# Chapter 2 – Working Knowledge of Computer System

## Introduction to the operating system

An Operating System (OS) is an interface between a computer user and computer hardware. An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

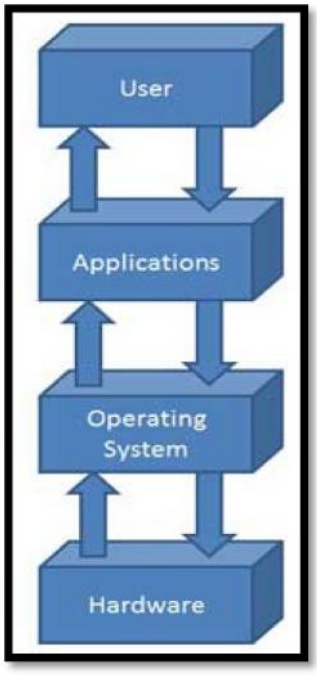
It is a program with following features:

- An OS is a program that acts as an interface between the software and the computer hardware.
- It is an integrated set of specialised programs that are used to manage overall resources and operations of the computer.
- It is specialised software that controls and monitors the execution of all other programs that reside in the computer, including application programs and other system software.

**Objectives of Operating System**

- To make a computer system convenient to use in an efficient manner
- To hide the details of the hardware resources from the users
- To provide users a convenient interface to use the computer system
- To act as an intermediary between the hardware and its users and making it easier for the users to access and use other resources
- To manage the resources of a computer system
- To keep track of who is using which resource, granting resource requests, according for resource using and mediating conflicting requests from different programs and users

**Characteristics / Functions of Operating System:**




- **Memory Management** -- keeps tracks of primary memory i.e. what part of it is in use by whom, what part is not in use etc. and allocates the memory when a process or program requests it.
- **Processor Management** -- allocates the processor (CPU) to a process and de-allocates processor when it is no longer required.
- **Device Management** -- keeps track of all devices. This is also called I/O controller that decides which process gets the device, when, and for how much time.
- **File Management** -- allocates and de-allocates the resources and decides who gets the resources.
- **Security** -- prevents unauthorized access to programs and data by means of passwords and similar other techniques.
- **Job accounting** -- keeps track of time and resources used by various jobs and/or users.
- **Control over system performance** -- records delays between request for a service and the system.
- **Interaction with the operators** -- The interaction take place via the console of the computer in the form of instructions. OS does the corresponding action and informs operation by a display screen
- **Error-detecting aids** -- Production of dumps, traces, error messages and other debugging and error-detecting methods.

## Types of Operating Systems

- **Batch Operating System:** It is one of the oldest method used to run the programs.Few years back to perform a simple calculation computer takes days and weeks of time.So the users used to prepare their job and it is in the form of punched cards then this batch of programs are loaded into the computer by the computer operator and they get executed one by one, It is a very slow process and when the program is getting executed no one can interrupt.Turn around time is large and the job can enter an infinite loop.
- **Real Time Operating System:** In this type of operating system job has to be completed within the set time limit otherwise the job gets lost or looses its meaning.This system is totally time dependent. This os is mainly used in Flight controllers,robotics,fuel injection system etc.
- **Network Operating System:** A network operating system (NOS) is software that just controls the network and transfers packets over the network.It provides certain features for the safe delivery of messages over internet. OSI reference model have 7 layers and it provides foundation to this network operating system. WINDGate,Cisco IOS,BSD are some of the example of NOS.
- **Distributed Operating System:** Distributed systems are located in geographical areas and it is comprised of collection of processors.In Distributed OS the task is divided among different processors that communicate using telephone lines or buses.In this the processors do not share resources such as CPUs, memories, peripheral devices, the network, and data of all kinds instead of this they have their own local memory.For Example- Amoeba,Angle,Chorus,Mach.
- **Multi user operating system:** In this case various users can perform different tasks on the computer.Well if you have made multiple accounts on the windows operating system it doesn't make it multi user operating system.It is still a single user operating system.The main disadvantage is if multiple users are using the system then it decreases the performance of the system.For example- UNIX,Windows 2000,Novell Netware
- **Embedded System:** The operating systems designed for being used in embedded computer systems are known as embedded operating systems. They are designed for small machines.They have limited number of resources and are very compact and extremely efficient by design.
- **Mobile Operating System:** Nowdays android is being used in mobiles as an operating system.Android is a linux based mobile platform operating system and it is developed by google. Tablet PCs and smartphones run on mobile operating systems. Ex: Android OS, Blackberry OS, and Apple's iOS are some of the most known names of mobile operating systems.

## Working knowledge of GUI based operating system

Graphical User Interface, a GUI (pronounced as either G-U-I or gooey) allows the use of icons or other visual indicators to interact with electronic devices, rather than using only text via the command line. For example, all versions of Microsoft Windows utilize a GUI, whereas MS-DOS does not. The GUI was first developed at Xerox PARC by Alan Kay, Douglas Engelbart, and a group of other researchers in 1981. Later, Apple introduced the Lisa computer, the first commercially available computer, on January 19, 1983. Below is a picture of the Windows 7 Desktop and an example of a GUI.

**How does a GUI work?**

A GUI uses windows, icons, and menus to carry out commands, such as opening, deleting, and moving files. Although many GUI operating systems are navigated through the use of a mouse, the keyboard can also be utilized by using keyboard shortcuts or arrow keys.

**What are the benefits of GUI?**

Unlike a command line operating system or CUI, like Unix or MS-DOS, GUI operating systems are much easier to learn and use because commands do not need to be memorized. Additionally, users do not need to know any programming languages. Because of their ease of use, GUI operating systems have become the dominant operating system used by today's end-users.


**What are examples of a GUI operating system?**

- Microsoft Windows
- Apple System 7 and macOS
- Chrome OS
- Linux variants like Ubuntu

**Are all operating systems GUI?**

No. Early command line operating systems like MS-DOS and even some versions of Linuxtoday have no GUI interface.

