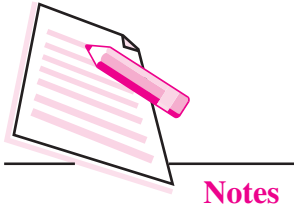**Notes**

9

SPREADSHEETS

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In the previous lesson you have learnt about digital documentation. In this lesson you will be learning OpenOffice Calc (version 4.1.1) which is the spreadsheet application that comes with OpenOffice Suite. Spreadsheet is one of the very useful application software for handling numerical data and short text strings. The data is arranged in a grid of rows and columns which can be manipulated, analysed and displayed in various formats including tables and charts. This helps us to make more informed decisions. We are able to track changes in data, write formulas to perform calculations on that data and even build models for analysing data. Various spreadsheet software available in the market are Lotus 1-2-3, MS Excel, and OpenOffice Calc.

OBJECTIVES

After reading this lesson, you will be able to:

● list applications of spreadsheets;

● explain the components of Calc application window;

● create, save, open and close a workbook;

● enter, select, edit a worksheet;

● use AutoFill feature and sort lists;

● format cell content;

● merge and wrap text in a cell;

● use formulas, functions and cell referencing;

● perform sorting and filtering of data;

● create charts;

● print the worksheets.

9.1 APPLICATIONS OF SPREADSHEETS

You know that spreadsheet is a very useful application, especially in offices where numerical data has to be stored, manipulated and analysed at regular intervals. Each page of a spreadsheet is known as a worksheet and a collection of worksheets constitutes a workbook. Some of the common applications of spreadsheets are as follows:

(i)   These act like a calculator for doing automatic calculations. They are used to calculate, analyse, store and present the information.

(ii)   In a spreadsheet if one value is changed, all the corresponding calculations will be re-calculated. So these are very useful in What-if analysis.

(iii)   Spreadsheets are very useful to manage financial data like stock exchange movements, account transactions etc.

(iv)   The data in a spreadsheet can be pictorially represented through charts.

(v)   Various in-built functions help in easy processing and manipulation of data.

9.2 STARTING OPENOFFICE CALC

To start OpenOffice Calc, follow the steps given below:

1.   Select **Start → All programs → OpenOffice 4.1.1**

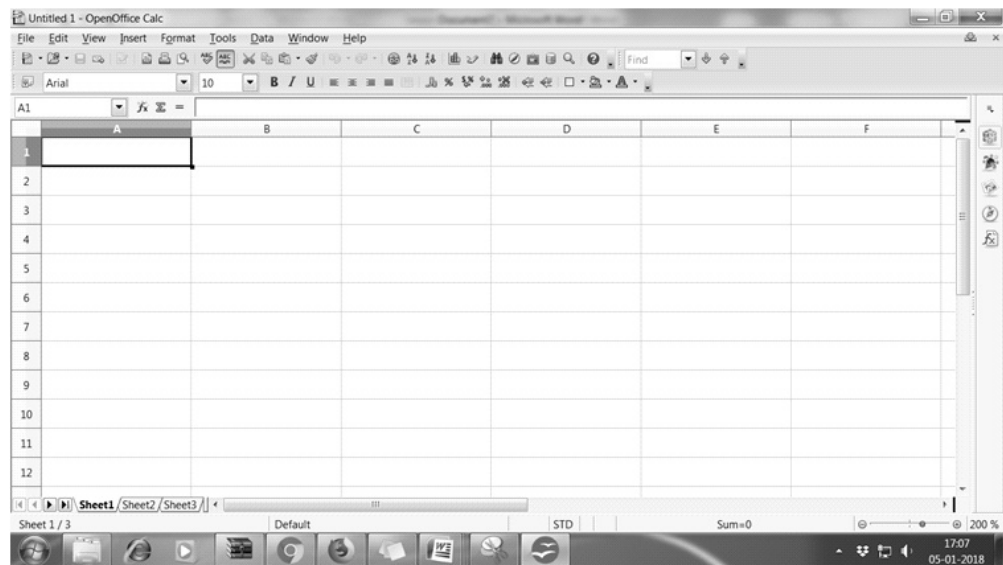2.   Select **OpenOffice Calc** option. The Calc application window is displayed as shown in Fig. 9.1.

Fig. 9.1: OpenOffice Calc Application Window

9.3 COMPONENTS OF CALC APPLICATION WINDOW

Fig. 9.1 shows the components of Calc Application Window.

Title Bar: It is located on the top of the application window. It displays the name of the workbook and the name of the application. The window control buttons (Minimize, Maximize/Restore and Close) are present on the extreme right of the title bar.

Menu Bar: Below the title bar is the menu bar which contains various menu items - File, Edit, View, Insert, Format, Tools, Data, Window and Help. The menu bar gives access to basic commands used in Calc.

Standard Toolbar: Below the menu bar is the Standard toolbar which contains buttons for frequently used commands such as New, Open, Save, Print, Cut, Copy, Paste etc. This toolbar is also known as Function toolbar.

Formatting Toolbar: This toolbar consists of commands that help in formatting text and number data like font style, size, colour, bold, italic, underline, various number formats etc.

Formula Toolbar: This toolbar contains the Name box and the Formula bar.

- **Name Box:** It displays the name of selected cell or range of cells. For example, in Fig. 9.1, the name of active cell A2 is displayed in the name box.

- **Formula Bar:** It contains the content of the selected cell or the formula applied on selected cell. It is also used for editing the cell contents or the formulas in the active cell.

Rows and Columns: The entire worksheet is divided into horizontal rows and vertical columns. The rows are numbered on the left side of the worksheet as 1, 2,3…and so on. The columns are named on the top of the application window as A,B,C…and so on.
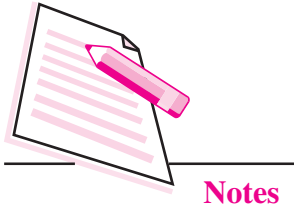
Cells: The rows and columns in a spreadsheet intersect to form the smallest unit of a worksheet i.e., a cell. Each cell has a unique address which is the combination of row number and column name. For example, the cell D10 will be formed by intersection of row number 10 and column name D.

Active Cell: It is the cell that is currently active or selected. The active cell has a thick black outline. Data is always entered in the active cell.

Sheet Tabs: The sheet tabs are present at the bottom of the worksheet. These are named as Sheet1, Sheet 2, Sheet 3 and so on. The active sheet tab indicates the current worksheet. By default, there are three worksheets in a workbook but we can add more worksheets as per our requirement.

Notes

Notes

Status Bar: This is located at the bottom of the Calc Application window and it displays information about the current worksheet.

When we place the mouse pointer over any of the buttons or icons on the toolbars, the name of the icon appears as a tooltip.

Scroll Bars: There are two scroll bars on the Writer Window:

- *Horizontal Scroll Bar:* It helps to navigate left and right of the worksheet.
- *Vertical Scroll Bar:* It helps to navigate the up and down of the worksheet.

We can click the arrows on the either side of the scroll bars to navigate through the worksheet.

Docking Toolbars: On the extreme right of the Calc window, there are five icons – Properties, Styles and Formatting, Gallery, Navigator and Functions. By clicking on any of these icons, the corresponding docking toolbar opens containing various buttons to format text, apply styles, insert pictures, navigate through the document and uses various built-in functions provided by Calc respectively.

9.4 CREATING A NEW WORKBOOK

When you start Calc, the application opens with a new workbook. However, if you want to open a new workbook when the Calc application is already running, select **File → New → Spreadsheet** (Fig. 9.2). The new workbook will be created and its name will appear on the title bar of the Calc window.

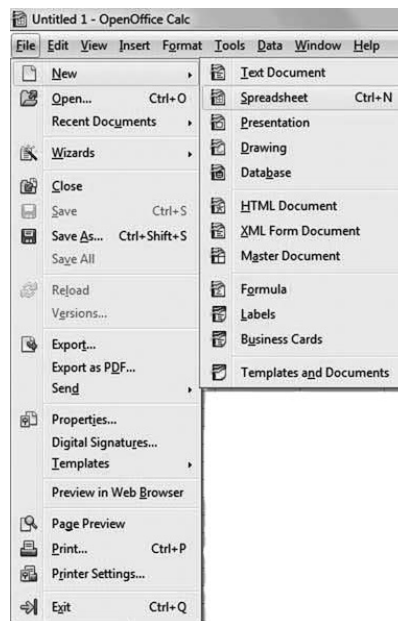*Press Ctrl + N to open a new workbook in Calc.*

Fig. 9.2: Opening a new workbook

9.5   SAVING A WORKBOOK

To save a workbook, follow the steps given below:

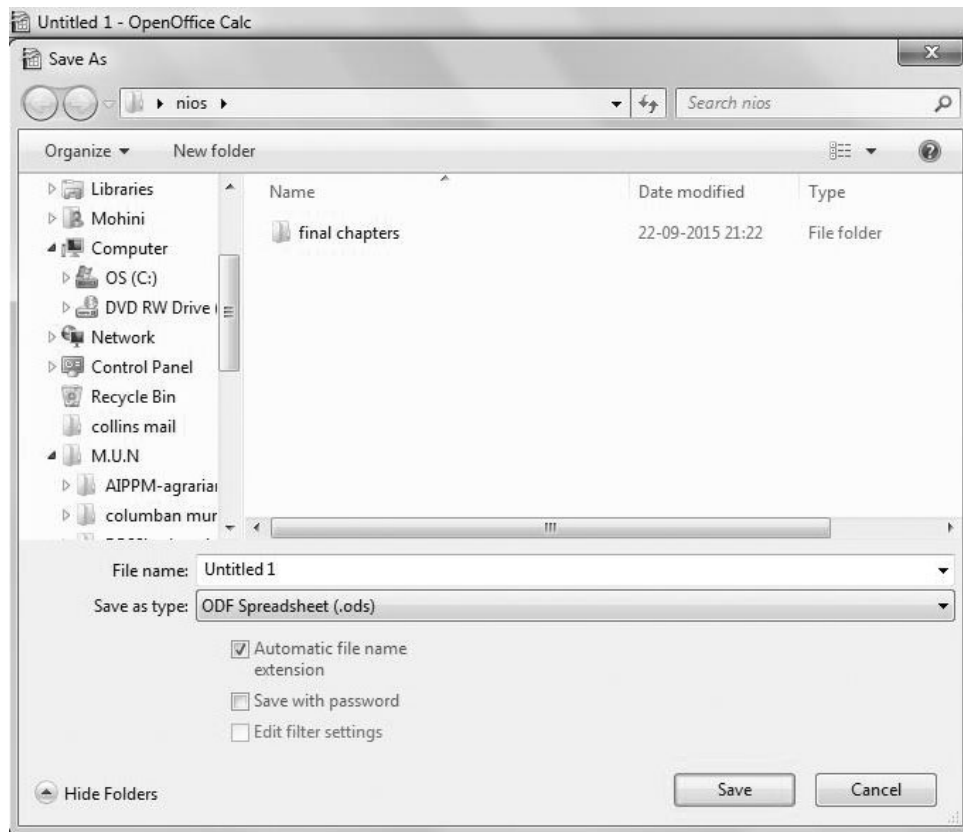1. Click **File** → **Save As**. The Save As dialog box appears (Fig. 9.3).

Notes

Fig. 9.3: Save as dialog box

2. Browse the folder where the file has to be saved.

3. Type the name with which the file has to be saved in the **File name** text box.

4. **Click Save** button. By default, the file created in OpenOffice Calc is saved with an extension .ods. After saving, the name of the file appears on the title bar of the Calc window.

We can also save the document by clicking on **Save** button on the Standard toolbar (Fig. 9.4). Please note that the **Save As** dialog box appears only when we are saving the file for the first time. However, if the same file has to be saved with a different name or at a different location, then select **Save As** option again from the **File** menu.

