPoint version 2007 or newer is .pptx

File type	Extension	Use to save
PowerPoint Presentation	.pptx	A presentation that you can open on a PC in PowerPoint 2007 and newer versions, or that you can open on a Mac in PowerPoint 2008 and newer versions. You can also open the presentation on any mobile device that has PowerPoint installed.
PDF Document Format	.pdf	A PostScript-based electronic file format developed by Adobe Systems that preserves document formatting and enables file sharing.
PowerPoint 97-2003 Presentation	.ppt	A presentation that you can open in PowerPoint 97 to Office PowerPoint 2003.

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UNIT – 7

INTERNET & INTRODUCTION TO VARIOUS DEVICES AND TOOLS

7.1 Computer Networks

A computer network is a set of computers sharing resources located on or provided by network nodes. The computers use common communication protocols over digital interconnections to communicate with each other. These interconnections are made up of telecommunication network technologies, based on physically wired, optical, and wireless radio-frequency methods that may be arranged in a variety of network topologies.

7.1.1 Data Communication

Data Communications

Components of a data communication

The five components are :

1. Message - It is the information to be communicated. Popular forms of information include text, pictures, audio, video etc.

2. Sender - It is the device which sends the data messages. It can be a computer, workstation, telephone handset etc.

3. Receiver - It is the device which receives the data messages. It can be a computer, workstation, telephone handset etc.

4. Transmission Medium - It is the physical path by which a message travels from sender to receiver. Some examples include twisted-pair wire, coaxial cable, radio waves etc.

5. Protocol - It is a set of rules that governs the data communications. It represents an agreement between the communicating devices. Without a protocol, two devices may be connected but cannot communicate.
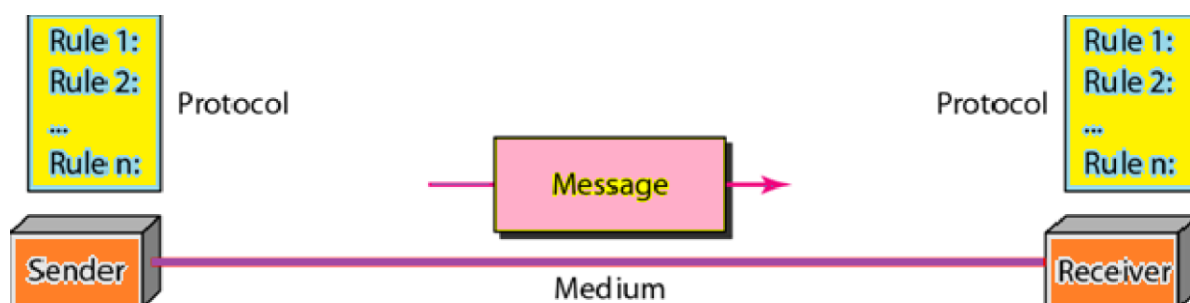
7.1.2 Types of Computer Networks

1. Local Area Network (LAN)
2. Metropolitan Area Network (MAN)
3. Wide area network (WAN)
4. campus area network (CAN)
5. Home Area Networks (HAN)

7.1.3 Local Area Networks & Wide Area Networks

Local Area Network (LAN) is generally a privately owned network within a single office, building or campus, covering a distance of a few kilometres. The main reason for designing a LAN is to share resources such as disks, printers, programs and data. Depending on the needs the LAN can be limited two PC's and a printer.   LAN size is

limited to a few kilometres. They are designed to allow resources to be shared between personal computers or workstations.

The resources include both hardware like printer or software like application program or data.
Here one computer may be provided with higher capacity hard disk which can act as the server and remaining as clients or workstations.
Topology mostly adopted in use are bus, ring,star.

A Wide area network (WAN) is a telecommunication network that is used for connecting computers and covers a wide geographical area. WANs often contain a few smaller networks (LANs, MANs, etc.).A WAN span across city, state, country or even continent boundaries.
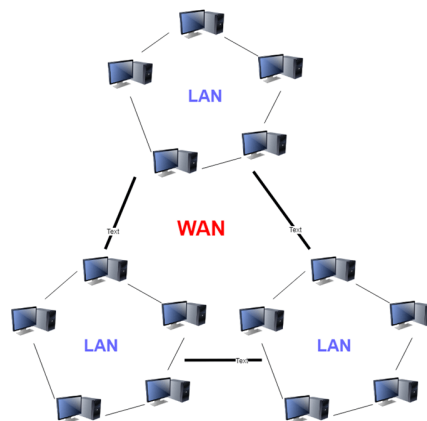
7.2 Internet and Web Browsers
It is a worldwide system which has the following characteristics:
- Internet is a world-wide / global system of interconnected computer networks.
- Internet uses the standard Internet Protocol (TCP/IP)
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 110.22.33.114) which identifies a computer's location.

- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name.

For example, a DNS server will resolve a name **http://www.google.com** to a particular IP address to uniquely identify the computer on which this website is hosted.
Internet is accessible to every user all over the world by using various devices both by wired and wireless.

Web Browser

The web browser is an application software to explore www (World Wide Web). It provides an interface between the server and the client and requests to the server for web documents and services. It works as a compiler to render HTML which is used to design a webpage. Whenever we search anything on the internet, the browser loads a web page written in HTML, including text, links, images, and other items such as style sheets and JavaScript functions. Google Chrome, Microsoft Edge, Mozilla Firefox, Safari are examples of web browsers.

A web browser helps us find information anywhere on the internet. It is installed on the client computer and requests information from the webserver such a type of working model is called a client-server model.
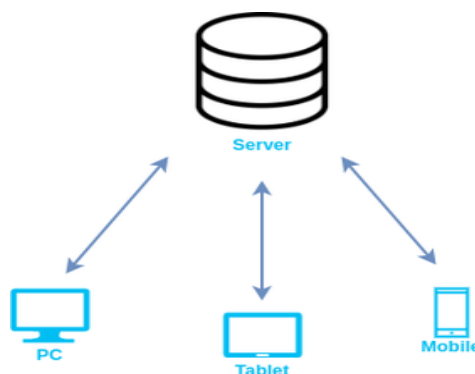
7.2.1 Definition & History of Internet

Internet & World Wide Web The internet is a globally connected network system that transmit data via various types of media. The internet is a network of global exchanges – including private, public, business, academic and government networks – connected by guided, wireless and fiber-optic technologies.

The terms internet and World Wide Web are often used interchangeably, but they are not exactly the same thing; the internet refers to the global communication system, including hardware and infrastructure, while the web is one of the services communicated over the internet. Billions of internet users rely on multiple application and networking technologies, including:

Internet Protocol (IP): The internet's primary component and communications backbone. Because the internet is comprised of hardware and software layers, the IP communication standard is used to address schemes and identify unique connected devices. Prominent IP versions used for communications include Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6).

Communications: The internet is the most cost-effective communications method in the world, in which the following services are instantly available:

- Email
- Web-enabled audio/video conferencing services
- Online movies and gaming
- Data transfer/file-sharing
- Instant messaging
- Social networking
- Online shopping
- Financial services

History of Internet The first workable prototype of the Internet came in the late 1960s with the creation of ARPANET, or the Advanced Research Projects Agency Network. Originally funded by the U.S. Department of Defense, ARPANET used packet switching to allow multiple computers to communicate on a single network.

The technology continued to grow in the 1970s after scientists Robert Kahn and Vinton Cerf developed Transmission Control Protocol and Internet Protocol, or TCP/IP, a communications model that set standards for how data could be transmitted between multiple networks. ARPANET adopted TCP/IP on January 1, 1983, and from there researchers began to assemble the "network of networks" that became the modern Internet.

The online world then took on a more recognizable form in 1990, when computer scientist Tim Berners-Lee invented the World Wide Web. While it's often confused with the Internet itself, the web is actually just the most common means of accessing data online in the form of websites and hyperlinks. The web helped popularize the Internet

among the public, and served as a crucial step in developing the vast trove of information that most of us now access on a daily basis.

World Wide Web

The World Wide Web (WWW), commonly known as the Web, is an information system where documents and other web resources are identified by Uniform Resource Locators (URLs, such as https://www.example.com/), which may be interlinked by hypertext, and are accessible over the Internet.