**What are examples of a GUI interface?**

- GNOME
- KDE
- Any Microsoft program (i.e. Word, Excel, Outlook)
- Internet browser (i.e. Internet Explorer, Chrome, Firefox)

**How does the user interact with a GUI?**

Typically the user uses a pointing device such as the mouse to interact and use most aspects of the GUI. However, it is also possible to interact with a GUI using a keyboard or other input device.

## Introduction to word processors and its features

Word Processing is using a computer to create, edit, and print documents. Of all computer applications, word processing is the most commonly used. To perform word processing, a computer, a special program called a word processor and a printer are required. A word processor enables the user to create a document, store it electronically on a USB or on a computer, display it on a screen, modify or format it by entering commands and characters from the keyboard, and print it on a printer.

**What Application Software is Available?**

Microsoft Word is the most widely used word processing software. Microsoft estimates that over 500,000,000 people use the Microsoft Office suite, which includes Word. Many other word processing applications exist, including WordPerfect and open source applications OpenOffice.org Writer, LibreOffice Writer, AbiWord, KWord, and LyX. Web-based word processors, such as Office Web Apps or Google Docs, are a relatively new category of application software.

Most Word processors support additional advanced features in addition to the basic features provided by the text editors. They enable you for creating and editing high quality documents. These advanced Word processors are sometimes called Full-Featured Word Processors. Microsoft Word is one of the most popular Full-Featured Word Processor.

**Features of Full Featured Word Processors**

- **File Management:** Many Word processors contain file management capabilities that allow the user to create, delete, move, and search files.
- **Font Specifications:** This feature allows you to change fonts within a document. For example, a user can specify bold, italics, and underlining. Most Word processors also allow the user to change the font size and the typeface.
- **Footnotes & Cross-References:** This feature allows the user to add footnotes in a document. A footnotes is added at bottom of the page. The Word processor also enables you to easily cross-reference other sections of the document.
- **Graphics:** This feature allows the user to insert pictures and graphs into a document. Some Word processors also provide facility to create and edit the pictures and graphics within the document. However, some Word processors provide facility to insert pictures created in different graphics programs.
- **Headers & Footers:**
  - ✓ This feature allows the user to specify information for header and footers.
  - ✓ Header is the information that is printed in the top of each page of the document.
  - ✓ Footer is the information that is printed in the bottom of each page of the document.
- **Page Numbering:** The Word processor automatically keeps track of page numbers so that the correct number appears on each page.
- Layout: This feature allows the user to specify page sizes, margins, indents, line spacing within a document.
- **Macros:** You can create macros in full-features word processor. A macro is a small code. It represents a series of keystrokes or commands. Usually, a single key is assigned to a macro. All commands in a macro are executed when a key assigned to a macro is pressed.
- **Mail Merge:** The most important feature of Word processor is the mail-merge, in which the records of a database can be merged into the document. It is a very shortcut method used to create form letters, mailing labels, envelopes etc. For example to send result cards to all the students of a college, the mail-merge method is used.
- **Spell Checker:** This feature allows the user to check incorrect spelling of words in the document and correct these incorrect words. It highlights the misspelled word. It is noted that most of the word processors have built-in-dictionary.
- **Thesaurus:** Thesaurus means vocabulary. Microsoft Word has a complete dictionary. The user can select a simple word for a difficult word from a list of altemate words.
- **Tables Contents and Indexes:** This feature allows the user to automatically create a table of contents and index based on special codes that you insert in the document.
- **Document Windows:** This feature allows the user to edit two or more documents at the same time. Each document appears in a separate windows. This is particularly valuable where working on a large project that consists of several different document files.
- **WYSIWYG:** WYSIWYG stands for What You See Is What You Get. It means that printout of document will be similar as appears on the display screen.
- **Creating, editing, printing and saving documents.**
  - ✓ **Ctrl + N** – for creating new document
  - ✓ **Ctrl + P** – for printing document
  - ✓ **Ctrl + S** – for saving document

# Mail merge

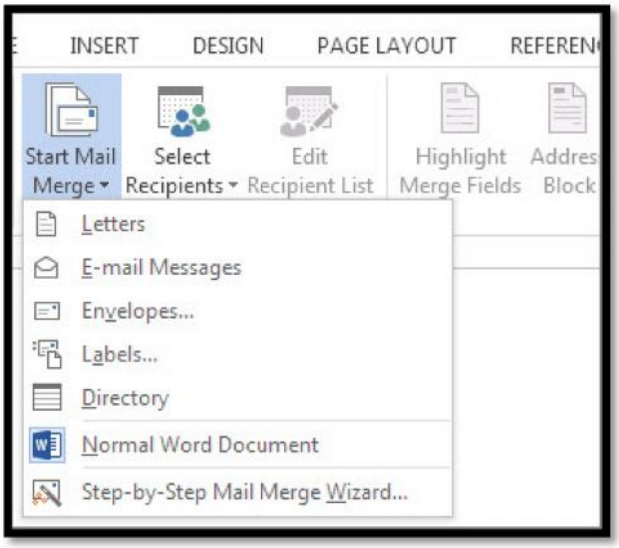
Mail merge is used to create multiple documents at once. These documents have identical layout, formatting, text, and graphics. Only specific sections of each document varies and is personalized. The documents Word can create with mail merge include bulk labels, letters, envelopes, and emails. There are three documents involved in the mail merge process:

- Your main document
- Your data source
- Your merged document

## Step 1: Prepare data in Excel for mail merge

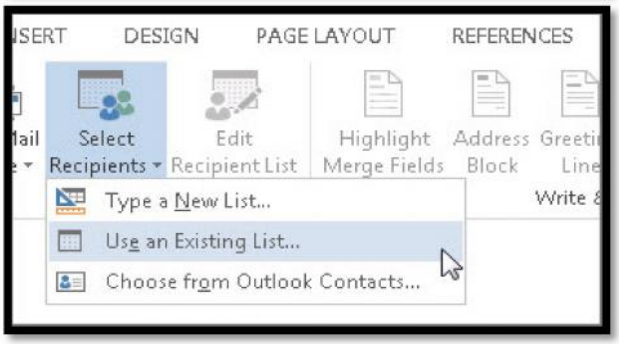
You'll use your Excel spreadsheet as the data source for the recipient list. Make sure:

- Column names in your spreadsheet match the field names you want to insert in your mail merge. For example, to address readers by their first name in your document, you'll need separate columns for first and last names.
- All data to be merged is present in the first sheet of your spreadsheet.
- Data entries with percentages, currencies, and postal codes are correctly formatted in the spreadsheet so that Word can properly read their values.
- The Excel spreadsheet to be used in the mail merge is stored on your local machine.
- Changes or additions to your spreadsheet are completed before it's connected to your mail merge document in Word.




## Step 2: Start the mail merge

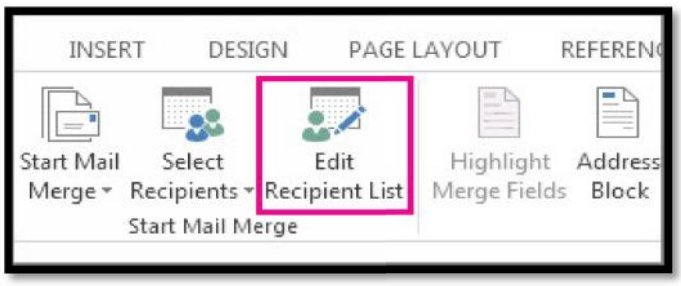
- In Word, choose File > New > Blank document.
- On the Mailings tab, in the Start Mail merge group, choose Start Mail Merge, and then choose the kind of merge you want to run.
- Choose Select Recipients > Use an Existing List.
- Browse to your Excel spreadsheet, and then choose Open.
- If Word prompts you, choose Sheet1$ > OK.



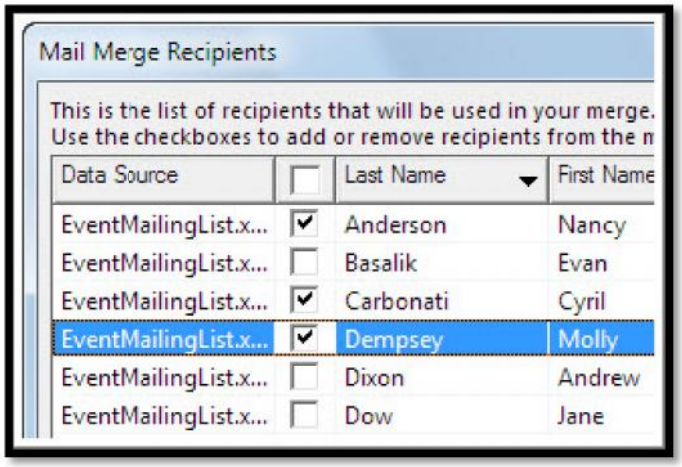

### Edit your mailing list

You can limit who receives your mail.

- Choose Edit Recipient List.

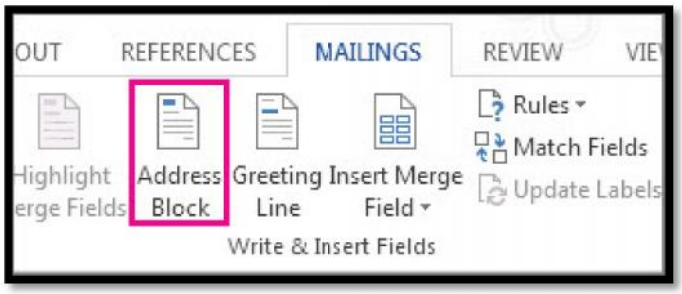


- In the Mail Merge Recipients dialog box, clear the check box next to the name of any person who you don't want to receive your mailing.




## Step 3: Insert a merge field

You can insert one or more mail merge fields that pull the information from your spreadsheet into your document. To insert an address block for an envelope, a label, an email message, or a letter



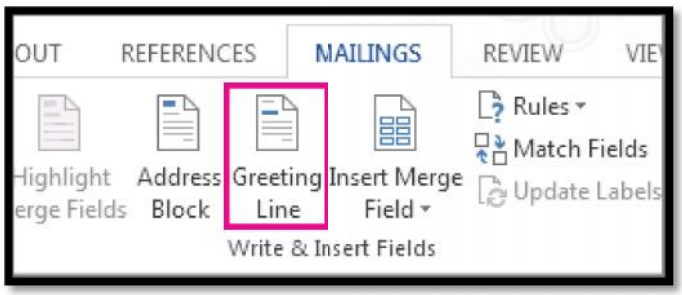

- On the Mailings tab, in the Write & Insert Fields group, choose Address Block.
- In the Insert Address Block dialog box, choose a format for the recipient's name as it will appear on the envelope.


Choose OK.

- Choose File > Save.

To insert a greeting line in an email message or a letter

- On the Mailings tab, in the Write & Insert Fields group, choose Greeting Line.




In the Insert Greeting Line dialog box, do the following:

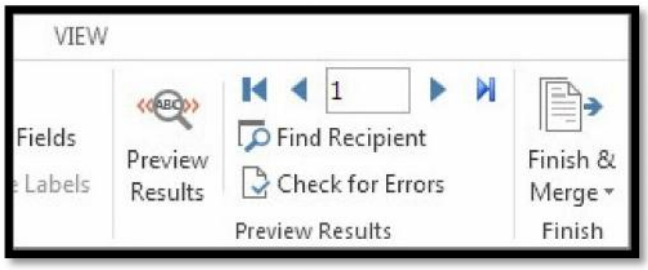
- Under Greeting line format, change the salutation if necessary by choosing the greeting (Dear is the default), the format for the recipient name, and the ending punctuation (a comma is the default).
- Under Greeting line for invalid recipient names, choose an option in the salutation list.
- Choose OK.
- Choose File > Save.

