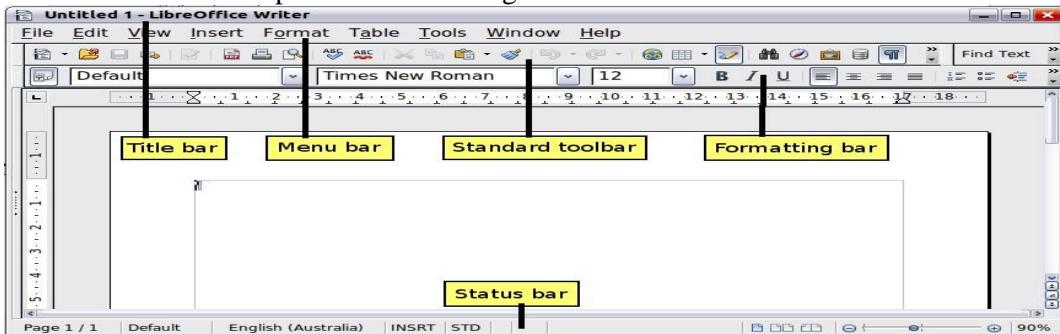


# Unit 1 - Office Writer

## Module 1 - Basics of Writer

### Parts of the main Writer window

The main Writer workspace is shown in Figure 1. Its features are described in this section.



### **Title bar**

The Title bar is located at the top of the Writer window, and shows the file name of the current document. When the document is newly created, the document name will appear as Untitled X, where X is a number.

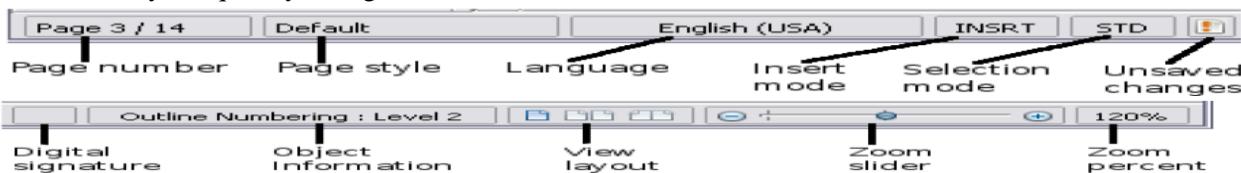
### **Menu bar**

The Menu bar is located just below the Title bar. When you choose one of the menus listed below, a submenu drops down to show commands.

- File contains commands that apply to the entire document such as Open, Save, Print, and Export as PDF.
- Edit contains commands for editing the document such as Undo: xxx (where xxx is the command to undo) and Find & Replace. It also contains commands to Cut, Copy, and Paste selected parts of your document.
- View contains commands for controlling the display of the document such as Zoom and Web Layout.
- Insert contains commands for inserting elements into your document such as Headers, footers, and pictures.
- Format contains commands, such as Styles and Formatting, Paragraph, and Bullets and Numbering, for formatting the layout of your document
- Table shows all commands to insert and edit a table in a text document.
- Tools contain functions such as Spelling and Grammar, Customize, and Options.
- Window contains commands for the display window.
- Help contains links to the LibreOffice Help file, What's This, and information about the program.

### **Status bar**

The Writer status bar is located at the bottom of the workspace. It provides information about the document and convenient ways to quickly change some document features.



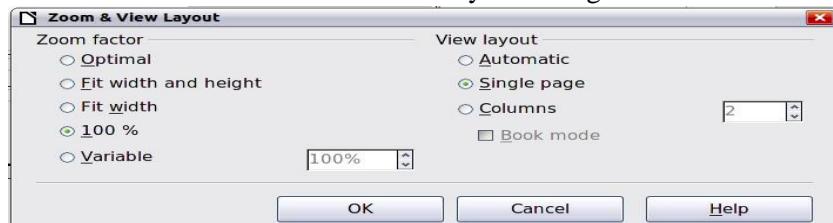
### **Changing document views**

Writer has three ways to view a document: Print Layout, Web Layout, and Full Screen. To change the view, go to the View menu and click on the required view.

Print Layout is the default view in Writer. In this view, you can use the Zoom slider and the View Layout icons on the **Status bar** to change the magnification.

You can also choose View → Zoom from the menu bar to display the Zoom & View Layout dialog box, where you can set the same options as on the Status bar.

In Web Layout view, you can use the Zoom slider; the View Layout buttons on the Status bar are disabled, and most of the choices on the Zoom & View Layout dialog box are not available. In Full Screen view, the document is



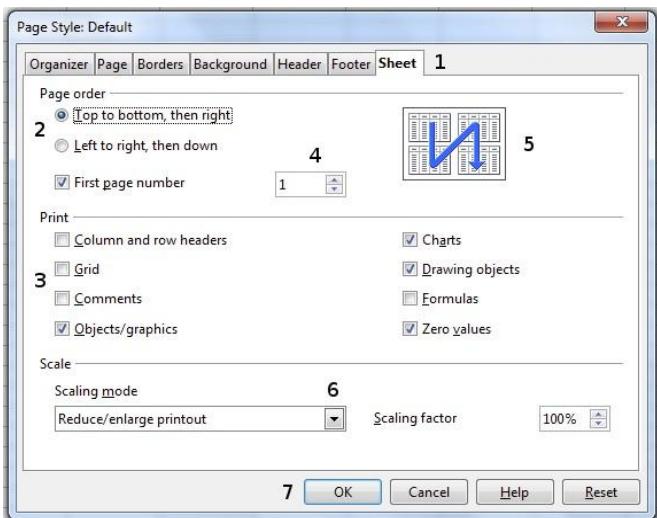
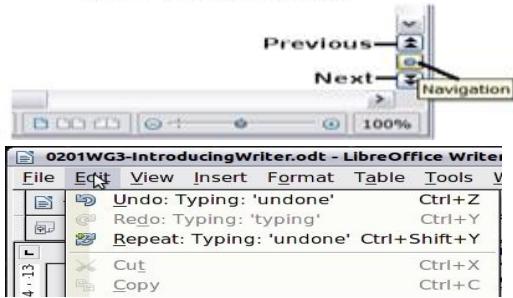
displayed using the zoom and layout settings previously selected. To exit Full Screen view and return to either print or Web Layout view, press the Esc key or click the Full Screen icon in the top left-hand corner. You can also use Ctrl+Shift+J to enter or exit Full Screen view.

## Using the Navigation toolbar

To display the Navigation toolbar click the Navigation icon (second icon from the left at the top of the Navigator, or the small Navigation icon near the lower right-hand corner of the document window below the vertical scroll bar.

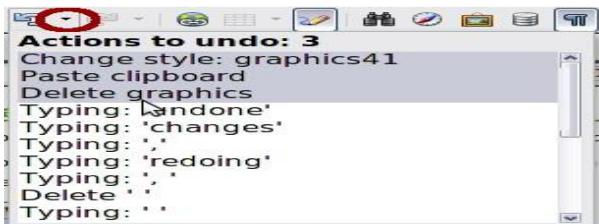


Figure 1: Navigation toolbar



## Cutting, copying, and pasting text

Cutting and copying text in Writer is similar to cutting and copying text in other applications. You can copy or move text within a document, or between documents, by dragging or by using menu selections, icons, or keyboard shortcuts.



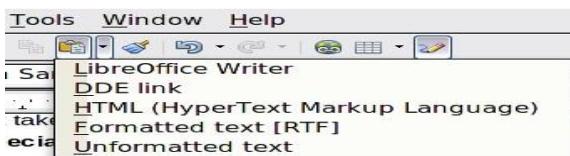
You can also copy text from other sources such as Web pages and paste it into a Writer document. To move (cut and paste) selected text using the mouse, drag it to the new location and release it. To copy selected text, hold down the Control key while dragging. In either case, the text retains the formatting it had before dragging.

When you paste text, the result depends on the source of the text and how you paste it. If you click on the Paste icon, then the pasted text keeps its original formatting (such as bold or italics). Text pasted from Web sites and other sources may also be placed into frames or tables. If you do not like the results, click the Undo icon or press control+z.

To make the pasted text take on the formatting of the text surrounding where it is pasted, you can:

- Edit → Paste Special, or
- Click the triangle to the right of the Paste icon, or
- Click the Paste icon without releasing the left mouse button.

Then select unformatted text from the resulting menu.



selected data in document A can be pasted into document B as a linked, 'live' copy of the original. It would be used,

The Navigation toolbar shows icons for all the object types shown in the Navigator, plus some extras (for example, the results of a Find command). Click an icon to select that object type. Now all the Previous and Next icons (in the Navigator itself, in the Navigation toolbar, and on the scroll bar) will jump to the previous or next object of the selected type. This is particularly helpful for finding items like index entries, which can be difficult to see in the text.

## Undoing and redoing changes

When a document is open, you can undo the most recent change by pressing control+z, or clicking the Undo icon on the Standard toolbar, or choosing Edit → Undo from the menu bar. The Edit menu shows the latest changes that can be undone. Click the small triangle to the right of the Undo icon to get a list of all the changes that can be

undone. You can select multiple changes and undo them at the same time

1=Tabbed page (not strictly speaking a control)

2=Radio buttons (only one can be selected at a time)

3=Checkbox (more than one can be selected at a time)

4=Spin box (click the up and down arrows to change the number shown in the text box next to it, or type in the text box)

5=Thumbnail or preview

6=Drop-down list from which to select an item

7=Push buttons.

After changes have been undone, Redo becomes active. To redo a change, select Edit → Redo, or press control+y or click on the Redo icon. As with Undo, click on the triangle to the right of the arrow to get a list of the changes that can be restored.

text retains the formatting it had before dragging.

The range of choices on the Paste Special menu varies depending on the origin and formatting of the text (or other object) to be pasted. See Figure for an example with text on the clipboard.

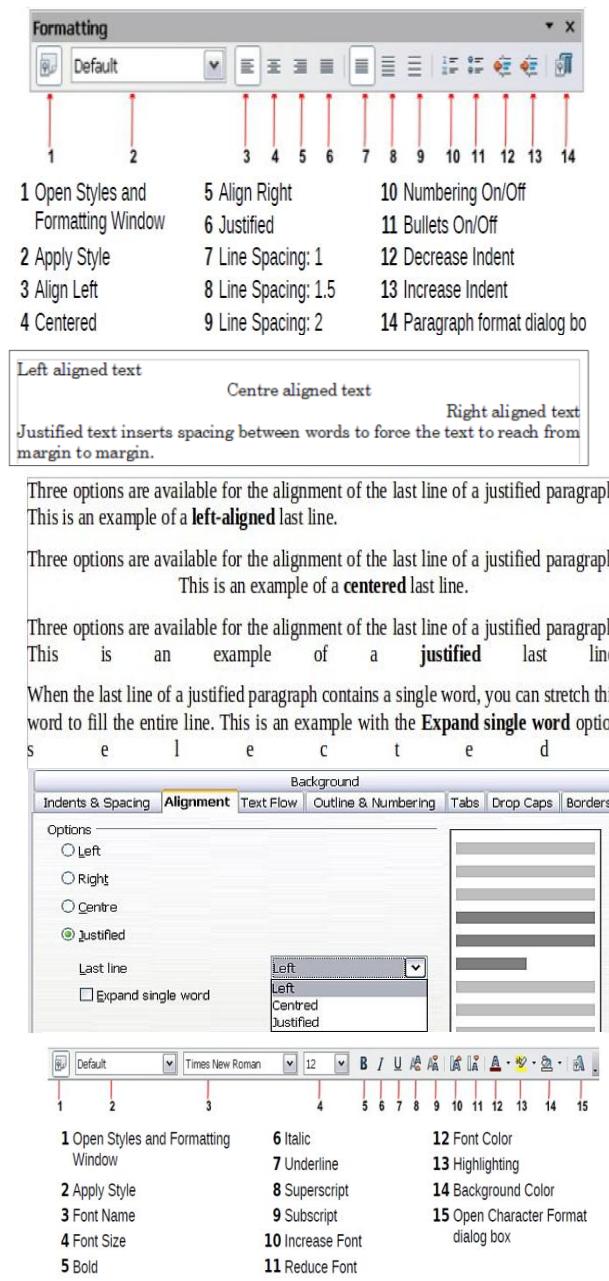
This example includes the formatting option DDE link. DDE is an acronym for Dynamic Data Exchange, a mechanism whereby

selected data in document A can be pasted into document B as a linked, 'live' copy of the original. It would be used,

for example, in a report written in Writer containing time-varying data, such as sales results sourced from a Calc spreadsheet. The DDE link ensures that, as the source spreadsheet is updated so is the report, thus reducing the scope for error and reducing the work involved in keeping the Writer document up to date.

## Formatting paragraphs

You can apply many formats to paragraphs using the buttons on the Formatting toolbar. Figure 67 shows the



Formatting toolbar as a floating toolbar, customized to show only the buttons for paragraph formatting. If you have Asian or Complex Text Layout language support enabled, two additional buttons are available: Left-to-Right and Right-to-Left

When using justified text, the last line is by default aligned to the left; however, if so desired, you can also align the last line to the center of the paragraph area or justify it so that spaces are inserted between the words in order to fill the whole line. In the case where the last line consists of a single word, you can also have this word stretched to cover the whole line.

Figure: Four choices for the last line of a justified paragraph.

These options are controlled in the Alignment page of the Format → Paragraph dialog box.

## Formatting characters

You can apply many formats to characters using the buttons on the Formatting toolbar. Figure shows the Formatting toolbar customized to show only the buttons for character formatting. It is highly recommended that you use character styles rather than manually formatting characters.

### Tip:

To remove manual formatting, select the text and choose Format → Default Formatting from the main menu bar, or

right-click and choose Default Formatting from the pop-up menu.

## Changing the case of selected text

To quickly change the case of text, select it, choose Format → Change Case from the menu bar, and then choose one of the following:

- Sentence case, where only the first word (and any proper nouns) is capitalized
  - Lower case, where no words (except proper nouns) are capitalized
  - UPPER CASE, where all letters are capitalized
  - Capitalize Every Word, where every word is capitalized
  - tOGGLE cASE, which changes every letter to the opposite case
- There are also several options that are used with Asian text. These are not "Case", but are lumped together under a broader meaning of replacing characters with different forms of the same

letter. These options are hidden with Asian language support is not enabled. Writer does not have an automated way to do Title Case, where all words are capitalized except for certain subsets defined by rules that are not universally standardized. To achieve this affect, you can use Capitalize Every Word and then UN capitalizes those words that were incorrectly capitalized.

## Creating numbered or bulleted lists

There are several ways to create numbered or bulleted lists:

- Use auto formatting, as described above.
- Use the Numbering and Bullets icons on the paragraph formatting toolbar.

This method is described here. To produce a numbered or bulleted list, select the paragraphs in the list and then click on the appropriate icon on the toolbar.

**Note:** It is a matter of personal preference whether you type your information first, then apply Numbering/Bullets or apply these as you type.

## Using the Bullets and Numbering toolbar

You can create a nested list (where one or more list items has a sub list under it, as in an outline) by using the buttons on the Bullets and Numbering toolbar. You can move items up or down the list, create sub points, and even change the style of bullets.

**Tip:** It is possible to move a list entry up, together with all of its sub-entries. Do this by clicking the Promote One Level with Sub point's button.



- |                     |                                    |                             |
|---------------------|------------------------------------|-----------------------------|
| 1 Bullets On/Off    | 6 Promote One Level with Subpoints | 10 Move Down                |
| 2 Numbering On/Off  | 7 Demote One Level with Subpoints  | 11 Move Up with Subpoints   |
| 3 Numbering Off     | 8 Insert Unnumbered Entry          | 12 Move Down with Subpoints |
| 4 Promote One Level | 9 Move Up                          | 13 Restart Numbering        |
| 5 Demote One Level  | 14 Bullets and Numbering           |                             |

If you create a nested list using the buttons on this toolbar, all the levels of the list (up to 10) apply the same numbering (or bullet). However, in many circumstances you will want to use a combination of numbering formats and bullets when creating nested lists. Such lists, with a mixture of numbering formats and bullets, can be easily configured as described in the following example.

**Tip:** When creating nested lists, one option is to enter all the list paragraphs first and apply the levels afterwards. You can use keyboard shortcuts to move paragraphs up or down the outline levels. Place the cursor at the beginning of

of the numbered paragraph and press: Tab Down a level shift+Tab Up a level. To insert a tab stop at the beginning of a numbered paragraph (that is, after the number but before the text), press control+Tab.

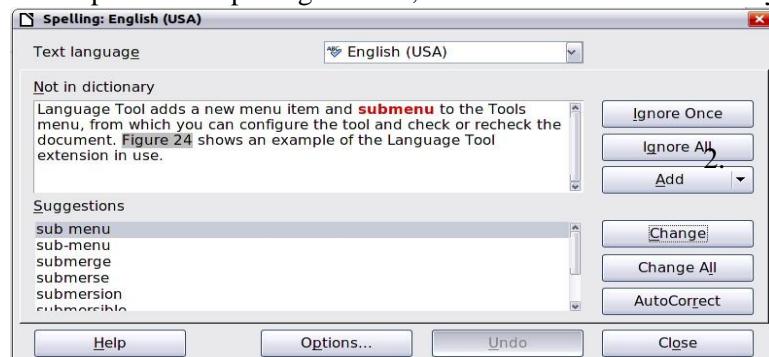
## Example: configuring a nested list

We will use a numbering style to produce the following effect:

- I. Level-1 list item
- A. Level-2 list item
- i. Level-3 list item
- a) Level-4 list item

## Checking spelling

Writer provides a spelling checker, which can be used in two ways.



1. Auto Spell check checks each word as it is typed and displays a wavy red line under any misspelled words. When the word is corrected, the red wavy line disappears.

To perform a separate spelling check on the document (or a text selection) click this button. This checks the document or selection and opens the Spelling dialog box (Figure 84) if any misspelled words are found. Figure 84: Selecting a word from dictionary using the Spelling dialog box here are some more features of the spelling

checker: You can right-click on a word with a wavy underline, to open a powerful context menu. If you select from the suggested words on the menu, the selection will replace the misspelled word in your text. Other menu options are discussed below. You can change the dictionary language (for example, Spanish, French, or German) on the Spelling and Grammar dialog box.

You can add a word to a dictionary. Click Add in the Spelling and Grammar dialog box and pick the dictionary to add it to.

Click the Options button on the Spelling dialog box to open a dialog box similar to the one in Tools → Options → Language Settings → Writing Aids. There you can choose whether to check uppercase words and words with numbers. You can also add or delete dictionaries and add or delete words in a dictionary.

## Finding and replacing text

Writer has two ways to find text within a document: the Find toolbar for fast searching and the Find & Replace dialog box. In the dialog box, you can:

- Find and replace words and phrases
- Use wildcards and regular expressions to fine-tune a search
- Find and replace specific formatting
- Find and replace paragraph styles



If the Find toolbar is not visible, you can display it using View → Toolbars → Find

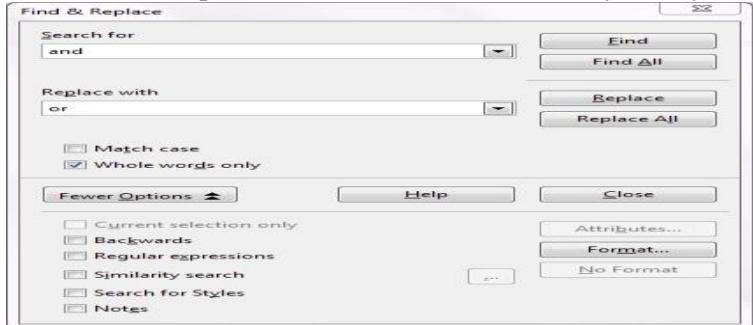
To display the Find & Replace dialog box, use the keyboard shortcut control+f or choose Edit → Find & Replace from the menu bar.

- 1) Type the text you want to find in the Search for box.
- 2) To replace the text with different text, type the new text in the Replace with box.
- 3) You can select various options, such as matching the case, matching whole words only, or doing a search for similar words. (See below for some other choices.)
- 4) When you have set up your search, click Find. To replace text, click Replace instead.

**Tip:** If you click Find All, Writer selects all instances of the search text in the document. Similarly, if you click replace All, Writer replaces all matches

**Caution:** Use Replace All with caution; otherwise, you may end up with some hilarious (and highly embarrassing) mistakes. A mistake with Replace All might require a manual, word-by-word, search to fix.

Figure: Expanded Find & Replace dialog box



## Module 2 – Insertions into Writer

### Inserting special characters

A “special” character is one not found on a Standard English keyboard. For example, © ¾ æ ç Ł ñ ö ø ø are all special characters. To insert a special character:

- 1) Place the cursor in your document where you want the character to appear.
- 2) Click **Insert → Special Character** to open the Special Characters dialog box.
- 3) Select the characters (from any font or mixture of fonts) you wish to insert, in order; then click OK.

The selected characters are shown in the lower left of the dialog box. As you select each character, it is shown on the lower right, along with the numerical code for that character.



**Tip** The characters selected appear in the bottom-left corner of the dialog box.

**Note:** Different fonts include different special characters. If you do not find a particular special character you want, try changing the Font selection.

[The Special Characters dialog box, where you can insert special characters](#)

### Using hyperlinks

When you type text (such as website addresses or URL) that can be used as a hyperlink, and then press the spacebar or the Enter key, Writer automatically creates the hyperlink and applies formatting to the text.

If this does not happen, you can enable this feature using **Tools → AutoCorrect Options → Options** and selecting the **URL Recognition** option.

If you do not want Writer to convert a specific URL to a hyperlink, choose **Edit → Undo Insert** from the menu bar or press control+z immediately after the formatting has been applied.

You can also insert hyperlinks using the Navigator and the Hyperlink dialog box, and you can modify all hyperlinks using the Hyperlink dialog box, as described in this section.

**Note:** Hyperlinks between documents can be set as relative or absolute, using the Save URLs relative to option in **Tools → Options → Load/Save → General**.

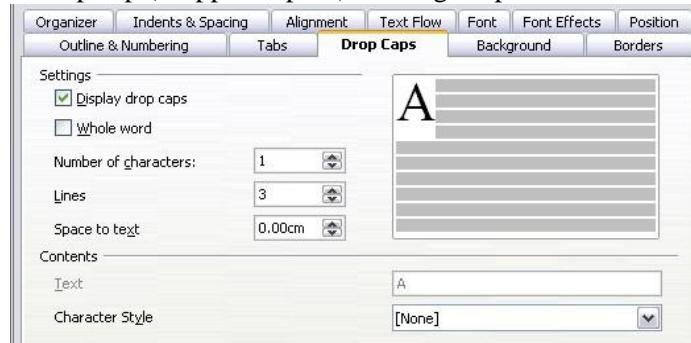
Relative linking is only possible when the document you are working on and the link destination are on the same drive, and you need to create the same directory structure on your hard disk as will apply on the destination website. LibreOffice uses absolute path names internally, so when you move your mouse cursor over a hyperlink, the tooltip displays the absolute reference even when it is set to be a relative link.

### Counting the words in a selection

Select a block of text and choose **Tools → Word Count**. LibreOffice displays the number of words and characters in the selection as well as the number of words in the document. You can also see the number of words and characters (and other information) in the entire document in **File → Properties → Statistics**.

## Setting up a drop cap

A drop cap (dropped capital) is a large capital letter used as a decorative element at the beginning of a paragraph or section. The size of a drop cap is usually two or more lines.



If you want your paragraph to use drop caps (usually this is suitable for a first paragraph style), then you can predefine the properties in the Drop Caps page of the paragraph style dialog box.

Selecting the option to display drop caps enables the subsequent options where you can fine tune the appearance: the number of lines occupied, the number of characters to enlarge (if you want the whole first word, check the corresponding box), and the space between the drop caps and the text.

Drop caps use the same font and have the same properties as the rest of the paragraph; however, you can easily modify their appearance by creating a specific character style and using it. For example, you may want the drop caps to be of a different color or apply an outline effect. Select the character style you want to use in the corresponding drop-down menu.