Press Ctrl + Shift + S to save document for the first time and Ctrl + S to save otherwise.
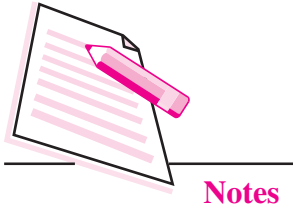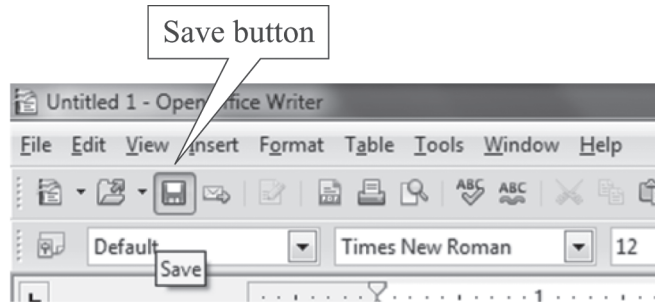
Notes

Fig. 9.4: Save button

9.6 OPENING AN EXISTING WORKBOOK

The existing file can be opened by browsing to the folder which contains the file and then double clicking on it. However, if the application is running, follow the steps given below to open an existing workbook:

1. Click **File → Open.** The Open dialog box appears (Fig. 9.5).

   Press Ctrl+O to open an existing workbook.

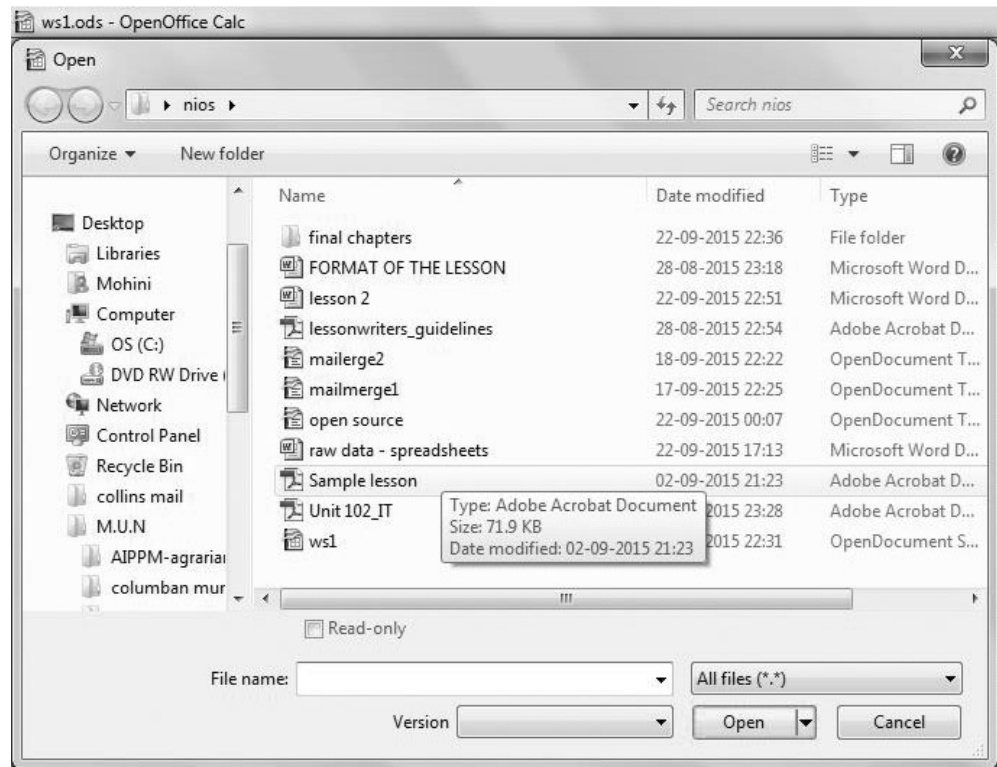2. Browse the folder where the file to be opened exists.

3. Select the file and click **Open** button.

Fig. 9.5: Open dialog box

9.7 CLOSING A WORKBOOK

We can close a workbook without closing the Calc Window by selecting **File** → **Close**. However, to exit Calc, click **Close** button (X) on the top right corner of the Title bar or click **File** → **Exit** option. In either of the ways, if our document to be closed is not saved, then Writer prompts us to save the document before closing.

Press Ctrl + Q to exit Writer

Notes

INTEXT QUESTIONS 9.1

1. Give one word for the following:

    (i)   The toolbar containing Save button.   _____

    (ii)   Smallest unit of a spreadsheet.   _____

    (iii)   The cell in which data will be entered.   _____

    (iv)   Shortcut key to exit Writer.   _____

    (v)   Number of scrollbars in Calc window.   _____

2. Give any three applications of spreadsheet.

3. How can you open a new workbook if Calc application is already running?

9.8 ENTERING DATA

As mentioned before, the data is entered in the cells of a worksheet. The data that we enter may be in the form of text, numbers or formulas. Entries containing an alphabet or a character even if they start with a number are called **text entries**. Any text entry containing alphabets or non-numeric special characters such as &,*,^,% etc. is called a **label**. For example, Grade, s@g, Maximum marks etc. are labels. Even numeric data in combination of alphabets and special characters like Flat # 100, Arjun Vihar form a label. These entries cannot be used in any type of calculations.

The data on which arithmetic calculations can be performed is known as **numerical data** or **value**. In addition to the numbers, characters like +, -, . , %, $(or any currency), ( ), E and can also be entered along with numerical data. The table 9.1 shows the purpose of each of the above characters:

Table 9.1: Purpose of special characters in numerical data

Character	Purpose
+	Positive number
-	Negative number
. (period)	Decimal number
( )	Enclose data in brackets
%	Percentage
$ (or any currency)	Denotes the number as a currency
E, e	Denotes Exponentiation for scientific notation of numbers
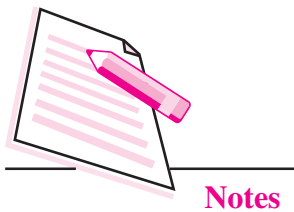
To enter labels or values, just click the cell in which the data has to be entered. The cell becomes the active cell in which the data can be typed. In Fig. 9.6, the cell A2 contains the label *Marks* and the cell A3 contains the value 67.89.
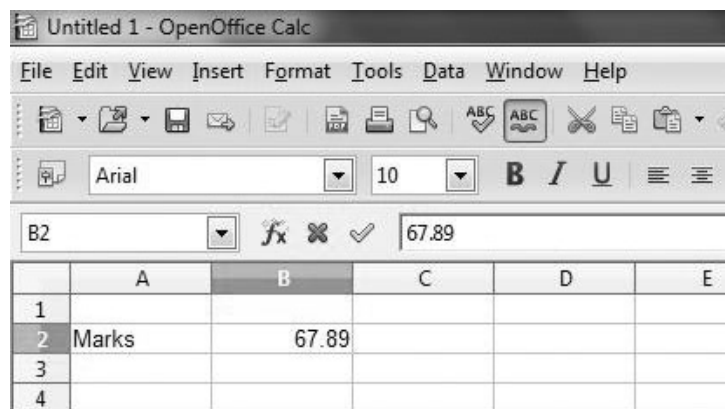
Fig. 9.6: Text and numerical data

9.8.1 Entering Formulas

Formulas are an essential part of any spreadsheet application and they generally define a relationship between two or more cells. It is a combination of values, operators, cell addresses etc. While entering a formula, we can either refer to individual cell or range of cells. They help in performing calculations and also in What–if analysis.

The formula always starts with an equal (=) sign. For example if, we want to add two numbers, say 20 and 30, we will type =20+30 in the active cell. If the data to be added is in the cells, say A2 and B2, we may also type = A2 + B2 say, in cell C2 (Fig. 9.7). In the latter method, if any of the values in either cell A2 or B2 is changed, the result in cell C2 will also change. When we type the

formula or click on the cell containing formula, we will see that the formula also appears in the formula bar.
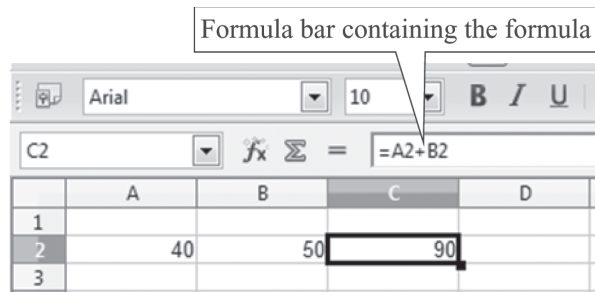

Fig. 9.7: Entering Formula

After entering the formula, if we try to edit it by clicking in the formula bar, the **Accept Editing** and **Cancel Editing** buttons on the left side of the formula bar become active (Fig. 9.8). Also notice that the colour of the cell reference and the colour of the border of the cell is same.
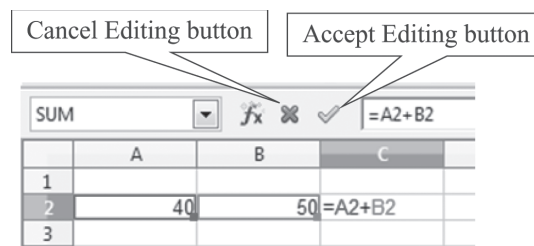
Formulas in OpenOffice Calc are not case-sensitive.

Notes

Fig. 9.8: Editing a Formula

9.9 SELECTING A CELL/RANGE OF CELLS

In OpenOffice Calc, we may require to select a single cell or a range of cells. These cells or range of cells can be selected using either a keyboard or a mouse. The selected cells are shaded in blue colour.

- To select a single cell, click on that cell. This currently selected cell is known as the **active cell** (Fig. 9.9 (a)).

- To select the entire row or column, click on the row number or column name. (Fig. 9.9 (c) & (d)).

- To select adjacent range of cells, place the mouse pointer in the first cell in the range. Thereafter click and drag the mouse pointer in the direction of selection till the last cell in the range is selected. For example, if cell range A3 to B8 has to be selected, place the mouse pointer on cell A3 (Fig. 9.9 (b)). Click and drag the mouse till cell B8. Using a keyboard, we

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can select the first cell. Thereafter holding down the **Shift** key and using the arrow keys in the direction of selection, move to the diagonally opposite corner of cell B8. Once the last cell in the range is selected, release the **Shift** key.
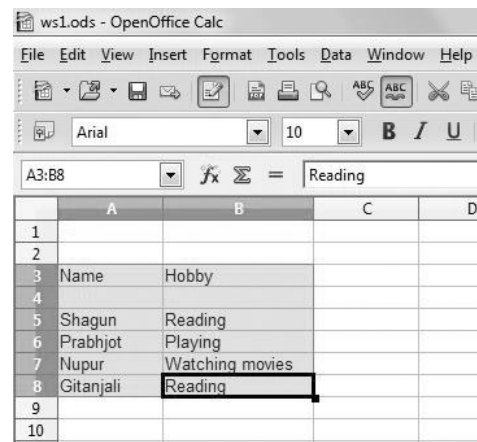
Press Shift + Spacebar to select all columns in current row.

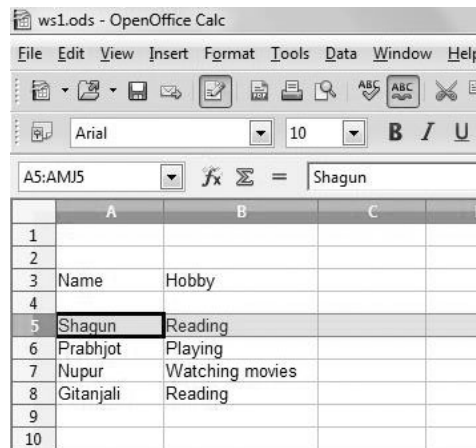*Press Ctrl + Shift + Spacebar to select current column completely.*
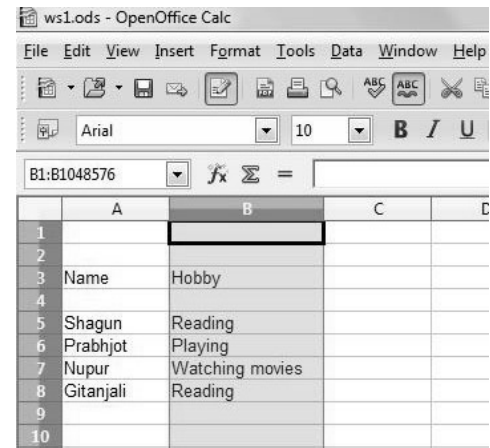
Press Ctrl + A to select the entire worksheet.
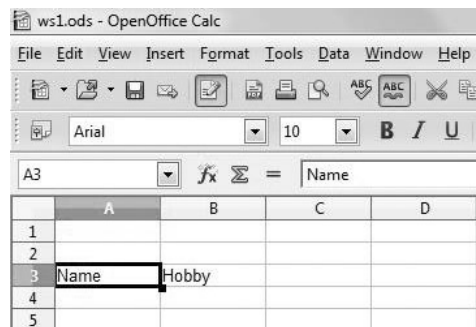
(a) Active Cell

(b) Range of selected cells

(c) Selecting the entire row

(d) Selecting entire column

Fig. 9.9: Selection of Cells

9.10 EDITING A WORKSHEET

Editing includes changing data by any means. It may be altering, inserting, deleting, copying, moving, changing appearance of the data and so on. The data once entered in the worksheet can be modified by any of the following methods:

(i) Overwriting

This is the default mode of editing cell contents in which the current content of the cell is replaced by the new one. For this, select the cell, type the new content and press the **Enter** key or click **Accept** button (✓) near the formula bar.

