



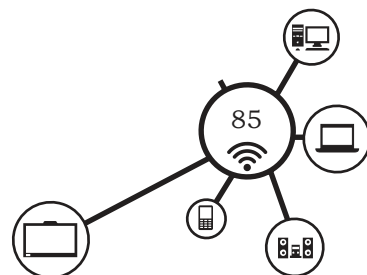
Electronic Spreadsheet (Advanced) using LibreOffice Calc

INTRODUCTION

In the modern digital world, one of the most important thing is counting and calculations. Every profession, household, institution and even our smart devices have to deal with numbers. In computers we can do the calculations on number of records spread over the long sheet using the spreadsheet software that helps to work with numbers efficiently. It resembles an accountant's ledger book wherein everything is recorded under suitable headings. We have already learned in Class 9, that how the spreadsheet software performs calculations and present data in tabular format. It becomes easy to visualise a huge grid of numbers when represented using charts in electronic spreadsheet. Moving further, in this unit you will learn advanced features of electronic spreadsheet using LibreOffice Calc to perform analysis, automate repeated tasks, link, share and review data. It includes – analysing data to extract useful information for making effective decisions. Macros, is the another powerful feature of spreadsheet covered in this unit. Macros are a set of stored functions used to automate processes repeatedly. They are tools which can be used

to perform most of the redundant tasks with relative ease. In the second chapter of this unit, you will learn to create multiple sheets and link the data in multiple sheets. It can be done in two ways, one is creating reference to other sheets by using keyboard and mouse, and other is by linking external data. LibreOffice Calc also provides the sharing feature that allows to share the spreadsheet for editing purpose. This saves to keep track of multiple copies of the same spreadsheet corrected by different users. Sharing allows the users to work on the same spreadsheet in collaboration.

NOTES



Analyse Data using Scenarios and Goal Seek

INTRODUCTION

Analysing data is the process to extract useful information for making effective decisions. The spreadsheet is one of the best software used for data analysis. It is used to retrieve, correlate, explore and visualise data to identify patterns, trends and relationships. The spreadsheet component in LibreOffice known as Calc includes several tools used to manipulate the data in the spreadsheet. You can analyse the data and interpret the results from it. In this chapter, you will learn to analyse data using LibreOffice Calc.

Consolidating Data

Consolidate is a function used to combine information from multiple sheets of the spreadsheet into one place to summarize the information. It is used to view and compare variety of data in a single spreadsheet for identifying trends and relationships.

You need to check the following before consolidating data.

- Open each sheet in the spreadsheet and check that the data types must match which you want to consolidate.
- Match the labels from all the sheets which are used for consolidating.
- Enter the first column as the primary column on the basis of which the data is to be consolidated.

Steps to consolidate the data are as follows:

- Step 1. Open the spreadsheet which has the data to be consolidated.
- Step 2. Create a new sheet where the data has to be consolidated.
- Step 3. Choose **Data > Consolidate** option that will open Consolidate dialog as shown in Fig. 4.1.

Step 4. Observe that the default function **“Sum”** is seen in the Function drop-down. You will be able to see the list of functions as shown in the Fig. 4.2 by clicking on the Function drop-down.

Step 5. Choose the required function from the drop-down list.

Step 6. The sources data range list contains existing named ranges to quickly select from that. But if the source range is undefined, then click and select the range from the sheet which is to be consolidated.

Step 7. Click on **Add** to add this range under the ‘Consolidation ranges’ of the Consolidation dialog.

Step 8. Repeat steps 6 and 7 to add more sheets to be consolidated.

Step 9. Remember to check the target range specified under Use **“Copy results to”**. If it is not mentioned, then click on the cell of sheet where the final data has to be produced.

Step 10. Click on *Options* that will list two checkbox under **Consolidate by** “Row labels” and “Column labels” and “Link to source data” under **Options**, as shown in Fig. 4.3. From this you can select the additional feature as per requirement. The option consolidate by rows and columns are checked to consolidate data as per row labels and column label. Link to source data is checked to make the modification automatically in the consolidated (target) sheet while making any changes in the source data.

Step 11. Finally click on **OK** button.

Let us illustrate this through following activity.



Fig. 4.1: Consolidate dialog box



Fig. 4.2: Functions under consolidate

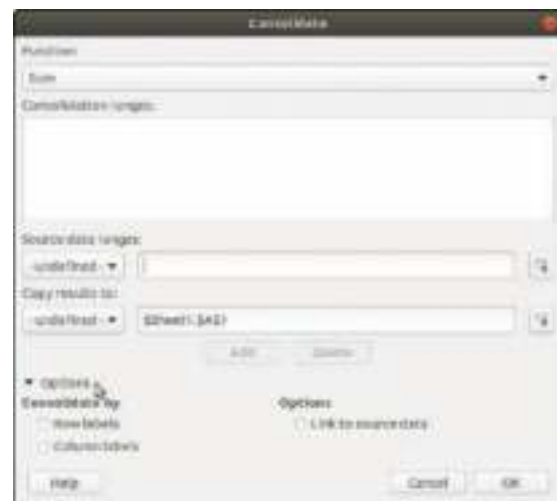
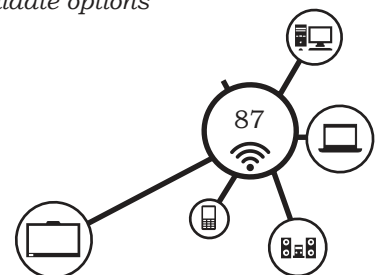


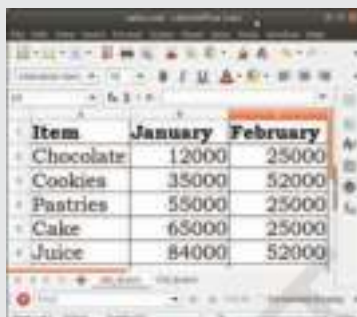
Fig. 4.3: Consolidate options



Practical Activity 4.1

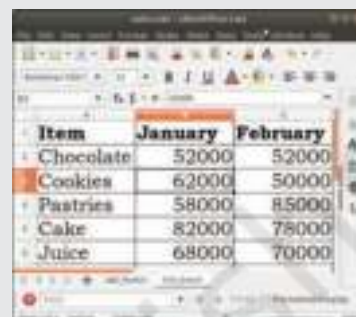
Let us take an example that we have two branches of our shop namely ABC and XYZ. We have the Sales records for the month of January and February of both the branches in two different sheets named ABC_Branch and XYZ_Branch. Now we have to consolidate these two sheets to get the sum of both the sheets monthly to get the insight about the sale as per product and branch.

Now let us create the following sheets in a spreadsheet sales.



Item	January	February
Chocolate	12000	25000
Cookies	35000	52000
Pastries	55000	25000
Cake	65000	25000
Juice	84000	52000

Fig. 4.4: Data for ABC_Branch



Item	January	February
Chocolate	52000	52000
Cookies	62000	50000
Pastries	58000	85000
Cake	82000	78000
Juice	68000	70000

Fig. 4.5: Data for XYZ_Branch

Now let us use the two sheets 'ABC_Branch' and 'XYZ_Branch' of a spreadsheet sales.ods which will be consolidated using the following steps:

- Step 1. Add a new sheet and rename it as *Consolidate*
- Step 2. Click on **Data > Consolidate** or use the keyboard shortcut key **ALT+D**, the *Consolidate* dialog window will open as shown in Fig. 4.6.



Fig. 4.6: Consolidate dialog window

- Step 3. In the Function box, choose *Sum* function from the drop down as we want to add the data from all the sheets.
- Step 4. Click in the Source data ranges box and then click on the worksheet ABC_Branch and select the area to be consolidated and then click on the Add button will add the copy reference in the consolidation ranges (Fig. 4.7).

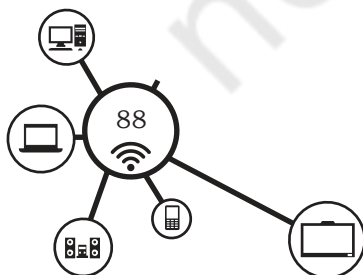




Fig. 4.7: Selecting the source data range from the sheet

- Step 5. Click on the sheet XYZ_Branch and select the area to be consolidated and then click on ADD will add the next consolidation range (Fig. 4.8).
- Step 6. Click on the '+' sign next to Options in the Consolidate dialog window to change the settings.

'Consolidate by' has two options Row labels and Column labels. Check row label or column label or both if you want to consolidate it by matching the label.

If Link to source data is checked then it will keep on updating the data of the Consolidate sheet automatically if there is any change made in the selected ranges.

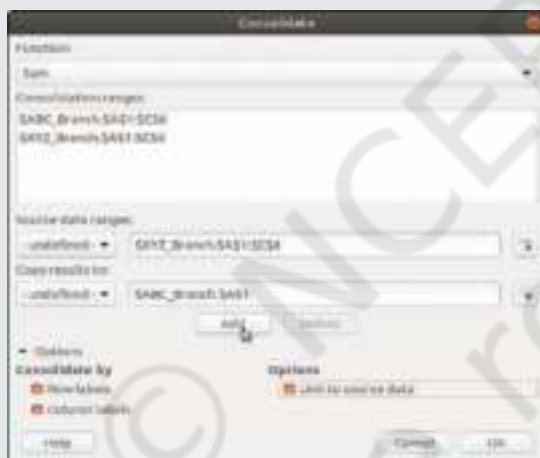


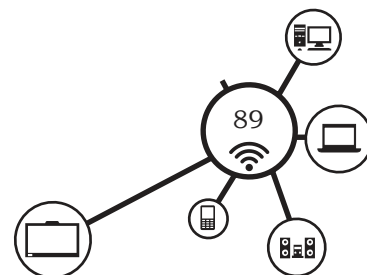
Fig. 4.8: Options for setting more properties

- Step 7. Click on '**Copy results to**' and then click on any of the cell in the Consolidate sheet where you want to copy the final result after consolidation.