To insert data from your spreadsheet in an email message or a letter

- On the Mailings tab, in the Write & Insert Fields group, choose Insert Merge Field.
- In the Insert Merge Field dialog box, under Fields, choose a field name (column name in your spreadsheet), and then choose Insert.
- Repeat step 2 as needed, and choose Close when done.
- Choose File > Save.

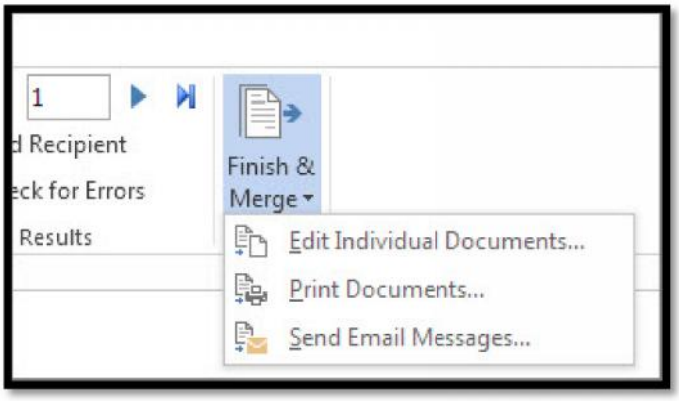
For more information about adding fields from your spreadsheet to the merge document, see Insert mail merge fields. And if you're interested in learning more about options for setting up email message, see Email merge in Word.

## Step 4: Preview and finish the mail merge




After you insert the merge fields you want, preview the results to confirm that the content is okay. and then you're ready to complete the merge process.

- On the Mailings tab, choose Preview Results.
- Choose the Next ▶ or Previous ◀ record button to move through records in your data source and view how the records will appear in the document.
- In the Finish group, choose Finish & Merge, and choose Print Documents or Send E-mail Messages.




## Step 5: Save your mail merge

- When you save the mail merge document, it stays connected to your data source. You can reuse the mail merge document for your next bulk mailing.
- Open the mail merge document and choose Yes when Word prompts you to keep the connection.

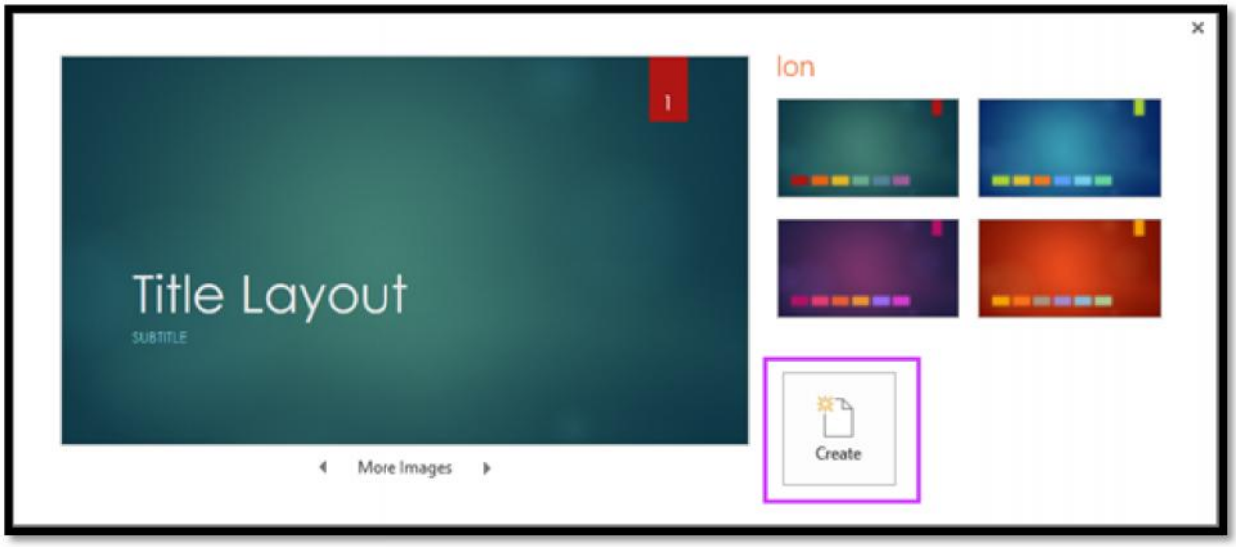
## Creating power point presentations

PowerPoint presentations work like slide shows. To convey a message or a story, you break it down into slides. Think of each slide as a blank canvas for the pictures, words, and shapes that will help you build your story.

**Choose a theme**

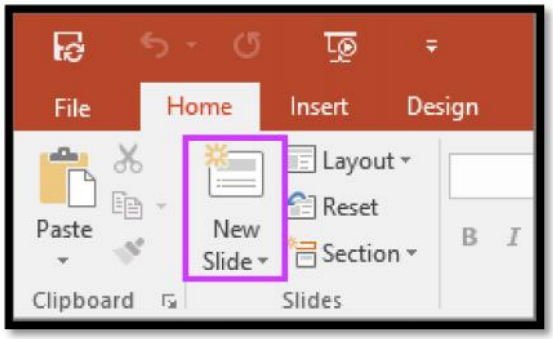
When you open PowerPoint, you'll see some built-in themes and templates. A theme is a slide design that contains matching colors, fonts, and special effects like shadows, reflections, and more.

- Choose a theme.
- Click Create, or pick a color variation and then click Create.