(ii) Partial Modification

This method is used if there are minor modifications to be done in the cell contents. Click the **Formula bar** or double click on the cell where modification is to be done. The cursor will appear. Enter the contents either in the formula bar, if you clicked the formula bar or in the cell, if you double clicked on the cell. Thereafter, press the **Enter** key or click the **Accept** (✓) button on the Formula bar.

9.10.1 Deleting Cell Content

To delete the cell contents in OpenOffice Calc, follow the steps given below:

1. Select the cell or range of cells whose contents are to be deleted.

2. Right click on the selected cells and click **Delete Contents** from the shortcut menu (Fig. 9.10). The **Delete Contents** dialog box will be displayed (Fig. 9.11).
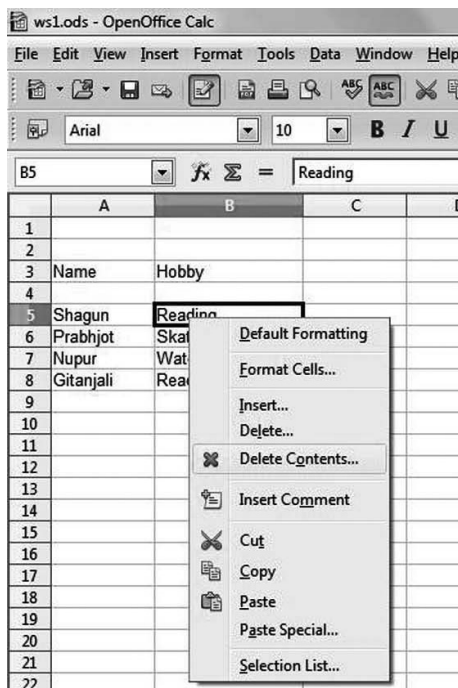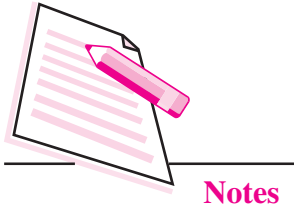
The shortcut key to edit the cell contents is F2.

Fig. 9.10: Delete Contents option

Fig. 9.11: Delete Contents dialog box

3. The various options available in **Delete Contents** dialog box are:

    ● *Delete All* : Deletes all the contents from selected range of cells.

    ● *Text*: Deletes only text from the selected range of cells, keeping all the other values.

    ● *Numbers:* Deletes only numbers from the selected range of cells.

    ● *Date & time:* Deletes only date and time values.

    ● *Formulas:* Deletes only formulas, keeping all the other values as it is.

    ● *Comments:* Deletes any notes or comments in the selected range.

    ● *Formats:* Deletes formatting styles applied to cells.

    ● *Objects:* Deletes only objects.

After clicking the appropriate checkboxes, click **OK** to delete the selected cells.

9.10.2 Copying Cell Content

The data when copied, is duplicated and pasted at a new location. To copy data, follow the steps given below:

1. Select the cell or range of cells whose data needs to be copied.

2. Click **Copy** button on the standard toolbar (Fig. 9.12). Alternatively, we can right click and select **Copy** option from the short cut menu.
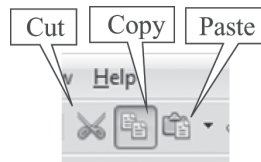

Fig. 9.12: Cut, Copy & Paste buttons

3. Click on the cell where the data has to be pasted or on the starting point where the data is to be pasted.

4. Click **Paste** button on the standard toolbar. Alternatively we may right click and select **Paste** option from the shortcut menu.

    Fig. 9.13 shows that the data is copied from A1: E4 and pasted at A10 : E13.

9.10.3 Moving Cell Content

When we move cell contents, they are removed (or cut) from the original location and pasted at a new location. Hence, unlike copying, the cell contents are not duplicated. Follow the steps given below to move data from one location to another:
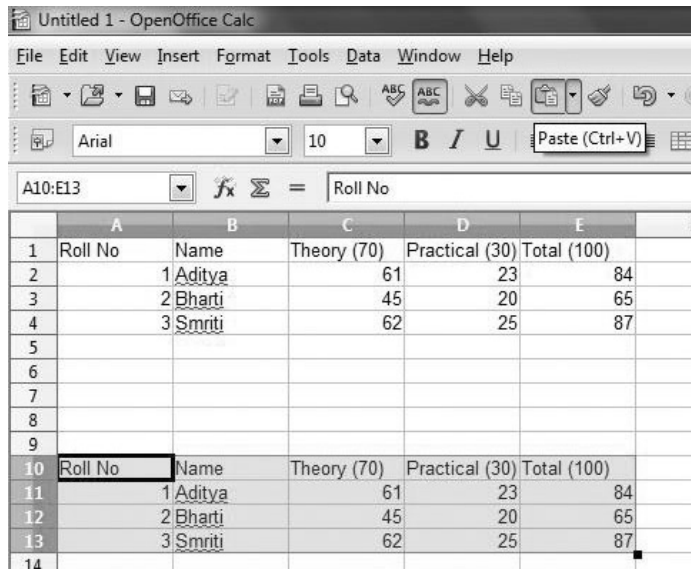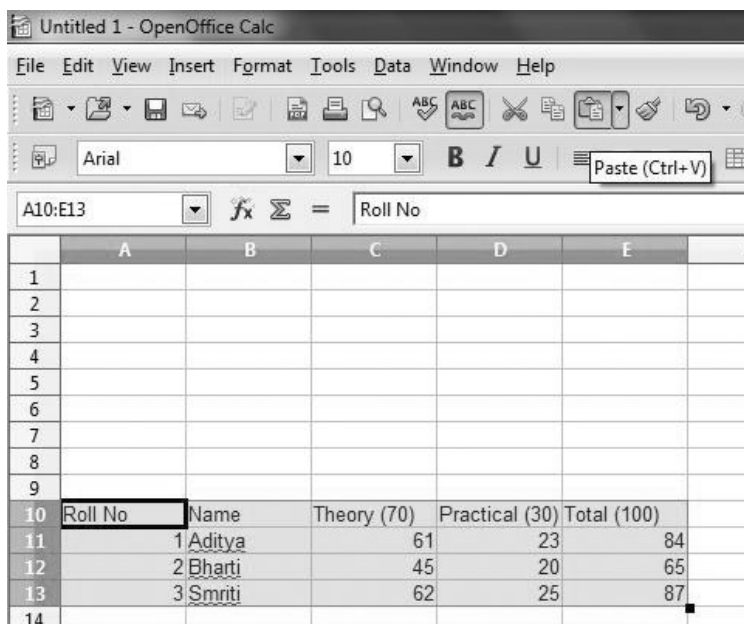
Notes

Fig. 9.13: Copying Cell contents

1. Select the cells whose data needs to be moved.

2. Click **Cut** button on the standard toolbar. Alternatively you can right click and select **Cut** from the shortcut menu.

3. Click on the cell that will be the starting point of the data when it is pasted i.e., on the upper left cell of the range where you want to copy the data.

4. Click **Paste** button on the standard toolbar. Alternatively we may right click and select **Paste** option from the shortcut menu.

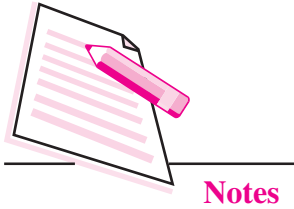   Fig. 9.14 below shows that the data is moved from A1: E4 and pasted at A10 : E13.

Fig. 9.14: Moving Data

Notes

9.10.4 Inserting Cells/Rows/Columns

We may have to insert cells, rows or columns in an already existing worksheet. To do so, follow the steps given below:

> *Select the cells and press Ctrl + C to copy, Ctrl + X to Cut and Ctrl + V to paste.*

1. Select the cell or range of cells where you want to insert new cell, row or column.

2. Right click and choose **Insert…**option from the shortcut menu (Fig. 9.15).

3. The **Insert Cells** dialog box is displayed (Fig. 9.16).
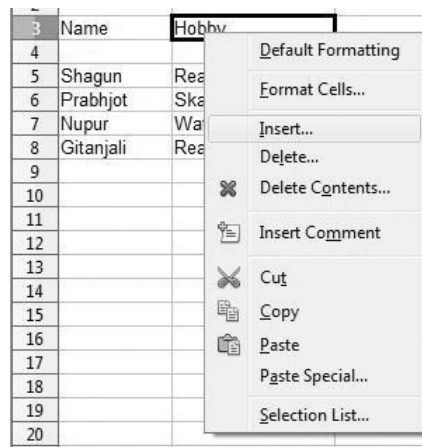
	Fig. 9.15: Insert option	**Fig. 9.16: Insert Cells dialog box**

It has four options :

- *Shift Cells down*: The existing cells are shifted towards the bottom of the worksheet and a new cell is inserted.

- *Shift Cells Right:* The existing cells are shifted to the right of the worksheet and a blank cell is inserted.

- *Entire Row*: A new row is inserted above the selected range of rows.

- *Entire Column*: A new column is inserted to the left of the selected range of columns.

4. Select the desired option and click **OK**.

9.10.5 Deleting Cells/Rows/Columns

To delete cells, rows or columns from the worksheet, follow the steps given below:

1. Select the cell or range of cells where you want to delete a cell, row or column.

2. Right click and choose **Delete…** option from the shortcut menu (Fig. 9.15).

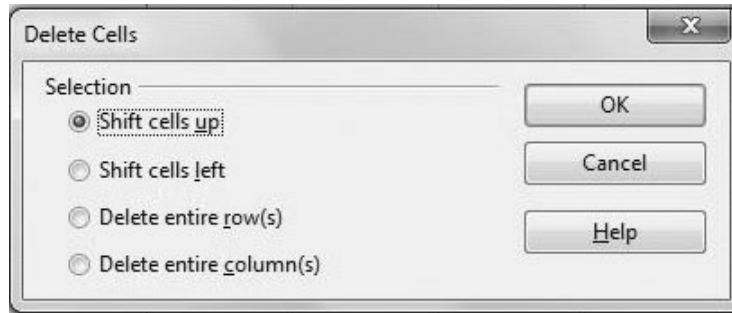3. The **Delete Cells** dialog box is displayed (Fig. 9.17) with the following four options:

Fig. 9.17: Delete Cells dialog box

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- *Shift Cells Up*: The selected cells are deleted and the cells below the deleted cells shift up.

- *Shift Cells Left*: The selected cells are deleted and the cells on the right of the deleted cells shift towards the left.

- *Delete Entire Row(s):*Deletes entire row(s).

- *Delete Entire Column(s):*Deletes entire column(s).

4. Select the appropriate option and click **OK**.

9.11 AUTOFILL FEATURE

AutoFill feature of OpenOffice Calc is used to fill sequential data in the cells to form a series automatically. The series to be formed may be numerical or alphabetical. OpenOffice Calc automatically fills the range of cells with the appropriate data. Let us use this feature to insert month names in the worksheet.

1. Type January in cell A3 (Fig. 9.18).

2. Position the pointer at the lower right corner of the cell.

3. The mouse pointer changes to a plus sign(+) and is known as the **fill handle.**

4. Hold down the left mouse button and drag the fill handle up to cell A14.

5. Release the mouse pointer. The days February to December will appear, automatically in the subsequent cells in the range. Similar mechanism works for names of days of week as well.

Fig. 9.18: Examples of AutoFill Feature

Let us consider some more examples to use the AutoFill feature (Fig. 9.18). If we enter 20 in cell C3 and 19 in cell C2, select both the cells and then click and drag the fill handle, we will see that numbers in decreasing order are displayed in the selected range. In another example, if we enter 51 in cell E3 and then 53 in cell E4, AutoFill feature will display all odd numbers in the selected range starting from 51. Hence, this feature uses the difference between the first two numbers to fill the range of cells automatically.