The resources of the WWW may be accessed by users by a software application called a web browser. English scientist Tim Berners-Lee invented the World Wide Web in 1989. He wrote the first web browser in 1990 while employed at The European Organization for Nuclear Research (CERN) near Geneva, Switzerland. The browser was released outside CERN in 1991, first to other research institutions starting in January 1991 and then to the general public in August 1991.

The World Wide Web has been central to the development of the Information Age and is the primary tool billions of people use to interact on the Internet. Web resources may be any type of downloaded media, but web pages are hypertext media that have been formatted in Hypertext Markup Language (HTML). Such formatting allows for embedded hyperlinks that contain URLs and permit users to navigate to other web resources. In addition to text, web pages may contain images, video, audio, and software components that are rendered in the user's web browser as coherent pages of multimedia content. The terms Internet and World Wide Web are often used without much distinction. However, the two terms do not mean the same thing. The Internet is a global system of interconnected computer networks. In contrast, the World Wide Web is a global collection of documents and other resources, linked by hyperlinks and URIs.

7.2.2 Uses of Internet
1. **Electronic mail.** At least 85% of the inhabitants of cyberspace send and receive e-mail. Some 20 million e-mail messages cross the Internet every week.

2. **Research.**

3. **Downloading files.**

4. **Discussion groups.** These include public groups, such as those on Usenet, and the private mailing lists that ListServ manages.

5. **Interactive games.** Who hasn't tried to hunt down at least one game?

6. **Education and self-improvement.** On-line courses and workshops have found yet another outlet.

7. **Friendship and dating.** You may be surprised at the number of electronic "personals" that you can find on the World Wide Web.

8. **Electronic newspapers and magazines.** This category includes late-breaking news, weather, and sports. We're likely to see this category leap to the top five in the next several years.

9. **Job-hunting.** Classified ads are in abundance, but most are for technical positions.

10. **Shopping.** It's difficult to believe that this category even ranks. It appears that "cybermalls" are more for curious than serious shoppers.

7.2.3 Definition of Web-Addressing - URL

A website address, also known as a URL (uniform resource locator), is an Internet or intranet name that points to to a location where a file, directory or website page is hosted. Website addresses can represent the home page of a web site, a script, image, photo, movie or other file made available on a server for viewing, processing or download. They can also be embedded into the code of web pages in the form of hyperlinks to direct the user to other locations on the Internet.

7.2.4 Different types of Internet Connections
Understanding the difference between Internet Connections

When determining which type of Internet speed and Internet connection type is right for you or your family, it's important to understand the distinction between each connection. In today's age, there are numerous ways to connect laptops, desktops, mobile phones, gaming consoles, e-readers and tablets to the Internet. Some of the most widely used Internet connections are described below.

1. Dial-up Connection

Dial-up connections require users to link their phone line to a computer in order to access the Internet. This particular type of connection—also referred to as analog—does not permit users to make or receive phone calls through their home phone service while using the Internet. Now more outdated, a dial-up connection used to be among the most common Internet connection type.

2. Broadband

This high-speed Internet connection is provided through either cable or telephone companies. One of the fastest options available, broadband Internet uses multiple data channels to send large quantities of information. The term broadband is shorthand for broad bandwidth. Broadband Internet connections such as DSL and cable are

considered high-bandwidth connections. Although many DSL connections can be considered broadband, not all broadband connections are DSL.

ISDN

ISDN (Integrated Services Digital Network) allows users to send data, voice and video content over digital telephone lines or standard telephone wires. The installation of an ISDN adapter is required at both ends of the transmission—on the part of the user as well as the Internet access provider.

There are quite a few other Internet connection options available, including T-1 lines, T-3 lines, OC (Optical Carrier) and other DSL technologies.

As you decide what Internet connection is the best fit for your needs, you may wish to narrow down your selection based on your preferred download and upload speeds, or based on deals and pricing options. Reliably fast speeds and comprehensive coverage make it easier than ever to stream your favorite TV shows and movies, share photos, chat with friends and play games online.

DSL

DSL, which stands for Digital Subscriber Line, uses existing 2-wire copper telephone line connected to one's home so service is delivered at the same time as landline telephone service. Customers can still place calls while surfing the Internet.

Cable

Cable Internet connection is a form of broadband access. Through use of a cable modem, users can access the Internet over cable TV lines. Cable modems can provide extremely fast access to the Internet, making a cable connection a viable option for many.

3. Wireless

Wi-Fi Hotspots

Wifi Hotspots are sites that offer Internet access over a wireless local area network (WLAN) by way of a router that then connects to an Internet service provider. Hotspots utilize WiFi technology, which allows electronic devices to connect to the Internet or exchange data wirelessly through radio waves. Hotspots can be phone-based or free-standing, commercial or free to the public.

WiMax

WiMax is a standardized wireless version of Ethernet intended primarily as an alternative to wire technologies (such as Cable Modems, DSL and T1/E1 links) to provide broadband access to customer premises. WiMAX would operate similar to WiFi, but at higher speeds over greater distances and for a greater number of users. WiMAX has the ability to

provide service even in areas that are difficult for wired infrastructure to reach and the ability to overcome the physical limitations of traditional wired infrastructure.

Satellite

In certain areas where broadband connection is not yet offered, a satellite Internet option may be available. Similar to wireless access, satellite connection utilizes a modem.

Mobile

Many cell phone and smartphone providers offer voice plans with Internet access. Mobile Internet connections provide good speeds and allow you to access the Internet.

Naming convention

- 802.11n technology will be referred to as Wi-Fi 4
- 802.11ac technology will be referred to as Wi-Fi 5
- 802.11ax technology will be referred to as Wi-Fi 6

7.2.5 Browsers and its types, Internet Browsing

Web Browsers are software installed on your PC. To access the Web, you need a web browser, such as Netscape Navigator, Microsoft Internet Explorer or Mozilla Firefox.

Currently you must be using any sort of Web browser while you are navigating through our site tutorialspoint.com. On the Web, when you navigate through pages of information, this is commonly known as web browsing or web surfing.

There are four leading web browsers – Explorer, Firefox, Netscape, and Safari, but there are many others browsers available. You might be interested in knowing Complete Browser Statistics. Now we will see these browsers in bit more detail.

While developing a site, we should try to make it compatible to as many browsers as possible. Especially sites should be compatible to major browsers like Explorer, Firefox, Chrome, Netscape, Opera, and Safari.

 Internet Explorer

Internet Explorer (IE) is a product from software giant Microsoft. This is the most commonly used browser in the universe. This was introduced in 1995 along with Windows 95 launch and it has passed Netscape popularity in 1998.

 Google Chrome

This web browser is developed by Google and its beta version was first released on September 2, 2008 for Microsoft Windows. Today, chrome is known to be one of the most popular web browser with its global share of more than 50%.

Mozilla Firefox

Firefox is a new browser derived from Mozilla. It was released in 2004 and has grown to be the second most popular browser on the Internet.

Safari

Safari is a web browser developed by Apple Inc. and included in Mac OS X. It was first released as a public beta in January 2003. Safari has very good support for latest technologies like XHTML, CSS2 etc.

Opera

Opera is smaller and faster than most other browsers, yet it is full- featured. Fast, user-friendly, with keyboard interface, multiple windows, zoom functions, and more. Java and non Java-enabled versions available.Ideal for newcomers to the Internet, school children, handicap and as a front-end for CD-Rom and kiosks.

Konqueror

Konqueror is an Open Source web browser with HTML 4.01 compliance, supporting Java applets, JavaScript, CSS 1, CSS 2.1, as well as Netscape plugins. This works as a file manager as well as it supports basic file management on local UNIX filesystems, from simple cut/copy and paste operations to advanced remote and local network file browsing.

Lynx

Lynx is a fully-featured World Wide Web browser for users on Unix, VMS, and other platforms running cursor-addressable, character-cell terminals or emulators.

7.2.6 Search Engines

Search Engines are now part of our daily life, whether it be carrying out research for Xmas presents or where is the nearest coffee shop open before 7am or looking for best Steak House in town. People are now becoming more and more dependent on search engines to get the answer for their everyday queries.

At Inspire we monitor our search traffic using a variety of analytics. Most of our queries returned are related to what we do and some are simply bizarre. Those we're interested

in relate to the services of what we do e.g improving search ranking, web design, web development, and many more.