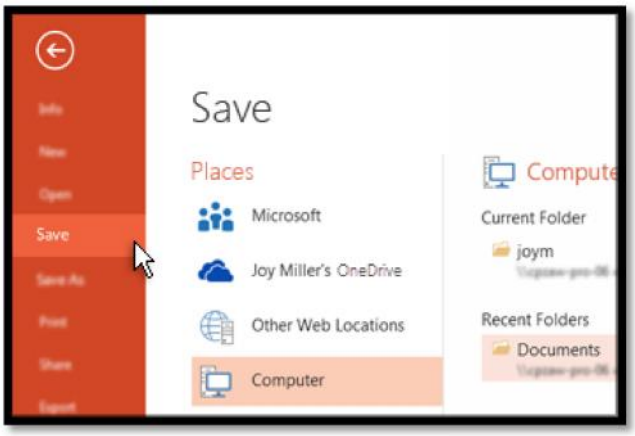

**Insert a new slide**

- On the Home tab, click New Slide, and pick a slide layout.




**Save your presentation**

- On the File tab, choose Save.
- Pick or browse to a folder.
- In the File name box, type a name for your presentation, and then choose Save.

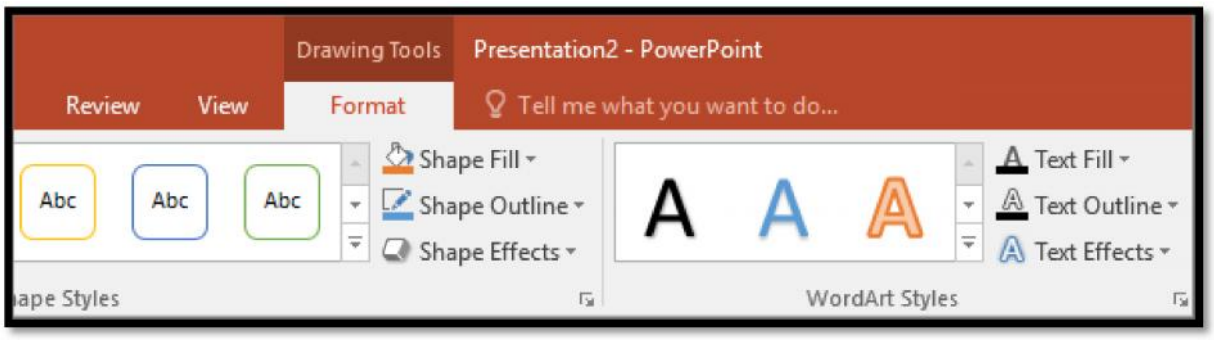



**Add text**

- Select a text placeholder, and begin typing.


**Format your text**

- Select the text.
- Under Drawing Tools, choose Format.

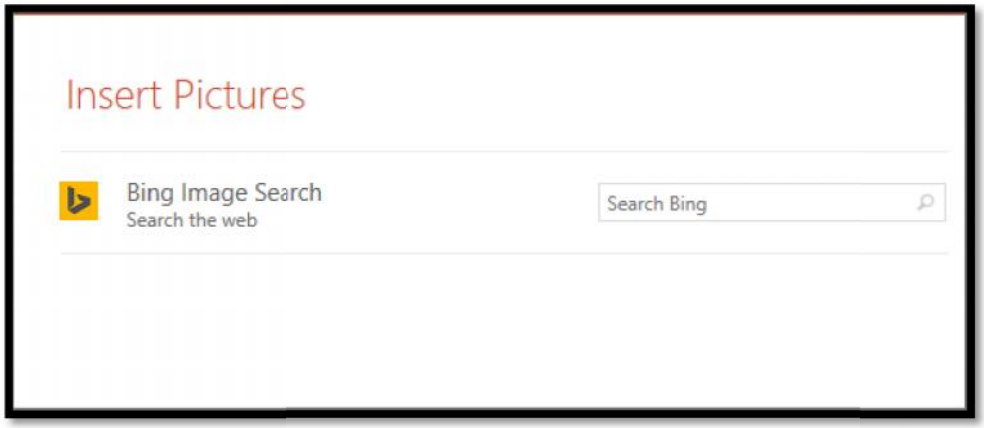


- Do one of the following:
- To change the color of your text, choose Text Fill, and then choose a color.
- To change the outline color of your text, choose Text Outline, and then choose a color.
- To apply a shadow, reflection, glow, bevel, 3-D rotation, a transform, choose Text Effects, and then choose the effect you want.

**Add pictures**

On the Insert tab, do one of the following:

- To insert a picture that is saved on your local drive or an internal server, choose Pictures, browse for the picture, and then choose Insert.
- To insert a picture from the Web, choose Online Pictures, and use the search box to find a picture.

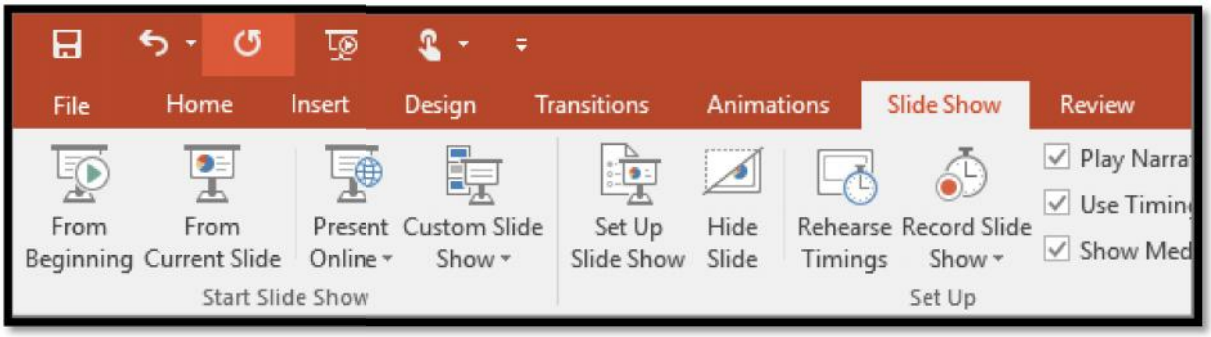



- Choose a picture, and then click Insert.