- Step 8. Click on **OK** button. Fig. 4.9 will display the Consolidate sheet with data after consolidation.

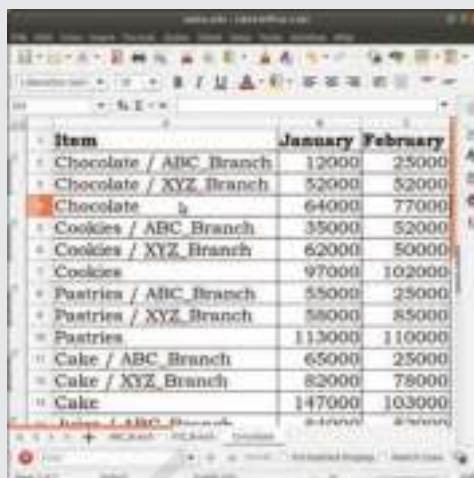
Item	January	February
Chocolate	64000	77000
Cookies	97000	102000
Pastries	113000	110000
Cake	147000	103000
Juice	152000	122000

Fig. 4.9: Consolidated sheet



NOTES

The consolidated sheet will have all the consolidated data along with the original data. You can view the original data of both the sheets and by clicking on the '+' sign in front of the consolidated row. Fig. 4.10 shows the original data and consolidated data.



Item	January	February
Chocolate / ABC Branch	12000	25000
Chocolate / XYZ Branch	52000	52000
Chocolate	64000	77000
Cookies / ABC Branch	35000	52000
Cookies / XYZ Branch	62000	50000
Cookies	97000	102000
Pastries / ABC Branch	55000	25000
Pastries / XYZ Branch	58000	85000
Pastries	113000	110000
Cake / ABC Branch	65000	25000
Cake / XYZ Branch	82000	78000
Cake	147000	103000
Total	147000	103000

Fig. 4.10: Consolidated sheet details by clicking on the + sign in front of rows

Practical Activity 4.2

Create two sheets Marks_Term1 and Marks_Term2 to store the marks in Term1 and Term2 for a set of students taking the following columns:

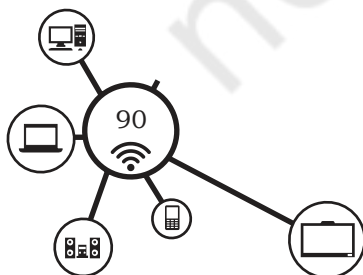
1. Name
2. Marks in English
3. Marks in Hindi
4. Marks in Maths
5. Marks in Science
6. Marks in Social Science
7. Total marks (using function Sum)
8. Percentage (using function Average)

Now, use the consolidate function to merge these two sheets.

Groups and Subtotals

Group and Outline in Calc is used to create an outline of the selected data and can group rows and columns together so that one can collapse (-) to hide it or expand (+) it using a single click on it.

Select the data to be grouped, click on **Data>Group and Outline**. Then choose Rows to group the data on the basis of rows or columns to group it on the basis of columns.



The **Subtotal** tool in Calc creates the group automatically and applies common functions like sum, average on the grouped data. One can use any type of summary function for each column as per the requirement of data analysis.

It can group subtotals by using category and sorts them in ascending or descending order so that one need not to use filters.

Follow the following steps to apply *Subtotal* tool.

- Step 1. The sheet where this is to be applied must have labels to the column
- Step 2. Click on **Data** menu and choose **Subtotals (Data>Subtotals)** as shown in Fig. 4.11.
- Step 3. Choose the column in the **Group by** list in the subtotal dialog which is to be used for grouping the data in the sheet as shown in Fig. 4.12.
- Step 4. Select the column by clicking the checkbox under **Calculate subtotals for** to create subtotals for.
- Step 5. Select the desired function by clicking the function under **Use function.**
- Step 6. You can use the 2nd Group and 3rd Group tabs to group the data in further levels.
- Step 7. Click on **OK** button.

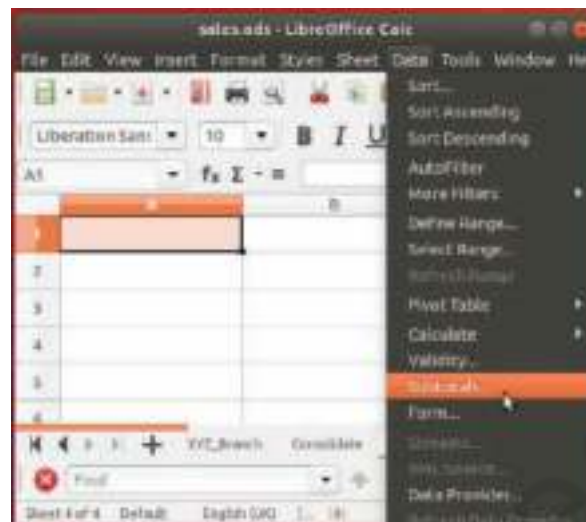


Fig. 4.11: Choosing subtotal option from Data menu

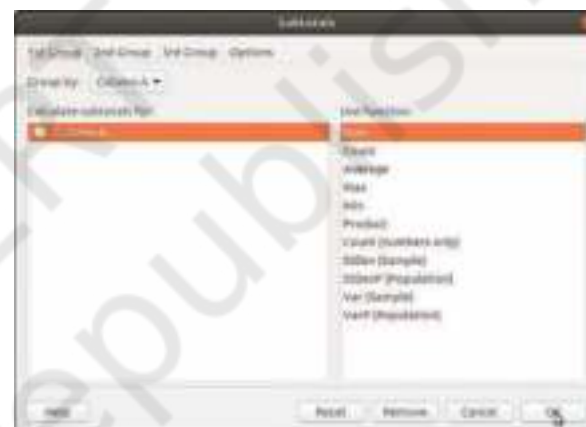
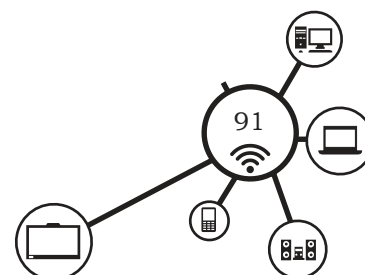


Fig .4.12: Choose the column in the Group by list

Practical Activity 4.3

Let us take an example to store marks in various subjects by students of Class X as shown in the table given in Fig. 4.13. To take out the average of the subjects scored in each class, use the subtotal tool which automatically group the data on a particular column and perform the selected function on any of the column.



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To solve this, perform the following steps:

Step 1. Create a sheet as shown in the Fig. 4.13 to take the marks for students in a term for a class.

Roll No	Class Name	English	Hindi	Maths	Science	Soc Sci
10001X-A	Amrit	51	60	85	49	57
10020X-A	Shubh	45	58	89	94	75
10704X-A	Chirvi	53	88	88	51	59
10077X-A	Akhilans	56	88	90	88	80
10006X-B	Ashwin	85	58	55	88	88
10003X-B	Vijay	54	51	88	58	58
10005X-B	Zohar	44	52	87	46	46
10006X-B	Herman	55	75	96	88	88
10059X-B	Arushi	58	88	58	90	80

Fig. 4.13: Spreadsheet with student marks in two class

Step 2. Now, to calculate the average marks scored by the students of each class in each subject, i.e. class-wise and subject analysis.

Step 3. To do so, click on **Data > Subtotal**, the subtotal dialog as shown in Fig. 4.14 will open.

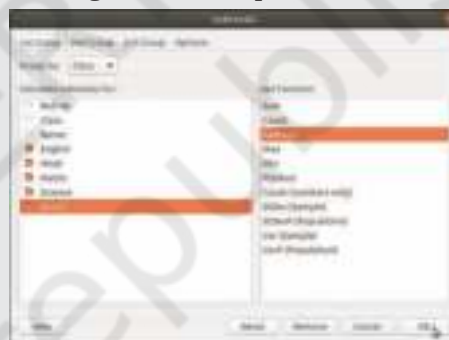


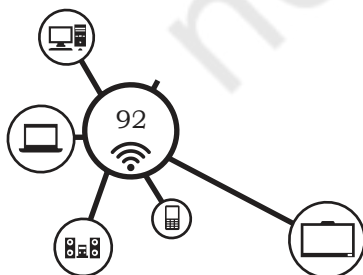
Fig. 4.14: Subtotal dialog window

Step 4. Choose the column i.e. Class under Group by in the 1st Group on which we need to group the whole data. Also, select the subjects i.e. English, Hindi, Maths, Science and Social Science under Calculate subtotals for. For each subject click on the Average under Use function individually otherwise Sum function will be used by default.

Step 5. Click **OK** and the sheet will look like as shown in the Fig. 4.15.