## Images to a document

Images can be added to a document in several ways: by inserting an image file, directly from a graphics program or a scanner, or from the LibreOffice Gallery Inserting an image file When the image is in a file stored on the computer, you can insert it into an LibreOffice document using either of the following methods.

### Drag and drop

- 1) Open a file browser window and locate the image you want to insert.
- 2) Drag the image into the Writer document and drop it where you want it to appear.

A faint vertical line marks where the image will be dropped. This method embeds (saves a copy of) the image file in the Writer document. To link the file instead of embedding it, hold down the control+shift keys while dragging the image.

### Insert Picture dialog box

- 1) Click in the LibreOffice document where you want the image to appear.
- 2) Choose Insert → Picture → From File from the menu bar.
- 3) On the Insert Picture dialog box, navigate to the file to be inserted, and select it. At the bottom of the dialog box are two options, Preview and Link. Select Preview to view a thumbnail of the selected image on the right (as shown in the example), so you can verify that you have the correct file. See “Inserting an image file” below for the use of Link and then Click Open.

## Inserting an image from the Gallery

The Gallery provides a convenient way to group reusable objects such as graphics and sounds that you can insert into your documents. The Gallery is available in all components of LibreOffice. It does not come with many graphics, but you can add your own pictures or find extensions containing more graphics.

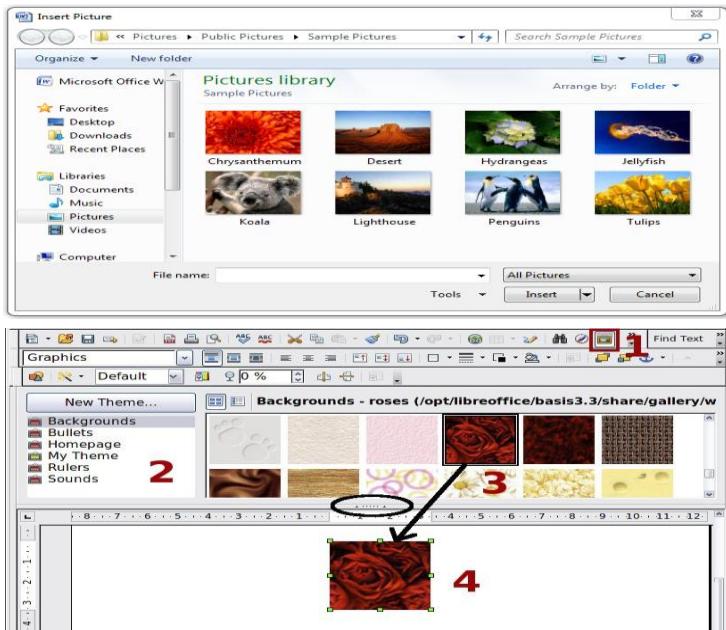


Figure: Inserting image from Gallery

### Insert picture dialog box

This section explains the basics of inserting a Gallery image into a Writer document:

1. To open the Gallery, click on the Gallery icon (located in the right side of the Standard toolbar) or choose Tools → Gallery from the menu bar.
2. Navigate through the Gallery to find the desired picture.
3. To insert the picture, click and drag it from the Gallery into the Writer document. You can also right-click on the picture and choose Insert → Copy.
4. To close the Gallery, choose Tools → Gallery to uncheck the Gallery entry, or click on the Gallery icon again.

## Creating a table

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, choose Insert → Table.
- From the main menu, choose Table → Insert → Table.
- Press Control+F12.
- From the Standard toolbar, click the Table icon.

Here you can specify the properties for the new table.

Under Name, you can enter a different name than the LibreOffice-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.



Figure: Inserting a new table using the Insert Table dialog box

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 LibreOffice-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) can be 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 box from which you can select one of the many predefined table layouts. See “Automatic formatting of tables” on page 271 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.

**Tip:** 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 (up to fifteen rows and up to ten 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. Figure 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.


Figure: Nested table example. The shaded table is nested in a cell of the larger table.

### 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 choose Table → Convert → Text to Table to open the dialog box shown in figure. 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 box are the same as those in the dialog box used to insert a table shown in Figure.

Figure: Dialog box to configure the text to table conversion

### 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.

<b>Row 1 Column 1</b>	<b>Row 1 Column 2</b>	<b>Row 1 Column 3</b>
<b>Row 2 Column 1</b>	<b>Row 2 Column 2</b>	<b>Row 2 Column 3</b>

Note that, unlike when creating a table with other mechanisms, the conversion from text to table preserves the paragraph style and character style applied to the original text.

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, choose **Table → Convert → Table to Text** in the main menu, pick the preferred row separator, and click **OK** to finish.

### Formatting the table layout

Formatting a table is, generally speaking, a two-step process: formatting of the table layout (the subject of this section) and formatting of the table text (the subject of the next section). Formatting the layout normally involves one or more of the following operations: adjusting the size of the table and its position on the page, adjusting sizes of rows and columns, adding or removing rows or columns, merging and splitting individual cells, changing borders and background.

### Inserting rows and columns

To insert any number of rows or columns:

- 1) Place the cursor in the row or column where you want to add new rows or columns and right-click.
- 2) On the pop-up menu, choose **Row → Insert** or **Column → Insert**. This will display a dialog box where you can select the number of rows or columns to add, and whether they appear before or after the selected one.
- 3) Set Amount to the number of rows or columns to insert, and Position to **Before** or **After**.
- 4) Click **OK** to close the dialog box.

The **Table → Insert → Row** and **Table → Insert → Column** choices from the main menu provide the same options

#### Note:

Clicking on the Insert Row icon on the Table toolbar inserts one row below the selected one. Clicking on the Insert Column icon on the Table toolbar inserts a column after (to the right of) the selected one. Regardless of how they are inserted, new rows or columns have the same formatting as the row or column where the cursor was when the insert command was issued.

You can also quickly insert a row or a column using only the keyboard:

- 1) Place the cursor in the row or column next to the row or column you want to insert.
- 2) Press Alt+Insert to activate keyboard handling.
- 3) Use the arrow keys as desired to add a row or column.

Left to insert a new column to the left of the cell where the cursor is located. Right click to insert a new column to the right of the cell where the cursor is. Down to insert a new row below the cell where the cursor is. Up to insert a new row above the cell where the cursor is. The above keyboard technique can also be used to delete rows or columns by substituting the Alt+Delete keystroke combination in Step 2 with Alt+Delete.

### Merging and splitting cells

To merge a group of cells into one cell:

- 1) Select the cells to merge.
- 2) Right-click and choose **Cell → Merge** on the pop-up menu, or choose **Table → Merge Cells** from the main menu.

### To split a cell into multiple cells:

- 1) Position the cursor inside the cell.
- 2) Right-click and choose **Cell → Split** on the pop-up menu, or choose **Table → Split Cells** from the menu.

- 3) Select how to split the cell. A cell can be split either horizontally (create more rows) or vertically (create more columns), and you can specify the total number of cells to create. It is generally a good rule to merge and split cells after completing other layout formatting. This is because some operations such as deleting a column or a row may produce a result difficult to predict when applied to a table with merged or split cells.

### Specifying table borders

On the Table Format dialog box, select the Borders tab. Here you can set borders for a whole table or groups of cells within a table. In addition, a shadow can be set for the whole table. Borders have three components: where they go, what they look like, and how much space is left around them. Line arrangement specifies where the borders go. If a group of cells is selected, the border will be applied only to those cells. You can specify individually the style of the border for the outside edges of the selected cells as well as for the cell divisions. Writer provides five default arrangements but you can just as easily click on the line you want to customize in the User-defined area to get exactly what you want. When multiple cells are selected, the User-defined area allows you to select the edges of the selection as well as the cell dividers. By clicking at the intersection of the lines, you can modify multiple borders simultaneously. For example, in Figure 283 the right edge and horizontal separators are modified with a single operation.

#### Note:

When the selected cells have different styles of border the User-defined area shows the border as a gray line. You can click on the gray line to choose a new border style (first click), leave the border as it is (second click) or delete the border (third click).

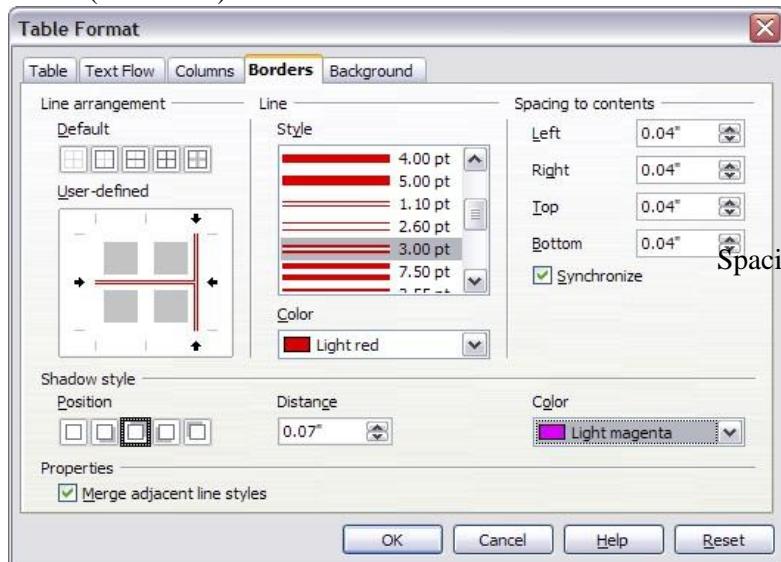


Figure: Table Format dialog box: Borders page  
Line specifies what the border looks like: the style and color. There are a number of different styles and colors to choose from. The Line Style and Color will apply to those borders highlighted by a pair of black arrows in the User-defined map on the left hand side of the dialog box.  
Spacing to contents specifies how much space to leave between the border and the cell contents. Spaces can be specified to the left, right, above, and below. Check Synchronize to have the same spacing for all four sides. This spacing is like padding and it is not factored in when calculating the text measurements. Shadow style properties always apply to the whole table. A shadow has three components: where it is, how far from the table it is cast, and what color it is.

If Merge adjacent line styles are checked, two cells sharing a common border will have their borders merged, rather than being side by side.

**Tip** To reset everything if you are having problems with borders, right-click in the table and choose Table or choose Table → Table Properties from the main menu. On the Borders tab, select the Set No Borders icon under Line arrangement: Default (the box on the left).

### Rotating text in a table cell

You can rotate text in a table cell by 90 or 270 degrees. Text rotation is useful when you have long headings for narrow columns.

- Select the text to be rotated and then choose Format → Character.

This is long	Another long heading	A rotated heading	Another heading	Another heading	Another heading	Another heading

On the Position page, in the Rotation / scaling section, choose the rotation angle and click OK.

Figure shows a sample table with rotated headings.

## Module 3 – Math & Writer Extension

### What is Math?

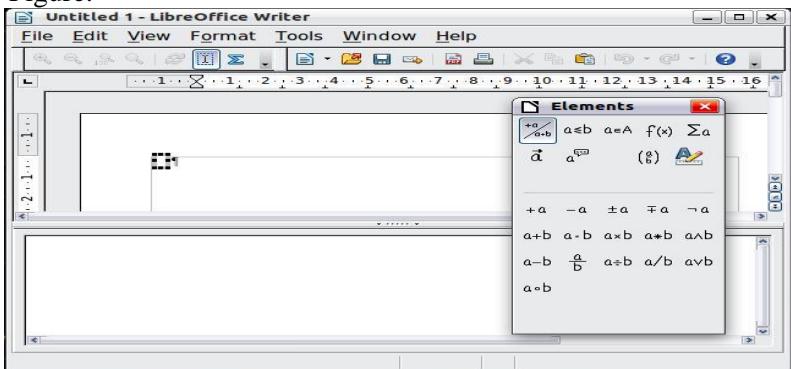
Math is LibreOffice component for writing mathematical equations. It is most commonly used as an equation editor for text documents, but it can also be used with other types of documents or stand-alone. When used inside Writer, the equation is treated as an object inside the text document.

### Getting started

To insert an equation, go to Insert > Object > Formula.

The equation editor opens at the bottom of the screen, and the floating Elements window may appear.

You will also see a small box with a gray border in your document, where the formula will be displayed, as shown in Figure.



The context menu and the Elements window insert the markup corresponding to a symbol. This provides a convenient way to learn the LibreOffice Math markup.

### The Elements window

The simplest method for entering a formula is the Elements window

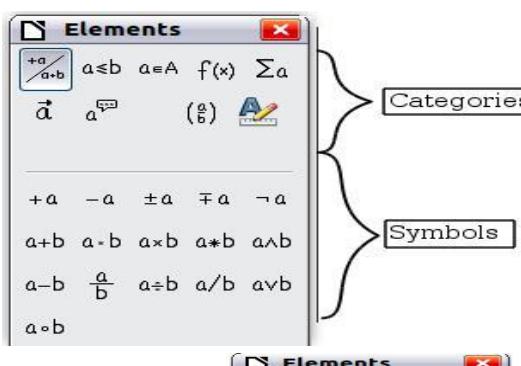


Figure: Symbols are divided into categories

The Elements window is divided into two main parts.

- The **top** shows the symbol categories. Click on these to change the list of symbols.
- The **bottom** shows the symbols available in the current category.

**Tip** You can hide or show the Elements window with View > Elements.

#### Example 1: $5 \times 4$

For this example we will enter a simple formula:  
 $5 \times 4$ .

On the Elements window:

- 1) Select the top-left button of the categories (top) section.
- 2) Click on the multiplication symbol.

Figure: Selecting the multiplication symbol

When you select the multiplication symbol on the Elements window, two things happen:

- The equation editor shows the markup:  $<?> \times <?>$
- The body of the document shows a gray box like this:  $\times$

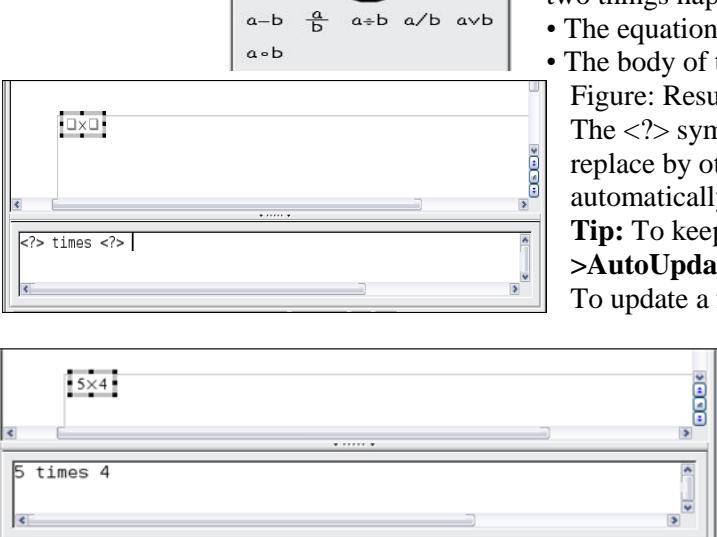
Figure: Result of selecting the multiplication symbol

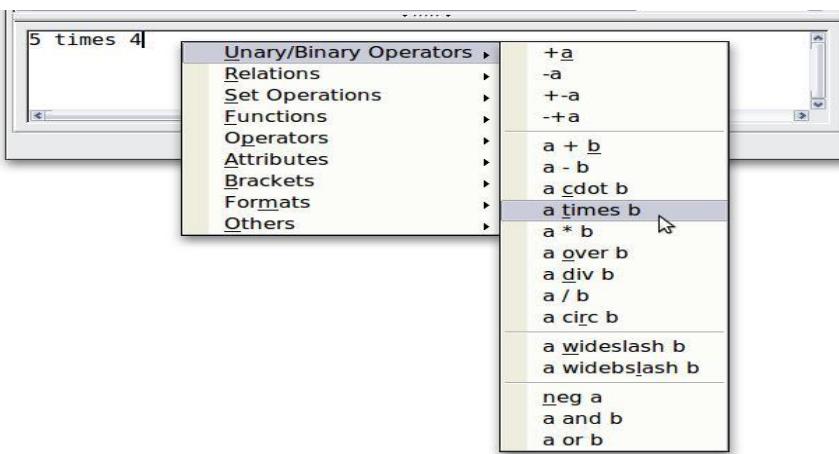
The  $<?>$  symbols shown in Figure 4 are placeholders that you can replace by other text, for example 5 and 4. The equation will update automatically, and the result should resemble Figure.

**Tip:** To keep the equation from updating automatically, select View >AutoUpdate display.

To update a formula manually, press F9 or select View > Update Right-click (context) menu

Another way to access mathematical symbols is to right-click on the equation editor. This pops up the menu shown in Figure. The items in this menu correspond exactly to those in the Elements window.





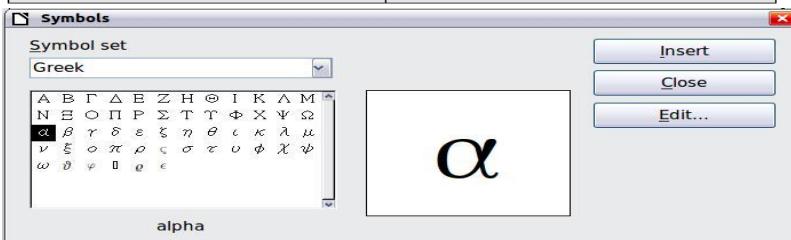
Display	Command	Display	Command
$a = b$	$a = b$	$\sqrt{a}$	$\text{sqrt}\{a\}$
$a^2$	$a^2$	$a_n$	$a\_n$
$\int f(x) dx$	$\text{int } f(x) dx$	$\sum a_n$	$\text{sum } a\_n$
$a \leq b$	$a \leq b$	$\infty$	$\text{infinity}$
$a \times b$	$a \times b$	$x \cdot y$	$x \cdot y$

mathematical formulas. These characters are not available in the Elements window or the right-click menu. Fortunately, the markup for Greek characters is simple: Type a % sign followed by the name of the character, in English.

- To write a lowercase character, type the name of the character in lowercase.
- To write an uppercase character, type the name of the character in uppercase.

See the table below for some examples.

Lowercase	Uppercase
%alpha → α	%ALPHA → Α
%beta → β	%BETA → Β
%gamma → γ	%GAMMA → Γ
%psi → ψ	%PSI → Ψ
%phi → φ	%PHI → Φ
%theta → θ	%THETA → Θ



Lowercase	Uppercase
%alpha → α	%ALPHA → Α
%beta → β	%BETA → Β
%gamma → γ	%GAMMA → Γ
%psi → ψ	%PSI → Ψ
%phi → φ	%PHI → Φ
%theta → θ	%THETA → Θ

Markup	Result
2 over x + 1	$\frac{2}{x} + 1$
2 over {x + 1}	$\frac{2}{x+1}$

Figure: Right-click (context) menu

## Markup

You can type the markup directly in the equation editor. For example, you can type 5 times 4 to obtain  $5 \times 4$ .

If you know the markup, this can be the fastest way to enter a formula.

**Tip:** The formula markup resembles the way the formula reads in English.

Below is a short list of common equations and their corresponding markup.

## Greek characters

Greek characters ( , , , etc) are common in

Another way to enter Greek characters is by using the Symbols catalog window. Choose **Tools > Catalog**. This window is shown in Figure. Under Symbol set, select Greek and double-click on a Greek letter from the list. The markup name of the character is shown below the list window.

Figure: Symbols catalog, used for entering Greek characters and some special symbols

## Formula layout

The most difficult part of using LibreOffice Math comes when writing complicated formulas. This section provides some advice.

### Brackets are your friends

LibreOffice Math knows nothing about order of operation. You must use brackets to state the order of operations explicitly. Consider the following example.

Markup	Result
sum from k = 1 to n a_k	$\sum_{k=1}^n a_k$
int from 0 to x f(t) dt or int_0^x f(t) dt	$\int_0^x f(t) dt$ or $\int_0^x f(t) dt$
int from Re f	$\int_{\Re} f$
sum to infinity 2^{-n}	$\sum^{\infty} 2^{-n}$

### How do I add limits to my sum/integral?

The sum and integral commands can (optionally) take the parameters from and to. These are used for lower and upper limits respectively. These parameters can be used singly or together. Limits for integrals are usually treated as subscripts and superscripts.

Markup	Result
matrix { a # b ## c # d }	$\begin{matrix} a & b \\ c & d \end{matrix}$

Markup	Result
{df} over {dx}	$\frac{df}{dx}$
{partial f} over {partial y}	$\frac{\partial f}{\partial y}$
{partial^2 f} over {partial t^2}	$\frac{\partial^2 f}{\partial t^2}$

### Brackets with matrices look ugly!

For background, we start with an overview of the matrix command.

### How do I make a derivative?

Making derivatives essentially comes down to one trick: Tell LibreOffice it's a fraction.

In other words, you have to use the over command. Combine this with either the letter d (for a total derivative) or the partial command (for a partial derivative) to achieve the effect of a derivative.

## Saving a document

To save a new document in Writer, do one of the following:

- Press **Control+S**.
- Choose **File → Save**.
- Click the **Save** button on the main toolbar.

When the **Save As** dialog box appears, enter the file name, verify the file type (if applicable), and click **Save**.

To save an open document with the current file name, choose **File → Save**. This will overwrite the last saved state of the file.

## Saving a document automatically

You can choose to have Writer save your document automatically at regular intervals. Automatic saving, like manual saving, overwrites the last saved state of the file. To set up automatic file saving:

- 1) Select **Tools → Options → Load/Save → General**.
- 2) Click on **Save AutoRecovery information every** and set the time interval. The default value is 15 minutes. Enter the value you want by typing it or by pressing the up or down arrow keys.

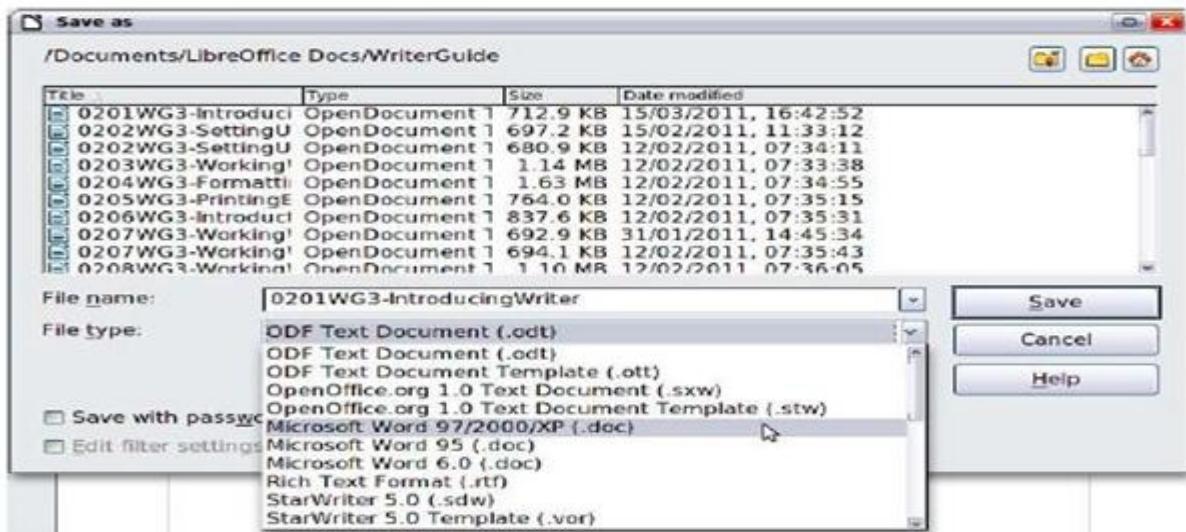


Figure 1. Saving a file in Microsoft Word format

## Password protection

Writer provides two levels of document protection: read-protect (file cannot be viewed without a password) and write-protect (file can be viewed in read-only mode but cannot be changed without a password). Thus you can make the content available for reading by a selected group of people and for reading and editing by a different group. This behavior is compatible with Microsoft Word file protection.