**Give your presentation**

On the Slide Show tab, do one of the following:

- To start the presentation at the first slide, in the Start Slide Show group, click From Beginning.
- If you're not at the first slide and want to start from where you are, click From Current Slide.
- If you need to present to people who are not where you are, click Present Online to set up a presentation on the web, and then choose one of the following options:



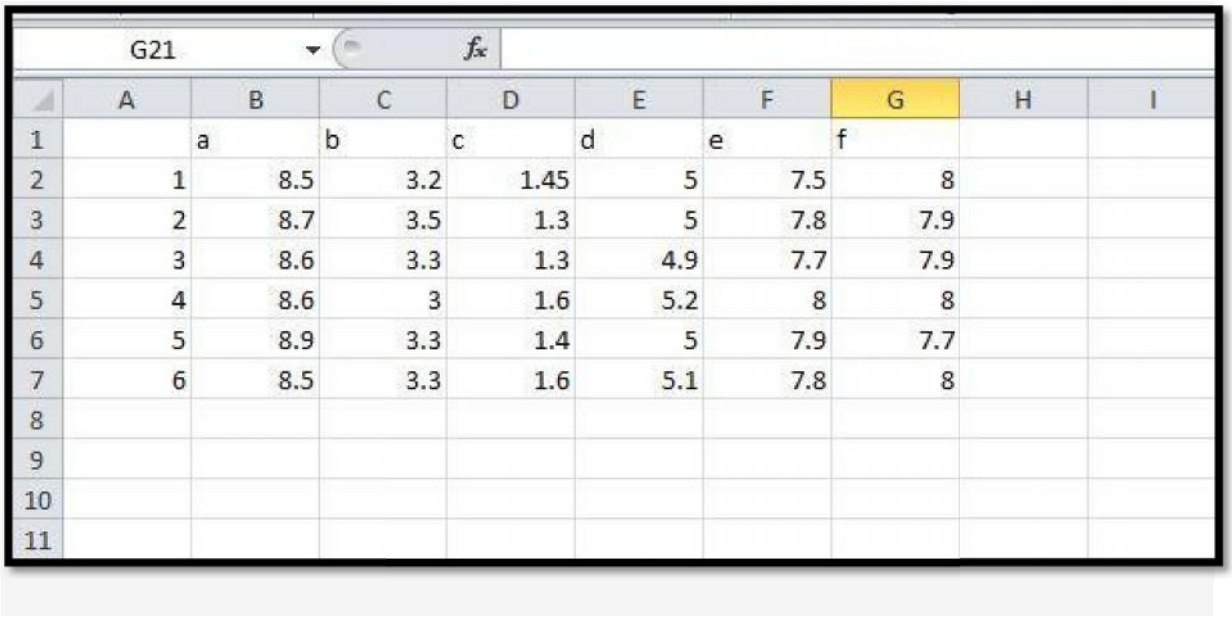

**Get out of Slide Show view**

- To get out of Slide Show view at any time, on the keyboard, press Esc.

# Creating spreadsheets and simple graphs

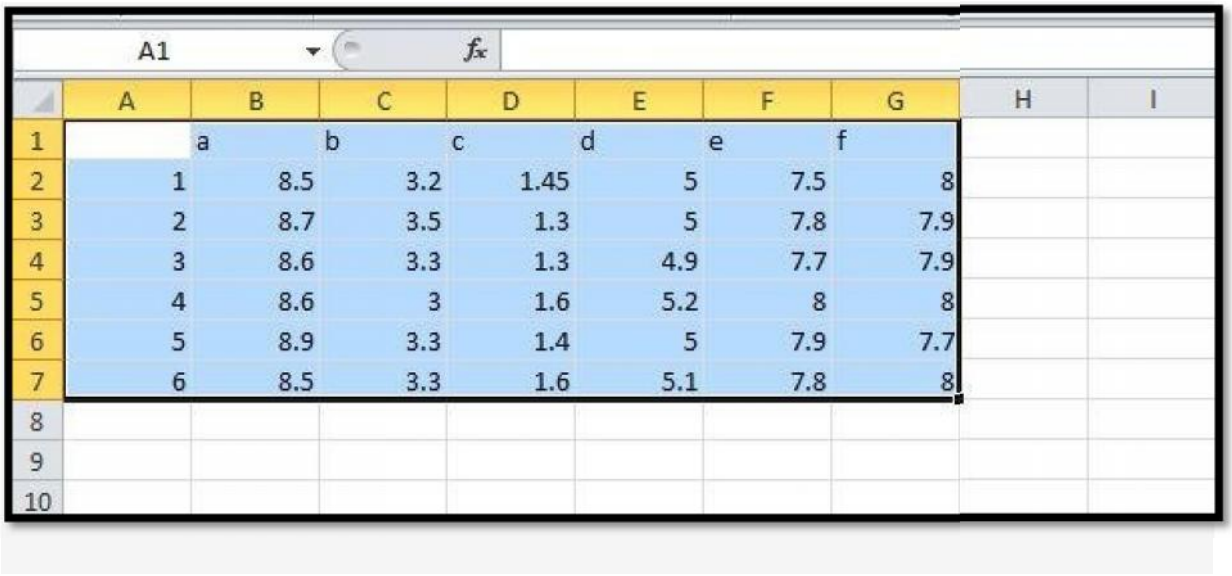
Excel is a great program to use for making and editing spreadsheets, but it can also be used to quickly produce some professional graphs. Excel graphs aren't extremely detailed, but they are a solid way to add easy-to-read data to any presentation or report.