Much as we utilise "all routes to market" we are still heavily dependent on the search engines for our bread & butter traffic.

1. Google

Google Search Engine is the best search engine in the world and it is also one of most popular products from Google. Almost 70 percent of the Search Engine market has been acquired by Google. The tech giant is always evolving and looking to improve the search engine algorithm to provide best results to the end-user. Although Google appears to be the biggest search engine, as of 2015 YouTube is now more popular than Google (on desktop computers).

2. Bing

Bing is Microsoft's answer to Google and it was launched in 2009. Bing is the default search engine in Microsoft's web browser. At Bing, they are always striving to make it a better search engine but it's got a long way to go to give Google competition. Microsoft's search engine provides different services including image, web and video search along with maps. Bing introduced Places (Google's equivalent is Google My Business), this is a great platform for business to submit their details to optimise their search results.

3. Yahoo

Yahoo & Bing compete more with each other than with Google. A recent report on netmarketshare.com tells us that Yahoo have a market share of 7.68 percent. Although a leader as a free email provider, this is declining significantly though with their recent acknowledgement that User Details & Passwords where hacked last year.

4. AOL

Aol.com is also among the top search engines. These are the guys that used to send out CD's which you'd load onto your PC to install their browser and modem software. Once the pre-eminent player they now have a market share of 0.59 percent. Verizon Communication bought AOL for $4.4 billion. It was started back in 1983 as Control Video Corporation. It was named America Online in 1991 and in 2009 as AOL Inc. AOL is a global mass media company which is based in New York. The company also provides advertising services as AOL Advertising, AOL mail and AOL Platform.

7.2.7 Portals

A portal is a web-based platform that collects information from different sources into a single user interface and presents users with the most relevant information for their context. Over time, simple web portals have evolved into portal platforms that support digital customer experience initiatives.

Web Portals Are About Personalized Access

The problem portals tried to solve in the early days of the internet was content discovery. In the face of the vast amount of information available online, the easiest way for the average user to discover information was through a human-curated content hub, known as a portal. Portals could display selected content in order to provide a custom experience for users.

Examples of portals, particularly those that use a login experience, abound in most industries:

- Patient Portals
- Government Portals
- Intranets/Extranets/Workplace Portals
- Knowledge Management Portals
- Student Portals
- Vendor Portals

The basic, uniting concept for each type of portal is personalized access, based on an assigned or assumed user role. For example, workplaces typically have multiple applications that their employees need to access, such as an application for recording time sheets, another for scheduling time off and a third for sending internal communications. Employees are frustrated when they have too many touchpoints that they need to jump between as part of their daily routine. A new employee portal brings together these common services and applications into one place for your team to access, and can further customize the page based on department or role.

This personalization can also extend to anonymous users. Clothing retail sites, for instance, can begin personalizing which products are displayed based on stored information from past visits, even if the user hasn't created an account.

7.2.8 Social Networking Sites

A social networking site is an online platform that allows users to create a public profile and interact with other users. Social networking sites usually allow a new user to provide a list of people with whom they share a connection, and then allow the people on the list to confirm or deny the connection. After connections are established, the new user can search the networks of connections to make more connections.

A social networking site is also known as a social networking website or social website.

There are numerous social networking websites, the following sites are the most popular:

Facebook: Facebook users create profiles, share information, send messages and post status updates on their "walls." Ranked the most active social networking platform by

DataReportal, Facebook has more than 2.9 billion active users. In 2021, the company was renamed Meta to reflect its business beyond just social media.

Top 10 social media sites

This information represents the number of active users or user accounts worldwide.

Platform	Users
Facebook	2.9 B+
YouTube	2 B+*
WhatsApp	2 B+
Instagram	2 B+*
TikTok	1.2 B+
Tumblr	518 M+
Twitter	436 M+
Pinterest	431 M*
Reddit	430 M*
Snapchat	319 M**

*MONTHLY, **DAILY; ILLUSTRATION: ELENABS/GETTY IMAGES   ©2022 TECHTARGET. ALL RIGHTS RESERVED. TechTarget
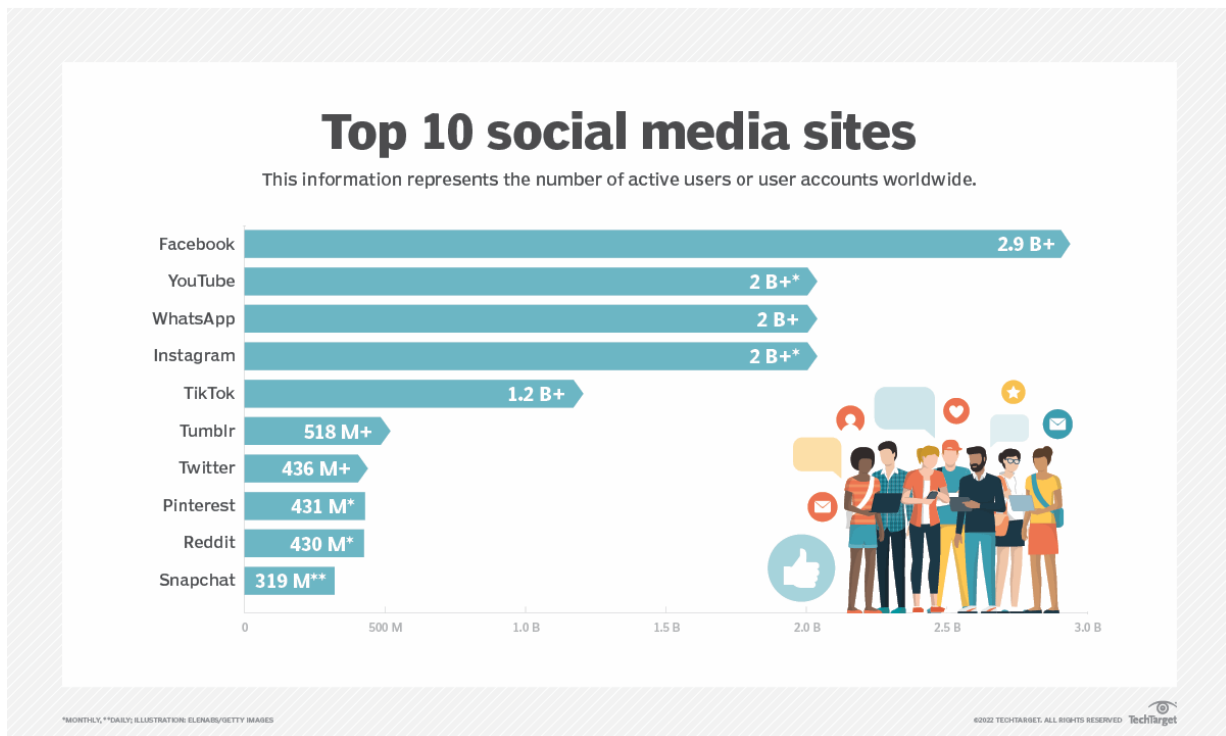
YouTube: This popular video-sharing website enables users to share, upload, and post videos and vlogs. According to Global Media Insight, YouTube has more than 2 billion monthly active users.

WhatsApp: This free instant messaging app lets users send text messages, make video and voice calls, and share documents. According to WhatsApp, it has more than 2 billion users worldwide.

Instagram: This free social media platform enables users to share long- and short-form videos and photos. It is primarily designed for iOS and Android smartphone users, but a desktop version is also available. However, sharing and uploading of content is only available through the Instagram app. Also owned by Meta, Instagram has over 2 billion monthly active users as of December 2021, according to CNBC.

Twitter: Launched in 2006, this social media platform enables users to share their thoughts and opinions with a broad audience by posting messages known as "tweets" that contain up to 280 characters. According to DataReportal, as of January 2022, Twitter has more than 436 million users.

Pinterest: The Pinterest bookmarking site enables users to save and organize links to favorite online resources and destinations through "tagging." According to Pinterest Inc., the platform has 431 million global monthly active users as of December 2021 -- a 6% decrease over the previous year.

7.2.9 Blogs

A blog (a shortened version of "weblog") is an online journal or informational website displaying information in reverse chronological order, with the latest posts appearing first, at the top. It is a platform where a writer or a group of writers share their views on an individual subject.