9.12 SORT LISTS

The AutoFill feature of OpenOffice Calc uses two lists that are already stored in the Calc application. These are names of months of the year and names of days of the week. That is why these are automatically filled in the selected range of cells. Such type of lists are called **Sort Lists**. We can create our own Sort Lists by following the steps given below:

1. Click **Tools → Options**. The **Options** dialog box is displayed with OpenOffice option already selected.

2. Click the plus sign **(+)** before **OpenOficeCalc** option.

3. From the list of options click **Sort Lists** option. The right side of the dialog box shows the sort lists already stored in Calc (Fig. 9.19).
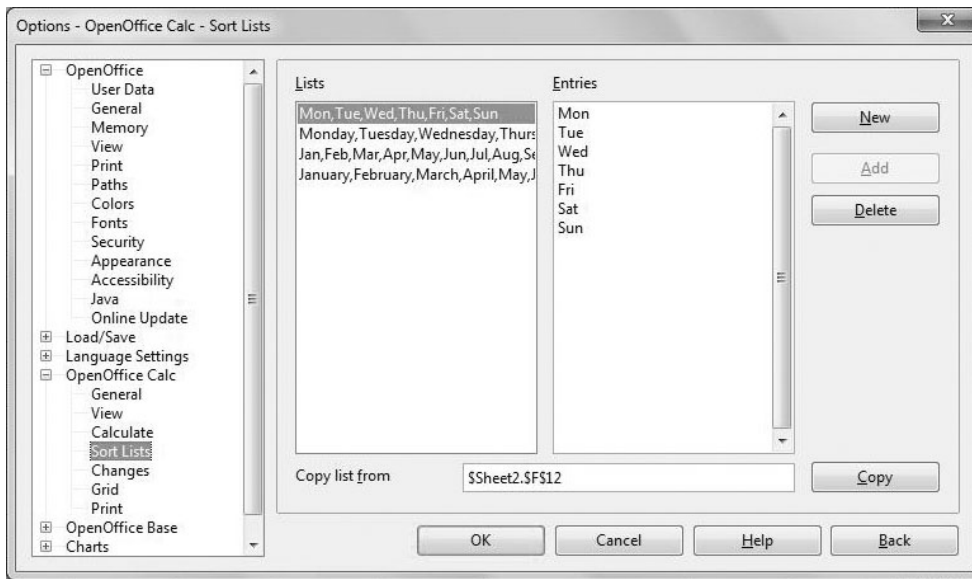
Notes

Fig. 9.19: Options dialog box

4.   Click **New** button. The cursor appears in the **Entries box**.

5.   Type each entry (in the desired order), pressing **Enter** key after each list
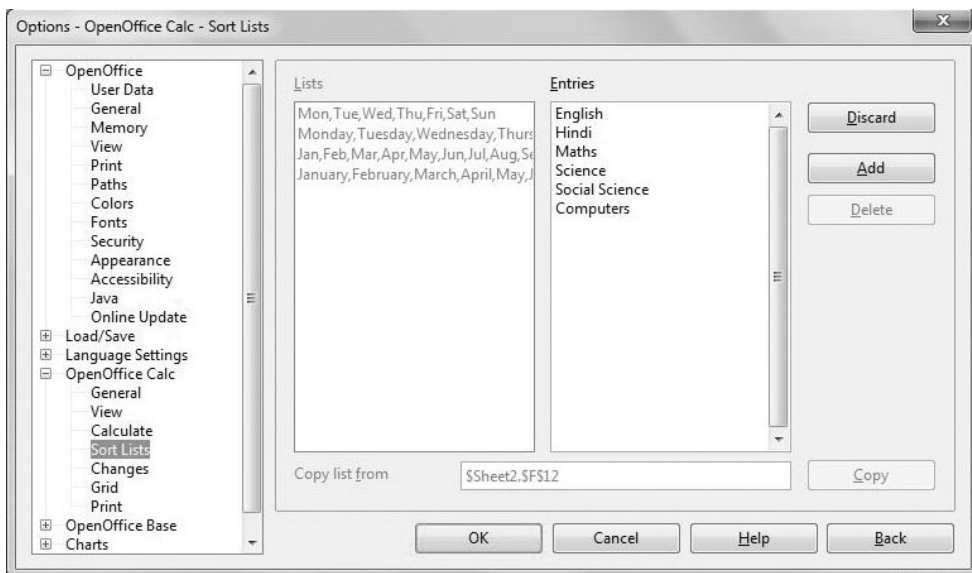   item. In Fig. 9.20, we have typed the names of the subjects.

Fig. 9.20: Creating a Sort List

6.   Click the **Add** button. In the **Lists box,** the new list appears in the same
      order as we entered in the **Entries box**.

7.   If the elements of the list are typed in the worksheet and we want to create
      a sort list with them, we may select the entire list and then open the **Options**
      dialog box as per the method given above. The selected range will be

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displayed in the **Copy List from** text box. Click **Copy** button to add to the main Sort Lists text box.

8. Click **OK** to close the Options dialog box.

Now if we type English in any cell on the worksheet and drag the fill handle, we will see that the subjects entered while creating the lists automatically fill up the selected range.
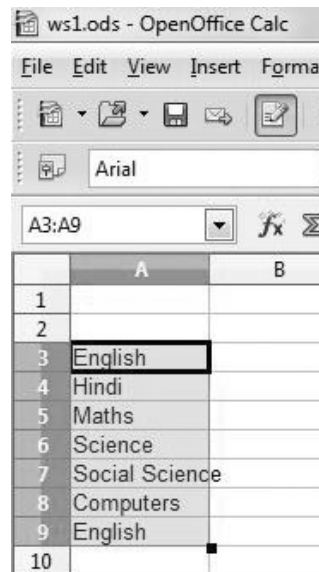

Fig. 9.21: AutoFill using the created Sort List

Also, if any of the sort lists have to be deleted, simply select the list and click **Delete** button in the **Options** dialog box.

INTEXT QUESTIONS 9.2

1. Fill in the blanks:
    (i)   .... is the shortcut key to edit data in cells.
    (ii) Press .... key while selecting adjacent cells in a worksheet.
    (iii) Cancel Editing button is present on the .... toolbar.
    (iv) All formulas must start with an .... sign.
    (v)   The data on which arithmetic calculations cannot be performed is called ....

2. How can you select the entire row in a worksheet?

3. What is the use of AutoFill feature?

4. Name the two ways of editing cell contents in OpenOffice Calc.

9.13 FORMATTING CELL CONTENTS IN CALC

Formatting is altering the style and appearance of data to enhance the appearance of the worksheet without affecting the data values. As we have done before that data can be either text or numeric, formatting can also be categorized into text formatting and number formatting. All the formatting commands are present on the formatting toolbar (Fig. 9.22).
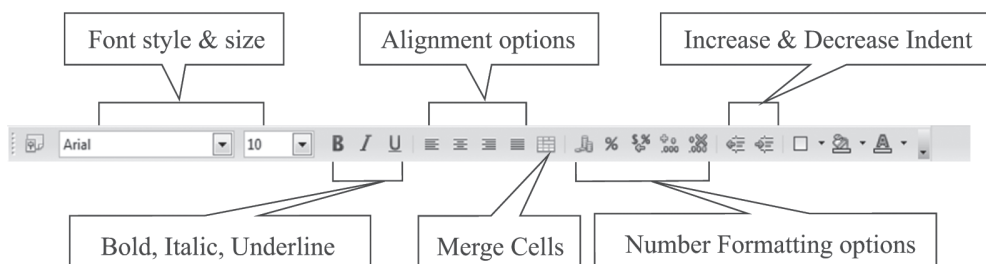
Fig. 9.22: Formatting Toolbar

9.13.1 Text Formatting

The desired font style, size and colour can be applied by selecting the text and clicking the appropriate icon on the formatting toolbar. We may even make the text bold, italic or underlined or even choose the background colour of cell(s) from the toolbar.

Alignment refers to the position of the data with respect to the boundary of the cell. By default, numbers and Date/Time data is always right aligned while textual data is left aligned. Vertically, all types of data appear at the bottom of the cell. To change the alignment, click on the desired alignment button on the formatting toolbar.

Orientation refers to rotating text according to the specified angle. This is often used for labelling narrow columns. The default orientation of the text is horizontal. To alter the orientation of the text, follow the steps given below:

1. Select the cell(s) for which the orientation has to be changed.

2. Select **Format** → **Cells**. The **Format Cells** dialog box is displayed (Fig. 9.23).

3. Click the **Alignment tab**.

4. In the **Text orientation** section, set the degrees by which the text has to be rotated. The preview shows the text accordingly.

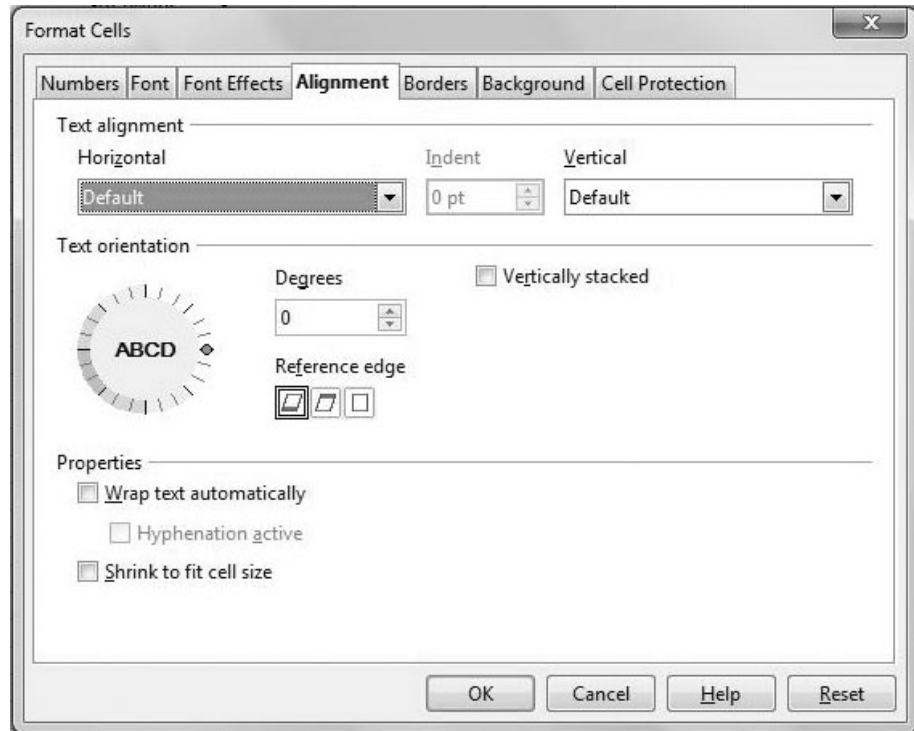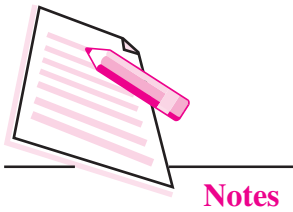5. Click OK button to view the rotated text on the worksheet.

Notes

Fig. 9.23: Format Cells dialog box – Alignment tab

Fig. 9.24 shows the text 'Activities' at various degrees of orientation.

Fig. 9.24: Text orientation

9.13.2 Merging and Wrapping Text

These two features are helpful to display long text in a single cell. Wrapping text means to make the entire cell content visible in a single cell by displaying it in multiple lines of the same cell. On the other hand, merging is the feature that makes the long text to merge with the adjacent cells and form one large cell.

Consider the long text 'Invoice cum Receipt number for Electronic Items' in cell A1 as shown in Fig. 9.25.
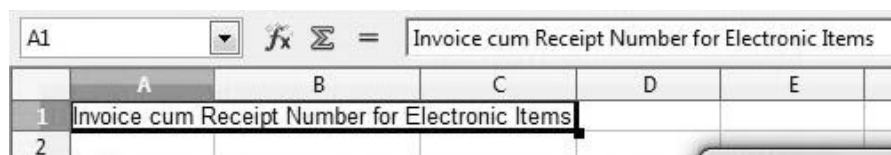
Fig. 9.25: Long text

To wrap this text, select the cell A1 and click **Format → Cells → Alignment** option. In the **Format Cells** dialog box, select **Wrap text automatically** checkbox in the **Properties** section (Fig. 9.26 (a)). The text will be wrapped in multiple lines as shown in the Fig. 9.26 (b).