**Step 1**- Enter information into a spreadsheet. Columns will be vertical on the graph and rows will be horizontal.




| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | a | b | c | d | e | f | | |
| 2 | 1 | 8.5 | 3.2 | 1.45 | 5 | 7.5 | 8 | | |
| 3 | 2 | 8.7 | 3.5 | 1.3 | 5 | 7.8 | 7.9 | | |
| 4 | 3 | 8.6 | 3.3 | 1.3 | 4.9 | 7.7 | 7.9 | | |
| 5 | 4 | 8.6 | 3 | 1.6 | 5.2 | 8 | 8 | | |
| 6 | 5 | 8.9 | 3.3 | 1.4 | 5 | 7.9 | 7.7 | | |
| 7 | 6 | 8.5 | 3.3 | 1.6 | 5.1 | 7.8 | 8 | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |

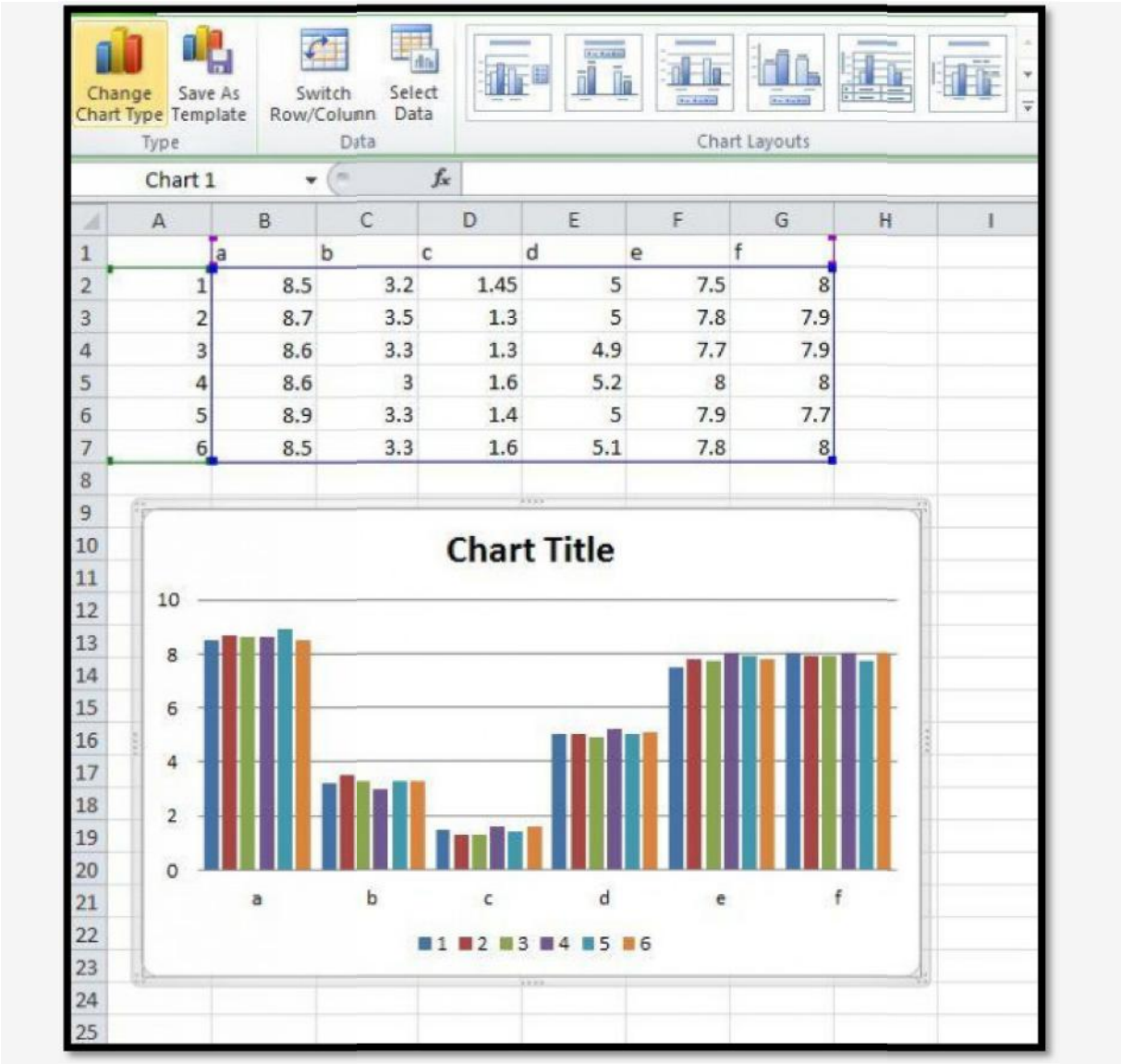
Step 2- Highlight the cells you want to graph.




| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | a | b | c | d | e | f | | |
| 2 | 1 | 8.5 | 3.2 | 1.45 | 5 | 7.5 | 8 | | |
| 3 | 2 | 8.7 | 3.5 | 1.3 | 5 | 7.8 | 7.9 | | |
| 4 | 3 | 8.6 | 3.3 | 1.3 | 4.9 | 7.7 | 7.9 | | |
| 5 | 4 | 8.6 | 3 | 1.6 | 5.2 | 8 | 8 | | |
| 6 | 5 | 8.9 | 3.3 | 1.4 | 5 | 7.9 | 7.7 | | |
| 7 | 6 | 8.5 | 3.3 | 1.6 | 5.1 | 7.8 | 8 | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

**Step 3-** Go to Insert, then Chart.

**Step 4-** Choose the kind of graph you want to use. Your choice largely depends on what you'll be using the graph for and what kind of information you have. To compare how things have changed over time, a line graph may be ideal. To display growth, a bar or column graph works nicely. Evaluate your information and how you want to present it.




| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | | a | b | c | d | e | f |
| 2 | 1 | 8.5 | 3.2 | 1.45 | 5 | 7.5 | 8 |
| 3 | 2 | 8.7 | 3.5 | 1.3 | 5 | 7.8 | 7.9 |
| 4 | 3 | 8.6 | 3.3 | 1.3 | 4.9 | 7.7 | 7.9 |
| 5 | 4 | 8.6 | 3 | 1.6 | 5.2 | 8 | 8 |
| 6 | 5 | 8.9 | 3.3 | 1.4 | 5 | 7.9 | 7.7 |
| 7 | 6 | 8.5 | 3.3 | 1.6 | 5.1 | 7.8 | 8 |

**Step 5-** At this point, you have a basic chart. Now it's time to spruce it up a bit. Add a title by clicking the "Chart Title" box at the top. You can change the colors using the options at the top, name each axis, and move or change the legend, which is located at the bottom. The goal is simply to make it very clear to read. A good graph is useless if it can't be understood easily.