Blog structure

The appearance of blogs has changed over time, and these days blogs include a wide variety of items and widgets. However, most blogs still include some standard features and structures.

Here are common features that a typical blog will include:

- Header with the menu or navigation bar.
- Main content area with highlighted or latest blog posts.
- Sidebar with social profiles, favorite content, or call-to-action.
- Footer with relevant links like a disclaimer, privacy policy, contact page, etc.

Basic blog structure
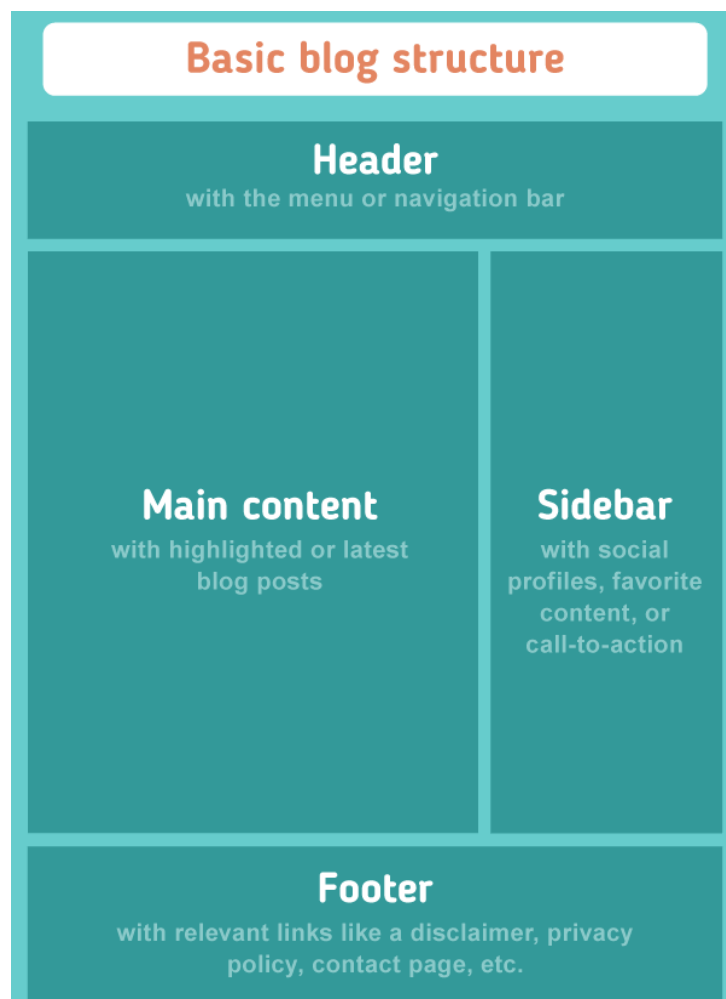
The above example is the basic structure of the average blog. Each item has its own importance and helps visitors to navigate through your blog.

Blogger

A blogger is someone who runs and controls a blog. He or she shares his or her opinion and knowledge on different topics for a target audience.

7.2.10 Viewing a Web page

Everything you view online has been put on a "server" – a computer that is serving the information to you when you request it by typing in a web address or clicking a link in a search engine.

Web pages and documents stored on servers are typically accessed via a Web Browser. There are various browsers available – mainstream examples are Internet Explorer, Firefox, Chrome and Safari. A web browser is just a piece of software you have on your computer that knows how to read and display web pages to you.

You access a website by typing it's address into the address bar on the browser (shown below with a red box around it).

7.2.11 Creating an email-ID

1. Go to the Gmail website.
2. At the bottom of the sign in screen, click the link.
3. On the account creation screen, fill out all the fields (A) and then click Next (B)
4. On the next screen, fill out your **birth date and gender** (**A**) and any other information you are comfortable with, then click **Next** (**B**).
5. Read **Google's Privacy and Terms**, then click the button.
6. Click the button until you've moved through the features menu.
7. Click the button, allowing you to access your new account.

Reading Email

Every email program offers you an interface to access email messages. Like in Gmail, emails are stored under different tabs such as primary, social, and promotion. When you click one of tab, it displays a list of emails under that tab.

In order to read an email, you just have to click on that email. Once you click a particular email, it gets opened.

The opened email may have some file attached with it. The attachments are shown at the bottom of the opened email with an option called **download attachment.**

Replying Email

After reading an email, you may have to reply that email. To reply an email, click **Reply** option shown at the bottom of the opened email.

Once you click on Reply, it will automatically copy the sender's address in to the To field. Below the To field, there is a text box where you can type the message.

Once you are done with entering message, click Send button. It's that easy. Your email is sent.

Saving Email

While composing an email in Gmail / Yahoo it is automatically saved as a draft, preventing accidental data loss in the event of an interrupted connection.

There are a couple of ways to save a message while composing in Gmail fast:
- Stop typing and editing for three seconds, and Gmail saves a draft. The composition window does not close using this method.
- Press the Esc key to save immediately. This saves email to the Drafts label and closes the composition window. The screen returns to inbox.
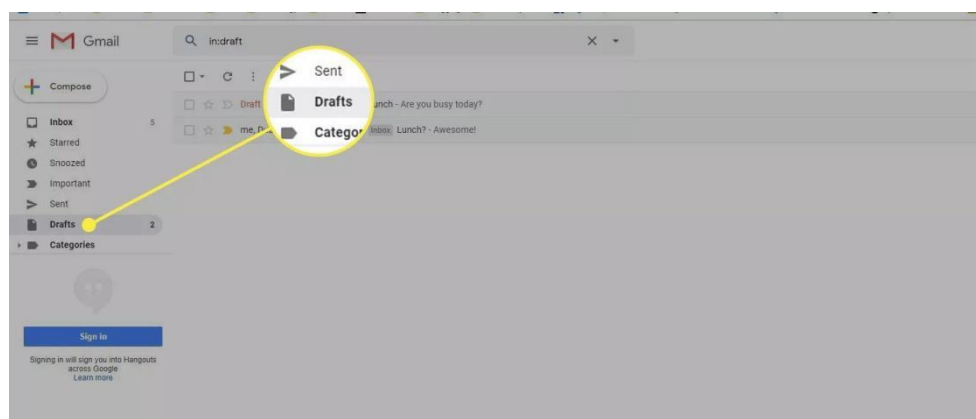
Locating Draft
When you are ready to continue working on the email, you'll find it in the Drafts folder in the left column of Gmail where all the labels are located. Click Drafts and click the email

to open it. As you work, Gmail continues to save until you are ready to click the Send button.

Printing Email

Open your mail and go to the mail you want to print.

Step 1: Open the specific mail or expand it if it's part of a long thread of conversations.