Roll No	Class Name	English	Hindi	Maths	Science	Soc Sci
10001X-A	Amrit	51	60	85	49	57
10020X-A	Shubh	45	58	89	94	75
10704X-A	Chirvi	53	88	88	51	59
10077X-A	Akhilans	56	88	90	88	80
Class A Grand		51.25	73.5	88	68.2	70.75
10006X-B	Ashwin	85	58	55	88	88
10003X-B	Vijay	54	51	88	58	58
10005X-B	Zohar	44	52	87	46	46
10006X-B	Herman	55	75	96	88	88
10036X-B	Arushi	58	88	58	90	80
Class B Grand		59.2	63.4	86.8	77.6	78.2
Grand Average		55.667	68.45	75.5	66.877	74.5

Fig. 4.15: Marks list after Subtotal



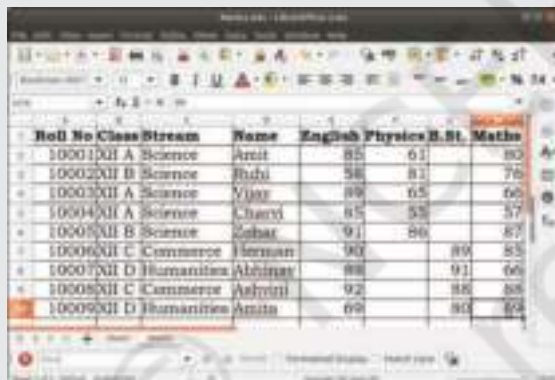
Observe that outline to the left of the row numbers which is inserted after performing the subtotal tool. This outline shows the hierarchical structure which can be used to show or hide different levels by clicking on the group indicators '+' sign to expand and '-' sign to collapse the data.

You can hide the low-level details and just look at the final totals and grand totals.

If you want to remove the outline feature from the sheet at any point of time then it is possible by just clicking on **Data > Group and Outline > Remove Outline.**

Practical Activity 4.4

Create a sheet as shown in Fig. 4.16 and then calculate the average of marks subject wise on the basis of class and stream. Also, try out another function Count to calculate the number of students in each subject.



Roll No	Class	Stream	Name	English	Physics	B.St.	Maths
10001	XII A	Science	Amit	85	61		80
10002	XII B	Science	Rishi	58	81		76
10003	XII A	Science	Vijay	89	65		66
10004	XII A	Science	Chand	85	55		57
10005	XII B	Science	Zohar	91	86		87
10006	XII C	Commerce	Herman	90		89	85
10007	XII D	Humanities	Abhinav	88		91	66
10008	XII C	Commerce	Ashwin	92		88	88
10009	XII D	Humanities	Amrita	69		80	64

Fig. 4.16: Marksheet

What-if Scenarios

What-if scenario is a set of values that can be used within the calculations in the spreadsheet. A name is given to the scenario and several scenarios can be created on the same sheet.

It is used to explore and compare various alternatives depending on changing conditions. It can be used in the beginning of any project to optimise the output. This tool is used to predict the output while changing the inputs which reflects the output and thus one can choose the best plan of action based on it.

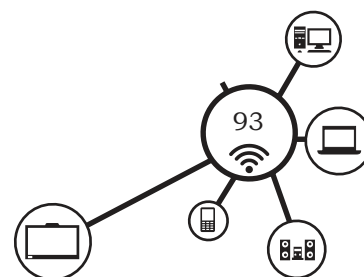




Fig. 4.17: Create Scenario dialog window

For example, a person who is taking car loan has to decide on certain factors as given below:

- The number of years for which the car loan is taken.
- The total amount of car loan

The above two factors, i.e. Principal amount and Number of years can display the EMI to be paid monthly.

Follow the following steps to create scenario.

- Step 1. Select the cells which contains values in the sheet that needs to be changed. To select multiple cells, hold *Ctrl* key and click on the cell to be selected.
- Step 2. Choose **Tools>Scenarios** will open scenario dialog window as shown in Fig. 4.17.
- Step 3. Enter a name for the new scenario and leave the other fields unchanged.
- Step 4. Click on OK button.
- Step 5. This will create a new scenario which is activated automatically.

Practical Activity 4.5

Let us take an example to get the insight of the EMI, Total Amount paid and Total Interest paid on the Loan Amount (Principal) taken for a fixed Rate of Interest for a number of time period. So, now we want to see what will be the EMI and how much is the total interest paid for different loan amount and time period. To do so, let us use the Scenario tool by using the following steps:

- Step 1. Create the following sheet (Fig. 4.18) and remember to put the formula to calculate EMI in B3 as

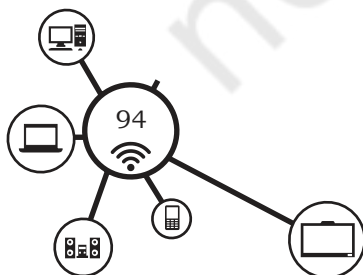
$$= \text{ABS}(\text{PMT}(\text{B2}/1200, \text{E1} \times 12, \text{B1}))$$
 Total Amount in B4

$$= \text{B3} \times \text{E1} \times 12$$
 Total Interest in B8

$$= \text{B4} - \text{B1}$$

Loan Amount	Interest Rate	EMI	Total Amount	Total Interest	No. of years
1000000.00	7	10283.81	1480868.78	480868.78	12

Fig. 4.18: Loan sheet



- Step 2. Select the cells B1 and E1 using **Ctrl + Click** on these cells as these two are the variables in this situation
- Step 3. Choose **Tools > Scenario** will display the *Create Scenario* dialog window as shown in Fig. 4.19.



Fig. 4.19: Create Scenario dialog window

- Step 4. Write the name of the Scenario and click on **OK** button will add this in the scenario list.
- Step 5. Let us create two more scenarios as LAmt_2 and LAmt_3 with Loan Amount as 2500000, No. of years as 12 and Loan Amount as 2500000, No. of years as 10 respectively. We can define different scenarios to do so on the same sheet, each with some different values in the defined cells. Click on **Tools > Scenario**, write the name of the scenario and click on OK. The Loan sheet will look like as shown in the Fig. 4.20



Fig. 4.20: Loan sheet with scenarios

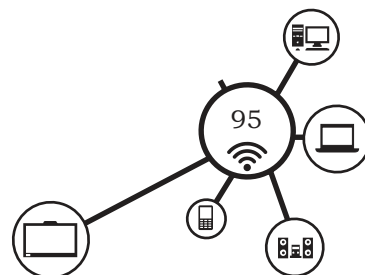
- Step 6. Click on the navigator icon in the toolbar and then click on scenarios. Click on the scenario name will display all the details as per that scenario.

Practical Activity 4.6

Calculate the income tax by entering the salary using different scenarios for two variables income tax slab and tax rate. The sheet should look as shown in Fig. 4.21.

The different scenarios to be taken as given below:

Income Slab	Tax rate
7.5 to 10 lakhs	15%
10 to 12.5 lakhs	20%



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12.5 to 15 lakhs 25%
>15 lakhs 30%



Income slab	Tax Rate	Salary per year	Income tax
1000000	20.00%	1200000	240000
1250000			

Fig. 4.21: Income tax sheet

What-if Analysis Tool

What-if tool uses **Data > Multiple Operations** and is a planning tool for what-if questions. In this, the output is not shown in the same cells, whereas it uses a drop-down list to display the output depending upon the input. The Multiple Operations tool creates a formula array to display the list of results applying the formula on a list of alternative values used in the formula.

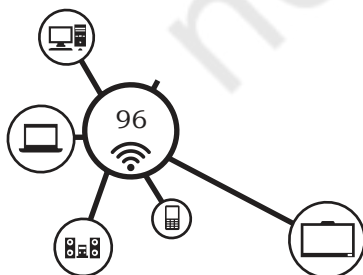
This tool uses two arrays of cells, one array contains the input values and the second array uses the formula and display the result.

It is useful to check in the beginning to understand from the output for the efficiency. What-if analysis tool is very helpful when we want to know how much profit we earn for a particular product for a series of selling units.

Following steps are used for what-if analysis tool:

Let us calculate with one formula and one variable:

- Step 1. Enter the data in the cells and then enter a formula to calculate a result from values in other cells.
- Step 2. Create an array of input values on the basis of which the output is to be generated using the formula.
- Step 3. Select the cell range of input array and output array.



Step 4. Click on **Data>Multiple Operations** will display the multiple operations dialog window as shown in Fig. 4.22.

Step 5. Enter the cell address in the Formulas box from the sheet which contains the formula

Step 6. Now, enter the cell address of the cell which is a variable and is used in the formula in Column input cell box.

Step 7. Click on **OK** will generate all the possible outputs based on the formula.



Fig. 4.22: Multiple operation dialog window

Practical Activity 4.7

Let us take an example to calculate the profit on annual series of sale depending on the Selling Price, Cost Price and Fixed Cost expenses.

Step 1. Create the sheet as given below in Fig. 4.23

		Annual Sale/Profit
Selling price	25	500
Cost price	8	1000
Fixed cost	8000	1500
Items sold	1500	2000
Profit	10000	2500
		3000
		3500
		4000
		4500
		5000

Fig. 4.23: Sale_incentive sheet

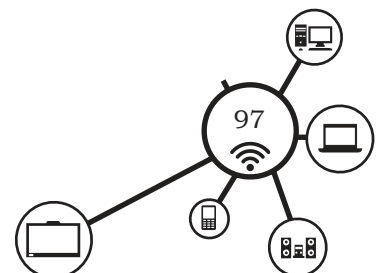
Step 2. In Cell B5 enter the formula = B4 * (B1 – B2) – B3

Step 3. Select the cell range from D2:E11

Step 4. Click on **Data > Multiple Operations** will display the Multiple operations dialog window as shown in Fig. 4.24.