- 1) Use **File → Save As** when saving the document. (You can also use **File → Save** the first time you save a new document.)
- 2) On the **Save As** dialog box, select the **Save with password** option, and then click **Save**.



- 3) The **Set Password** dialog box opens.



Figure 2. Two levels of password protection

Here you have several choices:

- To read-protect the document, type a password in the two fields at the top of the dialog box.
  - To write-protect the document, click the **More Options** button and select the **Open file read-only** checkbox.
  - To write-protect the document but allow selected people to edit it, select the **Open file read-only** checkbox and type a password in the two boxes at the bottom of the dialog box.
- 4) Click **OK** to save the file. If either pair of passwords do not match, you receive an error message. Close the message box to return to the **Set Password** dialog box and enter the password again.

## Closing a document

To close a document, choose **File .. Close** or click the **Close** icon on the document window. The appearance and placement of this icon varies with your operating system, but it typically looks like the X in the red box shown in Figure .

If more than one LibreOffice window is open, each window looks like the sample shown on the left in Figure ... . Closing this window leaves the other LibreOffice windows open.

If only one LibreOffice window is open, it looks like the sample shown on the right in Figure 18. Notice the small black X below the larger X in the red box. Clicking the small black X closes the document but leaves LibreOffice open. Clicking the larger X closes LibreOffice completely.



Figure 1. Close icons

If the document has not been saved since the last change, a message box is displayed. Choose whether to save or discard your changes.

- **Save:** The document is saved and then closed.
  - **Discard:** The document is closed, and all modifications since the last save are lost.
  - **Cancel:** Nothing happens, and you return to the document.

## Multiple Choice Questions

- 1) Which is the type of orientation in LibreOffice Writer?  
a) Portrait b) Landscape c) Slide d) Both Portrait and Landscape
  - 2) What is the default file name in LibreOffice Writer?  
a) New file b) Odt File c) Untitled 1 d) None of the above
  - 3) What is the correct sequence of steps required to insert the equation in LibreOffice Writer document?  
a) Insert > Object > \_\_\_\_\_ b) Insert > Object > Equation  
c) Insert > Object > Formula d) Insert > Header and Footer > Footer
  - 4) Shortcut key is \_\_\_\_\_ to open a document in LibreOffice Writer.  
a) Ctrl +Q b) Ctrl +O c) Ctrl + H d) Ctrl + P
  - 5) Which of the following Technique selects a sentence in Writer?  
a) Single Click( Pressing Left button of Mouse) b) Double Click c) Triple Click d) None of the above
  - 6) What is the default file extension in LibreOffice Writer?  
a) .odt b) .ods c) .odp d) .docx
  - 7) In which menu the commands like bold, italic, underline are found in the LibreOffice Writer?  
a) Style b) Format c) Insert d) View
  - 8) What is the correct sequence of steps required to insert the footer in LibreOffice Writer document?  
a) Insert>Footer>Default Style b) Insert>Footer  
c) Insert>Header and Footer>Footer>Default Style d) Insert>Header and Footer>Footer
  - 9) Saving an existing document with some other name using the Save As option \_\_\_\_\_  
a) Replace the current document b) Leaves the current document Intact  
c) Is not possible d) Closes the document
  - 10) Which one of the following menu options is used to start the spell checker in LibreOffice Writer?  
a) Tools>Automatic Spell Checking b) Format>Automatic Spell Checking  
c) Format>Spell Checking d) Tools>Spell Checking

## **Short Answer Questions**

- 1) What is paste Special function?
  - 2) What is the shape of the cursor when drawing a Table?
  - 3) Where are drop caps used in a document?
  - 4) How do you write math equations in LibreOffice Writer?
  - 5) Explain about Formatting paragraphs in LibreOffice Writer?
  - 6) Explain about Formatting character in LibreOffice writer?
  - 7) Brief about hyper linking? Apply it to RGUKT web address?
  - 8) Explain about creating nested table?
  - 9) Write about Merging and splitting Cells?
  - 10) Write about Elements window and Formula layout?

## Unit 2 - Office Calc

### Module 1 – Basics of Calc

#### **What is Calc?**

Calc is the spreadsheet component of LibreOffice. You can enter data (usually numerical) 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 spreadsheet or sheet.

Other features provided by Calc include:

- Functions, which can be used to create formulas to perform complex calculations on data
- Database functions, to arrange, store, and filter data
- Dynamic charts; a wide range of 2D and 3D charts
- Macros, for recording and executing repetitive tasks; scripting languages supported include LibreOffice Basic, Python, BeanShell, and JavaScript
- Ability to open, edit, and save Microsoft Excel spreadsheets
- Import and export of spreadsheets in multiple formats, including HTML, CSV, PDF, and PostScript.

#### **Spreadsheets, sheets, and cells**

Calc works with elements called spreadsheets. Spreadsheets consist of a number of individual sheets, each sheet containing cells arranged in rows and columns. A particular cell is identified by its row number and column letter. Cells hold the individual elements—text, numbers, formulas, and so on—that make up the data to display and manipulate. Each spreadsheet can have many sheets, and each sheet can have many individual cells. In Calc 3.3, each sheet can have a maximum of 1,048,576 (65,536 rows in Calc 3.2 and earlier) and a maximum of 1024 columns

#### **Starting new spreadsheets**

You can start a new, blank document in Calc in several ways.

- From the operating system menu, in the same way that you start other programs. When LibreOffice was installed on your computer, in most cases a menu entry for each component was added to your system menu. If you are using a Mac, you should see the LibreOffice icon in the Applications folder. When you double-click this icon, LibreOffice opens at the Start Center.
- From the Quick starter, which is found in Windows, some Linux distributions, and (in a slightly different form) in Mac OS X. The Quick starter is an icon that is placed in the system tray or the dock during system startup. It indicates that LibreOffice has been loaded and is ready to use.

Right-click the Quick starter icon in the system tray to open a menu from which you can open a new document, open the Templates and Documents dialog box, or choose an existing document to open. You can also double-click the Quick starter icon to display the Templates and Documents dialog box.



Figure: Quick starter menu on Windows 7 Start Center. When LibreOffice is open but no document is open (for example, if you close all the open documents but leave the program running), the Start Center is shown. Click one of the icons to open a new document of that type, or click the Templates Icon to start a new document using a template. If a document is already open in LibreOffice, the new document opens in a new window.

Figure: LibreOffice Start Center

When LibreOffice is open, you can also start a new document in one of the following ways.



Press the **control+n** keys.

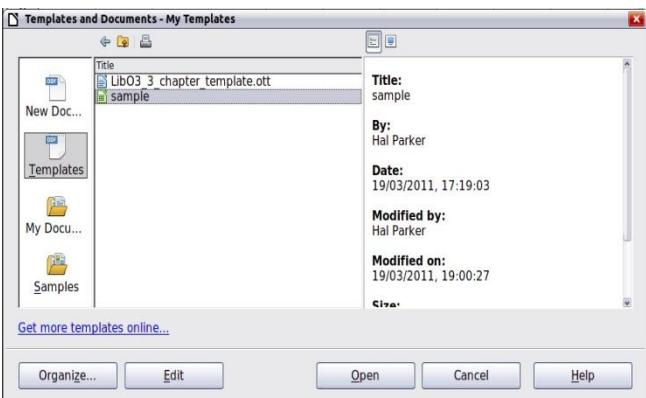
Use **File → New → Spreadsheet**.

Click the **New** button on the main toolbar.

#### **Starting a new document from a template**

Calc documents can also be created from templates. Follow the above procedures, but instead of choosing Spreadsheet, choose the **Templates** icon from the Start Center or **File → New → Templates and Documents** from the Menu bar or toolbar. On the Templates and Documents window, navigate to the appropriate folder and double-click on the required template.

A new spreadsheet, based on the selected template, opens. A new LibreOffice installation does not contain many templates, but you can add more by downloading them from <http://extensions.libreoffice.org/> and installing them. Setting Up and Customizing Calc.



go to and press Enter. Cell references are case insensitive: a3 or A3, for example, are the same. Or just click into the Name Box, backspace over the existing cell reference, and type in the cell reference you want to

### Using the Navigator

B6			B1:C10		
	A	B	C	A	B
1				1	
2				2	
3				3	
4				4	
5				5	
6				6	
7				7	
8				8	
9				9	
10				10	
11				11	
12				12	

Click on the Navigator button in the Standard toolbar (or press F5) to display the Navigator.

Type the cell reference into the top two fields, labelled Column and Row, and press Enter.

**Moving from cell to cell.** In the spreadsheet, one cell normally has a darker black border. This black border indicates where the focus is. The focus indicates which cell is enabled to receive input. If a group of cells is selected, they have a highlight color (usually gray), with the focus cell having a dark border.

### Using the mouse

To move the focus using the mouse, simply move the mouse pointer to the cell where you want the focus to be and click the left mouse button. This action changes the focus to the new cell. This method is most useful when the two cells are a large distance apart.

### Using the Tab and Enter keys

- Pressing Enter or Shift+Enter moves the focus down or up, respectively.
- Pressing Tab or Shift+Tab moves the focus to the right or to the left, respectively.

### Using the arrow keys

Pressing the arrow keys on the keyboard moves the focus in the direction of the arrows.

### Using Home, End, Page Up and Page Down

- Home moves the focus to the start of a row.
- End moves the focus to the column furthest to the right that contains data.
- Page Down moves the display down one complete screen and Page Up moves the display up one complete screen.
- Combinations of Control (often represented on keyboards as Ctrl) and Alt with Home, End, Page Down (PgDn), Page Up (PgUp), and the arrow keys move the focus of the current cell in other ways. Table 1 describes the keyboard shortcuts for moving about a spreadsheet.

## Module 2 - Cell and Sheet Operations

### Selecting items in a sheet or spreadsheet

#### Selecting cells

Cells can be selected in a variety of combinations and quantities.

#### Single cell

Do left-click on the cell. The result will look like the left side of. You can verify your selection by looking in the Name Box.

#### Range of contiguous cells

- 1) A range of cells can be selected using the keyboard or the mouse. To select a range of cells by dragging the mouse
- 2) Click in a cell.
- 3) Press and hold down the left mouse button.
- 4) Move the mouse around the screen.
- 5) Once the desired block of cells is highlighted, release the left mouse button.

Figure: Starting a new spreadsheet from a template.

#### Navigating within spreadsheets

Calc provides many ways to navigate within a spreadsheet from cell to cell and sheet to sheet. You can generally use whatever method you prefer.

#### Going to a particular cell

Using the mouse Place the mouse pointer over the cell and click.

#### Using a cell reference

Click on the little inverted black triangle just to the right of the Name Box. The existing cell reference will be highlighted. Type the cell reference of the cell you want to

## To select a range of cells without dragging the mouse

- 1) Click in the cell which is to be one corner of the range of cells.
- 2) Move the mouse to the opposite corner of the range of cells.
- 3) Hold down the Shift key and click

## Range of non-contiguous cells

- 1) Select the cell or range of cells using one of the methods above.
- 2) Move the mouse pointer to the start of the next range or single cell.
- 3) Hold down the Control key and click or click-and-drag to select another range of cells to add to the first range.
- 4) Repeat as necessary.

## Selecting columns and rows

Entire columns and rows can be selected very quickly in LibreOffice.

### Single column or row

To select a single column, click on the column identifier letter (see Figure 1).

To select a single row, click on the row identifier number.

### Multiple columns or rows

To select multiple columns or rows those are contiguous:

- 1) Click on the first column or row in the group.
- 2) Hold down the Shift key.
- 3) Click the last column or row in the group.

### To select multiple columns or rows those are not contiguous

- 1) Click on the first column or row in the group.
- 2) Hold down the Control key.
- 3) Click on all of the subsequent columns or rows while holding down the Control key.



### Entire sheet

To select the entire sheet, click on the small the box between the A column header and the 1-row header

You can also press Control+A to select the entire sheet.

## Selecting sheets

You can select either one or multiple sheets. It can be advantageous to select multiple sheets at times when you want to make changes to many sheets at once.

### Single sheet

Click on the sheet tab for the sheet you want to select. The active sheet becomes white

### Multiple contiguous sheets

To select multiple contiguous sheets:

- 1) Click on the sheet tab for the first desired sheet.
- 2) Move the mouse pointer over the sheet tab for the last desired sheet.
- 3) Hold down the Shift key and click on the sheet tab.

All the tabs between these two sheets will turn white. Any actions that you perform will now affect all highlighted sheets.

### Multiple non-contiguous sheets

To select multiple non-contiguous sheets:

- 1) Click on the sheet tab for the first desired sheet.
- 2) Move the mouse pointer over the sheet tab for the second desired sheet.
- 3) Hold down the Control key and click on the sheet tab.
- 4) Repeat as necessary.

The selected tabs will turn white. Any actions that you perform will now affect all highlighted sheets.

### All sheets

Right-click any one of the sheet tabs and choose Select All Sheets from the context menu.

## Working with columns and rows

### Inserting columns and rows

Columns and rows can be inserted individually or in groups.

### Single column or row

Using the Insert menu:

- 1) Select the cell, column, or row where you want the new column or row inserted.
- 2) Choose either **Insert → Columns** or **Insert → Rows**.

## Using the mouse:

- 1) Select the cell, column, or row where you want the new column or row inserted.
- 2) Right-click the header of the column or row.
- 3) Choose **Insert Rows or Insert Columns**.

## Multiple columns or rows

Multiple columns or rows can be inserted at once rather than inserting them one at a time.

- 1) Highlight the required number of columns or rows by holding down the left mouse button on the first one and then dragging across the required number of identifiers.
- 2) Proceed as for inserting a single column or row above.

## Deleting columns and rows

Columns and rows can be deleted individually or in groups.

### Single column or row

A single column or row can be deleted by using the mouse:

- 1) Select the column or row to be deleted.
- 2) Choose **Edit → Delete Cells** from the menu bar.  
Or
- 1) Right-click on the column or row header.
- 2) Choose **Delete Columns or Delete Rows** from the context menu.

## Multiple columns or rows

Multiple columns or rows can be deleted at once rather than deleting them one at a time.

- 1) Highlight the required columns or rows by holding down the left mouse button on the first one and then dragging across the required number of identifiers.
- 2) Proceed as for deleting a single column or row above.

## Working with sheets

Like any other Calc element, sheets can be inserted, deleted, and renamed.

### Inserting new sheets

There are several ways to insert a new sheet. The fastest method is to click on the Add Sheet button. This inserts one new sheet at that point, without opening the Insert Sheet dialog.

Use one of the other methods to insert more than one sheet, to rename the sheet at the same time, or to insert the sheet somewhere else in the sequence. The first step for all of the methods is to select the sheets that the new sheet will be inserted next to. Then use any of the following options.

- Choose **Insert → Sheet** from the menu bar.
- Right-click on the sheet tab and choose **Insert Sheet**.
- Click in an empty space at the end of the line of sheet tabs.

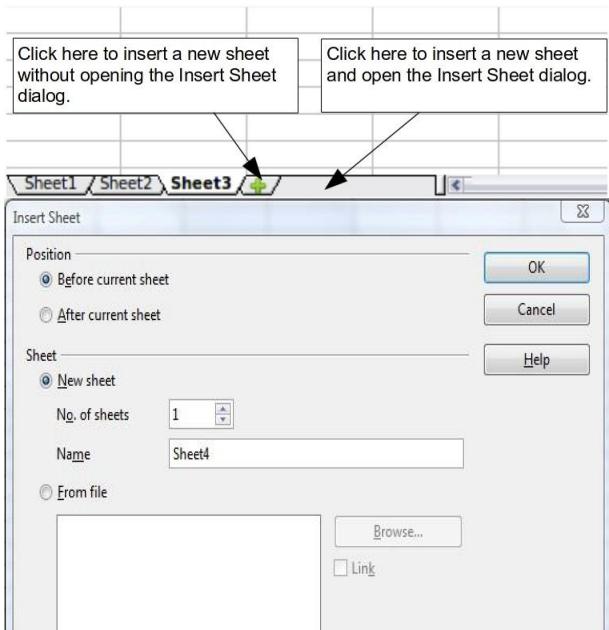


Figure: Creating a new sheet

Each method will open the Insert Sheet dialog.

Here you can select whether the new sheet is to go before or after the selected sheet and how many sheets you want to insert. If you are inserting only one sheet, there is the opportunity to give the sheet a name.

Figure: Insert Sheet dialog

## Deleting sheets

Sheets can be deleted individually or in groups.

### Single sheet

Right-click on the tab of the sheet you want to delete and choose **Delete Sheet** from the pop-up menu, or choose **Edit → Sheet → Delete** from the Menu bar. Either way, an alert will ask if you want to delete the sheet permanently. Click Yes.

### Multiple sheets

To delete multiple sheets, select them as described earlier, then either right-click over one of the tabs and choose **Delete Sheet** from the context menu, or choose **Edit → Sheet → Delete** from the Menu bar.

## Renaming sheets

The default name for the new sheet is Sheet X, where X is a number. While this works for a small spreadsheet with only a few sheets, it becomes awkward when there are many sheets.

To give a sheet a more meaningful name, you can:

- Enter the name in the Name box when you create the sheet, or
- Right-click on a sheet tab and choose Rename Sheet from the context menu; replace the existing name with a different one.
- Double-click on a sheet tab to pop up the Rename Sheet dialog.

## Freezing rows and columns

Freezing locks a number of rows at the top of a spreadsheet or a number of columns on the left of a spreadsheet or both. Then when scrolling around within the sheet, any frozen columns and rows remain in view.

Figure shows some frozen rows and columns. The heavier horizontal line between rows 3 and 14 and the heavier vertical line between columns C and H denote the frozen areas. Rows 4 through 13 and columns D through G have been scrolled off the page. The first three rows and columns remained because they are frozen into place.

You can set the freeze point at one row, one column, or both a row and a column as in Figure 26.

### Freezing single rows or columns

- 1) Click on the header for the row below where you want the freeze or for the column to the right of where you want the freeze.
- 2) Choose **Window → Freeze**.

A dark line appears, indicating where the freeze is put.

### Freezing a row and a column

- 1) Click into the cell that is immediately below the row you want frozen and immediately to the right of the column you want frozen.
- 2) Choose **Window → Freeze**.

Two lines appear on the screen, a horizontal line above this cell and a vertical line to the left of this cell.

	A	B	C	H	I	J	K	L	M	N	O	P	Q	R	S	T	
1				Safety Poster	Safety Contract	Safety Quiz 2	Unit Conv.	Pop Quiz	Element Quiz 1	Element Quiz 2	36 & 16	Article Quiz	Lab #	Chp. 1.1 #1	p. 35 ?s	Chp. 1 Test	Penny Density
2		Total		Date	10-02	10-03	10-04	10-05	10-06	10-07	10-08	10-09	10-10	10-11	10-12	10-13	10-14
3	Average	267.5	Possible	28.0	1.0	3.0	12.0	18.0	28.0	4.0	6.0	6.0	3.5	4.0	78.0	11.0	
14	78.6%	200.0	Smith, John	28.00	1.00	X	0.00	8.00	26.00	0.00	6.00	0.00	3.50	4.00	55.50	8.00	
15	67.9%	181.5	Klein, Mike	28.00	1.00	1.00	11.50	8.00	6.00	0.00	5.00	6.00	3.50	3.50	47.50	10.00	
16	72.7%	186.5	Johnson, Tom	27.00	1.00	3.00	0.00	13.00	6.00	0.00	6.00	6.00	3.50	3.00	47.50	9.00	
17	82.6%	213.0	Doe, John	27.00	1.00	1.00	2.00	17.00	17.00	4.00	6.00	6.00	3.50	3.50	54.00	9.00	
18	96.4%	258.0	Doe, Jane	28.00	1.00	3.00	9.00	16.00	28.00	4.00	6.00	6.00	3.50	4.00	79.50	10.00	
19	67.3%	172.0	Kupfer, Peter	26.00	1.00	3.00	X	16.00	20.00	0.00	6.00	6.00	0.00	3.50	41.00	6.50	
20	83.9%	224.5	Newton, Issac	28.00	1.00	3.00	6.00	15.00	23.00	4.00	6.00	6.00	3.50	3.50	57.50	9.00	
21	80.6%	207.5	Lunak, Robert	26.00	0.00	2.00	5.00	15.00	17.00	4.00	6.00	6.00	3.50	0.00	62.50	9.00	
22	78.1%	209.0	Matteson, Brittany	28.00	0.00	3.00	3.00	17.00	22.00	4.00	6.00	6.00	3.50	3.00	47.50	9.00	
23	79.4%	212.5	Murphy, Kathleen	26.00	1.00	3.00	6.00	16.00	11.00	4.00	6.00	6.00	3.50	4.00	53.50	9.00	

Figure: Frozen rows and columns

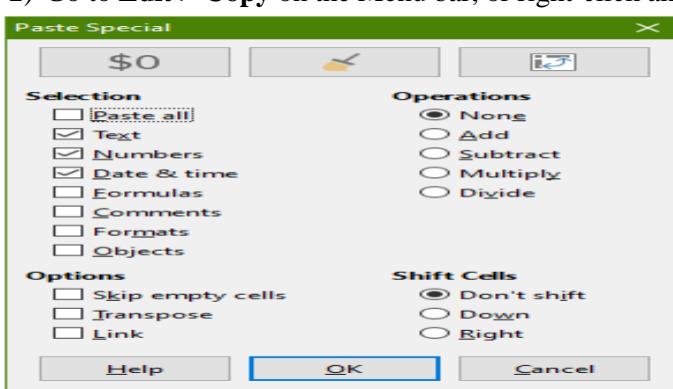
## Unfreezing

To unfreeze rows or columns, choose **Window → Freeze**. The check mark by Freeze will vanish.

### Paste Special function

You can use the Paste Special function to paste into another cell selected parts of the data in the original cell or cell range, for example its format or the result of its formula. Paste Special dialog

- 1) Select a cell or a cell range.
  - 2) Go to **Edit > Copy** on the Menu bar, or right-click and select Copy from the context menu.
  - 3) Select the target cell or cell range.
  - 4) Go to **Edit > Paste Special > Paste Special** from the Menu bar, or use the keyboard shortcut **Ctrl+Shift+V**, or right-click and select Paste Special > Paste Special from the context menu to open the Paste Special dialog.
  - 5) Select the options for Selection, Operations, Options and Shift cells.
- The Paste Special options are explained below.
- 6) Click **OK** to paste the data into to the target cell or range of cells and close the dialog.



## **Formatting cell backgrounds**

To format the background color for a cell or a group of cells

- 1) Select a cell or a range of cells.
- 2) Right-click and select Format Cells from the context menu, or go to Format > Cells on the Menu bar, or press Ctrl+1 to open the Format Cells dialog.
- 3) On the Background tab, select a color from the color palette.
- 4) Click OK to save the changes and close the dialog.

Alternatively, click on the Background icon on the Formatting toolbar and select a color from the Background color palette.

## **Password protection**

Calc provides two levels of document protection: read-protect (file cannot be viewed without a password) and write-protect (file can be viewed in read-only mode but cannot be changed without a password). Thus you can make the content available for reading by a selected group of people and for reading and editing by a different group. This behaviour is compatible with Microsoft Excel file protection.

- 1) Use File → Save As when saving the document. (You can also use File → save the first time you save a new document.)
- 2) On the Save As dialog, type the file name, select the Save with password option, and then click Save.
- 3) The Set Password dialog opens.

Here you have several choices:

File name:	Sample
File type:	ODF Spreadsheet (.ods)
<input checked="" type="checkbox"/> Save with password	<input checked="" type="checkbox"/> Automatic
<input type="checkbox"/> Edit filter settings	



Figure: Two levels of password protection

- 1) To read-protect the document, type a password in the two fields at the top of the dialog box.
- 2) To write-protect the document, click the More Options button and select the Open file read-only checkbox.
- 3) To write-protect the document but allow selected people to edit it, select the Open file read-only checkbox and type a password in the two boxes at the bottom of the dialog box.
- 4) Click OK to save the file. If either pair of passwords do not match, you receive an error message. Close the message box to return to the Set Password dialog box and enter the password again.