Step 2: Go to the top-right and click the Printer icon. You can also right-click on top of the mail and choose Print from the context menu. Alternatively, use the Ctrl + P shortcut.
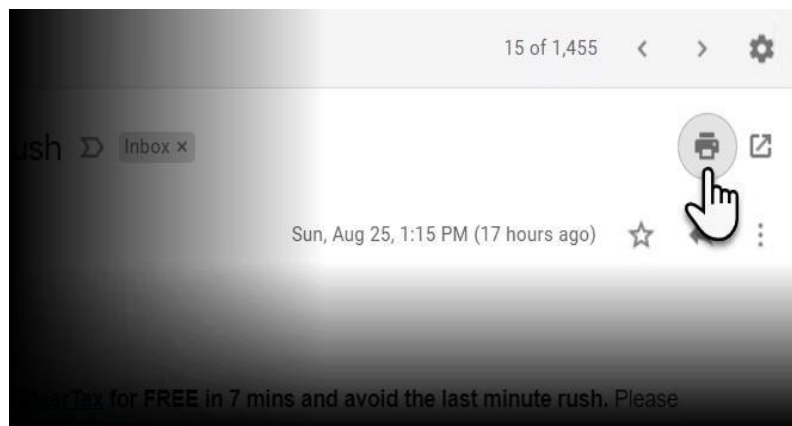
Step 3: The **Print** dialog is now displayed. Pick the printer you want to print to. Remember, you can print to your electronic printer, a cloud printer, PDF, or just "print" it to OneNote.
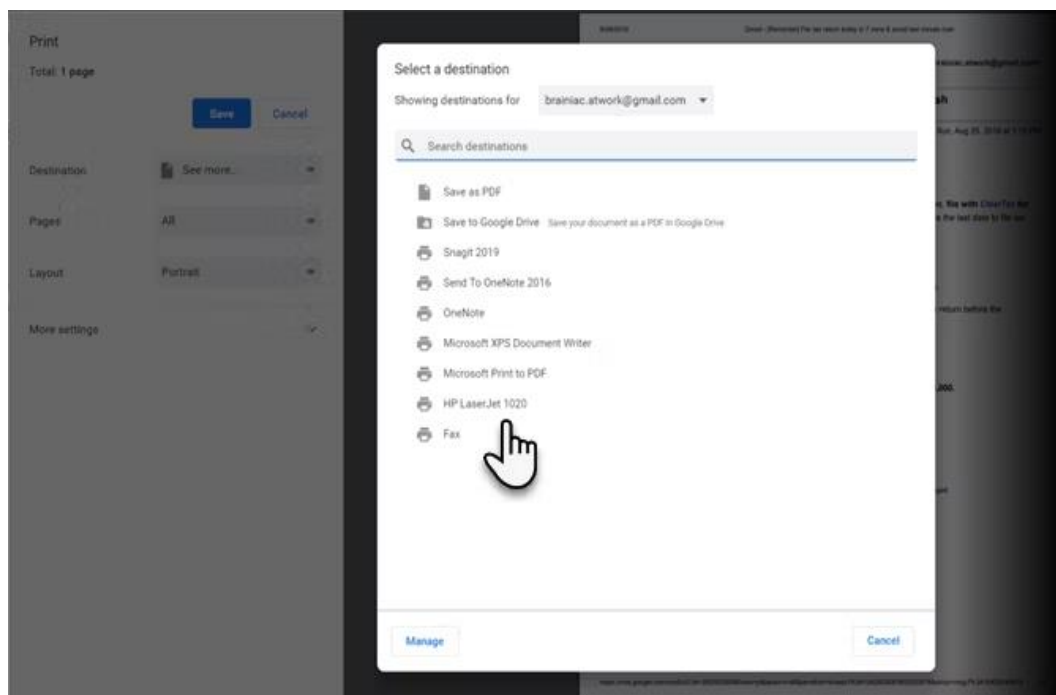
Forwarding Email

It is also possible to send a copy of the message that you have received along with your own comments if you want. This can be done using **forward** button available in mail client software.

The difference between replying and forwarding an email is that when you reply a message to a person who has send the mail but while forwarding you can send it to anyone.

When you receive a forwarded message, the message is marked with a > character in front of each line and **Subject:** field is prefixed with **Fw.**

Deleting Email

If you don't want to keep email into your inbox, you can delete it by simply selecting the message from the message list and clicking **delete** or pressing the appropriate command.

Some mail clients offers the deleted mails to be stored in a folder called deleted items or trash from where you can recover a deleted email.

Composing and Sending Email

Before sending an email, we need to compose a message. When we are composing an email message, we specify the following things:

- Sender's address in To field
- Cc (if required)
- Bcc (if required)
- Subject of email message
- Text
- Signature

You should specify the correct email address; otherwise it will send an error back to the sender.

Once you have specified all the above parameters, It's time to send the email. The mailer program provides a Send button to send email, when you click Send, it is sent to the mail server and a message **mail sent successfully** is shown at the above.

Viewing and running file attachments

Attaching file in mail

Ability to attach file(s) along with the message is one of the most useful features of email. The attachment may be a **word document, PowerPoint presentation, audio/video files,** or **images.**

- In order to attach file(s) to an email, click the attach button. As a result, a dialog box appears asking for specifying the name and location of the file you want to attach.

- Once you have selected the appropriate file, it is attached to the mail.
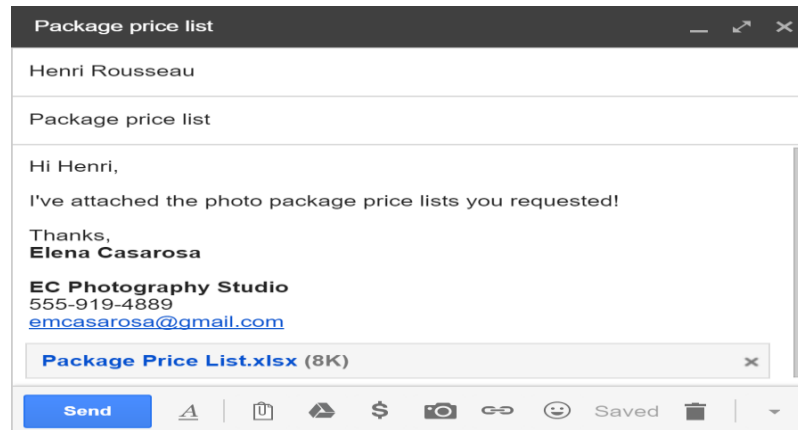
Viewing and downloading Attachment

- Login to your account. It will display the Inbox.
- If the mail has any attachment, it will be displayed under the message as shown below.
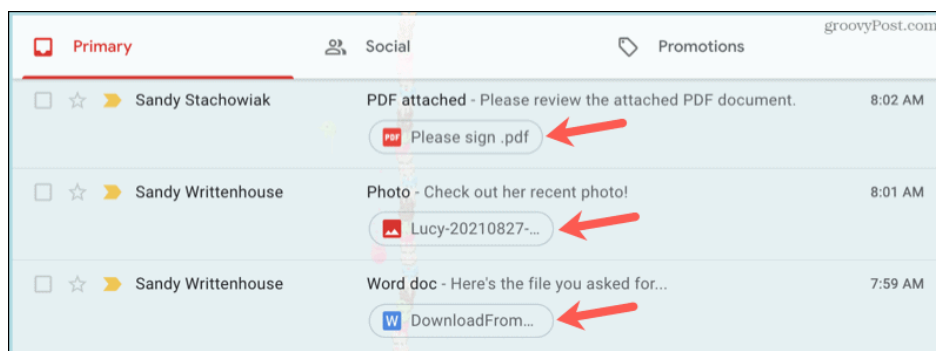
- Click on the mail to download attachment. To download file, click the button shown below. Select a folder location and then click save.

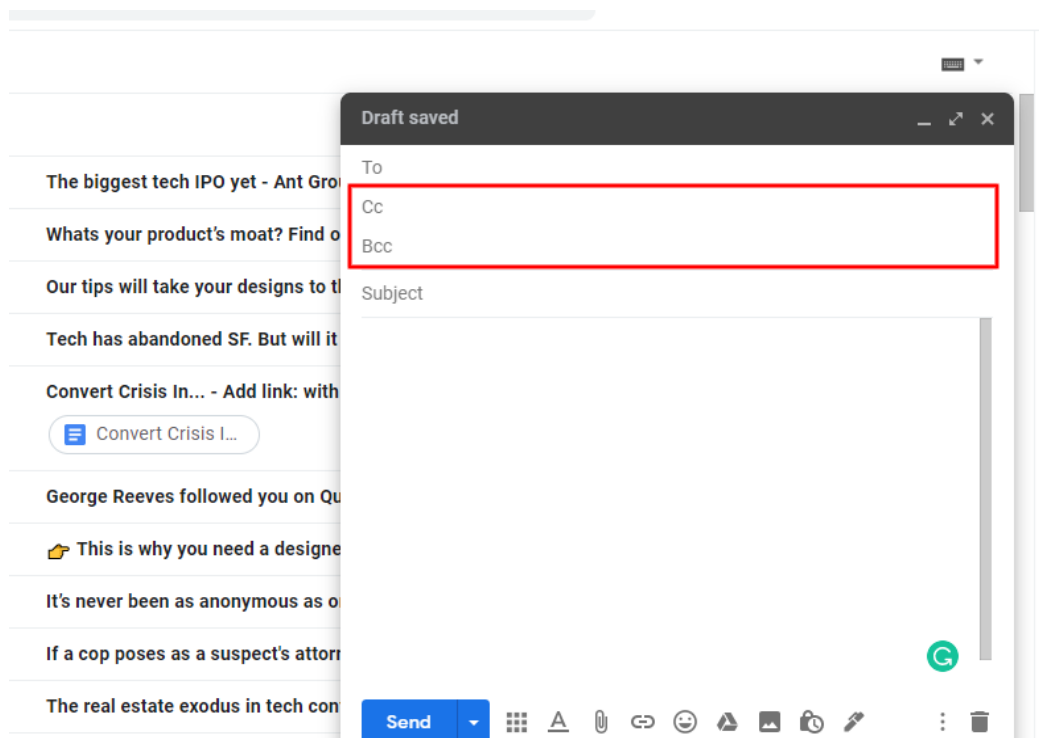**Addressing with cc and bcc**

CC and BCC are two fields that sit next to or below the "To" field at the top of any new message you compose in your inbox. CC stands for "Carbon Copy" and BCC stands for "Blind Carbon Copy". All are used to add the email addresses of the people you wish to send your message to. However, they differ significantly in their usage.