Fig. 4.24: Performing Multiple Operations



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- Step 5. We have formula in cell B5, as we want to use the same cell address to be copied therefore, we have used absolute cell referencing and written it as \$B\$5.
- Step 6. In this example, we have another variable as number of items sold which is in the cell \$B\$4
- Step 7. Click on OK will generate a sheet as shown in Fig. 4.25.



	Input	Annual Sale/Profit
Selling price	20	2000
Cost price	5	1000
Fixed cost	8000	1500
Items sold	1500	2500
Profit	10000	3000
		3500
		4000
		4500
		5000

Fig. 4.25: Result for multiple operations

Practical Activity 4.8

Create the following sheet (Fig. 4.26) to calculate the profit and then decide how many books are to be published based on the profit.

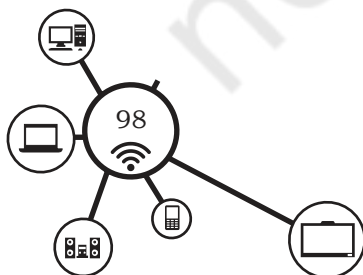


	Input	Annual Sale/Profit
Selling price	120	500
Cost price	40	1000
Books sold	200	1500
Profit	16000	2000
		2500
		3000
		3500
		4000
		4500
		5000

Fig. 4.26: Practical exercise

Goal Seek

In general we fill in the values in the cells and then create formula on these values to get the required result. To predict the output, we keep on changing all the input values to obtain the desired output. **Goal seek**



helps in finding out the input for the specific output.

For example, if you want to know the number of units produced to get the desired output then use *Goal seek* analysis tool. Follow the following steps to use Goal seek tool.

Step 1. Enter the values in the worksheet.

Step 2. Write the formula in the cell where the calculation has to be used.

Step 3. Place the cursor in the formula cell, choose **Tools > Goal Seek**.

Step 4. The Goal seek dialog window will appear as shown in Fig. 4.27, the Formula cell box will have the correct formula.

Step 5. Place the cursor on the Variable cell box and click on the cell that contains the value to be changed.

Step 6. Enter the desired result in the Target value box.

Step 7. Click on **OK** button.

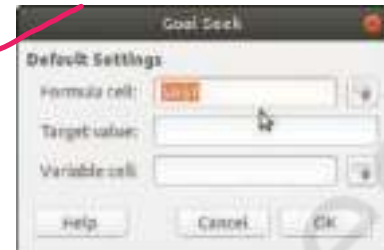


Fig. 4.27: Goal seek dialog window

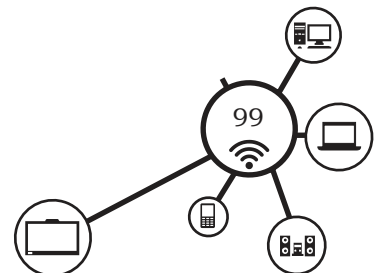
Practical Activity 4.9

Let us take a very simple example to perform the backward calculation to find out an input depending upon the specific output. A student has received marks in 4 subjects and has to appear for the 5th subject and plans an aggregate as 70. So, he can use goal seek tool to check how many marks he has to score in the 5th subject to get the required percentage. Follow the following steps to perform this task.

Step 1. Create the marksheet as shown below in the Fig. 4.28. Enter the average function in cell B7 as =Average(B2:B6)

	A	B	C
1	Subject	Marks	
2	English	54	
3	Hindi	56	
4	Maths	78	
5	Science	80	
6	So Science		
7	Average	67	

Fig. 4.28: Marksheets



NOTES

- Step 2. Click on **Tools > Goal Seek** will display the Goal seek dialog window as shown in Fig. 4.29.



Fig. 4.29: Goal seek dialog window

- Step 4. Write the cell address of the formula, i.e. B7 in the Formula cell box.
- Step 5. Write the cell address of the cell which is to be generated by the system in the Variable cell box. In this example, it is cell B6 which we want to be filled as per the average marks needed.
- Step 6. Enter the result in the Target value box. As per our question, we have to get minimum 70 aggregate so we will write 70 in the target value.
- Step 7. Clicking on **OK** will display an error as LibreOffice Calc will not accept the Variable cell to be empty. So, this error dialog window will prompt to add 0 value in the variable cell as shown in Fig. 4.30.

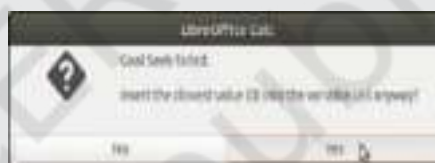


Fig. 4.30: Goal Seek failed alert

- Step 8. Click on Yes and then repeat the step 2 will display the dialog window and prompts whether to change the cell with the calculated value as shown in Fig. 4.31.

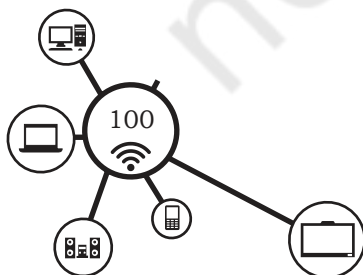


Fig. 4.31: Goal Seek succeeded

- Step 9. Click on Yes will change the value with the calculated one in the sheet as shown in the Fig. 4.32.

	A	B
1	Subject	Marks
2	English	54
3	Hindi	56
4	Maths	78
5	Science	80
6	So Science	82
	Average	70

Fig. 4.32: Marksheet after applying Goal seek



Practical Activity 4.10

Create the following spreadsheet (Fig. 4.33) to find out the quantity to be sold for the item Talc so as to get the total amount of 50000.

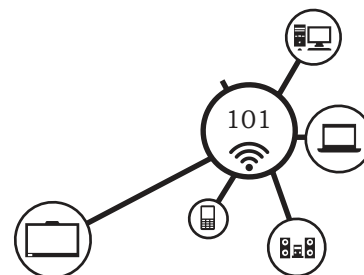
Item	Unit Price	Quantity sold	Amount
Soap	75	150	11250
Shampoo	120	200	24000
Talc	250	0	0
Total Amount			35250

Fig. 4.33: Practical Exercise

Check Your Progress

A. Multiple choice questions

- Which of the following feature is not used for data analysis in spreadsheet?
 - Consolidating data
 - Goal Seek
 - Subtotal
 - Page layout
- Which of the following office tool is known for data analysis?
 - Writer
 - Calc
 - Impress
 - Draw
- Which of the following operations cannot be performed using LibreOffice Calc?
 - Store and manipulate data
 - Create graphical representation of data
 - Analysis of data
 - Mail merge
- What is the extension of spreadsheet file in Calc?
 - .odb
 - .odt
 - .odg
 - .ods
- The default function while using Consolidate is _____.
 - Average
 - Sum
 - Max
 - Count
- Group by is used in _____ tool to apply summary functions on columns.
 - Consolidate function
 - Group and Outline
 - What-if scenario
 - Subtotal tool



NOTES

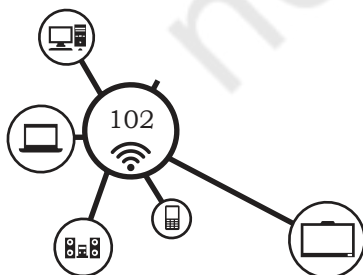
7. Which tool is used to predict the output while changing the input?
 - (a) Consolidate function
 - (b) What-if scenario
 - (c) Goal seek
 - (d) Fine and Replace
5. Which of the following is an example for absolute cell referencing?
 - (a) C5
 - (b) \$C\$5
 - (c) \$C
 - (d) #C
5. _____ analysis tool works in reverse order, finding input based on the output.
 - (a) Consolidate function
 - (b) Goal seek
 - (c) What-if analysis
 - (d) Scenario

B. State whether the following statements are True or False

1. Consolidate function is used to combine information from two or more sheets into one.
2. Consolidate function cannot be used to view and compare data.
3. Link to source data is checked updates the target sheet if any changes made in the source data.
4. Using subtotal in Calc needs to use filter data for sorting.
5. Subtotal tool can use only one type of summary function for all columns.
6. Only one scenario can be created for one sheet.
7. What-if analysis tool uses one array of cells.
8. Goal seek analysis tool is used while calculating the output depending on the input.
9. The output of What-if tool is displayed in the same cell

C. Fill in the blanks

1. Consolidate function is used to combine information from multiple sheets to _____ the information.
2. Data can be viewed and compared in a single sheet for identifying trends and relationships using _____ function.
3. _____ under Data menu can be used to combine information from multiple sheets into one sheet to compare data.
4. The _____ tool in Calc creates the group automatically and applies functions on the grouped data.



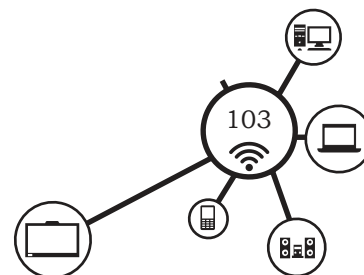
5. _____ scenario is used to explore and compare various alternatives depending on changing conditions.
6. _____ is a planning tool for what-if questions.
7. What-if analysis tool uses _____ array of cells, one array contains input values and the second uses the _____.
8. _____ helps in finding out the input for the specific output.

D. Answer the following questions

1. Define the terms
 - (a) Consolidate function
 - (b) What-if analysis
 - (c) Goal seek
2. Give one point of difference between
 - (a) Subtotal and What-if
 - (b) What-if scenario and What-if tool
3. Give any two advantages of data analysis tools.
4. Name any two tools for data analysis.
5. What are the criteria for consolidating sheets?
6. Which tool is used to create an outline for the selected data?