## **Module 3 - Functions**

### **Understanding functions**

Calc includes over 350 functions to help you analyze and reference data. Many of these functions are for use with numbers, but many others are used with dates and times, or even text. A function may be as simple as adding two numbers together, or finding the average of a list of numbers.

Alternatively, it may be as complex as calculating the standard deviation of a sample, or a hyperbolic tangent of a number.

Typically, the name of a function is an abbreviated description of what the function does.

For instance, the FV function gives the future value of an investment, while BIN2HEX converts a binary number to a hexadecimal number. By tradition, functions are entered entirely in upper case letters, although Calc will read them correctly if they are in lower or mixed case, too.

A few basic functions are somewhat similar to operators. Examples:

- + This operator adds two numbers together for a result. SUM() on the other hand adds groups of contiguous ranges of numbers together.
- \* This operator multiplies two numbers together for a result. PRODUCT() does the same for multiplying that SUM() does for adding.

Each function has a number of arguments used in the calculations. These arguments may or may not have their own name. Your task is to enter the arguments needed to run the function. In some cases, the arguments have predefined choices, and you may need to refer to the online help or Appendix B (Description of Functions) in this book to understand them. More often, however, an argument is a value that you enter manually, or one already entered in a cell or range of cells on the spreadsheet.

In Calc, you can enter values from other cells by typing in their name or range, or —unlike the case in some spreadsheets—by selecting cells with the mouse. If the values in the cells change, then the result of the function is automatically updated. For compatibility, functions and their arguments in Calc have almost identical names to their counterparts in Microsoft Excel. However, both Excel and Calc have functions that the other lacks. Occasionally, functions with the same names in Calc and Excel have different arguments, or slightly different names for the same argument—neither of which can be imported to the other. However, the majority of functions can be used in both Calc and Excel without any change.

### Understanding the structure of functions

All functions have a similar structure. If you use the right tool for entering a function, you can escape learning this structure, but it is still worth knowing for troubleshooting.

To give a typical example, the structure of a function to find cells that match entered search criteria is: =DCOUNT (Database; Database field; Search\_criteria)

Since a function cannot exist on its own, it must always be part of a formula. Consequently, even if the function represents the entire formula, there must be an = sign at the start of the formula. Regardless of where in the formula a function is, the function will start with its name, such as DCOUNT in the example above. After the name of the function come its arguments. All arguments are required, unless specifically listed as optional. Arguments are added within the parentheses and are separated by semicolons, with no space between the arguments and the semicolons.

#### Note:

LibreOffice uses the semicolon as an argument list separator, unlike Excel which uses a comma. This is a common mistake made by users accustomed to entering Excel formulas.

Many arguments are a number. A Calc function can take up to thirty numbers as an argument. That may not sound like much at first. However, when you realize that the number can be not only a number or a single cell, but also an array or range of cells that contain several or even hundreds of cells, then the apparent limitation vanishes.

Depending on the nature of the function, arguments may be entered as follows:

"text data"	The quotes indicate text or string data is being entered.
9	The number nine is being entered as a number.
"9"	The number nine is being entered as text
A1	The address for whatever is in Cell A1 is being entered

### Nested functions

Functions can also be used as arguments within other functions. These are called nested functions. =SUM(2,PRODUCT(5,7))

To get an idea of what nested functions can do, imagine that you are designing a self-directed learning module.

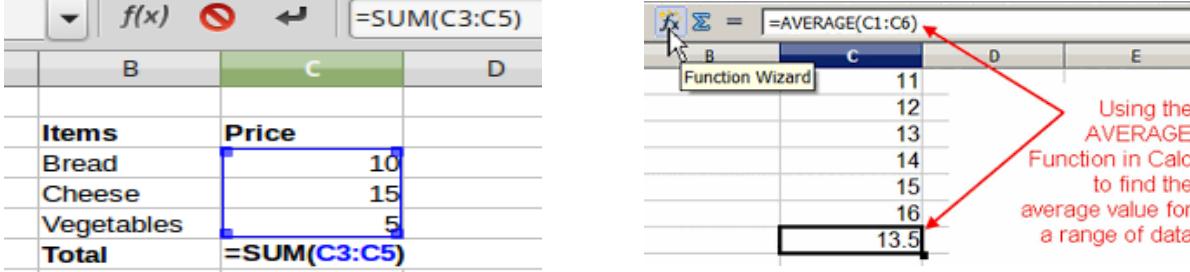
During the module, students do three quizzes, and enter the results in cells A1,

A2, and A3. In A4, you can create a nested formula that begins by averaging the results of the quizzes with the formula =AVERAGE(A1:A3). The formula then uses the IF function to give the student feedback that depends upon the average grade on the quizzes. The entire formula would read: =IF(AVERAGE(A1:A3) > 85;

Depending on the average, the student would receive the message for either congratulations or failure.

Notice that the nested formula for the average does not require its own equal sign. The one at the start of the equation is enough for both formulas.

If you are new to spreadsheets, the best way to think of functions is as a scripting language. We've used simple examples to explain the concept more clearly, but, through nesting of functions, a Calc formula can quickly become complex.



**Note:** Calc keeps the syntax of a formula displayed in a tool tip next to the cell as a handy memory aid as you type. A more reliable method is to use the Function List.

Available from the Insert menu, the Function List automatically docks as a pane on the right side of the Calc editing window. If you wish, you can Control+double-click on a blank space at the top of the pane to undock this pane and make it a floating window.

The Function List includes a brief description of each function and its arguments; highlight the function and look at the bottom of the pane to see the description. If necessary, hover the cursor over the division between the list and the description; when the cursor becomes a two-headed arrow, drag it upwards to increase the space for the description. Double-click on a function's name to add it to the current cell, together with placeholders for each of the function's arguments.

Clicking on the bar where the 5 dots and arrows are shown will hide the list on the right hand side of the screen.

Clicking this area again will show the list, making it easy to keep the list available for easy reference.

Using the Function List is almost as fast as manual entry, and has the advantage of not requiring that you memorize a formula that you want to use. In theory, it should also be less error-prone. In practice, though, some users may fumble when replacing the placeholders with values. Another feature is the ability to display the last formulas used.

### Function Wizard

The most commonly used input method is the Function Wizard. To open the Function Wizard, choose **Insert → Function**, or click the *fx* button on the Function tool bar, or press **Ctrl+F2**.

Once open, the Function Wizard provides the same help features as the Function List, but adds fields in which you can see the result of a completed function, as well as the result of any larger formula of which it is part.

Select a category of functions to shorten the list, then scroll down through the named functions and select the required one. When you select a function its description appears on the right-hand side of the dialog. Double-click on the required function.

The Wizard now displays an area to the right where you can enter data manually in text boxes or click the Shrink button to shrink the wizard so you can select cells from the worksheet.

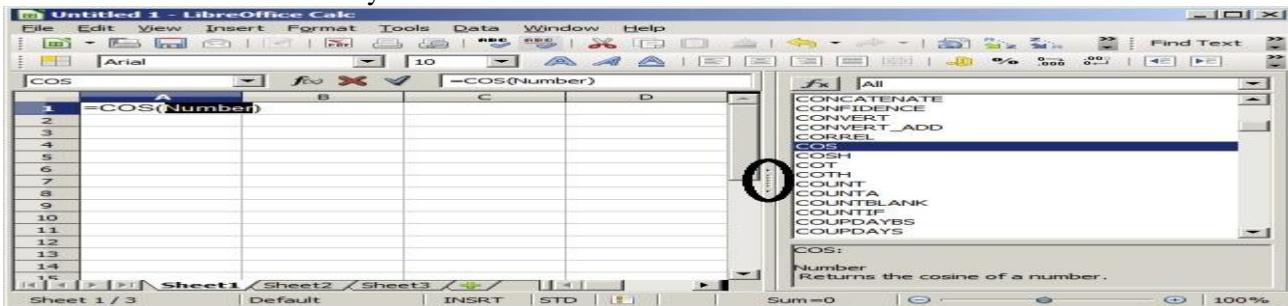
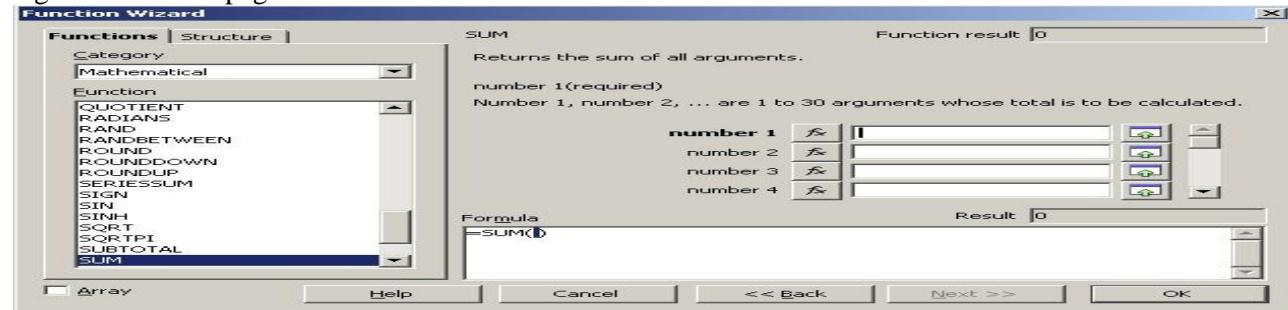


Figure: Function Wizard after shrinking



Figure: Functions page of Function Wizard



To select cells, either click directly upon the cell or hold down the left mouse button and drag to select the required area. When the area has been selected, click the Shrink button again to return to the wizard.

If multiple arguments are needed select the next text box below the first and repeat the selection process for the next cell or range of cells. Repeat this process as often as required. The Wizard will accept up to 30 ranges or arguments in the SUM function. Click OK to accept the function and add it to the cell and get the result.

You can also select the Structure tab to see a tree view of the parts of the formula.

The main advantage over the Function List is that each argument is entered in its own field, making it easier to manage. The price of this reliability is slower input, but this is often a small price to pay, since precision is generally more important than speed when creating a spreadsheet.

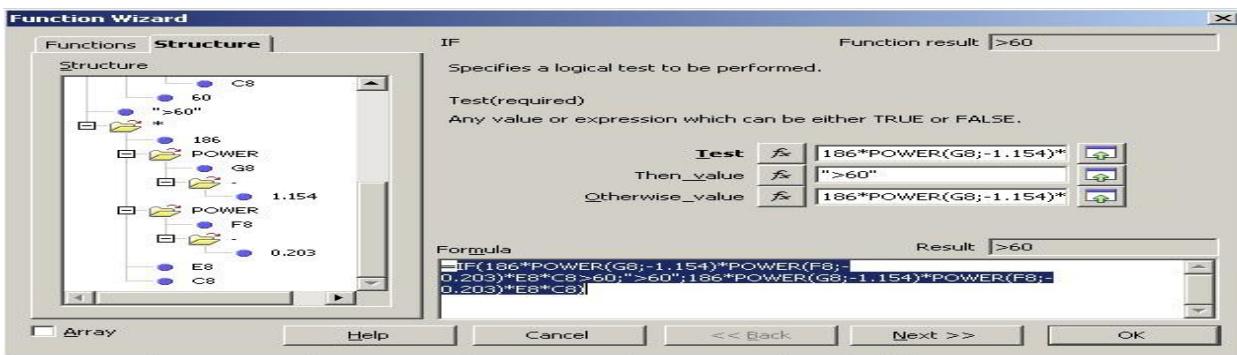


Figure: Structure page of Function Wizard

After you enter a function on the Input line, press the Enter key or click the Accept button on the Function toolbar to add the function to the cell and get its result.



Figure: The Function toolbar

- 1 Name Box showing list of common functions
- 2 Function Wizard
- 3 Cancel
- 4 Accept
- 5 Input Line

If you see the formula in the cell instead of the result, then Formulas are selected for display in Tools → Options → LibreOffice Calc → View → Display. Deselect Formulas, and the result will display. However, you can still see the formula in the Input line.

Figure: Setting up a formula with arguments

### Strategies for creating formulas and functions

Formulas that do more than a simple calculation or summation of rows or columns of values usually take a number of arguments. For example, the classic equation of motion  $s=s_0+vt-\frac{1}{2}at^2$  calculates the position of a body knowing its original position, its final velocity, its acceleration, and the time taken to move from the initial state to the final state.

In this example, the individual variables are input into cells on the sheet and no editing of the formula (in cell B9) is required.

You can take several broad approaches when creating a formula. In deciding which approach to take, consider how many other people will need to use the worksheets, the life of the worksheets, and the variations that could be encountered in use of the formula. Explanation of the purpose of the spreadsheet, basis of calculation, input required and output(s) generated are often placed on the first worksheet.

A spreadsheet that you build today, with many complicated formulas, may not be quite so obvious in its function and operation in 6 or 12 months time. Use comments and notes liberally to document your work.

You might be aware that you cannot use negative values or zero values for a particular argument, but if someone else inputs such a value will your formula be robust or simply return a standard (and often not too helpful) Err: message? It is a good idea to trap errors using some form of logic statements or with conditional formatting.

### Multiple Choice Questions

- 1) \_\_\_\_\_ sign is mandatory before any formula in Calc
  - a) +
  - b) =
  - c) -
  - d) \*
- 2) Which shortcut key is used for reach to last edit cell in LibreOffice Calc?
  - a) Ctrl + Home
  - b) Ctrl + End
  - c) Ctrl + H
  - d) Alt + Ctrl + O
- 3) What is the file extension of LibreOffice Calc spreadsheet?
  - a) .ods
  - b) .xlx
  - c) .odp
  - d) .odt
- 4) What is the combination of row and column in LibreOffice Calc?
  - a) Cell
  - b) Table
  - c) Position
  - d) Data
- 5) In LibreOffice Calc, Which symbol appears when a formula error occurs?
  - a) \$
  - b) \*
  - c) !
  - d) #
- 6) What will be the result of =product (-5,-1)?
  - a) 6
  - b) -6
  - c) 5
  - d) Error

- 7) What is the shortcut key to reach first column in LibreOffice Calc?  
a) Home b) Ctrl + Home c) Alt + Home d) Shift + Home
- 8) Which is the last menu in Calc?  
a) Format b) Help c) View d) Sheet
- 9) Protect Sheet option available in which menu?  
a) View b) Tools c) File d) Sheet
- 10) In LibreOffice Calc a formula start with a symbol \_\_\_\_  
a) % b) \$ c) & d) =

**Short Answer Questions**

- 1) What do you understand by splitting cells explain?
- 2) Describe the function wizard in office Calc?
- 3) How to insert new sheet in Office Calc?
- 4) Write about Freezing rows and Columns?
- 5) Explain about paste Special Function in LibreOffice Calc?
- 6) Brief about two levels of document protection in Office Calc
- 7) Write about renaming, deleting columns and rows?
- 8) What is the last column in LibreOffice Calc?
- 9) In which menu, Merge Cell command is found?
- 10) What is the value of =round(175,-2) ?

# Unit 3 - Office Impress

## Module 1 – Introduction to Slide Master

### **What is Impress?**

Impress is LibreOffice slide show (presentations) program. You can create slides that contain many different elements, including text, bulleted and numbered lists, tables, charts, clip art, and a wide range of graphic objects. Impress also includes a spelling checker, a thesaurus, prepackaged text styles, and attractive background styles. This chapter introduces the Impress user interface and describes how to create a simple slide show using the Presentation Wizard. The rest of this guide illustrates many other features available in Impress that can be used to create more sophisticated slide shows.

### **Starting Impress**

You can start Impress in several ways:

- If no component of LibreOffice is open, from the Start Center: click on the Presentation icon.
- From the system menu or the LibreOffice Quick starter. Details vary with your operating system;
- From any open component of LibreOffice: click the triangle to the right of the **New** icon on the main toolbar and select Presentation from the drop-down menu, or choose **File > New > Presentation** from the menu bar.

When you start Impress for the first time, the Presentation Wizard is shown. If you prefer not to use the wizard in future, you can select **do not show this wizard again**. Click **Create** to open the main Impress window.

### **The main Impress window**

The main Impress window has three parts: the Slides pane, the Workspace, and the Tasks pane. Additionally, several toolbars can be displayed or hidden during the creation of a presentation.

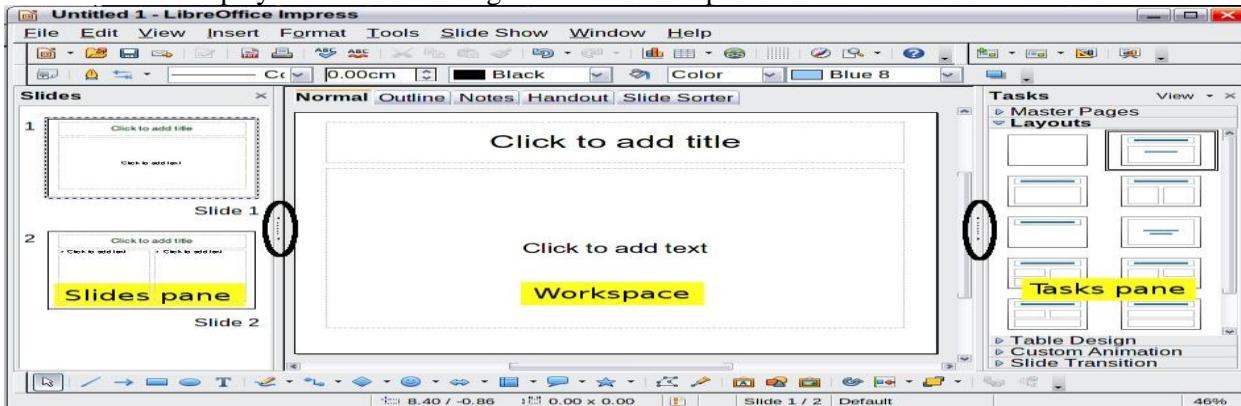


Figure: Main window of Impress

### **Slides pane**

The Slides pane contains thumbnail pictures of the slides in your presentation, in the order they will be shown—unless you change the slide show order.

Clicking a slide in this pane selects it and places it in the Workspace. When a slide is in the Workspace, you can change it in any way you like.

Several additional operations can be performed on one or more slides simultaneously in the Slides pane:

- Add new slides to the presentation.
  - Mark a slide as hidden so that it will not be shown as part of the presentation.
  - Delete a slide from the presentation if it is no longer needed.
  - Rename a slide.
  - Duplicate a slide (copy and paste) or move it to a different position in the presentation (cut and paste).
- It is also possible to perform the following operations, although there are more efficient methods than using the Slides pane, as you will see later in this chapter:
- Change the slide transition following the selected slide or after each slide in a group of slides.
  - Change the sequence of slides in the presentation.
  - Change the slide design.
  - Change slide layout for a group of slides simultaneously.

### **Tasks pane**

The Tasks pane has five sections: To expand the section you wish to use, click on the right-pointing triangle to the left of the caption. Only one section at a time can be expanded.

## Master Pages

Here you define the page style for your presentation. Impress contains prepackaged Master Pages (slide masters). One of them—Default—is blank and the rest have a background and styled text.

### Tip

Press F11 to open the Styles and Formatting window, where you can modify the styles used in any slide master to suit your purposes. This can be done at any time.

### What are slide masters?

A slide master is a slide that is used as the starting point for other slides. It is similar to a page style in Writer: it controls the basic formatting of all slides based on it. A slide show can have more than one slide master.

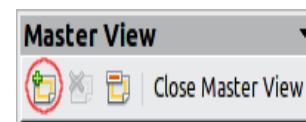
### Working with slide masters

Impress comes with a collection of prepackaged slide masters. They are shown in the Master Pages section of the Tasks pane. This section has three subsections: Used in This Presentation, Recently Used, and Available for Use. Click the + sign next to the name of a subsection to expand it to show thumbnails of the slides, or click the – sign to collapse the subsection to hide the thumbnails.

Each of the slide masters shown in the Available for Use list is from a template of the same name. If you have created your own templates, or added templates from other sources, slide masters from those templates will also appear in this list.

### 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 selecting **View > Master > Slide Master**. You can also right-click on the default slide master in the Master Pages section of the tasks pane, and select **Edit Master**. On the Master View toolbar, click the **New Master** icon (highlighted in the figure below).



A second slide master appears in the Slides pane. Modify this slide master to suit your requirements. It is 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 pop-up 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. To apply one of the slide masters to all slides in your presentation, click on it in the list.

- 1) To apply a different slide master to one or more selected slides:
- 2) In the Slides Pane, select the slides you want to change.
- 3) In the Tasks Pane, right-click on the slide
- 4) Master you want to apply to the selected slides, and click **Apply to Selected Slides** on the pop-up menu.

### Available master pages (slides)

### Modifying a slide master

The following items can be changed on a slide master:

- 1) Background (color, gradient, hatching, or bitmap)
- 2) Background objects (for example, add a logo or decorative graphics)
- 3) Text attributes for the main text area and notes
- 4) Size, placement, and contents of header and footer elements to appear on every slide
- 5) Size and placement of default frames for slide titles and content.

Before working on the slide master, make sure that the Styles and Formatting window is open.

To select the slide master for modification:

- 1) Select **View > Master > Slide Master** from the menu bar. This unlocks the properties of the slide master so you can edit it.
- 2) Click Master Pages in the Tasks pane. This gives you access to the pre-packaged slide masters.
- 3) Click on the slide master you want to modify among the ones available.
- 4) Make changes as described in this chapter, and then click the **Close Master View** icon on the Master View toolbar. Save the file before continuing.

### Caution:

Any changes made to one slide when in Master View mode will appear on all slides using this slide master. Always make sure you close Master View and return to Normal view before working on any of the presentation slides. Select **View > Normal** from the menu bar, or clicking **Close Master View** in the Master View toolbar to return to the normal slide view.

The changes made to one of the slides in Normal view (for example, changes to the bullet point style, the color of the title area, and so on) will not be overridden by subsequent changes to the slide master.

There are cases, however, where it is desirable to revert a manually modified element of the slide to the style defined in the slide master: to do that, select that element and choose **Format > Default Formatting** from the menu bar.

It is also possible to modify the default layout of the slide master, for example by moving the title to the side; however, you are restricted to modifications to the “Title, Text” layout (that is, the layout containing a title box and a text box).

Sometimes, depending on the contents of the slide, you may want to apply a different layout. The title and text boxes will inherit the properties of the slide master, but if you have changed the position of these text boxes in the slide master, the layout may appear corrupted and you may need to re-position some of the layout elements manually.

### Choosing and applying the background

Backgrounds can be applied to a number of elements in Impress: the page, a default text area, a graphic object and so on. The procedures to apply a background are always the same.

The following procedure is used to apply a background to the page.

- 1) To begin, do one of the following:
  - a) Select **Format > Page** from the menu bar. On the Page Setup dialog box, choose the Background tab.
  - b) Make sure the Presentation Styles icon is selected in the Styles and Formatting window, right-click **Background** and select **Modify** from the pop-up menu. This opens the Background dialog box.
- 2) Select the type of fill you want for your background from the five choices: None, Color, Gradient, Hatching, or Bitmap.



Figure: Background choices

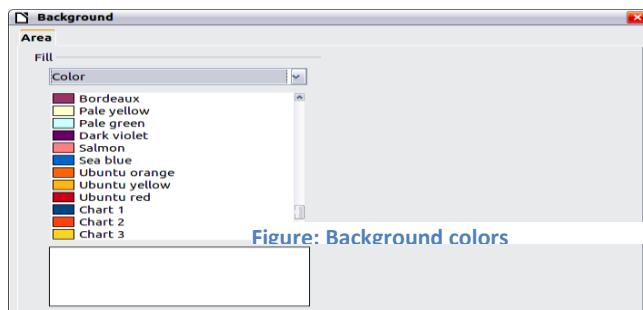


Figure: Background colors

A list of choices for the selected fill type then appears.

Select one of the items on the list and click OK. The fill you have chosen is added to the slide master, replacing any previously selected fill.