Notes

(a)

(b)

Fig. 9.26: Wrapping text

To merge cells, select the range of cells to be merged and click **Merge Cells** button on the formatting toolbar. In the example given in Fig. 9.25, select cells A1: C1 and then click **Merge Cells** button. The text will be merged into a single cell as shown in the Fig. 9.27.
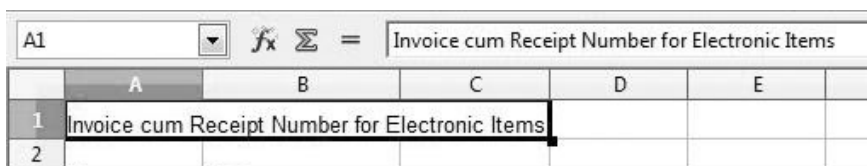
Fig. 9.27: Merging Cells

Notes

9.13.3 Number and Date Formatting

Numerical data is predominantly found in almost all spreadsheet. Calc allows us to format numbers in a variety of ways like displaying currency, placing commas to separate long numbers, adding percentage (%) sign, specifying number of decimal places and so on. Similarly date and time can also be displayed in variety of formats.

You can either use the formatting toolbar or perform the following steps to apply number and date formatting to the cell contents:

1. Select the cell(s) whose content has to be formatted.

2. Select **Format → Cells**. The **Format Cells** dialog box appears (Fig. 9.28).
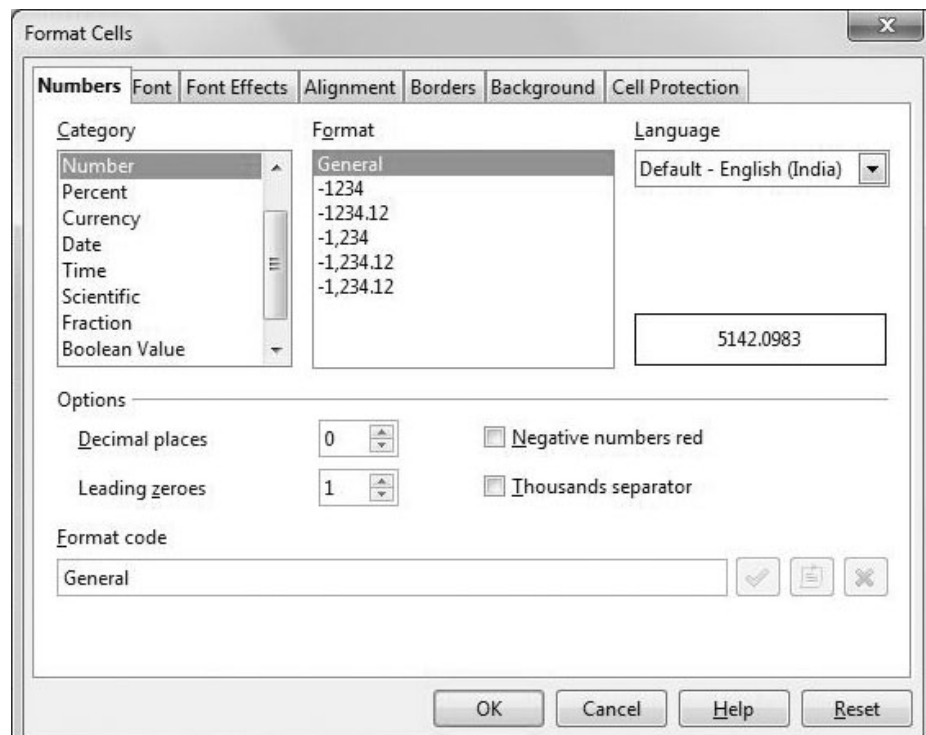
3. Select the **Numbers** tab, if not selected.

Fig. 9.28: Format Cells dialog box – Numbers Tab

4. Choose the desired **Category** (Number, Percent, Date, Time etc.) and then the desired **Format** from the respective list boxes. The preview of the selected format is displayed in the **Preview** text box.

5. Click **OK** button to apply the selected style.

9.14 USING FUNCTIONS

Functions are predefined formulas in any spreadsheet application. Various functions are provided by Calc to perform various operations on numerical, date,

time and text data. These functions may perform mathematical operations like addition, subtraction, multiplication, average etc., or may display current date and time or may join two texts and so on. The data values given to these functions for performing the specified operation are known as **arguments**. These arguments may be given in the form of numbers or in the form of cell addresses.

All functions must begin with an equal (=) sign. The basic structure of a function is shown below:

= Name of function(argument list)
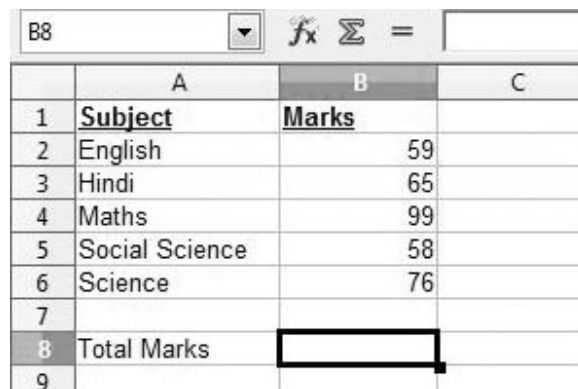
Here argument list may contain any number of arguments. Let us now learn to use some commonly used functions in OpenOffice Calc.

Sum ()

The Sum () adds the numbers given in the argument list. The result is displayed in the active cell containing the function. The syntax for Sum() is

=Sum (num1; num2; num3;……)

For example, to display the sum of 20, 30 and 40, we have to type = Sum (20;30;40) in the active cell. The range of cells can also be mentioned in the formula. For example, to display the sum of numbers stored in cells C3 to C10 will be written as =sum(C3:C10). Consider the worksheet as shown in Fig. 9.29 containing marks in five subjects.

	A	B	C
1	**Subject**	**Marks**	
2	English	59	
3	Hindi	65	
4	Maths	99	
5	Social Science	58	
6	Science	76	
7			
8	Total Marks		
9			

Fig. 9.29: Finding total marks

To calculate and display the total marks in cell B8, follow the steps given below:

1. Click the cell where sum has to be displayed. In our example, cell B8 is the active cell.

2. Type = sum (B2:B6) and press **Enter** key. The sum will be displayed in cell B8. Now, if we change any of the values in cells B2:B6, the sum will automatically change.

Notes

Average ()

This function is used to calculate average of all the arguments being passed. Click on cell where average has to be displayed (B9, in Fig. 9.30) and type = Average (B2:B6). Press **Enter** key to display the average marks.

Fig. 9.30: Finding average marks

Len ()

This text function displays the total number of characters in a cell. In Fig. 9.30, =Len(A2) will display the total number of characters in cell A2 (i.e., 7). Similarly =Len(A5) will display 14.

Today ()

This function displays the system date and does not take any argument. Click the cell where the current date has to be displayed. Type = today() and press **Enter** key. The current system date will be displayed.

9.14.1 Function Wizard

OpenOffice Calc provides numerous functions to perform various operations on data entered in the cells. All these functions can be accessed through the Function Wizard. To use Function Wizard, follow the steps given below:

1. Click the **Function Wizard** button (fx) near the Name box. The **Function wizard** starts(Fig. 9.31).

2. Select the category of functions from the **Category** list box. Let us calculate the minimum marks of all the subjects in the worksheet displayed in Fig. 9.30. So we choose the category as *Statistical*.

3. The corresponding list of functions is displayed in the **Functions** list box. Select **MIN** function. The name of the function appears in the **Formula** textbox (Fig 9.31).
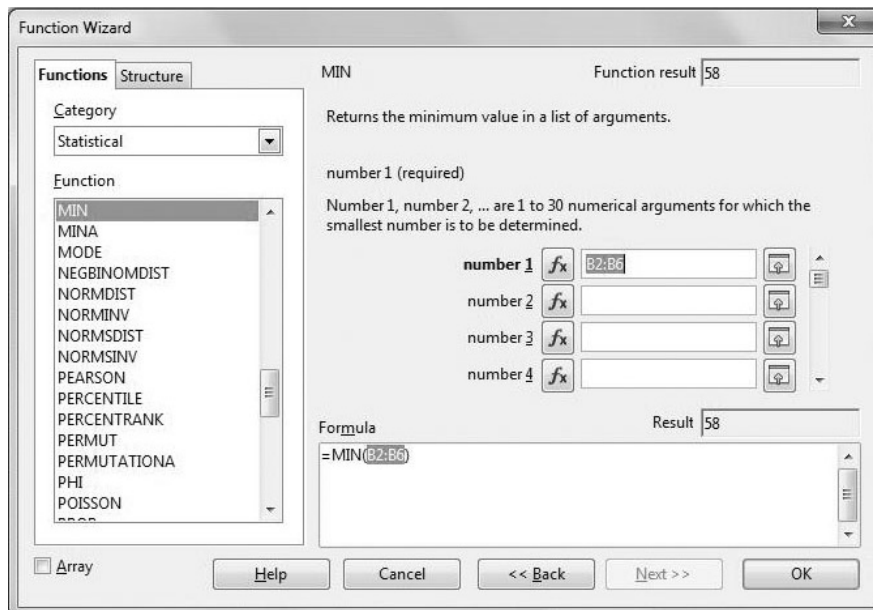
Fig. 9.31: Function Wizard

4. To specify the argument list, click **Select** button in front of **number 1** textbox.

5. The Calc worksheet appears (Fig. 9.32). Click and drag to select the range of cells from which the minimum value has to be found. In our example, this range is B2: B6 (bordered with red colour in the Fig. 9.32).

> *Click Function button (f_x) on the extreme right of the Calc window to display the docking toolbar containing all the functions and also the Function Wizard button.*
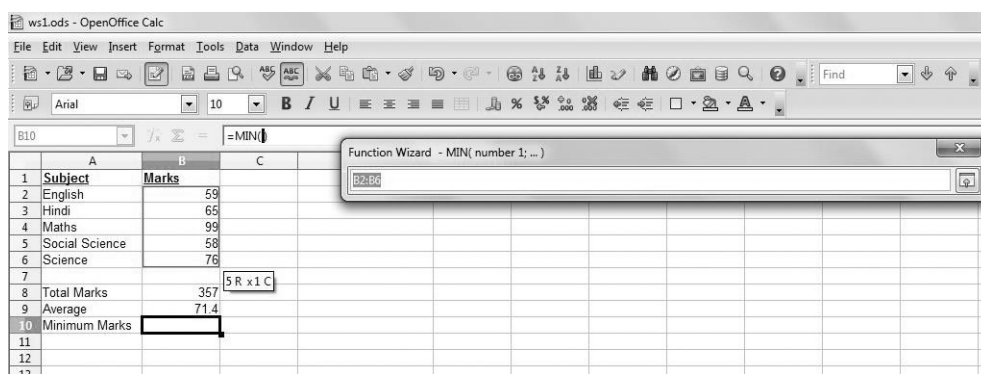
Fig. 9.32: Calc Worksheet to select the argument list

6. The selected range appears in the **Argument** text box. Click **Select** button again to go back to the Function Wizard. The function =MIN (B2:B6) is seen in the **Function** text box also.

7. Click OK to close the wizard and display minimum value in the active cell as shown in Fig. 9.33.

Notes

Fig. 9.33: Minimum Value using MIN ()

9.15 CELL REFERENCING

Cell reference is the address of the cell. By using cell referencing we can refer to a cell or a range of cells in a formula itself. In this way, the formulas will show updated results automatically if the value in a particular cell, being used in the formula changes or if the source cells are copied or moved. Based on how a cell reference in the formula is to be copied and used, cell referencing is of three types – relative referencing, absolute referencing and mixed referencing.

9.15.1 Relative Referencing

In this type of cell referencing, when the formula is copied from one cell to another in a worksheet, the cell reference or address of the cells being used in the formula automatically changes according to the relative position of the copied formula. Hence, this type of referencing is based on the relative position of the cell in which the formula is being pasted with respect to the cell address appearing in the formula. Consider the example shown in Fig. 9.34. To calculate the sale price of the item keyboard, the formula to subtract discount from price (=C3-D3) is entered in cell E3. Thereafter, the formula is copied to cells E4. The formula bar will now show the formula as C4-D4, thereby giving the correct sale price of item in row 4 i.e., mouse. Similarly, relative referencing is applied when the formula is copied to cells E5 and E6. This is because the relative position of the cell containing data and the cell containing the formula is same.