To	CC	BCC
Primary contact/s	Secondary contact/s	Tertiary contact/s
Used for emailing individual or multiple contacts	Used for emailing individual or multiple contacts	Used for emailing individual or multiple contact
Email addresses viewable by all	Email addresses viewable by all	Email addresses viewable only by the sender

7.3 Introduction to various devices & Applications (Electronic Gadgets)
Electronic Gadgets (Other than the computers)

- Mobile phones

- Tablet computers

- E-readers

- Storage devices, such as flash drives

7.3.1 Tablet, Smart Phone
Tablet vs Smartphone

Smart phones and tablets are the hottest gadgets nowadays. Even though tablets and smart phones look pretty much the same, there are still major differences between them. The main difference between tablets and smart phones is obviously the size. Tablets are much bigger than smart phones, and the screen size is typically the basis of measurement. Tablets range from models with 7 inch screens, with models around 10 inches being the most popular, and there also models that have even larger screen sizes. Smart phones are much smaller with most models sporting 4 inch screens. It is important for smart phones to be small since majority of people carry them in their pockets, especially men.

There is also a difference when it comes to the applications that you are able to run. Tablets and smart phones typically share the same operating; Android tablets and smart phones, as well as the iPad and the iPhone. But there are applications that only run in tablets and not in smart phones. This is not because of limitations in the processor but usually because of the impracticality of small screens with the app.

When it comes to network connectivity, smart phones trump tablets. Virtually all smart phones have WiFi and 3G connectivity, the latter is basically a given since connecting to a cellular network is a must for smart phones. Tablets have WiFi at the very least for connectivity, but only high-end and pricier models feature 3G connectivity.

Despite having a wide array of uses, the primary function of smart phones is still for communication. Tablets on the other hand are not intended as phone replacements. Although some tablets have the ability to send SMS or do calls, many do not. You can immediately rule out tablets that do not have 3G as the hardware is necessary for this functionality. And even if your tablet allows you to make calls, you would probably have to purchase a Bluetooth headset as it is rather awkward to hold a large tablet to your face.

7.3.1.1 Concept of Mobile Phone and Tablet and their uses

A mobile device is a general term for any type of **handheld computer**. These devices are designed to be extremely portable, and they can often fit in your hand. Some mobile devices—like **tablets**, **e-readers**, and **smartphones**—are powerful enough to do many of the same things you can do with a desktop or laptop computer.

Tablet computers

Like laptops, **tablet computers** are designed to be portable. However, they provide a different computing experience. The most obvious difference is that tablet computers don't have keyboards or touchpads. Instead, the entire screen is touch-sensitive, allowing you to type on a **virtual keyboard** and use your finger as a mouse pointer.

Tablet computers can't necessarily do everything traditional computers can do. For many people, a traditional computer like a **desktop** or **laptop** is still needed in order to use

some programs. However, the convenience of a tablet computer means it may be ideal as a **second computer**.

E-readers

E-book readers—also called **e-readers**—are similar to tablet computers, except they are mainly designed for reading **e-books** (digital, downloadable books). Notable examples include the **Amazon Kindle**, **Barnes & Noble Nook**, and **Kobo**. Most e-readers use an **e-ink** display, which is easier to read than a traditional computer display. You can even read in bright sunlight, just like if you were reading a regular book.
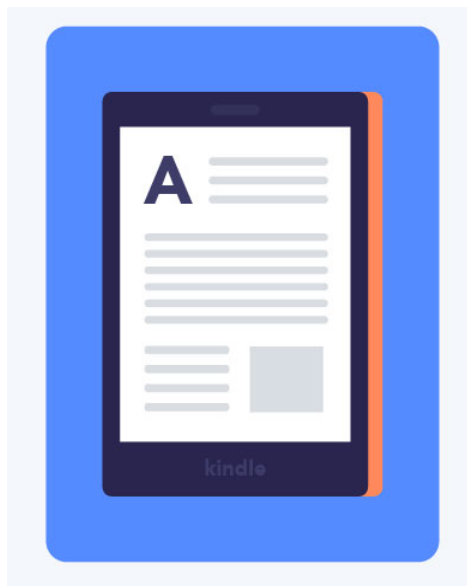
You don't need an e-reader to read e-books. They can also be read on **tablets**, **smartphones**, **laptops**, and **desktops**.

Smart phones

A smartphone is a more powerful version of a traditional cell phone. In addition to the same basic features—phone calls, voicemail, text messaging—smartphones can **connect to the Internet** over Wi-Fi or a cellular network (which requires purchasing a monthly **data plan**). This means you can use a smartphone for the same things you would normally do on a computer, such as checking your email, browsing the Web, or shopping online.

Most smartphones use a **touch-sensitive screen**, meaning there isn't a physical keyboard on the device. Instead, you'll type on a virtual keyboard and use your fingers to interact with the display. Other standard features include a high-quality digital camera and the ability to play digital music and video files. For many people, a smartphone can actually replace electronics like an old laptop, digital music player, and digital camera in the same device.

7.3.2 Applications of Google forms, Google sheets, Google Slides

Applications of Google Forms

1. Google forms are used to create surveys to meet curriculum objectives
2. Can be used to ask Various Types of Questions like
   - Text
   - Paragraph Text
   - Multiple Choice
   - Checkboxes
   - Choose from a list
   - Scale
   - Grid
   - Date
   - Time
3. Possible to Apply Validation Options to Control Data Entry
4. Google Forms helps to Create Professional Looking Forms using Themes
5. Google Forms helps us to collect data using multiple methods.
   - A form can be included in the body of an email allowing a respondent to submit their responses from their Inbox.
   - A link can be generated allowing respondents to answer the questions using a web-based form.
   - Code can be generated and then embedded into a blog or web page as another option for data collection.

Applications of Google Sheets

1. Editing

One of the key features of Google Sheets is that it allows collaborative editing of spreadsheets in real-time. Rather than emailing one document to multiple people, a single document can be opened and edited by multiple users simultaneously. Users can see every change made by other collaborators, and all changes are automatically saved to Google servers. Google Sheets also includes a sidebar chat feature that allows collaborators to discuss edits in real-time.

2. Explore

The Explore feature in Google Sheets was first introduced in September 2016, and it uses machine learning to bring additional functionalities. This feature provides a lot of information based on the data added to the spreadsheet, and it can auto-update itself depending on the selected data. With the Explore feature, users can ask questions, build charts, visualize data, create pivot tables, and format the spreadsheet with different colors.

3. Offline editing

Google Sheets supports offline editing, and users can edit the spreadsheet offline either on desktop or mobile apps.

4. Supported file formats

Google Sheets supports multiple spreadsheet file formats and file types. Users can open, edit, save or export spreadsheets and document files into Google Sheets. Some of the formats that can be viewed and converted to Google Sheets include: .xlsx, .xls, .xlsm, .xlt, .xltx, .xltxm, .ods, .csv, .tsv

5. Integration with other Google products

Google Sheets can be integrated with other Google products such as Google Form, Google Finance, Google Translate, and Google Drawings. For example, if you want to create a poll or questionnaire, you can input the questions in Google Forms, and then import the Google Forms into Google Sheets.