#### Tip:

You can make custom additions to each type of background, with the obvious exception of none. After you create new fills, they are listed in the Background dialog box along with the fills provided with LibreOffice. For example, the last color in Figure, Test Blue, is a custom color.

### Adding background objects

This section describes how to add background objects and graphic elements (such as a logo, decorative lines, and so on). LibreOffice supports a large number of graphical formats. When you want the same graphic to appear on every slide of your presentation, the easiest and quickest solution is to use the slide master. It saves time while creating the presentation, and also when you want to modify or reposition the graphic on the slide. If the graphic is added to each slide manually, these operations have to be performed on each individual slide in the presentation.

One of the most common actions in preparing a presentation is to add a picture to the slide master. To insert a picture already available on the hard disk, follow these steps:

- 1) Choose **View > Master > Slide Master** from the menu bar.
- 2) Select from the menu bar **Insert > Picture > From File**.
- 3) Navigate to the directory where your picture is and select it. If you want to see a preview, select the corresponding checkbox in the file browser dialog box.

### Adding text to all slides

Some of the supplied slide masters have text objects in the footer. You can add other text objects to the master page for your slides to act as a header or footer.

- 1) Choose **View > Master > Slide Master** from the menu bar.
- 2) On the **Drawing** toolbar, select the **Text** icon.
- 3) Click once and drag in the master page to draw a text object, and then type or paste your text into the object or add fields as described below.
- 4) Choose **View > Normal** when you are finished.

To add a field, such as the date or page number, to a text object in the header or footer, choose **Insert > Fields** and select the required field from the submenu. If you want to edit a field in your slide, select it and choose **Edit > Fields**.

The fields you can use in Impress are:

- Date (fixed)
- Date (variable) —updates automatically when you reload the file
- Time (fixed)
- Time (variable)—updates automatically when you reload the file
- Author—First and last names listed in the LibreOffice user data
- Page number (slide number)
- File name

**Tip:**

To change the number format (1, 2, 3 or a, b, c or i, ii, iii, etc.) for the page number field, choose **Format > Page** and then select a format from the list in the **Layout Settings** area.

To change the author information, go to **Tools > Options > LibreOffice > User Data**

## **Module 2 - Inserting Text, Images and Tables**

### **Inserting text**

#### **Pasting text**

Text may be inserted into the text box by copying it from another document and pasting it into Impress. However, the pasted text will probably not match the formatting of the surrounding text or that of the other slides in the presentation. This may be what you want on some occasions; however in most cases you want to make sure that the presentation style is consistent. There are several ways to ensure consistency; these methods are explained below.

#### **Pasting unformatted text**

It is normally good practice to paste text without formatting and apply the formatting later. To paste without formatting, either press Control+Shift+V or then select **unformatted text** from the dialog box that appears, or click on the small black triangle next to the paste symbol in the standard toolbar and select **unformatted text**. The unformatted text will be formatted with the outline style at the cursor position in an AutoLayout text box or with the default graphic style in a normal text box.

#### **Formatting pasted text**

If pasting the text into an **AutoLayout** area, then to give the pasted text the same look and feel of the rest of the presentation apply the appropriate outline style to the text. To do so:

- 1) Paste the text in the desired position. Do not worry if it does not look right: it will in a minute.
- 2) Select the text you have just pasted (see “Selecting text” on page 48 for details on how to do that).
- 3) Select **Format > Default formatting** from the menu bar. This operation will assign one of the nine Presentation styles to the text (depending on where the insertion is made).
- 4) Use the four arrow buttons in the Text Formatting toolbar to move the text to the appropriate position and give it the appropriate outline level. The button with the arrow pointing left promotes the list entry by one level (for example from Outline 3 to Outline 2), the right arrow button demotes the list entry by one level, the up and down arrow buttons move the list entry.
- 5) Apply manual formatting as required to sections of the text (to change font attributes, tabs, and so on).

If you are pasting text into a **text box**, you can still use styles to quickly format the text. Note that only one graphic style can be applied to the copied text. To do this:

- 1) Paste the text in the desired position.
- 2) Select the text you have just pasted (see “Selecting text” on page 48 for details).
- 3) Select the desired graphic style.
- 4) Apply manual formatting as required to sections of the text.

**Using tables:** Tables are a powerful mechanism to convey structured information quickly, so they represent an

important tool when creating a presentation. You can create tables directly in Impress; there is no need to embed a Calc spreadsheet or a Writer text table, although in some circumstances it makes sense to do so as the functionality provided by a Calc spreadsheet is far superior to that provided by an Impress table. Many predefined table designs are available in the Table design section of the task pan

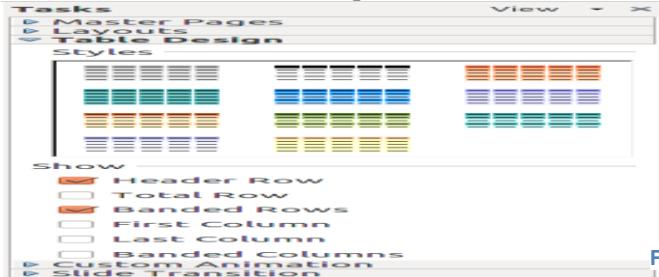


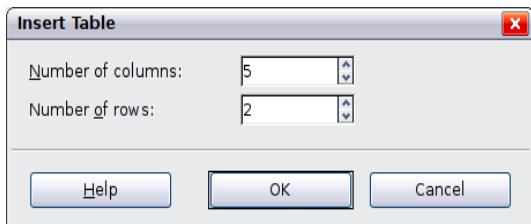
Figure: The Table Design task pane

## Creating a table

When working with tables it is useful to know the number of rows and columns needed as well as the look and feel. The parameters can be adjusted later, but this is more laborious than setting the correct table dimensions from the beginning.

To insert a table, proceed as follows:

- 1) Position the slide which will contain the table in the work area. If necessary modify the slide layout in order to reserve the place for the table.
- 2) If the task pane is already open select Table Design. If the task pane is not visible, select **View > Task pane**, then select the Table Design task.
- 3) Select one of the predefined styles, which only differ in the color scheme. You will be able to change the table colors later on; however, it is recommended that you select a color scheme similar to the one you want.



**Figure: Insert Table dialog box**

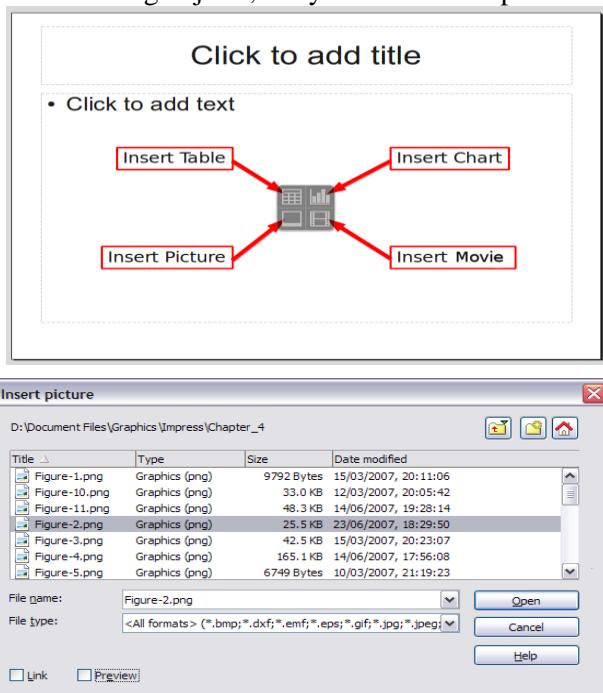
The table is placed initially at the center of the slide, but you can move it by selecting it and then dragging it to the new position. You can also create a table directly by selecting **Insert > Table** from the main menu or with the **Insert Table** button in the Standard toolbar. When using this method, the default style and settings are applied to the newly created table.

## Inserting pictures

This section describes several ways to insert a picture from an external source into the presentation. Once the picture has been inserted, it can be formatted extensively as explained later in this chapter.

### Inserting a picture from a file

Inserting a picture from a file is quick and easy. First choose the slide layout. Most layouts include a set of icons for inserting objects, but you can insert a picture into any slide.



**Figure: Slide with a placeholder for inserting objects**

Whether you are using an AutoLayout for the placement of the picture, or you are just inserting a picture, follow these steps:

- 1) Click on the **Insert Picture** icon or choose **Insert > Picture > From file** from the menu bar.
- 2) In the Insert picture dialog box, navigate to the directory containing the desired picture.
- 3) Select the file. LibreOffice recognizes a large number of image types.
- 4) Click **Open** to place the picture on the current (selected) slide. The picture is now displayed on the slide with green resizing handles around it.

**Figure: Inserting a picture from a file**

Notice in the Insert picture dialog box the two options **Link** and **Preview**. Their position is determined by the operating system, but they are normally in the bottom-left part of the dialog box. Select the **Link** option to insert the picture as a link to the file rather than embedding the file itself. In general it is preferable to embed images so that the presentation can be copied to other computers; however, on some occasions it makes sense to link the image rather than embed it.

These include:

- When the image file is quite large (linking rather than embedding will dramatically reduce the size of the presentation file)
- When the same image file is used in many presentations (for example when using the same background image for all the presentations created)
- When the linked file will be available when loading the presentation.

### Inserting a picture from the Gallery

The Gallery contains a collection of images that you can use in a presentation. You can also add your own images to the Gallery, making it an essential tool for creating presentations quickly and with a consistent look. The Gallery is available in all components of LibreOffice.

Choose **Tools > Gallery** or click the Gallery icon on the Drawing toolbar.

The Gallery displays categories of themes with images stored under each category. Select a theme from the left pane and then scroll as necessary through the right pane to find a suitable image. Click on the image and drag it onto the workspace. Figure shows an example



Figure: Inserting an image from the Gallery

### Formatting pictures

This section discusses the formatting of pictures inserted with one of the methods explained in “Inserting pictures”

#### Moving a picture

- 1) Click the picture, if necessary, to show the green resizing handles.
- 2) Move the pointer over the picture until the pointer changes shape. On most operating systems, the cursor associated with moving objects is a four headed arrow, but it may also be a hand or some other symbol.
- 3) Click and drag the picture to the desired position.
- 4) Release the mouse button.

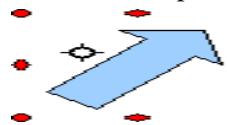
#### Resizing a picture

- 1) Click the picture to show the green resizing handles.
- 2) Position the pointer over one of the green resizing handles. The pointer changes shape giving a graphical representation of the direction of the resizing.
- 3) Click and drag to resize the picture.
- 4) Release the mouse button when satisfied with the new size.

The corner handles resize both the width and the height of the graphic object simultaneously, while the other four handles only resize one dimension at a time.

#### Rotating a picture

As with the position of the image on the page, rotation of a picture can be done manually or using a dedicated dialog box. To rotate a picture manually, do as follows:



- 1) Select the picture if necessary so that the green handles around it show.
- 2) Click the **Rotate** button on the Drawing toolbar. This toolbar is usually located at the bottom of the screen, but it can be undocked and used as a floating toolbar. If the toolbar is not showing, select **View > Toolbars > Drawing**.

## Module 3 – Slide Show & Animation

### Creating an animation

Several mechanisms can be used to create an animated image. This chapter describes only two of them, which should be sufficient to understand the functions offered.

#### Frame by frame animation

- 1) Create the image you intend to animate using the drawing tools.
- 2) Select the image and click the **Apply Object** button. This copies the object(or objects) into the upper part of the Animation dialog box.
- 3) Apply some desired transformation to the object: for example, rotate it or change the color; if you are animating text, add or subtract a letter and so on.
- 4) When you are ready, create the second frame of the animation and click the **Apply Object** button again.
- 5) Repeat steps 3 and 4 until you have created all the desired frames of the animation.
- 6) Select **Bitmap object** in the *Animation group* section of the Animator dialog box. This allows you to customize the timing of each of the frames and the number of repetitions for the animation
- 7) Click **Create** to place the animated image on the slide.

## Animated image in one step

For some simple animations it is possible to create all the animation frames in advance, and place them on the slide. This method works well for a rotating line, a shape gradually changing color, shapes increasing or decreasing size. In most of these occasions it is convenient to use the **Edit > Duplicate** command.

When all the frames are already prepared, use the **Apply objects individually**  to create one frame for each of the objects.

It is easy to obtain for example a rotating line segment:

- 1) Draw a fairly thick horizontal segment (use **Format > Line** or the Line and Filling toolbar to add thickness).
- 2) Open the Duplicate dialog box by selecting **Edit > Duplicate** and set the number of copies to 5, the X and Y axis to 0.1, the angle to 30, the enlargement width and height to 0, and press the **OK** button.
- 3) Select the 6 segments created by *Impress* and open the Animator (**Insert > Animated image** from the main menu bar).
- 4) On the Animator dialog box, click **Apply objects individually**.
- 5) Select **Bitmap object** in the lower part of the dialog box,
- 6) Create a new empty slide to contain your animation, then click the **Create** button.

## Putting together a slide show

LibreOffice Impress gives you the tools to organize and display a slide show, including:

- 1) Which slides to show and in what sequence
- 2) Whether to run the show automatically or manually
- 3) Transitions between slides
- 4) Animations on individual slides
- 5) Interactions: what happens when you click a button or link

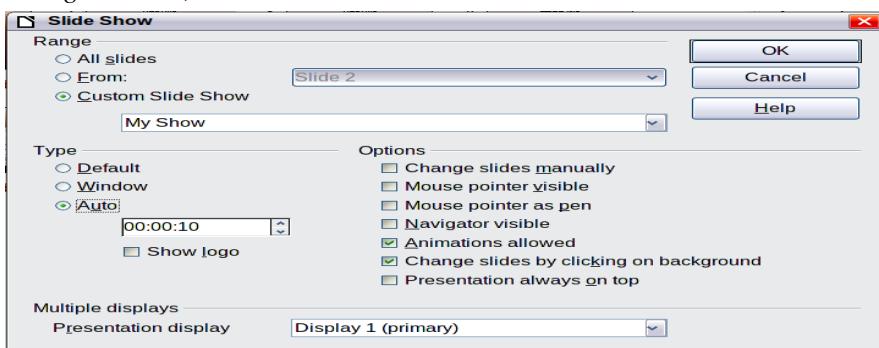
Most tasks associated with putting together a slide show are best done in Slide Sorter view. Choose **View > Slide Sorter** from the menu bar or click the Slide Sorter tab at the top of the workspace. All of your slides appear in the workspace; you may need to scroll to see them all.

## Choosing basic settings for a slide show

Basic settings for a slide show include which slide to start from, the way you advance the slides, the type of presentation, and pointer options.

Choose **Slide Show > Slide Show Settings**. The Slide Show dialog box appears.

In the *Range* section, choose which slides to include in the slide show:



- **All slides** include all of the slides except for those marked Hidden (see “Hiding slides” on page 172). Slides are shown in the sequence they occur in the file. To change the sequence, either rearrange the slides in the slide sorter or choose a custom slide show (see below).
- **From:** starts the show at a slide other than the first. For example, you might have several slides at the beginning that describe you and your company, but when you present this show to your work colleagues, you want to skip that introduction.
- **Custom Slide Show** shows the slides in a different sequence that you have previously set up. This choice is not available until after you set up a custom slide show.

In the *Type* section, choose how the slides will be displayed:

- **Default** shows the slides full screen, without the LibreOffice program controls visible, and exits the show after the last slide.
- **Window** runs the slide show in the LibreOffice program window and exits the show after the last slide.
- **Auto** restarts the slide show after the last slide. A pause slide is displayed between the last slide and the start slide. Press the *Esc* key to stop the show.

In the box under this choice, specify the length of time before the show restarts. If you enter zero, the show restarts immediately without showing a pause slide. The **Show Logo** option shows the LibreOffice logo on the pause slide.

In the *Options* section:

- **Change slides manually** prevent slides from changing automatically even if an automatic transition has been set up.
- **Mouse pointer visible** shows the mouse pointer during a slide show. If you do not have a laser pointer or other device to highlight items of interest during the show, this can be quite useful.
- **Mouse pointer as pen** enables you to write or draw on slides during the presentation. Anything you write with the pen is not saved when you exit the slide show. The color of the pen cannot be changed.
- **Navigator visible** displays the Navigator during the slide show. For more about the Navigator, see Chapter 1 (Introducing Impress).
- **Animations allowed** displays all frames of animated GIF files during the slide show. If this option is not selected, only the first frame of an animated GIF file is displayed.
- **Change slides by clicking on background** advances to the next slide when you click on the background of a slide. (Other ways of advancing to the next slide include pressing the spacebar on the keyboard.)
- **Presentation always on top** prevents any other program window from appearing on top of the presentation.

In the *Multiple displays* section:

- You can choose which display to use for full screen slide show mode, if the current desktop is displayed on more than one monitor.
- If the current desktop spans only one monitor, or if the multiple-display feature is not supported on the current system, you cannot select another display.
- By default the primary display is used for slide show mode.

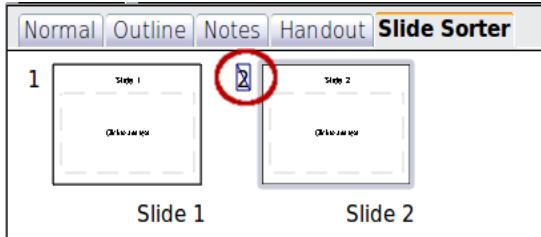
**Note:**

This multiple displays setting is not a property saved in the document, but is instead saved as a local setting in the user configuration. This means that if you open the presentation on a different computer the local settings are applied.

**Hiding slides**

You may not want to show all of the slides in a particular show. You can either hide some of the slides or set up a custom slide show; which method is best depends on your needs. For example, you may have draft slides that you do not want to show until they are finished, or you may have some slides that contain information for yourself, but not your audience.

**To hide a slide:**



- 1) In the Slides pane, or in Slide Sorter view, select the slides that you want to hide.
- 2) Click the **Show/Hide Slide** icon on the Slide View toolbar, right-click and select **Hide Slide** from the context menu, or choose **Slide Show > Show/Hide Slide**. The slide number is now in a box with a diagonal line through it, to indicate that it is hidden. The slide remains in the file.

Figure: Slide 2 is hidden

To show a hidden slide:

- 1) In the Slides pane, or in Slide Sorter view, select the hidden slides that you want to show.
- 2) Click the **Show/Hide Slide** icon on the Slide View toolbar, right-click and select **Show Slide** from the context menu, or choose **Slide Show > Show/Hide Slide**.

**Multiple Choice Questions**

- 1) What kind of program is LibreOffice Impress?
  - Spreadsheet
  - Word Processing
  - Presentation
  - None of these
- 2) Which of the following document appears blurred behind the text?
  - background
  - water mark
  - Front End
  - image
- 3) The maximum number of slides can be printed on A4 size page in LibreOffice Impress is
  - 1
  - 4
  - 5
  - 9
- 4) In LibreOffice Impress in order to see all the slides on one screen use\_\_\_\_\_
  - View->Slide
  - View->Master
  - View->Slide Sorter
  - View->Slide show
- 5) Which menu command is used to create a text box on a slide?
  - Tool->Text box
  - View->Text box
  - Insert->Text box
  - Format->Text box
- 6) We use\_\_\_\_\_in our slides to hold text, clip art and charts.
  - Text box
  - Drawing box
  - Placeholders
  - Window

- 7) In which menu slide master function available?
  - a) Slide Show
  - b) Slide
  - c) Format
  - d) Tools
- 8) Can we set custom slide show in LibreOffice Impress?
  - a) Yes
  - b) No
- 9) The Slide Show can be exited at any time during the show by pressing which of the following keys?
  - a) Space bar
  - b) End Key
  - c) Break Key
  - d) Esc Key
- 10) With which extension is the saved file in LibreOffice Impress saved?
  - a) .ods
  - b) .odp
  - c).odt
  - d).ppt

**Short Answer Questions**

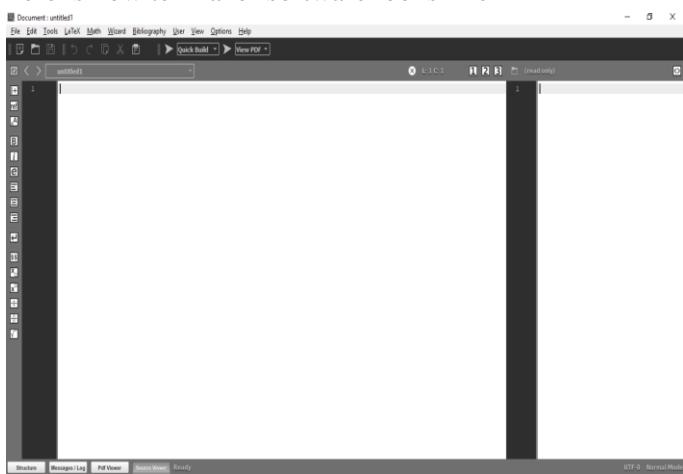
- 1) What are slide masters?
- 2) Describe the main impress window parts?
- 3) Explain in detail about the Hide slide in office Impress?
- 4) Explain basic settings for a slide show in office Impress?
- 5) How to rotate picture in Office Impress?
- 6) Write about animated image in one step? Other functions of animator?
- 7) Explain about slide sorter view?
- 8) What is custom Slide Show?
- 9) Insert date, Time, Page number in office Impress?
- 10) Insert your picture and apply different animations on it?

## **Unit IV: Introduction to Latex**

### **Module 1 – Introduction to LaTeX**

- LaTeX is excellent typesetting software
- LATEX (pronounced *LAY-tek* or *LAH-tek*) is a tool used to create professional-looking documents and quality of documents produced by latex is unmatched.
- It is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing. The input for Latex is a plain ASCII [American Standard Code for Information Interchange] textbook.
- It's extremely stable, no matter how complex the documents are.
- Tools like MS Word or OpenOffice Writer are recommended for low complexity documents if the complexity increases at one stage it is impossible to draw some kind of diagrams, math formulas etc but by using latex we can draw them. Here latex takes less time when compared with open office writer or ms word.
- Latex is free and open source
- The latex system is a markup language
- Latex is widely used in academia, scientific documents, journals and used in many fields like mathematics, statistics, computer science, engineering, chemistry, physics, economics, linguistics, quantitative psychology, philosophy, and political science. It also has a prominent role in the preparation and publication of books and articles that contain complex multilingual materials, such as Tamil, Sanskrit and Greek.
- It provides a logical approach to create documents instead of a physical, enhancing consistency.
- Your document is safe because the file format is open and there's no virus threat.
- Latex is available on windows and all UNIX systems, including Mac and Linux.
- Latex has outstanding features, such as, automatic numbering of equations, chapters and sections, figures, and tables.
- Documents with a lot of mathematical equations can also be generated easily in latex
- It will not crash like word processor.
- LaTeX allows typesetting math easily. Really - writing  $\alpha$  is quicker than searching alpha symbol in GUI. Similarly writing  $xy$  is quicker than searching power in list of symbols.
- Easily produce PDFs with hyperlinks, table of contents, indices, etc.
- Unlike MS Word, guaranteed backward compatibility.
- Typeset formulas and it's particularly strong when working with mathematical symbols.
- We can produce diagrams with lot of accuracy.
- It has no compatibility issues
- It is easy to produce bibliographic entries, which changeable format, on the fly.
- With LaTeX taking care of formatting, the writer can concentrate on more important activities, such as, content generation and logical sequencing of ideas
- We can use different software's like texstudio, texlive, texWroks, Lyx, TexnicCenter, miktex, texmaker etc to produce latex documents; sometimes it may depend on the Operating system.

Here is how texmaker software looks like



#### **Latex command:**

Latex typesetting is made by using special tags or commands that provide a handful of ways to format your document. Sometimes standard commands are not enough to fulfill some specific needs, in such cases new commands can be defined. Commands are special words that determine LATEX behavior. Usually these words are preceded by a backslash and may take some parameters. Most of the LATEX commands are simple words preceded by a special character.