Lab Exercise

1. Mr Gurdeep has to take a loan of Rs. 10 lakhs to buy a house. After assessing his situation, he has realized that he can pay the loan in 15 years by paying out an EMI of 20,000.
 - (a) Use Goal seek to find out the interest rate at which he can borrow the loan.
 - (b) Use What If Scenario to depict payment of loan in 25 years by paying out an EMI of 10,000.
 - (c) Use Scenario manager to find the best case.
2. Power Motors has 3 branches all over Bhopal. Each branch maintains monthly sales of different models of electric scooter and at the end of month mails it to the State Head. Prepare a consolidated sheet that shows total and average sales made for each model of the electric scooter with respect to the spreadsheet sent by the branches to the head office. You are required to identify the column headings for the various branches, enter data in three different spreadsheets indicating different branches and consolidate data to find total sales and average sales for each model.



CHAPTER 5

Using Macros in Spreadsheet

INTRODUCTION

Many times, we have to perform repeated tasks such as typing school name, address, contact numbers with a specific formatting or apply the same formula at a particular cell for different sheets in a workbook. How easy would it be if we could get this done at the click of a button? This will ensure that we maintain the standardization in terms of font style without any typing mistake. Can you think of any other advantage? In this chapter, you will learn how to use a macro to automate repeated tasks that are always performed in the same way over and over again.

Recording a Macro

A macro is a single instruction that executes a set of instructions. These set of instructions can be a sequence of commands or keystrokes that can be used for any number of times later. A sequence of actions such as keystrokes and clicks can be recorded and then run as per the requirement.



Fig. 5.1: Enabling a Macro

It is important to know that by default the macro recording feature is turned off when LibreOffice is installed on your computer. Hence, to record a Macro ensure that the macro recording is enabled. Macro recording can be enabled using the **Tools > Options > LibreOffice > Advanced**. Observe the **Optional Features**. There are two options which are not check marked. Put the checkmark on the option “*Enable macro recording*” as shown in Fig. 5.1.

Observe in Fig. 5.2, that the **Record Macro** option found under **Tools>Macros** is visible now.

The Macro records ~~all~~ the keyboard and mouse actions but the following actions are not recorded

- Opening of windows
- Actions carried out in another window than where the recording was started.
- Window switching
- Actions that are not related to the spreadsheet contents. For example, changes made in the Options dialog, macro organizer, customizing.
- Selections are recorded only if they are done by using the keyboard (cursor traveling), but not when the mouse is used.
- The macro recorder works only in Calc and Writer.

Follow the steps given below to record a macro.

Step 1. Click on **Tools > Macros** and then click on the *Record Macro* option.

Step 2. Now start taking actions that will be recorded.

Step 3. Once you click on *Record Macro* option, recording of actions starts and a small alert will be displayed as shown in Fig. 5.3. Clicking on "Stop Recording" button will stop the recording of actions.

Step 4. This will open the Basic Macros dialog window to save and run the created macro, as shown in Fig. 5.4.

Step 5. To save the macro, first select the object where you want the macro to be saved in the **Save Macro** to list box.

Step 6. The name of the macro by default is **Main** and is saved in the **Standard Library** in Module1. You can change the name of the macro.

Step 7. Click on **Save** button.

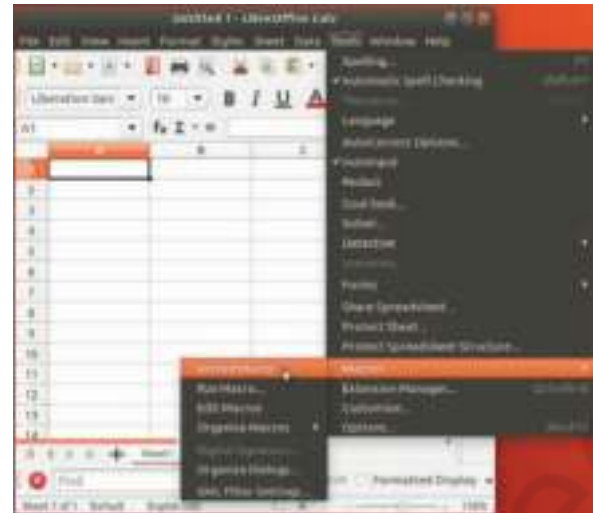


Fig. 5.2: Record Macro option after enabling macro

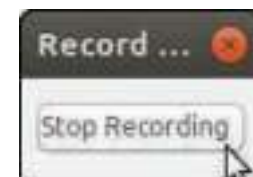
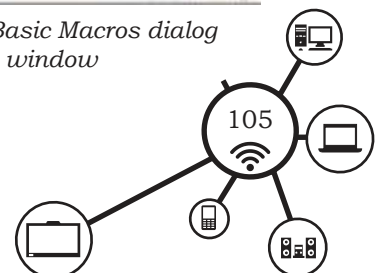


Fig. 5.3: Stop Recording button



Fig. 5.4: Basic Macros dialog window



NOTES

A Library is a collection of modules which in turn is a collection of macros.

Practical Activity 5.1

Record a macro to apply the following style to the Heading “Data Analysis” in the cell A1.

The font style should be “Times New Roman”

The font size should be “14”

The font colour should be “Blue”

Cells from A1 to G1 should be merged and centred

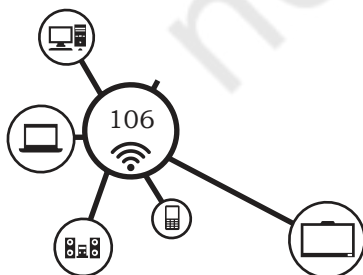
Procedure

- Step 1. Create the spreadsheet. Write the heading “Data Analysis” in cell A1.
- Step 2. Choose **Tools > Macros > Record Macro**. Perform the actions mentioned above in Practical Activity 5.1 in the spreadsheet.
- Step 3. Click **Stop Recording** to stop the Macro Recorder.
- Step 4. The Basic Macro dialog appears as shown in Fig. 5.4, in which you can save and run the macro.
- Step 5. A **Standard** library is present by default when a spreadsheet is created and saved.
- Step 6. To save the macro, first select the object where you want to save the macro in the **Save macro in** list box. Fig. 5.5 shows that the **Main** macro is saved by default in the **Standard Library** in **Module1**. You can change the name of the macro. Here, we have named the macro as **FormatHeading**.



Fig. 5.5: Naming a Macro

Note : If all the macros will be given the same name then they will overwrite the previous Macro created by that name.





Rules for naming a Macro, Module or a Library:

While naming a Macro, Module or a Library the name should :

- Begin with a letter
- Not contain spaces
- Not contain special characters except for _ (underscore)

Running a Macro

Let us now run the macro for another sheet which requires its heading in cell A1 to be given the same format as recorded in the *Formatheading* macro. To run a macro we need to perform the following steps.

Step 1. Type the heading in cell A1

Step 2. Use **Tools > Macros > Run Macro** to open the Macro Selector dialog box as shown in Fig. 5.6.

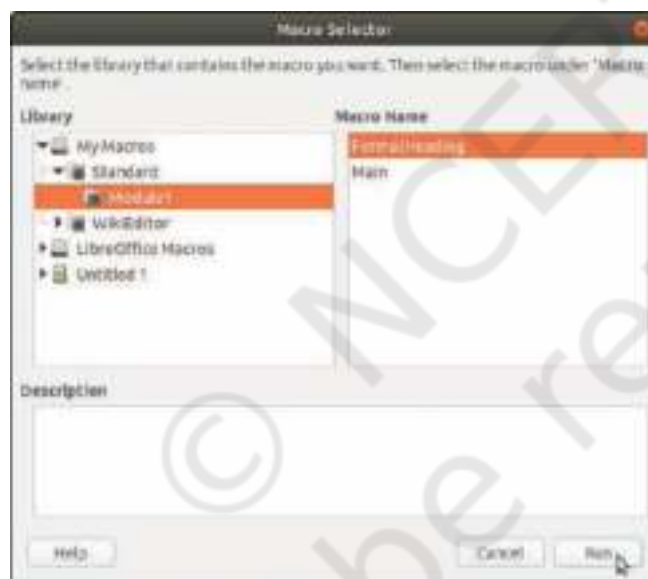
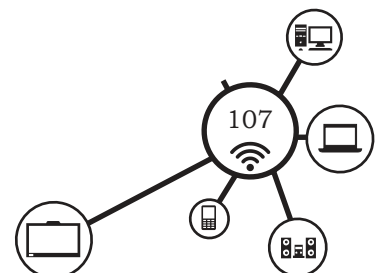


Fig. 5.6: Selecting and running a Macro

Fig. 5.6 shows three names in the library. Out of which

- *LibreOffice Macros library* is provided by LibreOffice and contains modules with pre recorded macros and should not be changed.
- *My Macros* contain macros that we write or add to LibreOffice.
- *Untitled1* is the name of the worksheet we are working on. Since at this time we have not saved

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the worksheet with another name it is showing *Untitled1*. You will see further that *Untitled1* will be replaced with the name of the spreadsheet.

Step 3. Select the library and module in the Library list.

Step 4. Select the macro in the Macro name list.

Step 5. Click **Run** to run the macro.

Practical Activity 5.2

Run a previously created Macro *Formatheading*.

Step 1. Type the heading in cell A1.

Step 2. Open the Macro selector dialog box by clicking **Tools -> Macros-> Run Macro**

Step 3. Click on **MyMacros > Standard > Module1**. Then select *Formatheading* from the **Macro Name box** and click **Run** as shown in Fig. 5.6.

You will observe that the Heading in Cell A1 is formatted.