Notes

(a)

(b)

Fig. 9.34: Relative referencing

9.15.2 Absolute Referencing

In this type of referencing, the address or the reference of the cell in the formula is not changed when the formula is copied from one cell to another. To make absolute reference of a formula, add a **dollar ($) sign** before the column and the row number. For example, B1. Now, when the formula is copied, the address of this cell (i.e., B1) will not change. In the example given in Fig. 9.35, the flat discount percentage is given in cell C9. So when the discount on keyboard is calculated (discount/100 * price of keyboard) , the formula used is = C9/100 * C3. This is **absolute referencing**. Now when the formula is copied to any other location, the cell address will not change. It will always be C9 for discount percentage and C3 for price.

(a)

Fig. 9.35: Absolute Referencing

9.15.3 Mixed Referencing

This type of cell referencing is the combination of absolute and relative referencing. Hence in this type of referencing either the row number is fixed or the column name is fixed. The cell references like $B1 or B$1 are examples of mixed referencing. In Fig. 9.36 below, the formula =E3 * $F3 entered in cell G3 is an example of mixed referencing.

Fig. 9.36: Mixed Referencing

9.16 SORTING OF DATA

Sorting means arranging data in ascending or descending order. The data to be sorted may be numeric or textual or both. Consider the worksheet given in Fig. 9.37 showing the sales figures of five sales persons. Follow the steps given below to sort data in descending order of sales amount.

Fig. 9.37: Sorting of data

1. Select the data range to be sorted (A4: B8).

2. Click **Data → Sort**. The **Sort** dialog box appears (Fig. 9.38).
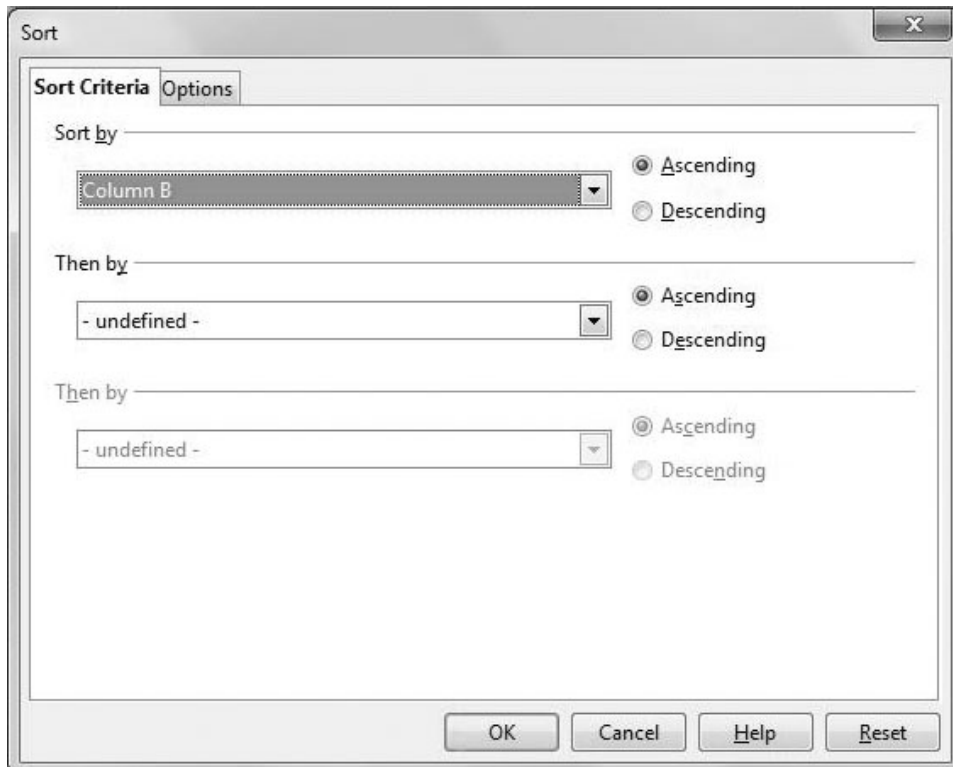
Notes

Fig. 9.38: Sort dialog box

3. The **Sort Criteria** tab is already selected. Specify the column according to which the data has to be sorted. In our example, it is column B.

4. Select the order in which the data has to be sorted – ascending or descending. Since we have to sort in descending order of sales amount, so we select **Descending** radio button.

5. Calc gives you option to sort data according to multiple columns also. Select the column in **Then by** list box in that case.

6. Click **OK** to see the data sorted in descending order of sales amount (Fig. 9.39).


Fig. 9.39: Data sorted in descending order of Sales Amount

Notes

9.17 FILTERING DATA

Filter feature of OpenOffice Calc blocks or hides the data based on specified criteria for a column. Unlike sorting, the data is not rearranged in case of filtering. Instead, the filtered subset of data is extracted and the rest is temporarily hidden from the user. This filtered data can then be edited, analysed, formatted or even printed. Consider the following worksheet (Fig. 9.40) and follow the steps given below to see filtered data.
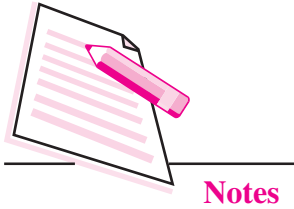
	A	B	C
1			
2			
3	Name	Hobby	Marks
4			
5	Shagun	Reading	75
6	Prabhjot	Skating	89
7	Nupur	Watching movies	90
8	Gitanjali	Reading	25
9	Arshiya	Dancing	67

Fig. 9.40: Data before applying filter

1. Select the column(s) on the basis of which filtering has to be done. Since we want to filter records based on Column B i.e., Hobby and Column C i.e., Marks, so we select the range B3:C9.

2. Select **Data → Filter → AutoFilter**. You will see that a filter icon (▼) appears on column headers i.e., Hobby and Marks (Fig. 9.41) indicating that the filter is applied on these two columns.

	A	B	C
1			
2			
3	Name	Hobby ▼	Marks ▼
4			
5	Shagun	Reading	75
6	Prabhjot	Skating	89
7	Nupur	Watching movies	90
8	Gitanjali	Reading	25
9	Arshiya	Dancing	67

Fig. 9.41: Filtering Data

3. If we want to view the data of the students who have hobby as reading, then click the filter arrow in the Hobby column header and select Reading

from the submenu (Fig. 9.42 (a)). The filtered data is displayed on the worksheet (Fig. 9.42(b)).
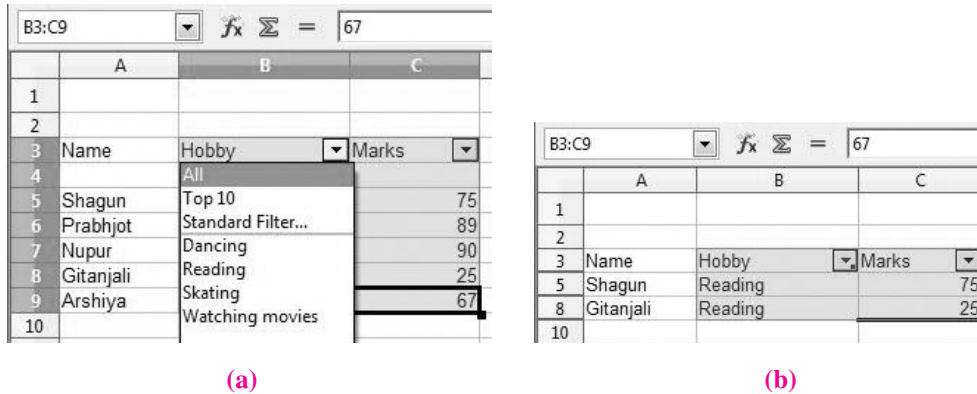
Notes

(a)   (b)

Fig. 9.42: Displaying Filtered data

4. Similarly if we want to filter data of those students whose marks are less than 70, click the filter arrow in Marks column header and select **Standard Filter** option. The **Standard Filter** dialog box will be displayed (Fig. 9.43). The field name, Marks is already entered. From the **Condition** list box, select <= and specify the value as 70 in the value combo box.
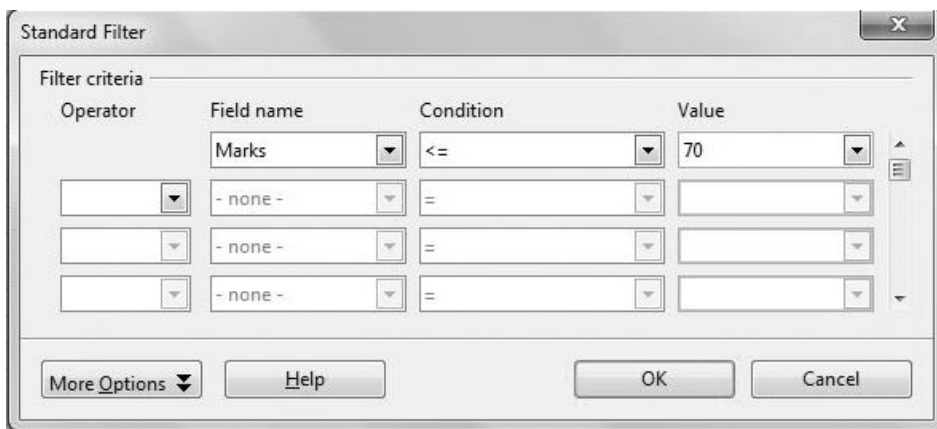
Fig. 9.43: Standard Filter dialog box

5. Click **OK** button. The filtered data with only those records whose marks are less than or equal to 70 is displayed (Fig. 9.44).
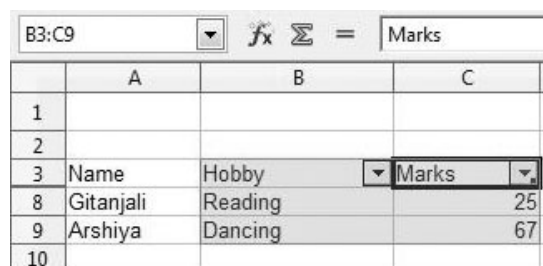
Fig. 9.44: Filtered data

9.18 MAKING CHARTS IN CALC

A chart is a form of pictorial representation of data. It is easier to explain a concept or to analyse and compare data using charts. The relationships between various sets of data can also be easily understood using charts. OpenOffice Calc provides various types of charts. The various types of charts provided by OpenOffice Calc.
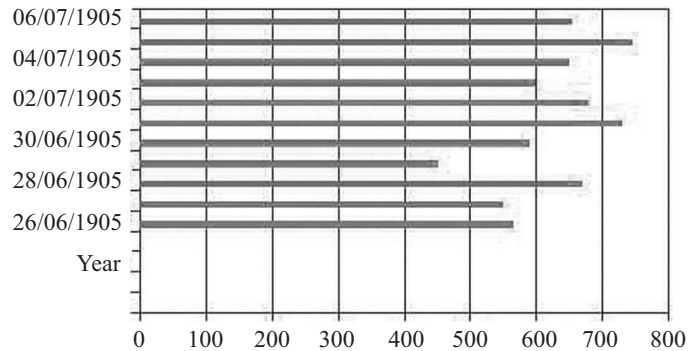
1. **Bar Chart**

    Feature: Displays data in the form long bars of different height, vertically or horizontally.

    Application: Demonstrate comparison among individual items.
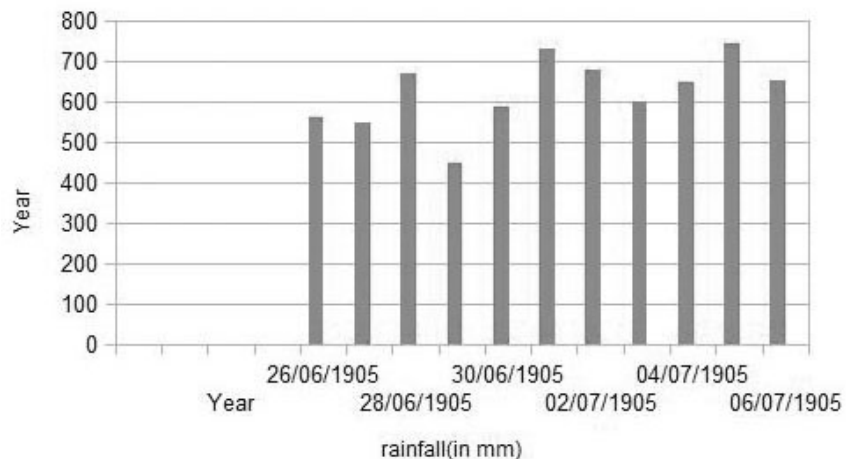
    Example:

2. **Column Chart**

    Feature: Data is represented in the form of vertical bars.