Example  $\alpha$ ,  $\beta$ ,  $\frac{1}{2}$ ,  $\sum$ ,  $\int \dots$  etc  
LATEX commands are case sensitive.

**Syntax:**  $\backslash\text{commandname}[\text{opt1}][\text{opt2}]\{\text{arguement1}\}\{\text{arguement2}\}$

#### **Latex environments:**

Environments are used to format blocks of text in a LATEX documents. Environments are delimited by an opening tag  $\begin{environment}$  and a closing tag  $\end{environment}$ . Everything inside those tags will be formatted in a special manner depending on the type of the environment.

**Syntax:**

```
\begin{environment_name} Text to be inserted  
\end{environment_name}
```

**Example-1:**

```
\begin{tabular}{ c c c } %opening tag cell1 & cell2 & cell3\\  
cell4 & cell5 & cell6\\  
\end{tabular} %Ending tag
```

**Example-2:**

```
\begin{center}  
Contents .....  
\end{center}
```

**The above code takes tabular environment**

%Symbol is used to insert comments, generally while compiling the documents, comments will be ignored.

\\\(A double backslash will be used for newline)

\LaTeX (Use this command to produce latex logo, it is case sensitive).

**Creating a document in LaTeX**

```
\documentclass{article} % No space between document and class  
\begin{document}  
Hello, this is my first latex document.  
I can insert images, lists, tables and formulas here.....  
\end{document}
```

These are the main three commands to create a latex document, without these we cannot create a document. The matter whichever you want to insert like text, images and formulas etc will come in between \begin{document} and \end{document}

The \documentclass command must appear at the very beginning of your LaTeX document, before any other LaTeX commands, otherwise you will get an error message.

**Preamble:**

Everything before \begin{document} is called preamble (or) the matter in between \documentclass and \begin{document} is called preamble.

- Generally packages will be used in preamble
- Abstract will come in preamble
- Title can be inserted here

**Example code:**

```
\documentclass[12pt]{article}  
\title{Student_Name \\Class}  
\author{RGUJIIT \\ Nuzyid}  
\date{\today} % \today command will produce today's date  
\maketitle % without \maketitle command title can't be reproduced  
\begin{abstract}  
This is for latex Demo  
\end{abstract} % the matter which is in the box called Preamble  
\begin{document}  
\LaTeX  
\end{document}
```

## Module 2 – Font styles and families

<b>Default font families</b>			
<b>typeface = family</b>	<b>command</b>	<b>switch command</b>	<b>output</b>
serif (roman)	\textrm{Sample Text 0123}	\rmfamily	Sample Text 0123
sans serif	\textsf{Sample Text 0123}	\sffamily	Sample Text 0123
typewriter (monospace)	\texttt{Sample Text 0123}	\ttfamily	Sample Text 0123

<b>Font styles</b>			
<b>style</b>	<b>command</b>	<b>switch command</b>	<b>output</b>
medium	\textmd{Sample Text 0123}	\mdseries	Sample Text 0123
bold	\textbf{Sample Text 0123}	\bfseries	<b>Sample Text 0123</b>
upright	\textup{Sample Text 0123}	\upshape	Sample Text 0123
italic	\textit{Sample Text 0123}	\itshape	<i>Sample Text 0123</i>
slanted	\textsl{Sample Text 0123}	\slshape	<i>Sample Text 0123</i>
small caps	\textsc{Sample Text 0123}	\scshape	SAMPLE TEXT 0123

### **Font sizes:**

There are LATEX commands for a range of font sizes:

```
\documentclass{article}
\begin{document}
{\tiny tiny words}                                     %tiny words
{\scriptsize \scriptsize words}                         %scriptsize words
{\footnotesize footnotesize words}                   %footnotesize words
{\small small words}                                 %small words
{\normalsize normalsize words}                       %normalsize words
{\large large words}                                %large words
{\Large Large words}                               %Large words
{\huge huge words}                                 %huge words
\end{document}
```

**Note: In order to apply the font sizes just insert the command before the text where you want to differentiate the font sizes.**

tiny words scriptsize words footnotesize words small words normalsize words large words Large words huge words

For Example the text is....

Hello Welcome to RGUJIIT

If you want to display hello as large just insert the command like below

{\huge Hello} Welcome to RGUJIIT

**Generally in LaTeX if you give more space in between text, LaTeX will treat it as one space. If you are giving more line spaces in between text of lines, LaTeX will treat it as one line space.**

**Observe the below code.**

```
\documentclass{report}
\begin{document}
Hello RGUKT \\
Hello welcome to rgukt \\
I am studying Pre University Course.
\end{document}
```

**Output:**

Hello RGUKT

Hello welcome to rgukt I am studying Pre University Course.

Just observe the output even we give more space between hello and rgukt it displayed as a single space, even we give more line spaces in between line of text it displayed a single line space.

**Spaces:**

\quad will produce a current font size space if you are using 12 pt fonts, then the space provided by \quad will also be 12 pt( horizontally). \quad will produce double amount space. Similarly you can use.

```

\ \ \ \ \ ! > ~ \space \enspace etc.

\documentclass{article}                               Demo code on giving spaces in text
\begin{document}
Demo code on giving spaces in text \\ ax+by+c=0
ax+by+c=0 \\ \\
ax+by+c=\, 0 \\
\$ax+by+c=\,: 0 \\
ax+by+c=\,; 0 \\
ax+by+c=\,! 0 \\
ax+by+c=\quad 0 \\
ax+by+c=\qquad 0 \$

\end{document}

```

### Using \hspace and \vspace:

\hspace is used to give horizontal space between text and \vspace is used to give space vertically between texts. These are followed by some recognized units, \hspace and \vspace followed by these units like \hspace{2cm}, \vspace{mm}, \hspace{3sp}, \vspace{3pt} etc. Just observe the below uints

```

pt point          (1 in = 72.27 pt)
pc pica           (1 pc = 12 pt)
in inch            (1 in = 25.4 mm)
bp big point      (1 in = 72 bp)
cm centimetre    (1 cm = 10 mm)
mm millimetre     (1 mm = 1000 pt)
dd didot point    (1157 dd = 1238 pt)
cc cicero          (1 cc = 12 dd)
sp scaled point   (65536 sp = 1 pt)

\documentclass{article}
\begin{document}
Hello\hspace{2cm} welcome to rgukt \\
This is the first paragraph of some text.
\vspace{15mm}
This is the second paragraph of some text. Hello World!!!
\end{document}

```

### Output:

```

Hello           welcome to rgukt
\documentclass{article}
\begin{document}
Some of the \textbf{greatest}                                %textbf means text bold font
Discoveries in \underline{science}                         %for underlined text
Were made by \textbf{\textit{accident}}.                    % for underlined and italic
This is for \textit{italic text}                           % for italicized text
Some of the greatest \emph{discoveries} in science
were made by accident.\textit{Some of the greatest \emph{discoveries} % for emphasized text
in science were made by accident.}
\textbf{Some of the greatest \emph{discoveries} in science
were made by accident.}

\end{document}

```

### Basic formatting in LaTeX:

#### Output:

Some of the **greatest** Discoveries in science Were made by *accident*. This is for *italic text* Some of the greatest *discoveries* in science were made by accident.*Some of the greatest discoveries in science were made by accident.* **Some of the greatest *discoveries* in science were made by accident.**

Text can be emphasized by using \emph command. Sometimes the \emph command behaves just as \textit, but is not exactly the same.

### Paragraphs and new lines:

```
\documentclass{article}
\begin{document}
\begin{center}
This text will be placed in the middle of the document
\end{center}
New paragraph without par command\\
par command will be used to start a new paragraph
This is the text in first paragraph. This is the text in first
paragraph. This is the text in first paragraph.
This is the text in second paragraph. This is the text in second
paragraph. This is the text in second paragraph.\\
New paragraph with par command
\par command will be used to start a new paragraph
This is the text in first paragraph. This is the text in first
paragraph. This is the text in first paragraph. \par
This is the text in second paragraph. This is the text in second
paragraph. This is the text in second paragraph.
\end{document}
```

#### Output:

This text will be placed in the middle of the document

New paragraph without par command

par command will be used to start a new paragraph This is the text in first  
paragraph. This is the text in first paragraph. This is the text in first paragraph.  
This is the text in second paragraph. This is the text in second paragraph. This  
is the text in second paragraph.

New paragraph with par command

command will be used to start a new paragraph This is the text in first  
paragraph. This is the text in first paragraph. This is the text in first paragraph.

This is the text in second paragraph. This is the text in second paragraph.

This is the text in second paragraph.

### Paragraph Indentation:

By default, LATEX does not indent the first paragraph of a section. The size of the subsequent paragraph indents is determined by the parameter. \parindent

```
\documentclass{article}
\begin{document}
\setlength{\parindent}{10ex}
This is the text in first paragraph. This is the text in first
paragraph. This is the text in first paragraph. \par
\noindent %The next paragraph is not indented
This is the text in second paragraph. This is the text in second
paragraph. This is the text in second paragraph.
\end{document}
```

#### Output:

This is the text in first paragraph. This is the text in first paragraph.

This is the text in first paragraph.

This is the text in second paragraph. This is the text in second paragraph. This  
is the text in second paragraph.

#### Explanation: \setlength{\parindent}{10ex}:

Here \setlength is for setting length of \parindent{10ex}, means where to start the paragraph line(space will begivenatlinestarting),toobservethedifferencejust20exintheplaceof10exandyoucanclearlyobserve the difference.  
\noindent means there will be no space given at second line starting.

**Note:** Try the above code with \noindent command and without \noindent command you can clearly observe the difference.

#### Text alignment:

The default environment for left-alignment is \flushleft.

Right-aligning text is straightforward with the environment \flushright.

To centre a block of text use the environment `\center`. Similarly `\centering` command will be used....

```
\documentclass{article}
\begin{document}
\begin{flushleft}
Hello! Welcome to latex, this module is about text alignment. This is the left alignment text. Happy learning latex.
\end{flushleft}
\begin{flushright}
Hello! Welcome to latex, this module is about text alignment. This is the right alignment text. Happy learning latex.
\end{flushright}
\begin{center} and \end{center} environment will be used for centered text.
\\
\centering
Text will come here.....
\end{document}
```

## Module 3 – Document Class and Packages

Document Classes

<code>article</code>	For articles in scientific journals, presentations, short reports, program documentation, invitations, ...
<code>IEEEtran</code>	For articles with the IEEE Transactions format.
<code>proc</code>	A class for proceedings based on the <code>article</code> class.
<code>report</code>	For longer reports containing several chapters, small books, thesis, ...
<code>book</code>	For real books.
<code>slides</code>	For slides. The class uses big sans serif letters.
<code>memoir</code>	For changing sensibly the output of the document. It is based on the <code>book</code> class, but you can create any kind of document with it [1]@
<code>letter</code>	For writing letters.
<code>beamer</code>	For writing presentations (see LaTeX/Presentations).

Document Class Options

<code>10pt, 11pt, 12pt</code>	Sets the size of the main font in the document. If no option is specified, 10pt is assumed.
<code>a4paper, letterpaper,...</code>	Defines the paper size. The default size is <code>letterpaper</code> ; However, many European distributions of TeX now come pre-set for A4, not Letter, and this is also true of all distributions of pdfTeX. Besides that, <code>a5paper</code> , <code>b5paper</code> , <code>executivepaper</code> , and <code>legalpaper</code> can be specified.
<code>fleqn</code>	Typesets displayed formulas left-aligned instead of centered.
<code>leqno</code>	Places the numbering of formulas on the left hand side instead of the right.
<code>titlepage, notitlepage</code>	Specifies whether a new page should be started after the document title or not. The <code>article</code> class does not start a new page by default, while <code>report</code> and <code>book</code> do.
<code>twocolumn</code>	Instructs LaTeX to typeset the document in two columns instead of one.
<code>twoside, oneside</code>	Specifies whether double or single sided output should be generated. The classes <code>article</code> and <code>report</code> are single sided and the <code>book</code> class is double sided by default. Note that this option concerns the style of the document only. The option <code>twoside</code> does not tell the printer you use that it should actually make a two-sided printout.
<code>landscape</code>	Changes the layout of the document to print in landscape mode.
<code>openright, openany</code>	Makes chapters begin either only on right hand pages or on the next page available. This does not work with the <code>article</code> class, as it does not know about chapters. The <code>report</code> class by default starts chapters on the next page available and the <code>book</code> class starts them on right hand pages.
<code>draft</code>	makes LaTeX indicate hyphenation and justification problems with a small square in the right-hand margin of the problem line so they can be located quickly by a human. It also suppresses the inclusion of images and shows only a frame where they would normally occur.

## Packages

If you define a lot of new environments and commands, the preamble of your document will get quite long. In this situation, it is a good idea to create a **LaTeX package** containing all your command and environment definitions.

Syntax:

`\usepackage{package_name}`

Some list of packages reference given below

Package name	Description
Inputenc	To choose the encoding of the input text. You might need it if you are writing documents in a language other than English.
Amsmath	It contains the advanced math extensions for LaTeX. The complete documentation should be in your LaTeX distribution; the file is called amsdoc, and can be dvi or pdf.
Amssymb	It adds new symbols in to be used in math mode.
Array	It extends the possibility of LaTeX to handle tables, fixing some bugs and adding new features. Using it, you can create very complicated and customized tables.
Graphic	Allows you to insert graphic files within a document.
mhchem	Allows you to easily type chemical species and equations. It automatically formats chemical species so you don't have to use subscript commands. It also Allows you to draw chemical formulas.
Geometry	For easy management of document margins and the document page size
wrapfig	Allows figures or tables to have text wrapped around them
Enumitem	Adds support for arbitrarily-deep nested lists (useful for outlines)
Color	The color package provides both foreground (text, rules, etc.) and background colour management; it uses the device driver configuration mechanisms of the graphics package to determine how to control its output.
Multirow	Create tabular cells spanning multiple rows
Tabu	Flexible LATEX tabulars
chemfig	Draw molecules with easy syntax

## Multiple Choice Questions:

- 1) Which of the following tool/software is used to prepare effective document preparation by using commands?
  - a) Microsoft word
  - b) LaTeX
  - c) Apple Pages
  - d) Libre Office
- 2) What is the command to write LATEX Logo?
  - a) \latext
  - b) \LATEX
  - c) \Latex
  - d) \LaTeX
- 3) Which of the following special symbol is required to write commands preceded by?
  - a) \
  - b) \*
  - c) {}
  - d) []
- 4) Is Latex commands are case sensitive?
  - a) True
  - b) False
- 5) Which of the following is correct extension of LaTeX?
  - a) .tex
  - b) .sty
  - c) .class
  - d) None of these
- 6) Which symbol is used to write comments in LaTeX?
  - a) &
  - b) \\
  - c) %
  - d) \$
- 7) Which command is used to display today's date?
  - a) \today
  - b) \Today
  - c) \TODAY
  - d) None of these

8) Match the following.

Typeface/style	command
a) Serif(roman)	1. \texttt{....}
b) Bold	2. \textsf{....}
c) Sanserif	3. \textbf{...}
d) Typewriter	4. \textrm{...}
a) a-2, b-3, c-4, d-1 b) a-4, b-3, c-1, d-2 c) a-4, b-2, c-3, d-1 d) a-4, b-3, c-2, d-1	
9) Which of the following switch command is used to slanted style?	
a) \scshape b) \slshape c) \itshape d) \upshape	
10) Which is providing some features in document styles is called?	
a) Package b) Documentclass c) Font style d) Special characters	
11) Which of the following command is not belongs to font size?	
a) \scriptsize{....} b) \textmd{...} c) \huge{....} d) \tiny{....}	
12) Which of the following command is different from other commands?	
a) \quad b) \vspace c) \quad d) \hspace	
13) Which command or symbol is used to create a newline?	
a) \\ b) \par c) \parindent d) \noindent	
14) Which of the following command is used for right alignment?	
a) \flushleft b) \flushright c) \align d) None of these	
15) Which of the following is not belongs to Document Class?	
a) Slides b) proc c) fleqn d) IEEETran	
16) Which of the following document class is used for writing presentations?	
a) Letter b) report c) slides d) beamer	
17) Which document class option is used for places the numbering of formulas on the left hand side instead of right?	
a) Twoside b) draft c) leqno d) openright	

#### Descriptive Questions:

- 1) Create a document with two pages, first page contains as the title page including your name, id, class,branch & university and write few lines about RGUKT in Second page.
- 2) What is preamble?
- 3) Write any four examples of font style commands and it's switch commands?
- 4) Write any three font size commands with examples?
- 5) Explain the spacing commands with examples?
- 6) Explain the paragraph indentation commands with example?
- 7) Explain the text alignment commands with examples?
- 8) Write any four document classes with examples?
- 9) Explain the document class options with examples?

#### Reference Links:

- 1) <https://www.latex-tutorial.com>
- 2) <https://www.overleaf.com>

## Unit IV: Tables and List

### Module 1 - Tables

Tables are common elements in most scientific documents, LATEX provides a large set of tools to customize tables, change the size, combine cells, and change the color of cells and so on. Table makes the information to become more presentable and easier to read.

```
\begin{tabular}{|lcr||}
left aligned column & center column & right column \\
\hline
text & text & text \\
text & text & text \\
\end{tabular}
```

#### Create tables in LaTeX

The tables in LaTeX can be created using the **table** environment and the **tabular** environment which uses **ampersands (&)** as column separators and **new line symbols (\|)** as row separators. The ‘**tabular**’ environment is the most basic way to create a table in LaTeX and doesn't require any other packages. The vertical lines (|) are passed as an argument and the letters **l**, **c** and **r** tell us whether we want to place the content in the left, centre or right respectively.

L	left aligned column
C	centered column
R	right aligned column
p{'width'} e.g. p{5cm}	paragraph column with defined width
(pipe character)	vertical line
(2 pipes)	2 vertical lines

Following is the code and result of a simple table created.

```
\documentclass{article}
\title{table}
\begin{document}
\begin{center}
\begin{tabular}{ c c c }
a & b & c \\
a & b & c \\
a & b & c \\
\end{tabular}
\end{center}
\end{document}
```

#### Output of the code

```
a b c
a b c
a b c |
```

Here **\begin{center}** command is center environment, which helps to print table at center of the page and **\begin{tabular}** command is table environment which helps to create table in LaTeX.

The **\hline** command is used to put a horizontal line on the top and bottom of the table.

Creating a table with boundaries is demonstrated below:

```
\documentclass{article}
\title{table}
\begin{document}
\begin{center}
\begin{tabular}{ /c /c /c / }
\hline
a & b & c \\
a & b & c \\
a & b & c \\
\hline
\end{tabular}
\end{center}
\end{document}
```

#### Output of the above code

a	b	c
a	b	c
a	b	c

{ |c|c|c| }: This declares that three columns, separated by a vertical line, are going to be used in the table. Each c means that the contents of the column will be centered; you can also use 'r' to align the text to the right and 'l' for left alignment.

**Combining rows and columns:** The command **\multicolumn** and **\multirow** are used to combine rows and columns in a table in LaTeX.

%multi-column

\multicolumn{number of cols}{align}{text} % align: l,c,r

%multi-row

\usepackage{multirow}

\multirow{number of rows}{width}{text}

**Example of multi-column is demonstrated below:**

```
\documentclass{article}
\begin{document}
\begin{tabular} { / p {3 cm} / p {3 cm} / p {3 cm} / }
\hline
\multicolumn{3} { / c / }{Time Table}\\
\hline
Subject name & Teacher & Period \\
\hline
Maths & MathsMentor & P1 \\
Physics & PhysicsMentor & P2 \\
Chemistry & ChemistryMentor & P3 \\
IT & ITMentor & P4 \\
\hline
\end{tabular}
\end{document}
```

TimeTable		
Subject	Teacher	Period
Maths	MathsMentor	P1
Physics	PysicsMentor	P2
Chemistry	ChemistryMentor	P3
IT	ITMentor	P4

This is Output of above code.

**The example of multi-row is as follows:**

```
\documentclass{article}
\begin{document}
\begin{center}
\begin{tabular} { / c / c / c / c / }
\hline
A & B & C \\
\hline
\multirow{3} {4em} {a} & b & c \\
& b & c \\
& b & c \\
\hline
\end{tabular}
\end{center}
\end{document}
```

Output of the above code is:

A	B	C
A	b	C
	b	C
	b	C

### Captions, labels and references:

Labels are a necessary part of typesetting as they are efficient pointers to information, one of the most useful properties of LaTeX is the ease and power of its labeling system. This allows one to reference equations, figures, tables, etc, with ease and flexibility.

There are three important commands used for Captions, labels and references;

- 1) **\caption{ }:** this command is used to make a caption for the table which is placed either above or below the table.
- 2) **\label{ }:** this command is used to refer a table within a document.
- 3) **\ref{ }:** this will be placed by the number corresponding to the referenced table.

Following code is the example of how we use caption, label and reference to Table

```
\documentclass{article}
\begin{document}
\begin{table} [h!]
\centering
\begin{tabular}{ // c c c c // }
\hline
Col1 & Col2 & Col3 & Col4 \\ [0.5ex]
\hline
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 \\
9 & 10 & 11 & 12 \\
13 & 14 & 15 & 16 \\
17 & 18 & 19 & 20 \\ [1ex]
\hline
\end{tabular}
\caption{Table to test captions and labels}
\label{table:1}
\end{table}
\end{document}
```

Col1	Col2	Col3	Col4
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

Table 1: Table to test captions and labels

### Positioning a table:

For a table to establish at what position it must be placed, a parameter ‘h!’ has to be placed in table environment. Few other parameters are passed which are mentioned below:

- 1) **h:** the table will be placed here approximately.
- 2) **t:** the table is placed at the top of the page.
- 3) **b:** table is placed at the bottom of the page.
- 4) **p:** put table on a special page for tables only.
- 5) **!: override external LaTeX parameter**
- 6) **H:** place the table at a precise location
- 7) **\centering:** centres the table.

Below is an example of a table is placed here

```
\documentclass{article}
\begin{document}
\begin{table} [h!]
\centering
\begin{tabular}{ // c c c c // }
\hline
C1 & C2 & C3 & C4 \\ [0.5ex]
\hline
1 & 2 & 3 & 4 \\
2 & 7 & 5 & 9 \\
3 & 8 & 7 & 0 \\
4 & 6 & 8 & 6 \\
5 & 8 & 7 & 3 \\ [1ex]
\hline
\end{tabular}
\end{table}
\end{document}
```

C1	C2	C3	C4
1	2	3	4
2	7	5	9
3	8	7	0
4	6	8	6
5	8	7	3

### Lists of tables:

A list of the tables and figures keep the information organized and provide easy access to a specific element. This article explains how to create a list of figures, a list of tables and how to change the default title in both of them.

Example for List of Tables & Figures:

```
\documentclass{article}
\usepackage{graphicx}
\graphicspath{ {figures/} }
\usepackage{array}

\begin{document}
>thispagestyle{empty}
\listoffigures
\listoftables
\newpage
\pagenumbering{arabic}
\end{document}
```

### List of Figures

1	Three dimensional graph . . . . .	2
2	Second 3d plot . . . . .	2
3	Scattered plot . . . . .	3

### List of Tables

1	First table . . . . .	3
2	Dummy table . . . . .	4
3	Third table . . . . .	4

### Changing the names:

The default titles, "List of Tables" and "List of Figures", can be changed to any other text

Example:

```
\documentclass{article}
\usepackage{graphicx}
\usepackage{array}
\graphicspath{ {figures/} }
\renewcommand{\listfigurename}{List of plots}
\renewcommand{\listtablename}{Tables}
\begin{document}
>thispagestyle{empty}
\listoffigures
\listoftables
\clearpage
\pagenumbering{arabic}
\end{document}
```

Output of above code:

### List of plots

1	Three dimensional graph . . . . .	2
2	Second 3d plot . . . . .	2
3	Scattered plot . . . . .	3

### Tables

1	First table . . . . .	3
2	Dummy table . . . . .	4
3	Third table . . . . .	4

The commands **\listoffigures** and **\listoftables** are self explanatory, the first one generates the list of figures and the second one the list of tables. In this example there are two more relevant commands:

**\thispagestyle{empty}** - Removes the page numbering.  
**\pagenumbering{arabic}** - Re-start the page numbering with Arabic style.