The action recorded by a macro is recorded as instructions in a programming language called BASIC. It is also possible to view and thus edit the code of a macro. But remember, it is advised to edit a macro only if you have knowledge of the language in which the macro is written which is BASIC in case of CALC. You can view the code generated for the macros by going to Tools > Macros > Edit Macros.

Choose the macro name from the *Object Catalog* and the associated code will be visible as shown in Fig. 5.7.

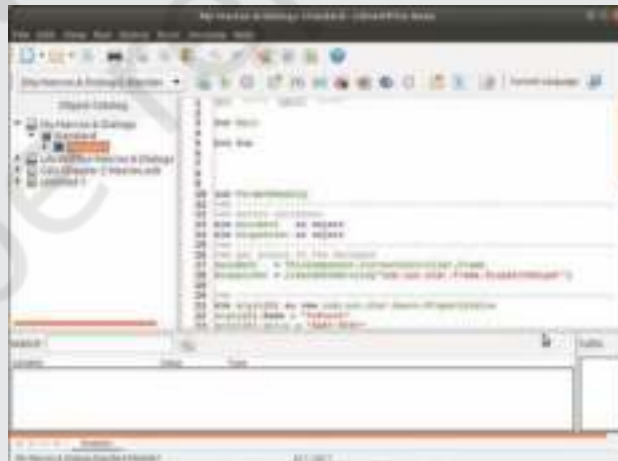
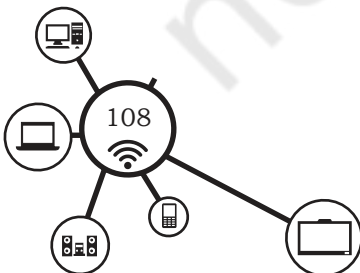


Fig. 5.7: Code generated for macro in IDE

Warning – Do not make any changes to the code unless you are aware of the language.

Note – The code of a macro begins with Sub followed by the name of the macro and ends with End Sub .



Creating and Organising a Simple Macro

Till now we have learned to record, store and run the macro. The recorded macro is internally stored as instructions written in a programming language that are executed when the macro is executed or run.

We selected a library or module to store our recorded macro, similarly while creating a macro, either create a new library/module or edit an existing module stored in a library. Use the following steps to organize the macro.

Step 1. Click on **Tools > Macros > Organize Macros > LibreOffice Basic** to open the LibreOffice Basic Macro dialog window as shown in Fig. 5.8.

Step 2. Click **Organizer** to open the Basic Macro Organizer dialog as shown in Fig. 5.9.



Fig. 5.8: Basic Macro dialog window



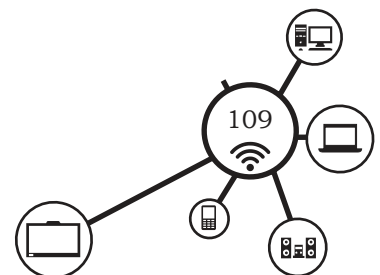
Fig. 5.9: LibreOffice Basic Macro Organizer

Create a library to store a macro

To create a new library containing modules, click on **Library > New**.

Use the following steps to create a module to store a macro.

Choose the **Modules** Tab and select a **Module**. Click on **New** to create a new Module.



Practical Activity 5.3

Create a simple Macro using BASIC programming instructions that will display Hello in a dialog box stored in the Standard module as shown in Fig. 5.10 when executed.



Fig. 5.10: A Dialog Displaying Hello using macro

- Step 1. Open the LibreOffice Basic Macro dialog box using **Tools > Macros > Organize Macros > LibreOffice Basic**.
- Step 2. From the **Basic Macros dialog box** select **Organizer**
- Step 3. From **Modules** tab, select **My Macros** folder and click on **New** button as shown in Fig. 5.11.



Fig. 5.11: Creating a Module with name Hello

- Step 4. Give a name to the New Module say 'Hello' and click **Ok**. You will see **Hello** under Standard Library in **My Macros** Library.



Fig. 5.12: Module Hello in Basic Macro Organizer Dialog

- Step 5. Select Hello and click **Edit** (Fig. 5.12) to open the Integrated Development Environment (IDE). It is a text editor that allows you to create and edit macros. Type Print "Hello" between Sub Main and End Sub as shown in Fig. 5.13.

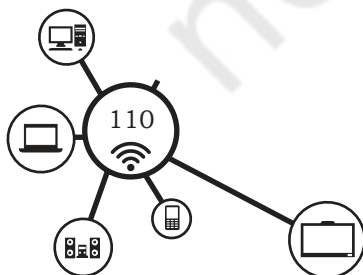




Fig. 5.13: Code of Hello Macro

The created module can be executed as explained in the previous section. Besides, the module can be executed from the IDE by either clicking the Run button or pressing F5.

Macro as a Function

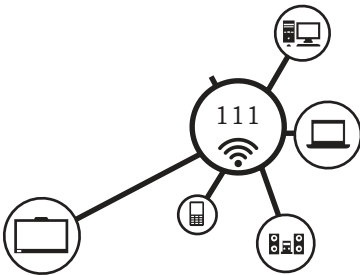
Consider a situation wherein you need to perform calculations that are repetitive in nature. Assume that the same formula needs to be applied to different data in different sheets and there is no predefined function for it. In such a situation will it not be convenient if we could create a macro that performs the calculations? It will save us the effort of remembering and typing the formulas. It is possible to do so if we use Macro as a function. Instead of writing instructions in between Sub and End Sub, we can write instructions in between Function and End Function. A function is capable of accepting arguments or values. It can perform operations on the arguments, perform calculations and return the result.

Practical Activity 5.4

Calculate the number of tiles required for flooring of a room using macro as a function. The length and width of the room and the length and width of a tile is entered in the sheet as shown in Fig. 5.14.

	A	B	C	D	E
	Length of the room (in feet)	Width of a room (in feet)	Length of a tile (in feet)	Width of a tile (in feet)	Number of tiles required for the room
1	10	10	2	2	
2	18	24	4	4	
3	12	14	3	2	
4	30	40	5	5	

Fig. 5.14: Sheet storing length and width of floor and tile



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- Step 1. Enter data in a sheet and save it with the name as *Calculatetiles.ods*
- Step 2. Select **Tools > Macros > Organize Macros > LibreOffice Basic** to open the LibreOffice Basic Macros dialog.
- Step 3. Choose *Calculatetiles.ods*. Click on New and type a name. We have named it as Calctiles as shown in Fig. 5.15 and press **OK**.



Fig. 5.15: Creating a New Module to define function

- Step 4. Write a function to calculate the number of tiles. A function starts with Function followed by the name of the function and then the statements to calculate area of the floor, tiles and number of tiles and store the final result in the name of the function as shown in Fig. 5.16. Press the **Save** button on the toolbar or press **Ctrl+S**.



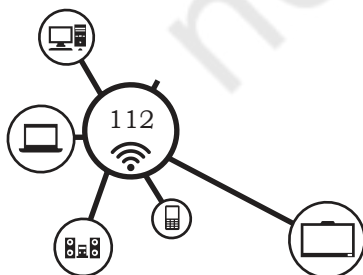
Fig. 5.16: IDE showing function definition to calculate number of tiles

Note: The text in grey is preceded by ' (single quote) indicating it is a comment. A comment is written to write descriptive text to support the code.

- Step 5. Use the function in the sheet as shown in Fig. 5.17.

Length of the room (in feet)	Width of the room (in feet)	Length of a tile (in feet)	Width of a tile (in feet)	Number of tiles required for the room
10	10	2	2	=NUNTILES(A3,B3,C3,D3)
16	24	4	4	
12	14	3	2	
30	40	5	5	

Fig. 5.17: Sheet using Macro as a function



- Step 6. Use fill handle to drag the function for other cells. The final sheet is shown in Fig. 5.18.



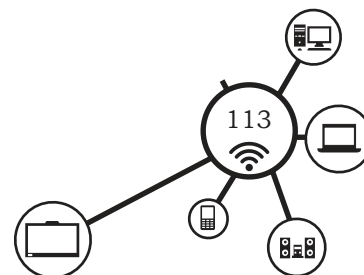
Length of the room (in feet)	Width of the room (in feet)	Length of a tile (in feet)	Width of a tile (in feet)	Number of tiles required for the room
10	10	2	2	25
18	14	4	4	33
12	14	3	2	28
20	40	5	5	4

Fig. 5.18: Displaying Number of tiles using Macro as a function

Check Your Progress

A. Multiple choice questions

- Macro Recordings can be enabled from the _____ option in the menu bar.
 - Sheet
 - Data
 - Tools
 - Window.
- Which of the following is an invalid Macro Name?
 - 1formatword
 - format word
 - format*word
 - Format_word.
- Which of the following Libraries contains modules with prerecorded macros and should not be changed?
 - My Macros
 - LibreOfficeMacros
 - Untitled1
 - Test.
- Identify which of the following is a programming Language?
 - Calc
 - BASIC
 - Writer
 - Macro.
- The Module can be executed from the IDE by pressing _____.
 - F3
 - F4
 - F5
 - F6
- Which of the following is the default name of the Macro _____.
 - Default
 - Main
 - Macro1
 - Main_Macro



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B. Fill in the blanks

1. _____ library is automatically loaded when the document is opened.
2. IDE stands for _____.
3. Macro as a function is capable of accepting _____ and returning a _____.
4. Macro _____ allows us to add, delete a module.
5. The code of macro begins with _____ followed by the name of the macro and ends with _____.
6. By default a macro is saved in the _____.