    Application: Used to emphasize comparison of data items within specified period.
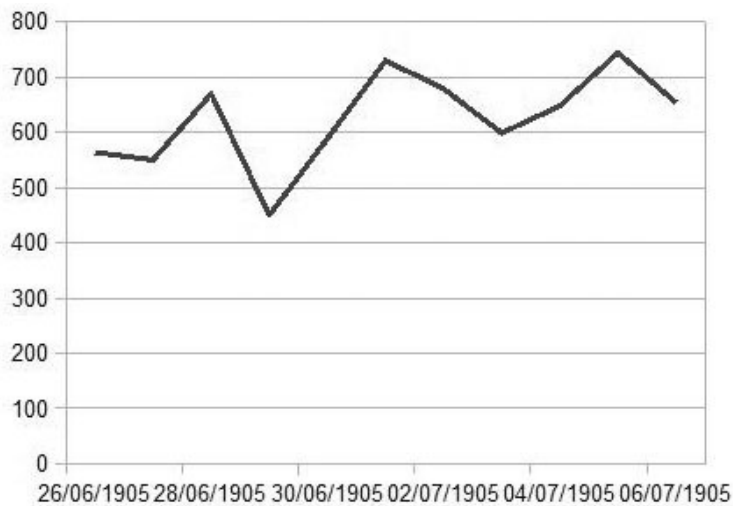
    Example:

3. **Line Chart**

    Feature : Series of data points are connected together with a line.

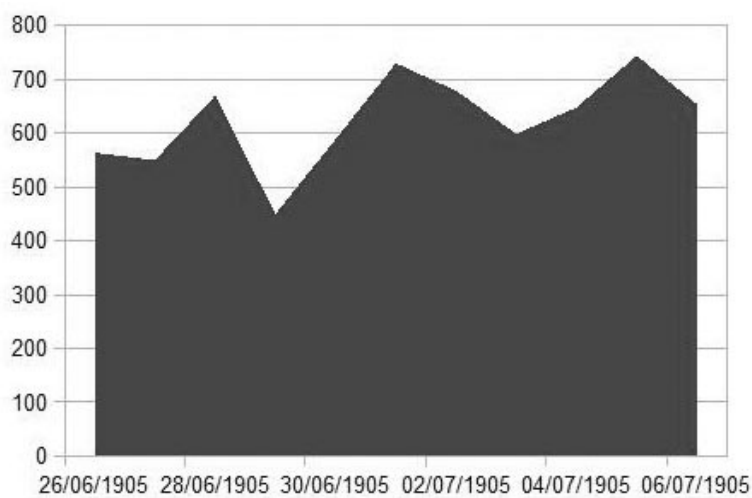   **Application:** Used to display data trends at regular intervals.

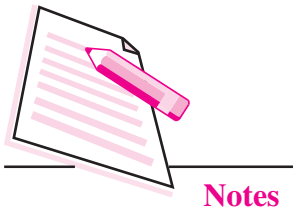   **Example:**

4. **Area Chart**

    Feature: It is based on a line chart but the area between the axes and the lines is filled with different colours

    Application: Used to highlight change over time or to display quantitative data graphically.
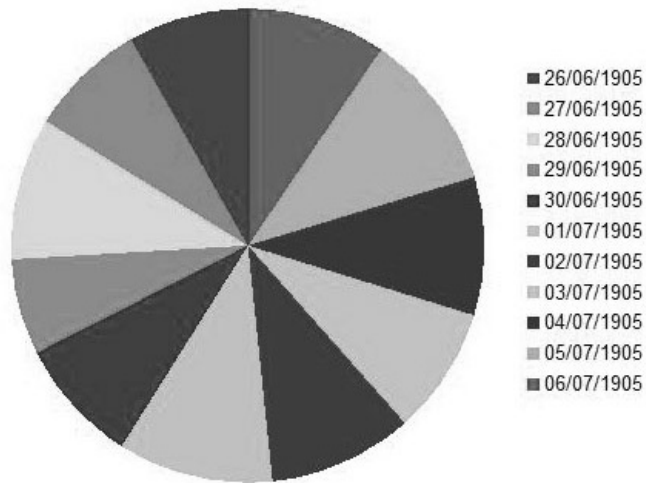
    Example:

Notes

5.   Pie Chart

Feature: Data is displayed in the form of circles divided into sectors whose size is proportional to the value it represents.

Application: Used to demonstrate the proportional size of the item with respect to sum of all items.
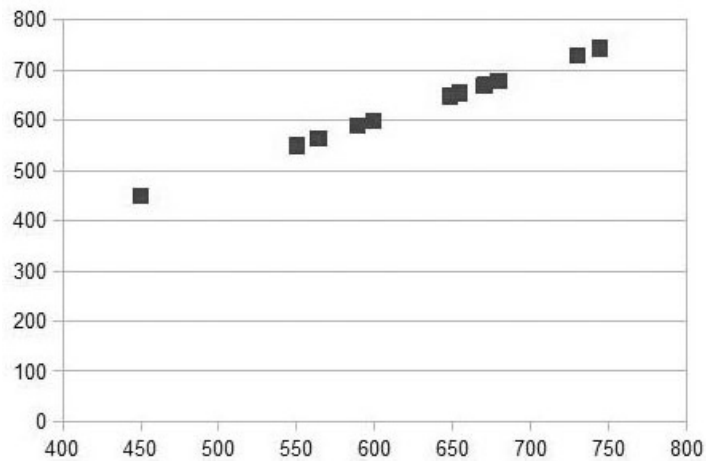
Example:

6.   XY(Scatter) Chart

Feature: It is used to depict the relationship of numerical values using variety of data series. The location of points represents the value of the chart and the set of points depicts the data series.
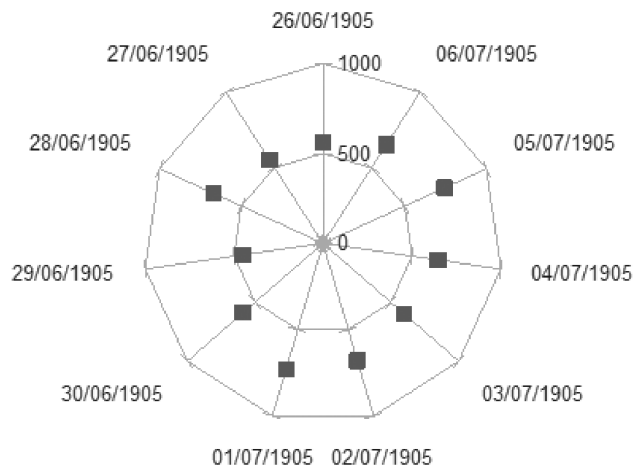
Application: Used to analyse scientific data.

Example:

7. **Net Chart**

Feature: The data is displayed as points that are connected by some lines in a grid that looks like a spider's net. It plots the data of each row in a separate radial.

Application: Used to analyze records of multiple series.
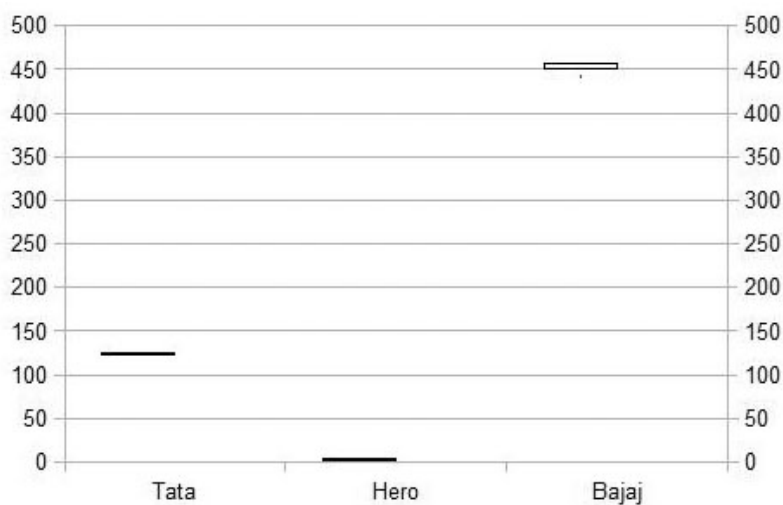
Example:

8. **Stock Chart**

Feature: It uses lines with markers (with height corresponding to the value being depicted) to show the data series.

Application: Used to analyze the stock market movement.

Example:

Notes

9. **Bubble Chart**

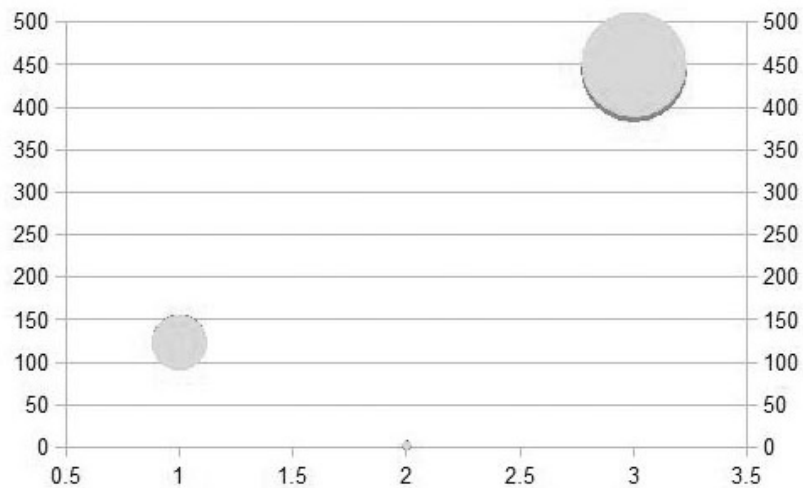**Feature:** A variation of scatter chart in which data points are represented by bubbles. It can show relations of three variables in two dimensions.

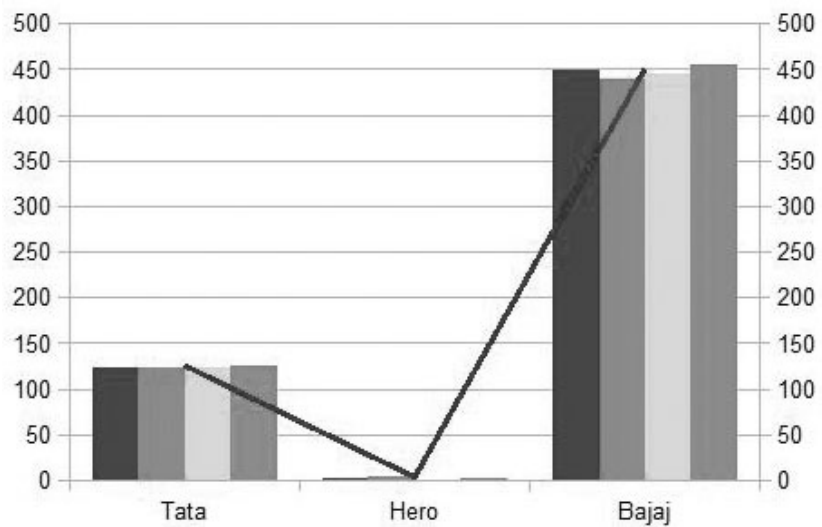**Application:** It is used to present financial data.

Example:

10. **Column and Line Chart**

Feature: A combination of line and column chart.

Application: Used to display data trends and at the same time compare them.