The commands that re-write the titles are:

- **\renewcommand{\listfigurename}{List of plots}** will write "List of plots" instead of "List of Figures".
- **\renewcommand{\listtablename}{Tables}** will write "Tables" instead of "List of Tables".

*Note: your document may need to be compiled twice for the lists to be properly generated*

## Module 2 - Lists

### List:

List is basic elements in a document, when used correctly they keep concepts organized and structured. The motive of list is to present information in a simple and concise manner. In this module, various kinds of lists in LaTeX like enumerate, itemize, description and custom lists along with ordered, unordered and special lists will be discussed.

List structures in LaTeX are classified into three types:

- **Itemize:** This is an environment used for bulleted list basically when the given details or information or to be put in an unordered list.
- **Enumerate:** This is an environment used for numbered list. This list is given when the information to be updated should be in a sequence or in a specified order.

- **Description:** This environment is used when the item of the list has a description or more information to it.

### Ordered List:

The ordered lists are created using the **enumerate environment**. These lists are the ones that keep the details in a specific order.

Example:

```
\documentclass{article}
\begin{document}
\begin{enumerate}
\item one
\item two
\item three
\end{enumerate}
\end{document}
```

Output:

1. one
2. two
3. three

### Unordered List

Unordered list in LaTeX is created using the itemize environment. These lists are used where a specific order for details is not necessary.

Example:

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\begin{document}
\begin{enumerate}
\item one
\item two
\item three
\end{enumerate}
\end{document}
```

Output:

- one
- two
- three

### Description List:

A description list is written using the description environment. These lists are used when the items of the list have descriptions as well.

Example:

```
\documentclass{article}
\begin{document}
\begin{description}
\item [one] it is numerically written as 1
\item [two] it is numerically written as 2
\end{description}
\end{document}
```

one it is numerically written as 1

two it is numerically written as 2

Output

### Nested List:

Nested lists are lists inside a list. These lists are designed when an item has other various sub-items.

Example:

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\begin{document}
\begin{enumerate}
\item one
\begin{enumerate}
\item 1
\end{enumerate}
\item two
\item three \ldots
\end{enumerate}
\end{document}
```

1. one

(a) 1

2. two

3. three ...

The default maximum level of nesting for each type of list is four. If more than four lists of the same type are nested, LATEX throws the error: “Too deeply nested”.

```
\begin{enumerate}
    \item An ordered list item
    \begin{enumerate}
        \item A nested ordered list item
        \begin{itemize}
            \item A nested unordered list item
        \end{itemize}
        \item Another nested ordered list item
    \end{enumerate}
    \item Another ordered list item
\end{enumerate}
```

#### Output:

1. An ordered list item
  - (a) A nested ordered list item
    - A nested unordered list item
  - (b) Another nested ordered list item
2. Another ordered list item

### List Manipulations:

The appearance of a list is alterable. For example, one might want a different label from the default, or to add/remove space between items. There are several packages which implement macros for list manipulations. Some of the most commonly used packages are: enumerate [1], enumitem [2], and mdwlist [4]. Here, focused on enumitem as it provides the most comprehensive set of macros to manipulate list structures and comes with extensive documentation. The commands here assume that this package is loaded in the preamble:

```
\usepackage{enumitem}
```

#### Changing the label:

The label can be changed using the optional environment parameter label. In the example below the label of an unordered list, which is a bullet by default, is changed to a diamond.

Example:

```
\begin{itemize}[label=\diamond]
    \item A diamond-labelled item
    \item Another diamond-labelled item
\end{itemize}
```

Some symbols frequently used as labels for unordered lists are given in below table.

Table 1: Label options for itemize and enumerate.			
Itemize	Enumerate		
Label	Code	label	Code
•	\billet\$	1,2,...	\arabic*
-	\$-\$	i, ii,...	\roman*
.	\cdot\$	I, II,...	\Roman*
*, ★	\$*, \$\star\$	a, b,...	\alph*
◊	\diamond\$	A,B,...	\Alph*

Example:

Output:

```
\begin{enumerate}[label=(\roman*)]
    \item A roman-numeralled item
    \item Another roman-numeralled item
\end{enumerate}
```

- (i) A roman-numeralled item
  - (ii) Another roman-numeralled item

### List styles:

As many other LATEX elements, unordered and ordered list styles can be personalized.

#### Unordered Lists:

Bullet lists are unordered (unnumbered) lists produced by the itemize environment. The default bullet style for level 1 is a filled circle. The label scheme of unordered lists also changes depending on the depth of the nested list:

Example:

```
\begin{itemize}
    \item First Level
    \begin{itemize}
        \item Second Level
        \begin{itemize}
            \item Third Level
        \end{itemize}
    \end{itemize}
\end{itemize}
```

Output:

- First Level
  - Second Level
    - \* Third Level
      - . Fourth Level

```

\begin{itemize}
    \item Fourth Level
\end{itemize}
\end{itemize}
\end{itemize}

```

**The default label scheme for itemized lists is:**

- ✓ Level 1 is \textbullet (•),
- ✓ Level 2 is \textendash (–),
- ✓ Level 3 is \textasteriskcentered (\*)
- ✓ Level 4 is \textperiodcentered (◦).

To redefine the label use one of the next commands, depending on the level of list mark you intend to change:

- ✓ Level1: labelitemi
- ✓ Level2: labelitemii
- ✓ Level3: labelitemiii
- ✓ level4: labelitemiv

Bullet label schemes can be changed on a go forward basis by redefining the commands that typeset them.

Redefinition is achieved using `\renewcommand{}` for a specific list levels. For example, the following code changes Level 1 to a black square and Level 2 to a white square:

```

\renewcommand{\labelitemi}{$\blacksquare$}
\renewcommand{\labelitemii}{$\square$}
\begin{itemize}
    \item First Level
\begin{itemize}
    \item Second Level
\begin{itemize}
        \item Third Level
\begin{itemize}
            \item Fourth Level
\end{itemize}
\end{itemize}
\end{itemize}
\end{itemize}

```

**Output for above code:**

- First Level
- Second Level
- \* Third Level
- . Fourth Level

The symbols used here belong to the **amssymb** package, which must be added to the preamble with `\usepackage{amssymb}`. You can also change the item label for a specific row.

For example:

```

\begin{itemize}
    \item Default item label
    \item Default item label
    \item[$\square$] Custom item
\end{itemize}

```

■ Default item label      Output:

- Default item label
- Custom item

### Ordered lists:

The numbering styles change depending on the depth of the nested lists:

Ordered list have the same syntax inside the enumerate environment. The enumerate labels consists of sequential numbers, and each numbered list starts at 1 with every call to the enumerate environment:`\begin{enumerate}`

Example:

```

\begin{enumerate}
    \item First level item
    \item First level item
\begin{enumerate}
    \item Second level item
    \item Second level item
\begin{enumerate}
        \item Third level item
        \item Third level item
\end{enumerate}
\end{enumerate}

```

**Output:**

1. First level item
2. First level item
  - (a) Second level item
3.
  - (a) Second level item
    - i. Third level item
    - ii. Third level item
  - A. Fourth level item
  - B. Fourth level item

```

\begin{enumerate}
    \item Fourth level item
    \item Fourth level item
\end{enumerate}
\end{enumerate}
\end{enumerate}

```

The default numbering scheme is:

- ✓ Level 1: Arabic number (1, 2, 3, ...) which uses \arabic,
- ✓ Level 2: Lowercase letter (a, b, c, ...), which uses \alph,
- ✓ Level 3: Lowercase Roman numeral (i, ii, iii, ...) which uses \roman,
- ✓ Level 4: Uppercase letter (A, B, C, ...) which uses \Alph.

These numbers can be changed by redefining the commands that typeset the numbers of various list levels.

For example:

```

\renewcommand{\labelenumii}{\Roman{enumii}}
\begin{enumerate}
    \item First level item
    \item First level item
\begin{enumerate}
    \item Second level item
    \item Second level item
\begin{enumerate}
    \item Third level item
    \item Third level item
\begin{enumerate}
    \item Fourth level item
    \item Fourth level item
\end{enumerate}
\end{enumerate}
\end{enumerate}
\end{enumerate}

```

The command \renewcommand{\labelenumii}{\Roman{enumii}} changes the second level to upper case Roman numeral. It is possible to change the labels of any level, replace \labelenumii for one of the listed below.

\theenumi for Level 1  
\theenumii for Level 2  
\theenumiii for Level 3  
\theenumiv for Level 4

The command must be placed in the preamble to change the labels globally or right before \begin{enumerate} to change labels only in this list. In numbered lists the counter is incremented by \item before it is printed, and starts from 1, a, i, A, I.

This can be changed:

```

\renewcommand{\labelenumii}{\Roman{enumii}}
\begin{enumerate}
    \item First level item
    \item First level item
\begin{enumerate}
    \setcounter{enumii}{4}
    \item Second level item
    \item Second level item
\begin{enumerate}
    \item Third level item
    \item Third level item
\begin{enumerate}
    \item Fourth level item
\end{enumerate}
\end{enumerate}
\end{enumerate}

```

Output:

1. First level item
  2. First level item
    - I Second level item
    - II Second Level item
      - i. Third level item
      - ii. Third level item
- A. Fourth level item  
B. Fourth level item

Output:

1. First level item
2. First level item
  - V Second level item
  - VI Second level item
    - i. Third level item
    - ii. Third level item
      - A. Fourth level item
      - B. Fourth level item

```
\end{enumerate}
\end{enumerate}
\end{enumerate}
```

To change the start number or letter you must use the `\setcounter` command. In the example, to change the start number of level 2 to V the command `\setcounter{enumii}{4}` was used.

To set the start number to any other counter change `enumii` for any of these:

- ✓ `enumi` for Level 1
- ✓ `enumii` for Level 2
- ✓ `enumiii` for Level 3
- ✓ `enumiv` for Level 4

## **Module 3 – Images**

Images are essential elements in most of the scientific documents. LATEX provides several options to handle images and make them look exactly what you need. In this article is explained how to include images in the most common formats, how to shrink, enlarge and rotate them, and how to reference them within your document.

```
\documentclass{article}
\usepackage{graphicx}
\graphicspath{ {./images/} }
```

```
\begin{document}
```

*The universe is immense and it seems to be homogeneous,  
in a large scale, everywhere we look at.*

```
\includegraphics{universe}
```

*There's a picture of a galaxy above*

```
\end{document}
```

### **Output:**

The universe is immense and it seems to be homogeneous, in a large scale, everywhere we look at.



**There's a picture of a galaxy above**

Latex can not manage images by itself, so we need to use the `graphicx` package. To use it, we include the following line in the preamble: `\usepackage{graphicx}`. The command `\graphicspath{ {./images/} }` tells LATEX that the images are kept in a folder named `images` under the directory of the main document.

The `\includegraphics{universe}` command is the one that actually included the image in the document. Here `universe` is the name of the file containing the image without the extension, then `universe.PNG` becomes `universe`. The file name of the image should not contain white spaces nor multiple dots.

**Note:** The file extension is allowed to be included, but it's a good idea to omit it. If the file extension is omitted it will prompt LaTeX to search for all the supported formats.

### **The folder path to images**

When working on a document which includes several images it's possible to keep those images in one or more separated folders so that your project is more organized.

The command `\graphicspath{ {images/} }` tells LATEX to look in the `images` folder. The path is relative to the current working directory - so, the compiler will look for the file in the same folder as the code where the image is included. The path to the folder is relative by default, if there is no initial directory specified, for instance,

*%Path relative to the .tex file containing the \includegraphics command*

```
\graphicspath{ {images/} }
```

This is a typically straightforward way to reach the `graphics` folder within a file tree, but can leads to complications when `.tex` files within folders are included in the main `.tex` file. Then, the compiler may end up looking for the images

folder in the wrong place. Thus, it is best practice to specify the graphics path to be relative to the main .tex file, denoting the main .tex file directory as ./ , for instance as in the introduction.

*%Path relative to the main .tex file*

```
\graphicspath{ {./images/} }
```

The path can also be absolute, if the exact location of the file on your system is specified. For example:

*%Path in Windows format:*

```
\graphicspath{ {c:/user/images/} }
```

*%Path in Unix-like (Linux, Mac OS) format*

```
\graphicspath{ {/home/user/images/} }
```

Notice that this command requires a trailing slash / and that the path is in between double braces.

You can also set multiple paths if the images are saved in more than one folder. For instance, if there are two folders named images1 and images2, use the command.

```
\graphicspath{ {./images1/}{./images2/} }
```

If no path is set LATEX will look for pictures in the folder where the .tex file the image is included in is saved.

Changing the image size and rotating the picture:

If we want to further specify how LATEX should include our image in the document (length, height, etc), we can pass those settings in the following format:

```
\begin{document}
```

```
\includegraphics[scale=1.5]{lion-logo}
```



As you probably have guessed, the parameters inside the brackets [width=3cm, height=4cm] define the width and the height of the picture. You can use different units for these parameters. If only the width parameter is passed, the height will be scaled to keep the aspect ratio.

The length units can also be relative to some elements in document. If you want, for instance, make a picture the same width as the text:

```
\begin{document}
```

*The universe is immense and it seems to be homogeneous, in a large scale, everywhere we look at.*

```
\includegraphics[width=\textwidth]{universe}
```

The universe is immense and it seems to be homogeneous, in a large scale, everywhere we look at.



There is another common option when including a picture within your document, to rotate it. This can easily be accomplished in LaTeX:

```
\begin{document}
```

```
\includegraphics[scale=1.2, angle=45]{lion-logo}
```



The parameter angle=45 rotates the picture 45 degrees counter-clockwise. To rotate the picture clockwise use a negative number.

### Captioning, labelling and referencing

Captioning images to add a brief description and labelling them for further reference are two important tools when working on a lengthy text.

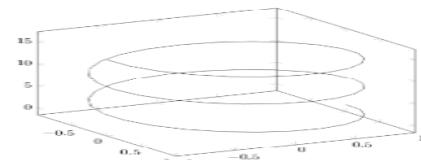
### Captions

Let's start with a caption example:

```
\begin{figure}[h]
```

```
\caption{Example of a parametric plot ( $\sin(x), \cos(x), x$ )}
```

Figure 1: Example of a parametric plot ( $\sin(x), \cos(x), x$ )



```
\centering
\includegraphics[width=0.5\textwidth]{spiral}
\end{figure}
```

It's really easy, just add the `\caption{Some caption}` and inside the braces write the text to be shown. The placement of the caption depends on where you place the command; if it's above the `\includegraphics` then the caption will be on top of it, if it's below then the caption will also be set below the figure.

Captions can also be placed right after the figures. The `sidecap` package uses similar code to the one in the previous example to accomplish this.

```
\documentclass{article}
\usepackage[rightcaption]{sidecap}
\usepackage{graphicx} %package to manage images
\graphicspath{ {images/} }
\begin{SCfigure}[0.5][h]
\caption{Using again the picture of the universe.  
This caption will be on the right}
\includegraphics[width=0.6\textwidth]{universe}
\end{SCfigure}
```

There are two new commands



Figure 2: Using again the picture of the universe. This caption will be on the right

As you may expect this line will import a package named `sidecap`, but there is an additional parameter: `rightcaption`. This parameter establishes the placement of the caption at the right of the picture, you can also use `leftcaption`. In book-like documents `outercaption` and `innercaption` are also available. The names of these are selfdescriptive.

```
\begin{SCfigure}[0.5][h] \end{SCfigure}
```

Defines an environment similar to `figure`. The first parameter is the width of the caption relative to the size of the image, as declared in `\includegraphics`. The second parameter `h` works exactly as in the `figure` environment. See the placement section for more information.

### Labels and cross-references:

Figures, just as many other elements in a LATEX document (equations, tables, plots, etc) can be referenced within the text. This is very easy, just add a label to the figure or `SCfigure` environment, and then later use that label to refer the picture.

```
\begin{figure}[h]
\centering
\includegraphics[width=0.25\textwidth]{mesh}
\caption{a nice plot}
\label{fig:mesh1}
\end{figure}
```



Figure 3: a nice plot

As you can see in the figure 3, the function grows near 0. Also, in the page 7 is the same example.

As you can see in the figure `\ref{fig:mesh1}`, the function grows near 0. Also, in the page `\pageref{fig:mesh1}` is the same example.

There are three commands that generate cross-references in this example.

```
\label{fig:mesh1}
```

This will set a label for this figure. Since labels can be used in several types of elements within the document, it's a good practice to use a prefix, such as `fig:` in the example.

```
\ref{fig:mesh1}
```

This command will insert the number assigned to the figure. It's automatically generated and will be updated if insert some other figure before the referenced one.

```
\pageref{fig:mesh1}
```

This prints out the page number where the referenced image appears.

The `\caption` is mandatory to reference a figure.

Another great characteristic in a LATEX document is the ability to automatically generate a list of figures. This is straightforward.

```
\listoffigures
```

This command only works on captioned figures, since it uses the caption in the table. The example above lists the images in this article.

### List of Figures

1	Example of a parametric plot ( $\sin(x)$ , $\cos(x)$ , $x$ ) . . . . .	6
2	Using again the picture of the universe. This caption will be on the right . . . . .	6
3	a nice plot . . . . .	7
4	a nice contour plot . . . . .	7

This command only works on captioned figures, since it uses the caption in the table. The example above lists the images in this article.

### Multiple Choice Questions

- 1) Which of the following symbol is worked as a cell separator in table?  
a) \ b) | c) & d) \hline
- 2) Which of the following command is used in preamble to combine to rows in table?  
a) \usepackage{multirow} b) \usepackage{multiplerow}  
c) \usepackage{multicolumn} d) usedpackage{multirow}
- 3) How to create a list of tables straightforward?  
a) \tablelist b) \listoftables c) \listtables d) \listoftables
- 4) \begin{enumerate} command is related to?  
a) Unordered list b) Ordered list c) Description List d) None of the above
- 5) It is possible to change the labels of any level by using following command  
a) \renewcommand b) \reviewcommand c) \levelchanger d) None of the above
- 6) The default numbering scheme for level-4 in ordered list is?  
a) a, b, c,d b) 1,2,3,4 c) A,B,C,D d) i,ii,iii,iv
- 7) Match the Following
 

1. Level 1 [ ]	A. \textperiodcentered (.)
2. Level 2 [ ]	B. \textasteriskcentered (*)
3. Level 3 [ ]	C. \textbullet (•),
4. Level 4 [ ]	D.\textdash (–),

 a) 1-A, 2-B, 3-C, 4-D b)1-C, 2-D, 3-B, 4-A c) 1-C, 2-D, 3-A, 4-B d) 1-A, 2-C, 3-B, 4-D
- 8) Which of the following is not related to Table in LaTeX?  
a) Multirow b) Wrapfig c) Array d) Geometry
- 9) Command to list all the figures of the LaTeX document.  
a) \listoffigures b) \allfigures c) \figureslist d) \dcoumentfigureslist
- 10) Package used to insert an image  
a) \graphicx b)\graphics b)\includegraphicscs d)\includegraphix

### Descriptive Questions:

- 1) How do create Table and write a code for following table in Latex?

RGUKT		
PUC	Boys	1000
	Girls	1000
Engineering	Boys	2000
	Girls	2000

- 2) Write a code for following table in Latex?

PUC-1 Time Table								
DAY	P1	P2	P3	P4	B R E A K	P5	P6	
MON	P	M	CLAB			IT	C	
TUE	C	P	E	M		PLAB		
WED	E	IT	P	T		C	M	
THU	E	T	C	P		M		
FRI	M	IT	E	C		P	T	
SAT	IT	M	T	E		C	P	

3) Write a code for following nested list in Latex?

- PUC-I
  - I. IT
    - Sem-I
      - Fundamentals of Computers
      - Network Hardware Components
    - Sem-II
      - Latex
      - HTML
      - CSS
  - PUC-II
    - I. IT
      - Sem-I
        - Algorithms
      - Sem-II
        - Basics of Python
        - Python

4) Write a code for following ordered list in Latex?

1. PUC
  - a. PUC-I
  - b. PUC-II
2. Engineering
  - a. Engineering-I
    - i. Civil Engineering
      - A. Theory
      - B. Lab
    - ii. Chemical Engineering
      - A. Theory
      - B. Lab

5) Insert an image into the document using Latex code.

(Let the image file name be yyyy.jpeg.

Image height should be 15cm

Angle should be 40 degrees)

## **UNIT 6- Math equations and explanation of document classes**

### **Module 1 – Mathematical Expressions**

The feature that makes LATEX the right edition tool for scientific documents is the ability to render complex mathematical expressions. Here, explain the basic commands to display equations.

Mathematical models:

LATEX allows two writing modes for mathematical expressions: the inline mode and the display mode. The first one is used to write formulas that are part of a text. The second one is used to write expressions that are not part of a text or paragraph, and are therefore put on separate lines.

Type	Inline (within text) formulas	Displayed equations	Displayed and automatically numbered equations
Environment	<code>math</code>	<code>displaymath</code>	<code>equation</code>
LaTeX shorthand	<code>\(...\)</code>	<code>\[...\]</code>	
TeX shorthand	<code>\$...\$</code>	<code>\$\$...\$\$</code>	
Comment			<code>equation*</code> (starred version) suppresses numbering, but requires amsmath

Inline mode expressions:

Math environment:

```
\documentclass{article}
\begin{document}
My first Math expression is
\begin{math}
X^3+y^3=(x+y)^3
\end{math}
\end{document}
```

My first math expression is  $x^3 + y^3 = (x + y)^3$

(Or)

Latex shorthand:

```
](...)\)
|x^2+y^2=z^2)
```

(Or)

Tex shorthand:

```
$....$
$x^3+y^2=z^3$
```

Display mode expressions:

Displaymath environment:

```
\begin{document}
Dispaly mode expression is
\begin{displaymath}
X^3+y^3=(x+y)^3
\end{displaymath}
\end{document}
```

$x^3 + y^3 = (x + y)^3$

(Or)

Latex shorthand: `\[ ... \] \[x^2+y^2 =z^2\]`

(Or)

Tex shorthand: `$$....$$ $$x^3+y^2 =z^3$$`

We can write math formulas using these modes. Now we learn different math formulas using latex code as follows here.

**Symbols:** In latex writing symbols directly from the keyboard

`+ - = ! / ( ) [ ] < > | ^ :`

**Greek letters commands:**

`\alpha, \Alpha, \beta, \Beta, \gamma, \Gamma, \pi, \Pi, \phi, \varphi, \mu, \Phi`

## Binary Operation/Relation Symbols

$\times$	<code>\times</code>	$\otimes$	<code>\otimes</code>
$\div$	<code>\div</code>	$\cap$	<code>\cap</code>
$\cup$	<code>\cup</code>	$\neq$	<code>\neq</code>
$\leq$	<code>\leq</code>	$\geq$	<code>\geq</code>
$\in$	<code>\in</code>	$\perp$	<code>\perp</code>
$\notin$	<code>\notin</code>	$\subset$	<code>\subset</code>
$\simeq$	<code>\simeq</code>	$\approx$	<code>\approx</code>
$\wedge$	<code>\wedge</code>	$\vee$	<code>\vee</code>
$\oplus$	<code>\oplus</code>	$\otimes$	<code>\otimes</code>
$\square$	<code>\Box</code>	$\boxtimes$	<code>\boxtimes</code>
$\equiv$	<code>\equiv</code>	$\cong$	<code>\cong</code>

## Trigonometric functions:

$$\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$$

$$\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$$

## Powers and Indices:

Powers and indices are equivalent to superscripts and subscripts in normal text mode. Character  $\text{^}$  is used to raise something, and the underscore ( $\_$ ) is for lowering. If more than one expression is raised or lowered, they should be grouped using curly braces ( $\{$  and  $\}$ ).