C. State whether the following statements are True or False

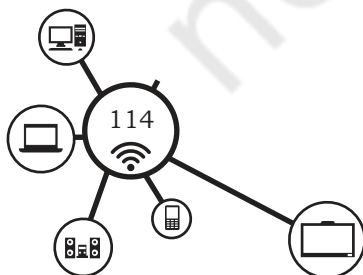
1. Macro is a group of instructions executing a single instruction.
2. Once created, Macro can be used any number of times.
3. By default, the Macro recording feature is turned on.
4. It is not possible to stop recording of a Macro.
5. Every Macro should be given a unique name.
6. A macro once created can be edited later.

D. Answer the following questions

1. What is a Macro? List any two real life situations where they can be used.
2. List the actions that are not recorded by a macro.
3. How is LibreOffice Macros Library different from my Macros?
4. Differentiate between predefined function in Calc and Macros as a function
5. List the rules that should be kept in mind while naming a macro.
6. Give any one advantage of macros.

Lab Exercises

1. Record a Macro that performs Bold, Underline on the Heading in Cell A1. Give macro the name BoldunderlineA1 and save it in a New Module named Basic Formatting which is created in a New Library named DocumenHeadingA1.
2. Record a Macro that creates a bar chart for data stored in cells A2 – A9 and K2 to K9.
3. Run the macro recorded in (i) and display a barchart for the following data showing Minimum and Maximum temperature from 2010-2017.



		A	B	C	D	E	F	G	H	I	J	K
	Year	Annual -Min	Annual -Max	Jan- Feb- Min	Jan- Feb- Max	Mar- May- Min	Mar- May- Max	Jun- Sep- Min	Jun- Sep- Max	Oct- Dec- Min	Oct- Dec- Max	
1	2010	20.15	30.13	14.51	25.96	22.09	33.47	23.57	31.43	17.42	27.78	
2	2011	19.58	29.82	13.84	25.33	20.68	32.07	23.56	31.55	17.16	28.23	
3	2012	19.54	29.81	13.68	25.03	20.78	32.33	23.68	31.77	16.8	27.88	
4	2013	19.83	29.81	14.38	25.58	21.14	32.58	23.61	31.33	16.82	27.83	
5	2014	19.77	29.72	14.26	24.9	20.66	31.82	23.8	32	17.2	27.81	
6	2015	19.96	29.9	14.53	25.74	20.91	31.68	23.62	31.87	17.75	28.27	
7	2016	21.28	31.63	16.17	28.33	23.15	34.57	24.61	32.28	18.37	30.03	
8	2017	21.17	31.42	15.72	27.95	22.68	34.13	24.58	32.41	18.73	29.69	

Source: <https://data.gov.in/resources/seasonal-and-annual-minmax-temp-series-india-1901-2017>

Collect information about the population of the South Asian countries from the Internet and store it in a Calc sheet. Run the Macro created in (i) to display a chart for the data stored.

Create Macro as a function to calculate Amount to be paid after a 5% discount. A sample sheet for the same is given below.

		A	B	C	D	E
			Price per unit	No. of units	Total amount after 5%	
1	Item name					
2	1Toothpaste		35	150		
3	2Tooth brush		15	120		
4	3Mouthwash		120	80		
5	4Sanitizer		50	150		

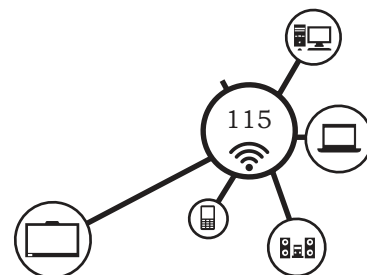
Fig. 5.19: Lab Exercise 5

4. Anuja has to create a Marks list for every term. The format is as follows :

		Mark List														
Roll No.	Student Name	English			Hindi			Maths			Science			Social Science		
		50	100	150	50	100	150	50	100	150	50	100	150	50	100	150

Fig. 5.20: Sample Sheet for Marks Entry

- (a) Record two macros to create the format given in Fig. 5.20.
- (b) To enter names of students in the list so that she doesn't need to retype or copy the names
- Run the above created macros for a new sheet.
5. Use Macro as a function to calculate Mileage of a vehicle. Mileage (in km/L) is calculated as Distance Travelled (in km)/ Fuel filled (in Litre). Create a sheet with three columns Distance Travelled (in Km), Fuel filled (in L) and Mileage (in km/L).



INTRODUCTION

We have learned in Class IX to organise the data in a spreadsheet. Let us take a situation where the marks scored by each student of three terms in three terminal examinations are stored in three different sheets Term1, Term2, Term3. Now to generate final result in single result sheet by finding the average marks of each subject, what would be the ideal solution?

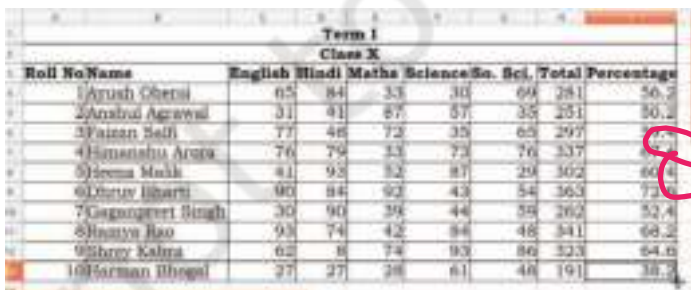
Retyping or copying the marks can be one solution but it will be time consuming and also there are chances of committing typing errors.

Instead, the ideal solution will be to find a way to refer the marks stored in the sheets Term1, Term2 and Term3. In this manner, there are nearly no chances of errors and if the marks of a subject are changed, they will be reflected and thus ensuring correctness while performing calculations, such as calculating average.

In this chapter, we will learn how to create multiple sheets, and also to link the data in multiple sheets. It can be done in two ways, one is creating reference to other sheets/documents by using keyboard and mouse, and other is by linking external data.

Setting up Multiple Sheets

Let us consider a worksheet storing marks of the first term in a sheet named Term1 as shown in Fig. 6.1.



Roll No	Name	English	Hindi	Maths	Science	Soc. Sci.	Total Percentage
1	Aarush Choudhary	85	84	33	30	69	56.2
2	Anshul Agrawal	31	41	87	57	35	55.1
3	Faizan Bhatti	77	46	72	35	65	59.0
4	Himanshu Arora	76	79	33	73	76	53.7
5	Heena Malik	81	93	52	87	29	50.2
6	Omav Bhatti	90	84	92	43	54	56.3
7	Gaganpreet Singh	30	90	39	44	58	52.4
8	Shravya Rao	93	74	42	84	48	54.1
9	Shrey Kalra	62	8	74	93	86	54.6
10	Harman Bhasini	27	27	28	61	48	38.2

Fig. 6.1: Marks scored by students in Term1

To add a new sheet in the spreadsheet, click on the Add Sheet by clicking on the (+) sign located in the left bottom of the spreadsheet.

Alternatively, you can right click anywhere on the sheet tab and select Insert sheet option from the drop-down list displayed as shown in Fig. 6.2. It gives us a choice to put the new sheet, assign the name of the sheets, delete a sheet and so on.

Note: Insert Sheet dialog box can be invoked from the menu option **Sheet > Insert Sheet**

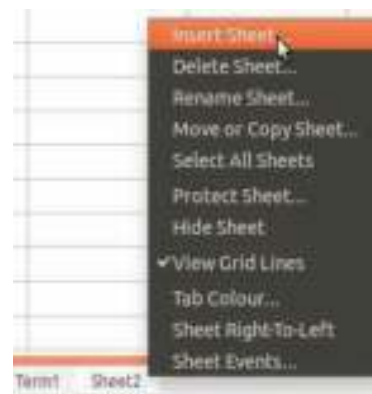


Fig. 6.2: Inserting a new sheet using context menu displayed after right click option

Practical Activity 6.1

Add a new sheet to store data for Term2 in the spreadsheet by using the Insert Sheet Dialog box.

- Step 1. Open the **Insert Sheet** Dialog and add a sheet after the current sheet by selecting **After Current Sheet** option. The current sheet is our active sheet which in this case is Term1 as shown in Fig. 6.1.
- Step 2. Name the Sheet as Term2 as shown in Fig. 6.3.

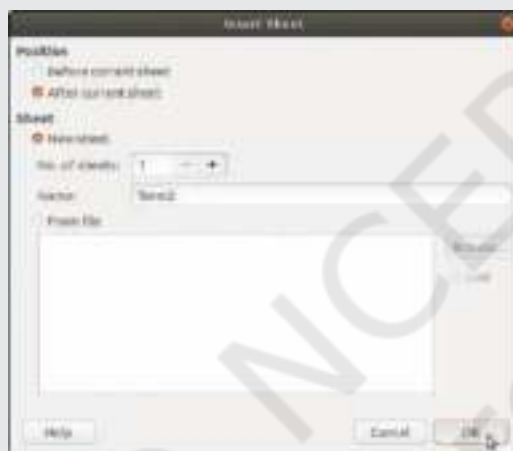


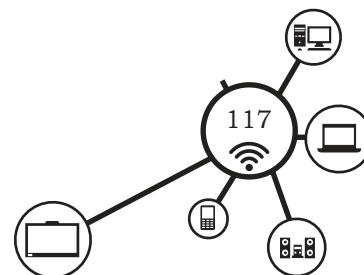
Fig. 6.3: Insert sheet dialog

- Step 3. Enter the marks obtained by the students in second term in Term2 sheet as shown in Fig. 6.4.
- Step 4. Insert a new sheet and name it as "Result".