Example:

9.18.1 Components of a chart

The various components of a chart are shown in the Fig. 9.45 below. When we move the mouse pointer over a chart object, a screen tip giving the component's name is displayed.
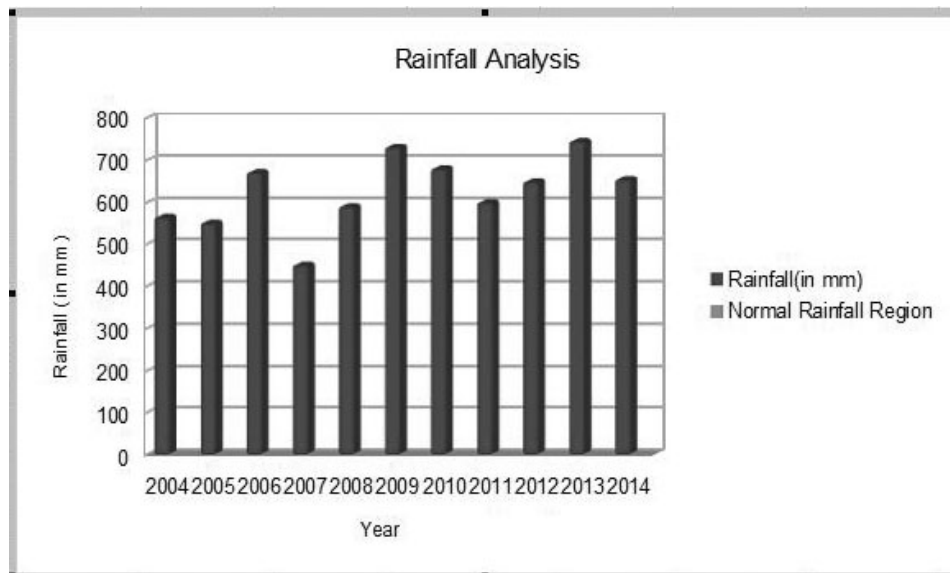

Fig. 9.45: Components of chart

Notes

Chart Area: It includes the total area in which all the components of the chart are placed.

Plot Area: It is the area, bounded by two axes for a 2-D chart and three axes for a 3-D chart. It contains the actual chart and also includes the plotted data, data series and the two axes.

Chart Title: It is the topic of the chart, usually given at the top. In Fig. 9.45, 'Rainfall Analysis' is the title of the chart. The title helps us to know what data can be inferred through the chart.

Axis titles: A 2-D chart has two axes (x & y) while a 3-D chart has three axes (x, y and z). Each axis is given a title, called **axis title**, which depicts what data series the respective axis is representing. In the Fig. 9.45 above Year and Rainfall(in mm) are X-axis and Y-axis titles respectively.
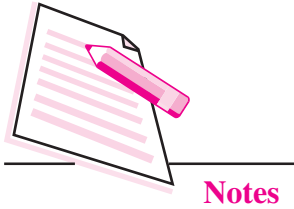
X-axis or Category Axis: It is the horizontal axis of the chart.

Y-axis or Value axis: It is the vertical axis used to plot the value of each data point.

Data Series: It is the set of data that we want to display in the chart.

Legend: It identifies the data series being represented in the chart. A unique colour, pattern or symbol is assigned to each data series so that they can be easily distinguished.

Gridlines: These are the horizontal and vertical lines that run across the plot area. It helps us to know the exact data point to be plotted.

9.18.2 Steps to create a chart

Follow the steps given below to create a chart:

1. Select the table or range of values for which the chart has to be created.

2. Select **Insert → Chart**. The **Chart Wizard** starts.

3. On the left side of the wizard are the steps to be followed to create a chart and on the right are corresponding actions of each step. For the first step, choose the **Chart type** and its **sub type** (Fig. 9.46). Click **Next** button.
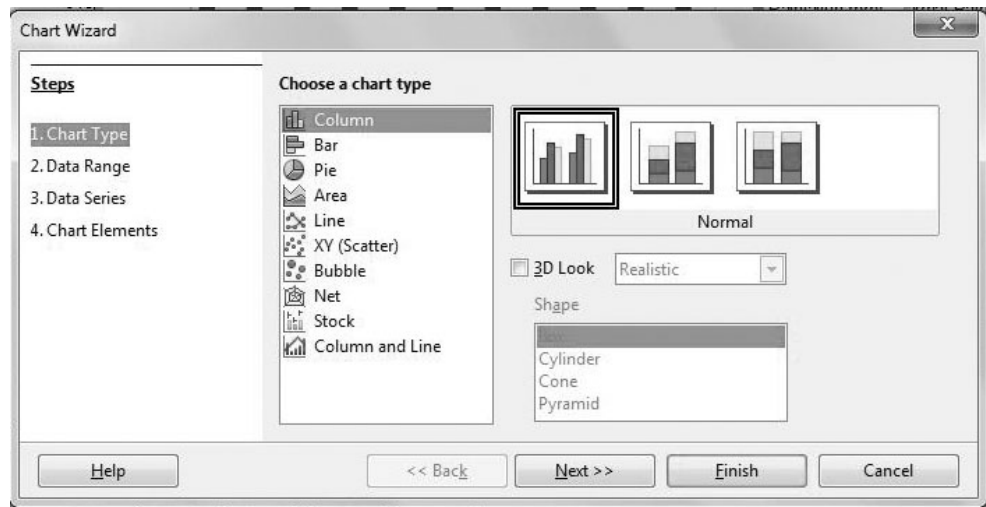

Fig. 9.46: Step 1 of Chart Wizard

4. Choose the data range for which the chart has to be created and then click **Next** button.

5. For step-3, specify the data series and data ranges.

6. In the last step, specify various chart elements like Chart title, Axis title etc. and then click on **Finish** button. The chart will be inserted in your worksheet (Fig. 9.47).

Fig. 9.47: Chart inserted on the worksheet
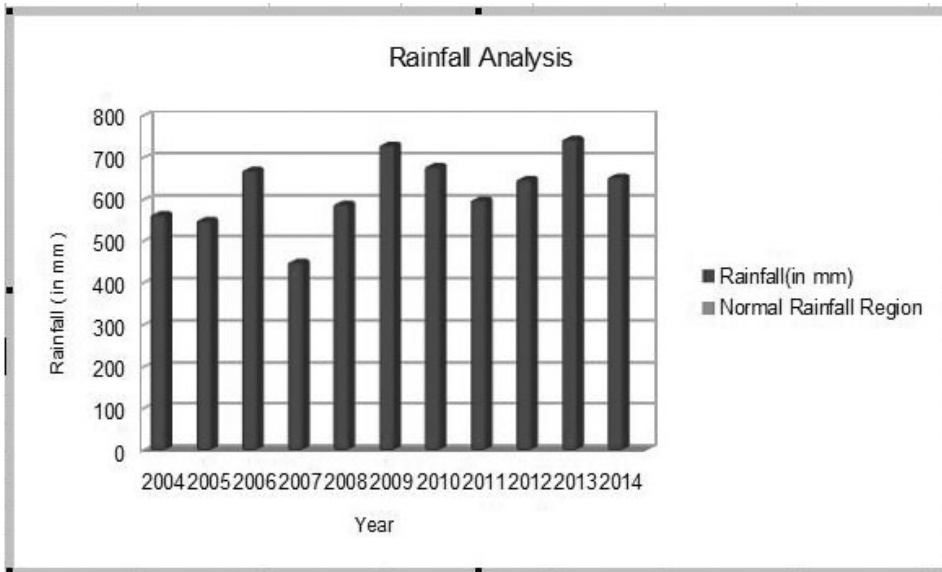
Notes

9.19 PRINTING A WORKSHEET

Follow the steps given below to print the worksheet or a chart.

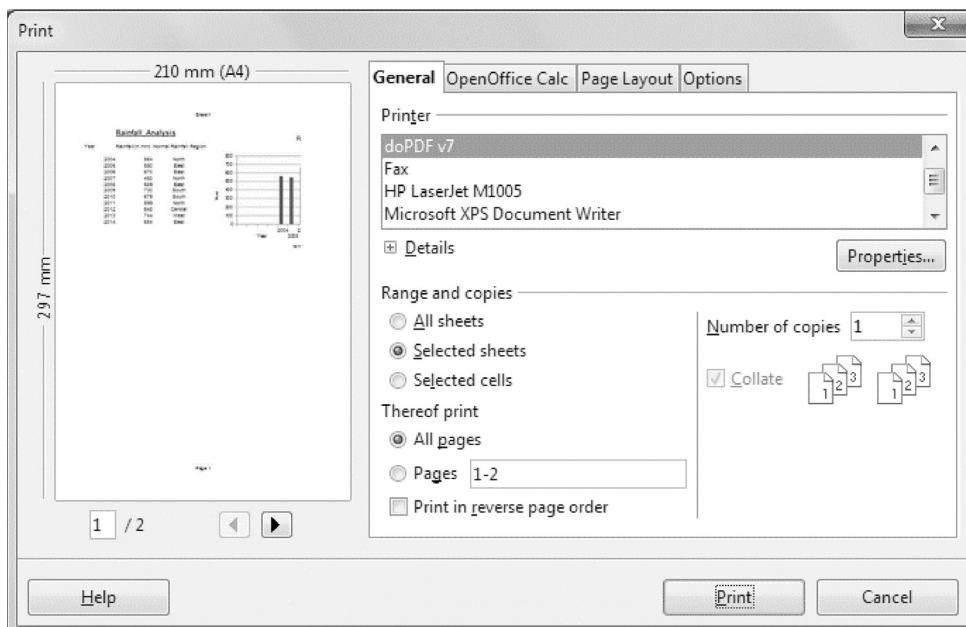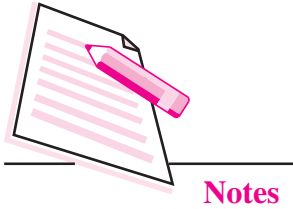1. Select **File → Print**. The **Print** dialog box appears (Fig. 9.48).

Fig. 9.48: Print dialog box

2. The left side of the dialog box shows the preview of the active worksheet. On the right, the **General tab** will be selected by default. Specify the Printer

Notes

name, range of worksheets to be printed and number of copies to be printed. If we want to print only the chart, then choose the *Selected sheets* option. Also make sure that the chart is selected on the worksheet.

3. Click **Print** button to print the worksheet.

INTEXT QUESTIONS 9.3

1. Fill in the blanks.

   (i) The function that displays current system date is ....

   (ii) The Cells option is in .... menu.

   (iii) K9 is an example of .... referencing.

   (iv) The type of chart in which data is represented as parts of a circle is .... chart.

   (v) The X-Axis in a chart is also known as .... axis.

   (vi) Various functions provided by OpenOffice Calc can be accessed using ....

2. Differentiate between filtering and sorting of data.

3. What is relative referencing? Give one example.

4. How can you merge cells on a worksheet?

WHAT YOU HAVE LEARNT

- Each page of a spreadsheet is known as a worksheet.

- Collection of worksheets constitutes a workbook.

- Autofill feature is used to fill sequential data in the cells to form a series automatically.

- Formatting is altering the style and appearance of data to enhance the appearance of the worksheet without affecting the data values.

- Funtions are predefined formulas in any spreadsheet application.

- Cell reference is the address of the cell.

- A chart is a form of pictorial representation of data.

- Components of a chart are chart area, plot area, chart title, axis titles, data series, legend, gridlines x axis, y axis.

TERMINAL EXERCISE

1. What is a spreadsheet? Name any two spreadsheet applications.

2. Explain the two ways to change the cell contents in OpenOffice Calc.

3. Why and how do we use the Function Wizard in OpenOffice Calc?

4. Write the steps to a create a sort list containing names of your teachers.

5. Differentiate between absolute and mixed referencing.

6. How do you come to know that filtering has been turned on?

7. In a Calc worksheet containing price and quantity of electronic items, write the steps to sort the data in descending order of cost of items. Also apply filters to price and quantity columns.

8. Give one point of difference between bar chart and column chart.

9. How can you print a chart? Write steps to do so.

10. What is the use of gridlines in a chart?

Notes

ANSWERS TO INTEXT QUESTIONS

9.1

1. (i) Standard   (ii) Cell   (iii) Active Cell   (iv) Ctrl + Q   (v) 2

2. Uses of spreadsheet application:

   a. They are used to calculate, analyse and store and present the information.

   b. These are very useful in What-if analysis.

   c. Spreadsheets are very useful to manage financial data like stock exchange movements, account transactions etc.

   d. The data in a spreadsheet can be pictorially represented through charts.

   e. Various in-built functions help in easy processing and manipulation of data.

3. Select File → New → Spreadsheet.

9.2

1. (i) F2   (ii) Shift   (iii) Formula   (iv) =   (v) label

2. By clicking on the row number

Notes

3. AutoFill feature is used to fill sequential data in the cells to form a series automatically.

4. Overwriting and Partial Modification.

9.3

1. (i) TODAY()   (ii) Format   (iii) absolute   (iv) Pie

   (v) Category   (vi) Function Wizard

2. In case of sorting, the data is arranged in ascending or descending order. In filtering, data is selectively displayed based on certain criteria on a column(s).

3. In this type of cell referencing, when the formula is copied from one cell to another in a worksheet, the cell reference or address of the cells being used in the formula automatically changes according to the relative position of the copied formula. For example, A10/5.

4. To merge cells, select the range of cells to be merged and click Merge Cells button on the formatting toolbar.