Applications of Google Slides

1. Using Google Slides we can create Lectures and Presentations
2. It is used to create Pre-Class Slides for the Flipped Classroom
3. Possible to create Animated Diagrams and Demonstrations
4. We can conduct Polls and Assessment Check-Ins between the lecture
5. It is possible to design Posters and Display Work in a Digital Gallery or Poster Session
6. Used to Create Illustrations by Adding Slides to Google Sites, a Blog, or Canvas
7. It is having features like Sticky Note Board and Interactive Notebooks
8. Provides features to Lock the Background of a Slide

7.3.3 Scanning Image using Scanner and edit it using tools available

Click *Start*, type: *devices and printer* then hit Enter. Right-click your *scanner or printer*, then click *Start Scan*.
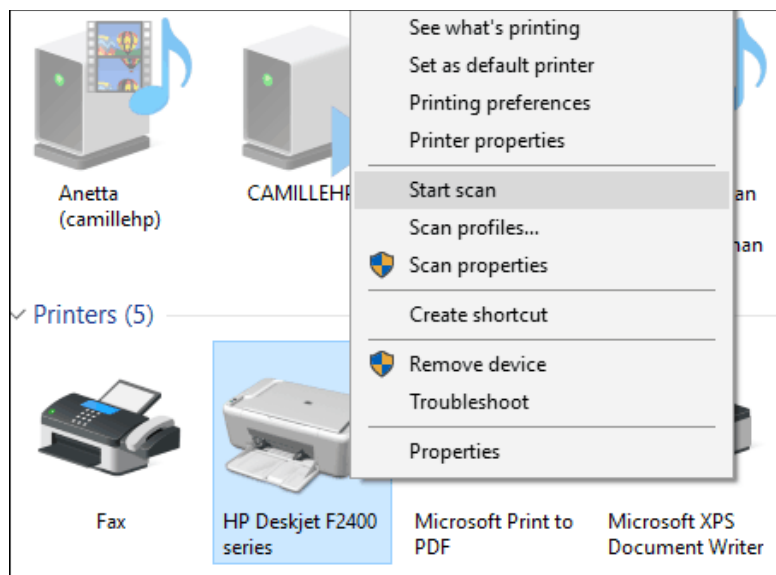

Users have several options on the screen which let you preview the document, choose a color format (color or black and white), adjust brightness, set the appropriate resolution, and even choose the format you want to save it in: JPEG, PDF, or PNG. If you are satisfied with the results after reviewing the document, proceed to click Scan.
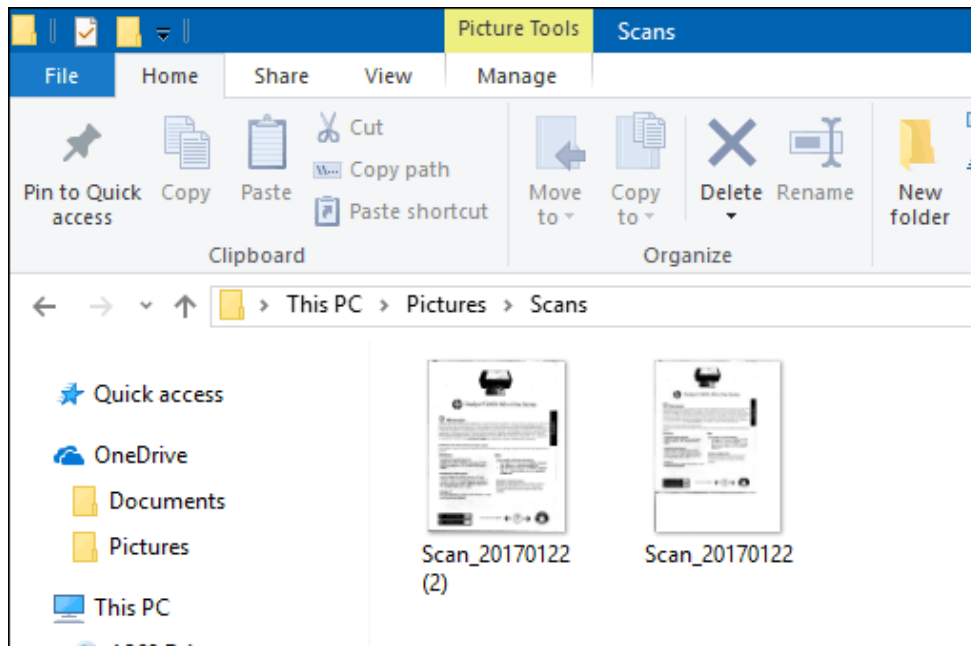
Make your selections, Click *Preview* to ensure everything looks good then click **Scan**.
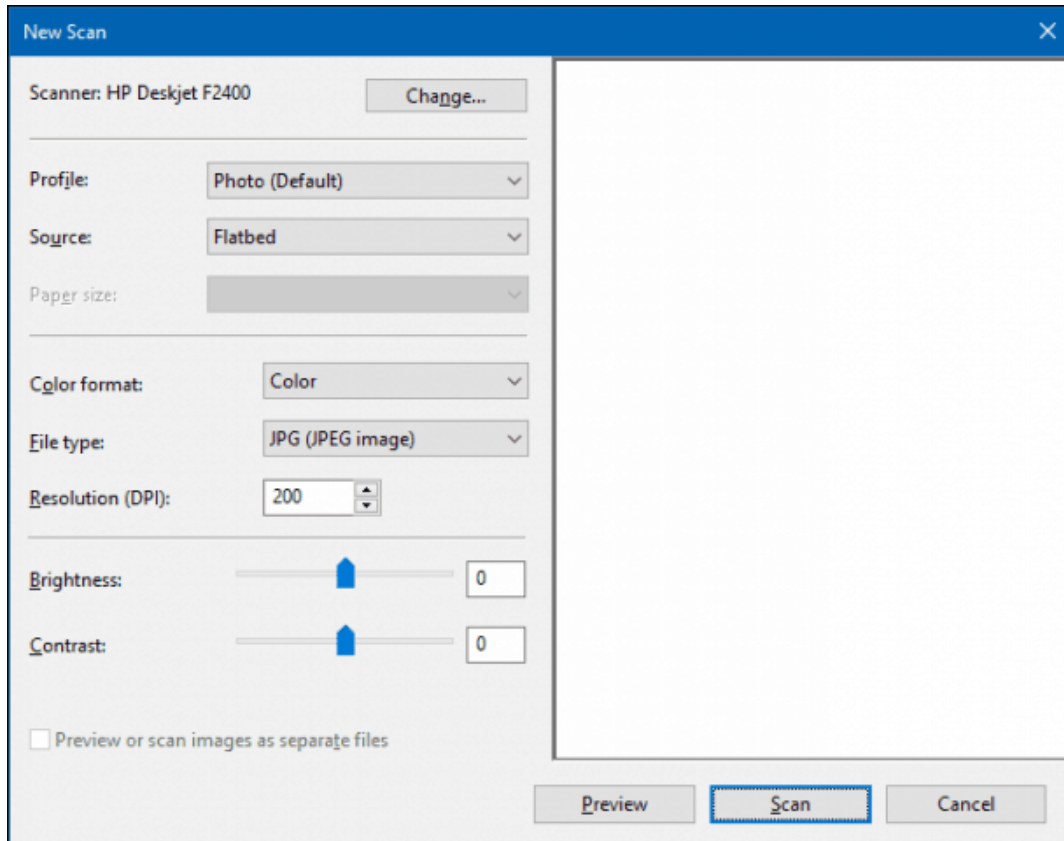
After giving your scanned document a Name, add a few tags to make it easier to search for later. Click *Import*.
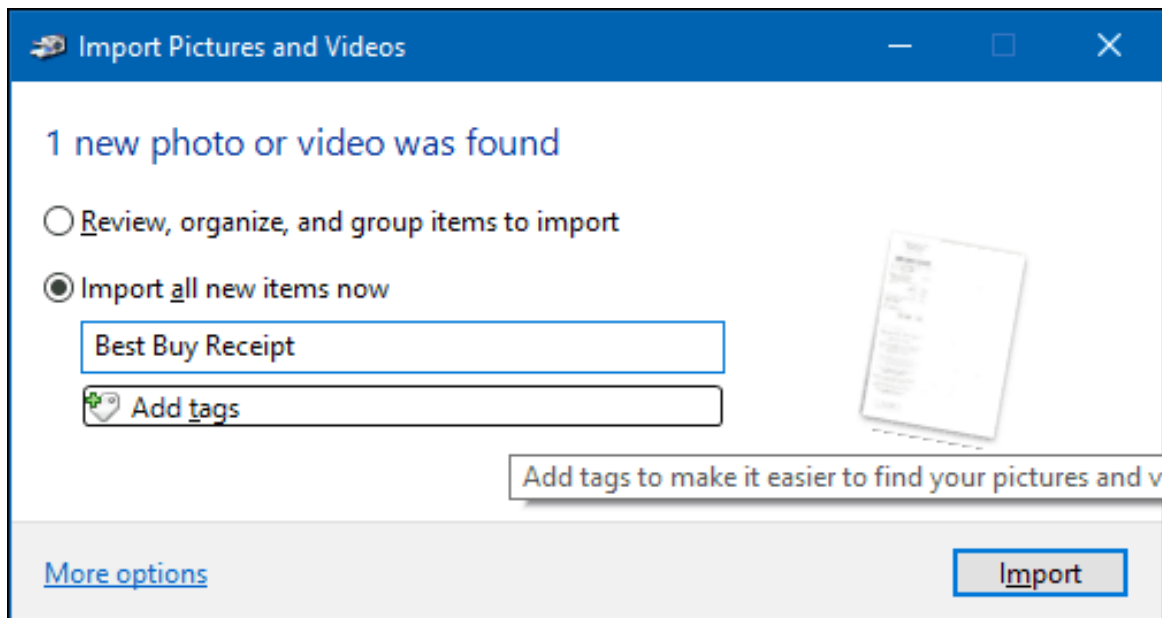
Your scanned document can normally be found in Pictures within the scanned files folder.
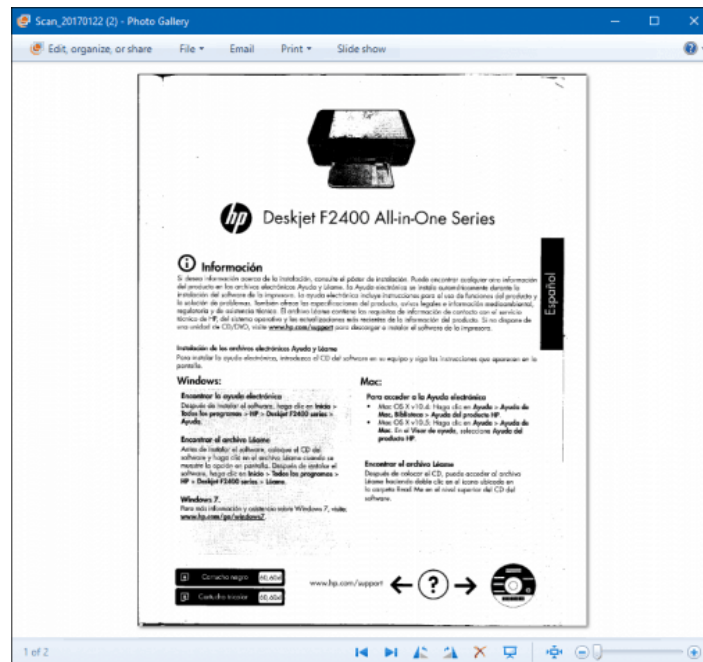
Edit using tools available by default in Windows Operating System