### Exercises:

$$\begin{aligned} a^m \times a^n &= a^{m+n} \\ (a^m)^n &= a^{mn} \\ a^m \div a^n &= a^{m-n} \\ a^0 &= 1 \\ a^{-1} &= \frac{1}{a} \text{ and } a^{-m} = \frac{1}{a^m} \\ a^{\frac{1}{2}} &= \sqrt{a} \text{ and } a^{\frac{1}{3}} = \sqrt[3]{a} \\ a^{\frac{p}{q}} &= (a^p)^{\frac{1}{q}} = \sqrt[q]{a^p}, \\ a^{\frac{p}{q}} &= (a^{\frac{1}{q}})^p = (\sqrt[q]{a})^p \end{aligned}$$

## Fractions:

**Syntax:** `\frac{numerator}{denominator}`

$$\frac{n!}{k!(n-k)!}$$

## Continued fractions:

Continued fractions should be written using `\cfrac` command

### Exercises:

$$\frac{3x+5}{2x^2-5x-3} = \frac{2}{x-3} - \frac{1}{2x+1} \quad \frac{5x}{(x^2+x+1)(x-2)} = \frac{-\frac{10}{7}x + \frac{5}{7}}{x^2+x+1} + \frac{\frac{10}{7}}{x-2} \quad \frac{5x}{(x^2+x+1)(x-2)} = \frac{Ax+B}{x^2+x+1} + \frac{C}{x-2}$$

## Exercises:

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$$

$$k_{n+1} = n^2 + k_n^2 - k_{n-1}$$

$$k_{n+1} = n^2 + k_n^2 - k_{n-1}$$

### Exercises:

$$\begin{aligned} \sqrt{x+y} &\neq \sqrt{x} + \sqrt{y} \\ \sqrt{\frac{x}{y}} &= \frac{\sqrt{x}}{\sqrt{y}} \end{aligned}$$

### Square root:

$$\begin{aligned} \sqrt[n]{\frac{a}{b}} &= \sqrt[n]{a} \cdot \sqrt[n]{b} \\ \sqrt[n]{1+x+x^2+x^3+\dots} &= \sqrt[3]{1+x+x^2+x^3+\dots} \end{aligned}$$

$$\begin{aligned} \begin{array}{l} \begin{aligned} x &= a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \cfrac{1}{a_4}}}} \end{aligned} \\ \end{array} \end{aligned}$$

$$x = a_0 + \cfrac{1}{a_1 + \cfrac{1}{a_2 + \cfrac{1}{a_3 + \cfrac{1}{a_4}}}}$$

## Module 2 - Differential equations

**Differential equation:**

$$\frac{dQ}{dt} = \frac{ds}{dt}$$

**Partial differential equation:**

$$\frac{\partial Q}{\partial t} = \frac{\partial s}{\partial t}$$

Exercises:

$$\begin{aligned} \frac{d^3y}{dx^3} + 2\left(\frac{d^2y}{dx^2}\right)^2 - \frac{dy}{dx} + y &= 0 & \frac{dy}{dx} &= (1+x^2)(1+y^2) \\ \left(\frac{d^2y}{dx^2}\right)^2 + \cos\left(\frac{dy}{dx}\right) &= 0 & x^5 \frac{dy}{dx} &= -y^5 \\ \frac{\partial^2 z}{\partial x \partial y} &= \frac{\partial^2 z}{\partial y \partial x} & \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} &= \frac{\partial^2 u}{\partial r^2} + \frac{1}{r} \frac{\partial u}{\partial r} + \frac{1}{r^2} \frac{\partial^2 u}{\partial \theta^2} \\ \frac{du}{dx} &= \frac{dv}{dy} & \frac{d}{dx}\left(\frac{u}{v}\right) &= \frac{v \frac{du}{dx} - u \frac{dv}{dy}}{v^2} \end{aligned}$$

**Limits:**

\begin{document}  
Testing notation for limits  
\lim\_{h \rightarrow 0} \frac{f(x+h)-f(x)}{h}

**Output**

Testing notation for limits

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

\end{document}

**Exercises:**

$$\begin{aligned} 1) \lim_{x \rightarrow 0} \frac{\sqrt{1+x}-\sqrt{1}}{x} & 2) \lim_{y \rightarrow 2} \frac{y^2-2^2}{y-2} & 3) \lim_{x \rightarrow \frac{\pi}{2}} (\sec x - \tan x) & 4) \lim_{y \rightarrow 0} \frac{2 \sin^2 \frac{y}{2}}{2 \sin \frac{y}{2} \cos \frac{y}{2}} & 5) \lim_{h \rightarrow 0} \frac{2 \cos\left(\frac{2x+h}{2}\right) \sin \frac{h}{2}}{2 \cdot \frac{h}{2}} \end{aligned}$$

**Integration:**

\int\_{lower}^{upper} a^b x^2 dx

**output**

$$\int_a^b x^2 dx$$

**Exercises:**

$$1) \int_a^b f(x) dx = \int_a^b f(a+b-x) dx \quad 2) \int_0^{2a} f(x) dx = \int_0^a f(x) dx + \int_0^a f(2a-x) dx \quad 3) \int \left( \frac{2a}{\sqrt{x}} - \frac{b}{x^2} + 3\sqrt[3]{x^2} \right) dx$$

$$4) \int 2a(x)^{-\frac{1}{2}} dx - \int bx^{-2} dx + \int 3cx^{\frac{2}{3}} dx \quad 5) \int_0^{\frac{\pi}{2}} \frac{\tan^7 x}{\cot^7 x + \tan^7 x} dx \quad 6) \int_0^{\frac{\pi}{2}} \frac{\tan^7\left(\frac{\pi}{2}-x\right)}{\cot^7\left(\frac{\pi}{2}-x\right) + \tan^7\left(\frac{\pi}{2}-x\right)} dx$$

**Sum:**

\sum\_{lower}^{upper}

Command:

\sum\_{i=1}^{10} t\_i

**Output**

$$\sum_{i=1}^{10} t_i$$

Command:

\displaystyle\sum\_{i=1}^{10} t\_i

**Output**

$$\sum_{i=1}^{10} t_i$$

## Exercises:

$$1) \sum_{n=1}^{\infty} n = 1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$
$$2) \sum_{k=1}^n f(a+k) = 16(2^n - 1)$$
$$3) n^3 = 3 \sum_{k=1}^n k^2 - 3 \sum_{k=1}^n k + n$$

## Brackets and Parentheses:

The size of the brackets can be manually set, or they can be resized dynamically in your document, as shown in the next example:

```
\left[  
\begin{matrix}  
1&5&8\\  
0&2&4\\  
3&3&-8  
\end{matrix}  
\right ]
```

$$\begin{bmatrix} 1 & 5 & 8 \\ 0 & 2 & 4 \\ 3 & 3 & -8 \end{bmatrix}$$

Notice that to insert the brackets, the `\left` and `\right` commands are used. Even if you are using only one bracket *both* commands are mandatory. Manually sized brackets use commands `\Bigg` and `\bigg`.

**Complete list of parentheses and sizes see here**

## LATEX commands

## Renders as

`\big( \Big( \bigg( \Bigg(`

$$\left( \left( \left( \left($$
  
$$\right) \right) \right) \right)$$

`\big] \Big] \bigg] \Bigg]`

$$\left\{ \left\{ \left\{ \left\{$$

`\big\{ \Big\{ \bigg\{ \Bigg\{`

`\big\langle \Big\langle \bigg\langle \Bigg\langle`

$$\left\langle \left\langle \left\langle \left\langle$$

`\big\rangle \Big\rangle \bigg\rangle \Bigg\rangle`

$$\left\rangle \right\rangle \right\rangle \right\rangle$$

## Matrices:

A basic matrix may be created using the matrix environment: in common with other table-like structures, entries are specified by row, with columns separated using an ampersand (&) and a new rows separated with a double backslash (\\).

```
$  
\begin{matrix}  
a & b & c \\  
d & e & f \\  
g & h & i  
\end{matrix}  
$
```

Output

$$\begin{array}{ccc} a & b & c \\ d & e & f \\ g & h & i \end{array}$$

## **Exercises:**

$$A = \begin{pmatrix} x & 4 & 3 \\ 4 & 3 & x \\ 3 & x & 4 \end{pmatrix}$$

1) 2)

$$A = \begin{bmatrix} e^{2x} \sin x & e^{2x} \sin 2x \\ e^{4x} \sin x & e^{4x} \sin 2x \end{bmatrix}$$

$$\begin{bmatrix} 2x & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} x \\ 8 \end{bmatrix}$$

4)

$$\left[ \begin{array}{ccc} 2 & \frac{11}{2} & \frac{-5}{2} \\ \frac{11}{2} & 3 & \frac{3}{2} \\ \frac{-5}{2} & \frac{3}{2} & 4 \end{array} \right]$$

## Controlling horizontal spacing:

### Command:

```
\[ f(n) =
\begin{cases}
n/2 & \text{if } n \text{ is even} \\
-(n+1)/2 & \text{if } n \text{ is odd} \\
\end{cases}
\]
```

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ -(n+1)/2 & \text{if } n \text{ is odd} \end{cases}$$

(Note that this particular example can be expressed in more elegant code by the `\cases` construct provided by the **amsmath** package.) LATEX has defined two commands that can be used anywhere in documents (not just maths) to insert some horizontal space. They are `\quad` and `\qquad`.

## **Exercises:**

$$f(x) = \begin{cases} \frac{1 - \cos 4x}{8x^2}, & x \neq 0 \\ k, & x = 0 \end{cases}$$

$$f(x) = \begin{cases} x \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

$$f(x) = \begin{cases} x^2, & \text{if } x \geq 0 \\ -x^2, & \text{if } x < 0 \end{cases}$$

### **Spaces:**

The spacing depends on the command you insert, the example below contains a complete list of spaces and how they look like.

## Description of spacing commands

LATEX code	Description
\quad	space equal to the current font size (= 18 mu)
\,	3/18 of \quad (= 3 mu)
\colon	4/18 of \quad (= 4 mu)
\;	5/18 of \quad (= 5 mu)
\!	-3/18 of \quad (= -3 mu)
\ (space after backslash!)	equivalent of space in normal text
\quad\quad	twice of \quad (= 36 mu)

Note: to see a description of the align\* environment see Aligning equations with amsmath

### *Spaces in mathematical mode:*

```
\begin{align*}
f(x) =& x^2! + 3x! + 2 \\
f(x) =& x^2 + 3x + 2 \\
f(x) =& x^2\!, + 3x\!, + 2 \\
f(x) =& x^2\!: + 3x\!: + 2 \\
f(x) =& x^2\langle + 3x\rangle + 2 \\
f(x) =& x^2\langle + 3x\rangle + 2 \\
f(x) =& x^2\langle quad + 3x\|quad \rangle \\
f(x) =& x^2\langle qquad + 3x\|qquad \rangle \\
\end{align*}
```

## Spaces in mathematical mode-

### Aligning equations:

If there are several equations that you need to align vertically, the align environment will do it:

\begin{align*}	Output	
$x = y \quad \& w = z \quad \& a = b + c \\ 2x = -y \quad \& 3w = \frac{1}{2}z \quad \& a = b \\ -4 + 5x = 2 + y \quad \& w + 2 = -1 + w \quad \& ab = cb$	$x = y$ $2x = -y$ $-4 + 5x = 2 + y$	$w = z$ $3w = \frac{1}{2}z$ $w + 2 = -1 + w$
		$a = b + c$ $a = b$ $ab = cb$
\end{align*}		

### Exercises:

$$\begin{aligned} f'(x) &= \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\ &= \lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h} \\ &= \lim_{h \rightarrow 0} \frac{x^3 + h^3 + 3xh(x+h) - x^3}{h} \\ &= \lim_{h \rightarrow 0} (h^2 + 3x(x+h)) = 3x^2 \end{aligned}$$

### Mathematical fonts:

\begin{align*}	Output
$3x^2 \in R \subset Q$	$3x^2 \in R \subset Q$
$\mathit{3x^2} \in R \subset Q$	$3x^2 \in R \subset Q$
$\mathrm{3x^2} \in R \subset Q$	$3x^2 \in R \subset Q$
$\mathit{3x^2} \in R \subset Q$	$3x^2 \in R \subset Q$
$\mathbf{3x^2} \in R \subset Q$	$3\mathbf{x}^2 \in R \subset Q$
$\mathsf{3x^2} \in R \subset Q$	$3\mathsf{x}^2 \in R \subset Q$
$\mathtt{3x^2} \in R \subset Q$	$3\mathtt{x}^2 \in R \subset Q$
\end{align*}	

## Module 3- Standard classes

The following classes are distributed with LATEX:

- 1) Article
- 2) Report
- 3) Book
- 4) letter

### Article:

Articles in scientific journals, presentations, short reports, program documentation, invitations.

### Example for an article class:

```
\documentclass{article}
\usepackage{blindtext}
\usepackage[utf8]{inputenc}
\title{Sections and Chapters}
\author{Gubert Farnsworth}
\date{\today} \begin{document}
\maketitle
\section{Introduction}
```

This is the first section.

*Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales...*

```
\section{Second Section}
```

*Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisissem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi necante...*

```
\end{document}
```

## Output:

# Sections and Chapters

Gubert Farnsworth

March 27, 2014

## 1 Introduction

This is the first section.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

## 2 Second Section

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

The command `\section{}` marks the beginning of a new section, inside the braces is set the title. Section numbering is automatic and can be disabled.

### Report:

For longer reports containing several chapters, small books, thesis...

### Example:

As mentioned before, `\chapter` can be used in documents and reports. Below you can see an example:

```
\documentclass{report}
\begin{document}
\tableofcontents{}
\chapter{Editing compile}
\section{First Compile}
```

how to compile basic hello world into a pdf.

Write your favorite text editor create file and copy/paste the following (with `hello.tex`):

```
\subsection{Output formats}
different output formats (dvi, pdf)
```

The output of this command `\$latex hello.tex` will be a dvi file (`hello.dvi`). This file (.dvi) can be converted by `\$dvipdf hello.dvi` The get an pdf file from tex file, run this command `\$texi2pdf hello.tex \chapter{Document Structure} \section{Reserved Characters}`

The following symbols characters are reserved by LATEX because they introduce a command and have a special meaning.

### Contents

1	Editing compile	2
1.1	First Compile	2
1.1.1	Output formats	2
2	Document Structure	2
2.1	Reserved Characters	2

### Chapter 1

#### Editing compile

##### 1.1 First Compile

How to compile basic hello world into a pdf? Write your favorite text editor create file and copy/paste the following (with `hello.tex`):

##### 1.1.1 Output formats

different output formats (dvi, pdf) The output of this command `\$texi2pdf hello.tex` will be a dvi file (`hello.dvi`). This file (.dvi) can be converted by `\$dvipdf hello.dvi` The get an pdf file from tex file, run this command `\$texi2pdf hello.tex`

### Chapter 2

#### Document Structure

##### 2.1 Reserved Characters

The following symbols characters are reserved by LATEX because they introduce a command and have a special meaning.

## LETTER

Letters are still rarely written in Latex, even though it's so simple and straight forward. The advantages are obvious, you get a standard layout (which can be changed if necessary), and the output is in PDF-format.

To write letters use the standard document class letter.

You can write multiple letters in one LaTeX file - start each one with `\begin{letter}{recipient}` and end with `\end{letter}`. You can leave *recipient* blank. Each letter consists of four parts.

- 1) Opening (like `\opening{Dear Sir or Madam,}` or `\opening{Dear Kate,}`).
- 2) Main body (written as usual in LaTeX). If you want the same body in all the letters, you may want to consider putting the entire body in a new command like `\newcommand{\BODY}{actual body}` and then using `\BODY` in all the letters.
- 3) Closing (like `\closing{Yours sincerely,}`).

- LaTeX will leave some space after closing for your hand-written signature; then it will put your name and surname, if you have declared them.

- 4) Additional elements: post script, carbon copy and list of enclosures.

If you want your name, address and telephone number to appear in the letter, you have to declare them first signature, address and telephone.

The following is a sample code, which can be used for writing a letter in Latex.

```
\documentclass{letter}
\signature{Your name}
\address{Street || City || Country}
\begin{document}
\begin{letter}{Company name ||
Street\ City\ Country}
\opening{Dear Sir or Madam:}
\dotso
\closing{Yours Faithfully,}
\ps{P.S. Here goes your ps.}
\encl{Enclosures.}
\end{letter}
\end{document}
```

## Beamer:

Beamer is a powerful and flexible LATEX class to create powerful, flexible and nice-looking presentations and slides. This article explains the most common features to create a presentation: make the title page, add a logo, highlight important points, make a table of contents and add effects to the presentation.

## Introduction:

A minimal working example of a simple **beamer** presentation is presented below.

```
\documentclass{beamer}
\title{Beamer Example}
\author{HOD-IT}
\institute{RGUKT}
\date{2019}
\begin{document}
\frame{\titlepage}
\begin{frame}
\frametitle{Latex Beamer}
This is the example of first frame in beamer class of Latex.
\end{frame}
\end{document}
```

Street  
City  
Country

August 15, 2007

Company name  
Street  
City  
Country

Dear Sir or Madam:

"Lorem ipsum dolor sit amet, consectetur adipisciing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum."

"Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt. Neque porro quisquam est, qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, sed quia non mensaque eius modi tempora incidunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim ad minimam veniam, quis nostrum exercitationem ullam corporis suscipit laboriosam, nisi ut aliquid ex ea commodo consequat? Quis autem vel eum iure reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur, vel illum qui dolorem eum fugiat quo voluptas nulla pariatur?"

Yours Faithfully,

Your name

P.S. Here goes your ps.  
encl: Enclosures

**Output:**  
**First Slide**  
**Beamer Example**

HOD-IT

RGUKT

2019

**Second Slide**  
Latex Beamer

This is the example of first frame in beamer class of Latex.

This is the example of first frame in beamer class of Latex.

After compilation, a two-page PDF file will be produced. The first page is a titlepage, the second one contains sample content. The first statement in the document declares this is a Beamer slideshow: `\documentclass{beamer}` The first command after the preamble, `\frame{\titlepage}`, generates the title page. This page may contain information about the author, institution, event, logo, and so on. See the title page section for a more complete example. The `frame` environment creates the second slide, the self-descriptive command `\frametitle{Sample frame title}` is optional. It is worth to notice that in beamer the basic container is **frame**. Frame is not exactly equivalent of slide, one frame may contain more than one slides.

### Creating a table of contents:

Usually when you have a long presentation, it's convenient to divide it into sections or even subsections. If this is the case, it's also recommended to add a table of contents at the beginning of the document. Below is an example of how to do it:

Output	Table of Contents
<code>\begin{frame} \frametitle{Table of Contents} \tableofcontents \end{frame}</code>	<ul style="list-style-type: none"> <li>➊ First section</li> <li>➋ Second section</li> </ul>

As you see, is simple. Inside the `frame` environment you set the title and add the command `\titlepage`. It's also possible to put the table of contents at the beginning of each section and highlight the title of the current section. Just add the code below to the **preamble** of your LATEX document:

Output	Table of Contents
<code>\AtBeginSection[] { \begin{frame} \frametitle{Table of Contents} \tableofcontents[currentsection] \end{frame} }</code>	<ul style="list-style-type: none"> <li>➊ First section</li> <li>➋ Second section</li> </ul>

If you use `\AtBeginSubsection[]` instead of `\AtBeginSection[]` the table of contents will appear at the beginning of each subsection.

### HIGHLIGHTING TEXT IN SLIDES:

```
\begin{frame}  
\frametitle{Sample frame title}  
In this slide, some important text will  
\alert{highlighted} because it's  
important.  
Please, don't abuse it.  
\begin{block}{Remark}  
Sample text  
\end{block}  
\begin{alertblock}{Important theorem}  
Sample text in red box  
\end{alertblock}  
\begin{examples}  
Sample text in green box. "Examples"  
is fixed as block title.  
\end{examples}  
\end{frame}
```

Sample frame title						
<p>In this slide, some important text will be <b>highlighted</b> because it's important. Please, don't abuse it.</p> <table border="0" style="width: 100%;"> <tr> <td style="background-color: #0070C0; color: white; padding: 5px; text-align: center;">Remark</td> </tr> <tr> <td style="background-color: #D9E1F2; padding: 5px;">Sample text</td> </tr> <tr> <td style="background-color: #E63935; color: white; padding: 5px; text-align: center;">Important theorem</td> </tr> <tr> <td style="background-color: #FFFACD; padding: 5px;">Sample text in red box</td> </tr> <tr> <td style="background-color: #2ECC71; color: white; padding: 5px; text-align: center;">Examples</td> </tr> <tr> <td style="background-color: #D9E1F2; padding: 5px;">Sample text in green box. The title of the block is "Examples".</td> </tr> </table>	Remark	Sample text	Important theorem	Sample text in red box	Examples	Sample text in green box. The title of the block is "Examples".
Remark						
Sample text						
Important theorem						
Sample text in red box						
Examples						
Sample text in green box. The title of the block is "Examples".						

### Multiple Choice Questions

- 1) Identify the correct LaTeX shorthand Type in Displayed equation?  
 a)  $\$...\$$  b)  $\(...\)$  c)  $...$$  d)  $\[...\]$
- 2) Beamer is used to create \_\_\_\_\_ in LaTeX?  
 a) Presentation b) Article c) Book d) Report
- 3) Syntax for integrals in LaTeX?  
 a)  $\int^{\text{lower}}_{\text{upper}}$  b)  $\int_{\text{lower}}^{\text{upper}}$  c)  $\int^{\text{lower}}_{\text{upper}}$  d)  $\int_{\text{lower}}^{\text{upper}}$

- 4) Which function can be used in Continued fractions?  
 a) \canfrac b) \cfrac \$ c) \cfrac d) \\$\cfrac\$
- 5) \$\$\lim\_{h \rightarrow 0} \frac{a^2}{b^2} \rightarrow 0 \} \frac{a^2}{b^2} \} \{ b^2 \}\$\$ write equation for this LaTeX code?  
 a)  $\lim_{h \rightarrow 0} \left( \frac{a^2}{b^2} \right)$  b)  $\lim \left( \frac{a^2}{b^2} \right)$  c)  $\lim_0 \left( \frac{a^2}{b^2} \right)$  d) None
- 6)  $\frac{Ax^2+Bx^2}{(Cx+D)^2}$  identify the correct mathematical equation form the given LaTeX command?  
 a)  $\frac{Ax^2+Bx^2}{(Cx+D)^2}$  b)  $Ax^2 + Bx^2 (Cx + D)^2$  c)  $(Ax + Bx)/(Cx + D)$  d) None
- 7)  $\frac{dQ}{dt} = \frac{ds}{dt}$  what is the output ?  
 a)  $\frac{dQ}{dt} = \frac{\partial Q}{\partial t}$  b)  $\frac{\partial Q}{\partial t} = \frac{\partial s}{\partial t}$  c) Error d) None
- 8) Command used to highlight slides in beamer  
 a) \block b) \alertblock c) \example d) All the above
- 9) Environment used to create a slide in beamer  
 a) beamerslide b) slide c) frame d) framecreate
- 10) Command used to enclosure anything to a letter.  
 a) \enclosure b) \encl c) enclose d) All the above

### Short Answers Questions

- 1) How to write math equation in Latex
- 2) What is horizontal spacing? Explain with example?
- 3) Explain spacing commands with example?
- 4) Write below expressing using Latex
 
$$\begin{aligned}
 f'(x) &= \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\
 &= \lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h} \\
 &= \lim_{h \rightarrow 0} \frac{x^3 + h^3 + 3xh(x+h) - x^3}{h} \\
 &= \lim_{h \rightarrow 0} (h^2 + 3x(x+h)) = 3x^2
 \end{aligned}$$
- 5) What is article explain with example?
- 6) What is Beamer? Explain with example.
- 7) How to highlight text in slides?
- 8) Write about mathematical modes used in LaTeX with example and output.
- 9) Write a letter to your parents about RGUKT campus using LaTeX code.
- 10) Write the difference between article and report.