## Evolution of Internet

The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:

- The origin of Internet devised from the concept of **Advanced Research Project Agency Network (ARPANET).**
- ARPANET was developed by United States Department of Defence.

- Basic purpose of ARPANET was to provide communication among the various bodies of government.
- Initially, there were only four nodes, formally called **Hosts.**
- In 1972, the ARPANET spread over the globe with 23 nodes located at different countries and thus became known as Internet.
- By the time, with invention of new technologies such as **TCP/IP** protocols, **DNS, WWW,** browsers, scripting languages etc., Internet provided a medium to publish and access information over the web.

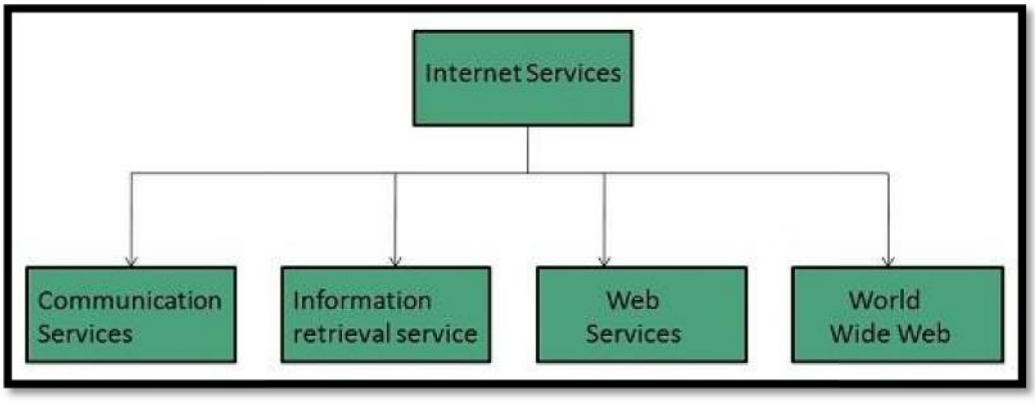
## Applications and services of Internet

The Internet is a global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support electronic mail.

**Applications:**

- **Search engine:** It can be used to search anything and everything. Most popular search engines are Google and yahoo searches.
- **Shopping:** Shopping has become easier with the advent of internet. You can buy or sell online.
- **Communication**: This is a major role of the internet. It helps people to communicate either with the use of social networking websites or through e mails. Even chatting is a major use of the internet.
- **Job search:** Nowadays, many people search for their jobs online as it is quicker and there is a larger variety of job vacancies present.
- **Hobbies:** Those who are having certain hobbies can try to improve on it by reading up on many aspects of their hobby.
- **Research:** Research papers are present online which helps in the researcher doing a literature review.
- **Studying:** Now right from kinder garden children are exposed to internet and computers.). Up to doctorate level education, people rely on internet for their education. Online educational books have even reduced the need for a library

**Internet Services** allows us to access huge amount of information such as text, graphics, sound and software over the internet. Following diagram shows the four different categories of Internet Services.



Internet provides a lot of services. Few of them are described below:

- World Wide Web (WWW)
- E-Mail
- Telnet
- File Transfer Protocol (FTP)
- Gopher
- Chat Groups

- **World Wide Web (WWW):** The World Wide Web is commonly known as web. It is a network of web servers that stores web pages. The web pages are connected to each other using hyperlinks. The user can jump from one page to another by clicking the hyperlinks. The web web pages are accessed using web browsers. The HTTP (Hyper Text Transfer Protocol) protocol is used for communication between browser and web servers.
- **E-Mail:** E-mail stands for electronic email. It is the most popular service provided by the Internet. It provides the fast and efficient way to send and receive messages through Internet. One message can be sent to many persons with a single e-mail. Different types of files can also be sent through e-mail.
- **Telnet:** Telnet is an abbreviation for Terminal Network. It is a software. It is used to connect to a remote or host computer for accessing information. Through this service, the user can also access information on the Internet.
  When a user runs this software on his/her computer, it provides a prompt on the user's computer screen. The user can access the host computer by giving commands through this prompt. When a command is sent to the host computer, information is accessed from host and displayed on user's computer screen. The user's computer linked to the remote computer will act as a terminal. The expert users mostly use this service. In some remote servers, this service is not allowed.
- **File Transfer Protocol (FTP):** FTP stands for File Transfer Protocol. It is a way for transferring files from one computer to another. The process of transferring a file from a server (or remote computer) to local computer is called downloading. Similarly, the process for transferring a file from local computer to the server on the Internet is called uploading.
  Different FTP client programs are available for uploading and downloading files to and from the server. The most commonly used FTP client programs are WS_FTP and Cute FTP.
- **Gopher:** A gopher is a menu-based information retrieval system. It is used for retrieving files and programs on the Internet. Gopher allows access to files found on FTP servers and web servers.
- **Chat Groups:** Internet provides the facility to Internet users to chat (talk) with people online all over the world. Different programs like MSN Messenger, Yahoo Messenger, AOL online etc. are available for chatting on the Internet. Chat rooms allow the users to participate in a chat on the Internet. Chat rooms on are locations on the web that provide facilities to the users to chat with each other online over the Internet. They send messages by typing with keyboard and receive messages from other end instantly. Some chat rooms support voice chats and video chats where people talk with each other and see them also.