The User Interface of Scanner

The interface is quite similar to the old scanning utility. You can preview your document, crop it before scanning the final document, adjust resolution, select appropriate file formats and choose your save location.
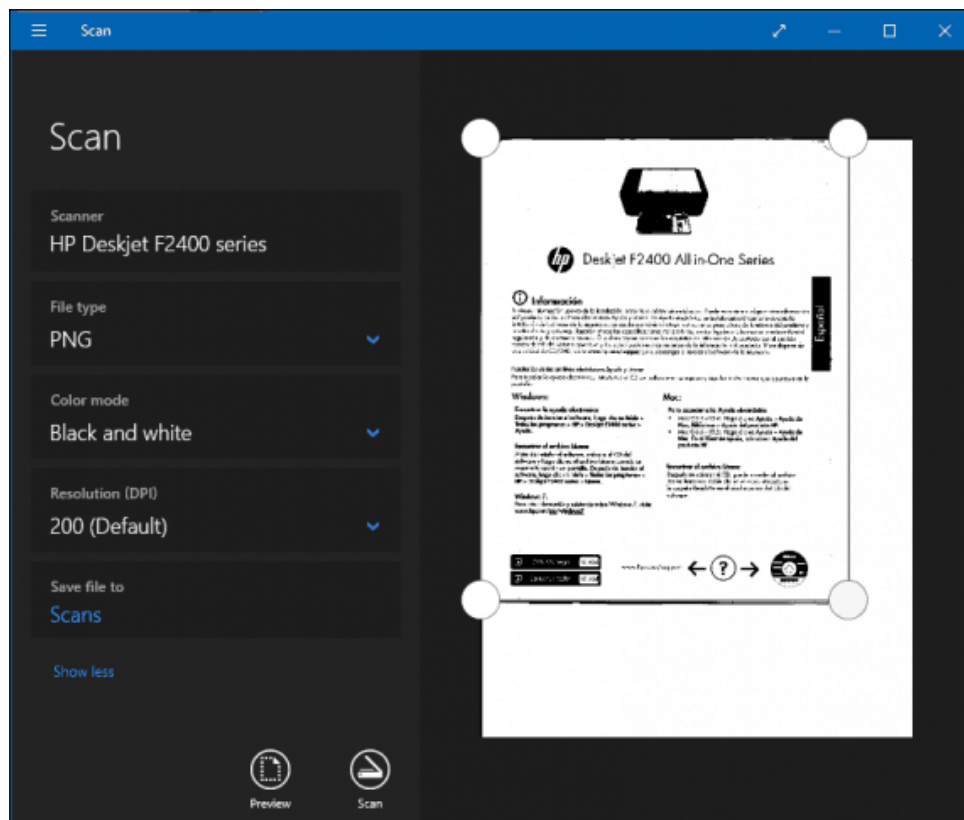
When ready, click Scan then review the scanned document.

Edit using tools available by default in Linux Operating System
Simple Scan

Simple Scan is a lightweight Scanner utility with a handful of editing features. It allows you to scan documents at the click of a button, rotate and/or crop your scan, and save it as JPG, PNG, or PDF. By default, it uses 300dpi for photos and 150dpi for text – settings you can edit in its preferences menu. Simple Scan is the default scanner app on many Linux distros including the GNOME desktop.

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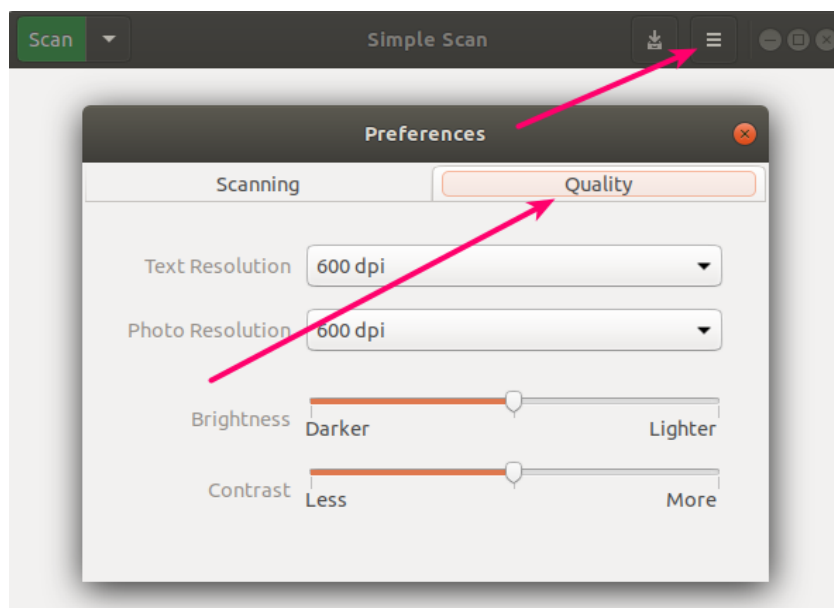
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