Term II							
Class X							
Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total Percentage
1	Aayush Oberoi	60	75	45	45	67	292
2	Anshul Agrawal	40	45	88	54	56	283
3	Faizan Sali	72	44	65	45	65	291
4	Himanshu Arora	71	67	45	65	56	304
5	Heena Malik	56	76	56	67	45	300
6	Ohruv Gharti	76	71	89	56	55	347
7	Ojaspreet Singh	33	83	48	45	56	264
8	Ranya Rao	91	77	47	78	53	346
9	Shrey Kabra	60	40	77	87	84	348
10	Harman Bhogal	34	45	45	71	53	248

Fig. 6.4: Marks scored by students in Term2

Note: You can use the macro created by you in the previous chapter to create the format of the result sheet and populate the name of the student column to save time.



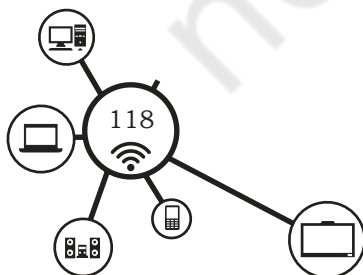
Creating Reference to Other Sheets by Using Keyboard and Mouse

We have been using cell references for applying functions and formulas in class IX. In this section we will learn how to reference cells in other sheets using mouse and keyboard.

To calculate the final result, it is required to store the final marks for each subject in the sheet named “*Result*” inserted in Activity 6.1 by applying the formula (Marks obtained in Term1 + Marks obtained in Term2)/2. As we know that marks obtained in Term1 and Term2 are stored in different sheets named Term1 and Term2 respectively.

To calculate the final marks for English in the cell C4 of Result sheet, as shown in Fig. 6.5, follow the following steps.

- Step 1. First copy the Roll No and Name of the Student from Term1 sheet to Result sheet, copy all headings of and give the name as Final Result.
- Step 2. Click on the = icon next to the input line (or type = in cell C4), type Sum() and click between the brackets.
- Step 3. Now click on the Term1 sheet and click the English Marks for the first student and add (,) comma for the next value
- Step 4. Next click on the Term 2 sheet and click the English Marks for the first student.
- Step 5. To calculate average type /2 after the sum(+) as shown in Fig. 6.5 to calculate average.
- Step 6. Press *Enter key*, the average is displayed in cell C4 of *Result* sheet. Then use fill handle to fill the cells up to the last student’s data.
- Step 7. The result sheet gives the average marks scored by each student in English as shown in Fig. 6.5.
- Step 8. You can copy the same formula for other subjects.



Final Result								
Class X								
Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total	Percentage
1	Ayush Oberoi	62.5						
2	Anshul Agrawal	35.5						
3	Faizan Sali	74.5						
4	Himanshu Arora	73.5						
5	Heena Malik	48.5						
6	Dhruv Bhatti	63						
7	Gaganpreet Singh	31						
8	Ramya Rao	92						
9	Shrey Kabra	61						
10	Harman Bhogal	30.5						

Fig. 6.5: Result sheet after referencing the data from Term1 and Term2 sheets

Any changes made to marks in Term1 and Term2 sheet will be reflected in the result sheet as well. That is how the sheets are linked together.

We had selected cell reference by clicking on the cells. An alternative could be to type the reference. First, we need to understand how referencing is performed across sheets in the same spreadsheet document.

Hence, to refer to a cell in another sheet precede the cell reference with a '\$' sign. It is then followed by the name of the sheet in ' ' (single quotes) followed by a . (dot) and then the cell address. For example, to refer a cell C4 of sheet named Term1 we will type:

\$'Term 1'.C4

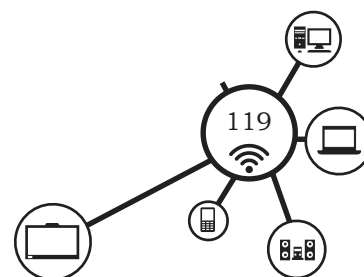
Note: Single quotes (' ') are used as there is a space between Term and 1 in the sheet name.

Let's Practice– Calculate Final marks for all the subjects by referencing with Keyboard for one of the columns and mouse for other columns.

Creating Reference to Other Documents by Using Keyboard and Mouse

In the previous section we had created references to other sheets in a spreadsheet. Sometimes we may intend to reference sheets stored in another spreadsheet file.

Let us consider a situation where it is required to create a Summary report consisting of the average of result sheets for each section of a class. To do so, we need to insert sheets that are stored in different files. Fig. 6.6 shows the final result of class X-A and Fig. 6.7 shows Final Result of class X-B.



Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total	Percentage
1	Arushi Ghosh	62.5	78.5	78	37.5	65	286.5	57.3
2	Anshu Agrawal	35.5	43	87.5	55.5	45.5	267	53.4
3	Arushi Singh	74.5	40	68.5	40	65	248	49.6
4	Anamika Arora	72.5	73	39	69	84	307.5	61.5
5	Shera Malik	46.5	84.5	54	37.5	37	200	40
6	Dhruv Bhatt	83	77.5	80.5	69.5	54.5	365	73
7	Chandni Singh	31	86.5	43.5	44.5	57.5	263	52.6
8	Kavya Rao	92	75.5	44.5	81	50.5	343.5	68.7
9	Shrey Kabra	81	24	75.5	90	85	355.5	71.1
10	Hemant Singh	20.5	30	38.5	60	50.5	199.5	39.9

Fig. 6.6: Result of class X-A stored in Result-X-A spreadsheet

Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total	Percentage
1	Harshit	57	97	54	72	90	370	73.2
2	Arvi Chandra	63	40	70	44	50	267	53.4
3	Melika Bhat	69	45	77	53	50	300	60
4	Manish Kaur	30	70	40	69	67	276	55.2
5	Varadha Sharma	90	88	50	70	52	344	68.8
6	Arvi Bhat	55	70	50	45	70	320	64
7	Anamika Arora	85	75	90	40	95	485	97
8	Shrey Kabra	82	61	60	48	84	390	78
9	Shrey Mehta	40	41	47	39	60	227	45.4
10	Chandni Singh	80	70	50	51	75	356	71.2

Fig. 6.7: Result of class X-B stored in Result-X-B spreadsheet

Practical Activity 6.2

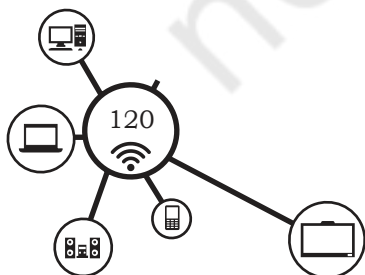
Create Summary of result in a spreadsheet document named *Result Analysis* of class X-A and X-B as shown in Fig. 6.8.

Subject	Highest Score	Lowest Score	Average Score
English			
Hindi			
Maths			
Science			
So. Science			
Percentage			

Fig. 6.8: Result Analysis spreadsheet

Since the marks of both the classes are stored in separate spreadsheet file and Result Analysis itself is a separate spreadsheet, therefore we need to create reference to other spreadsheets.

- Step 1. Open the spreadsheets namely *Result-X-A*, *Result-X-B* and *Result Analysis*.
- Step 2. Click on cell B4 of *Result Analysis* spreadsheet and type =MAX(), as shown in Fig. 6.9.
- Step 3. Click between the brackets of MAX() and then click on the cell range containing marks of English in *Result sheet* of *Result-X-A* spreadsheet.
- Step 4. Type (,) comma and click on the cell containing marks of English in the *Result* sheet of *Result-X-B* spreadsheet.
- Step 5. Press Enter, Maximum of the marks will be displayed in cell B4 as shown in Fig. 6.9.



Result Analysis			
Class X			
Subject	Highest Score	Lowest Score	Average Score
English	95		
Hindi			
Maths			
Science			
Sa. Science			
Percentage			

Fig. 6.9: Displaying the highest score in English using Max function

We had selected cell reference by clicking on the cells in the separate spreadsheet and an alternative could be to type the reference. First, we need to understand how referencing is performed across different spreadsheet files.

To refer to a cell in a different spreadsheet we write in single quotes the path of the file followed by # then the name of the sheet followed by a . (dot) and then the cell address.

For example: 'file:///C:/Users/ADMIN/Documents/X-A.ods'# \$Result.C4

Note : The path of a file has three forward slash ///. A filename can have space within its name hence single quotes (' ') are used. It is also possible to insert a sheet from another file. The **From file** option of **Insert Sheet Dialog box** allows us to insert sheet from another file as well (refer Fig. 6.10).

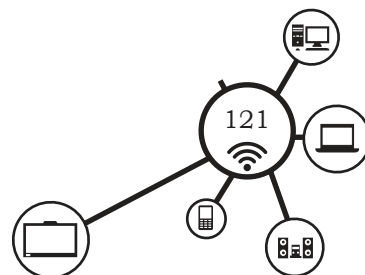
Insert a sheet from an existing file into the current document.

Practical Activity 6.3

- Step 1. To insert the sheet "Result" from Result-X-A spreadsheet in the Result Analysis spreadsheet, open the Result Analysis spreadsheet.
- Step 2. Select **Sheet > Insert Sheet > From File** as shown in Fig. 6.10.
- Step 3. Click on **Browse** button, which will open a file selection dialog box.
- Step 4. Select the file from which you want to import the sheets. After selecting the file, the sheets contained in it are displayed in the list box, as shown in Fig. 6.10. The file path is displayed below this box. Select the sheet to be inserted from the list box.

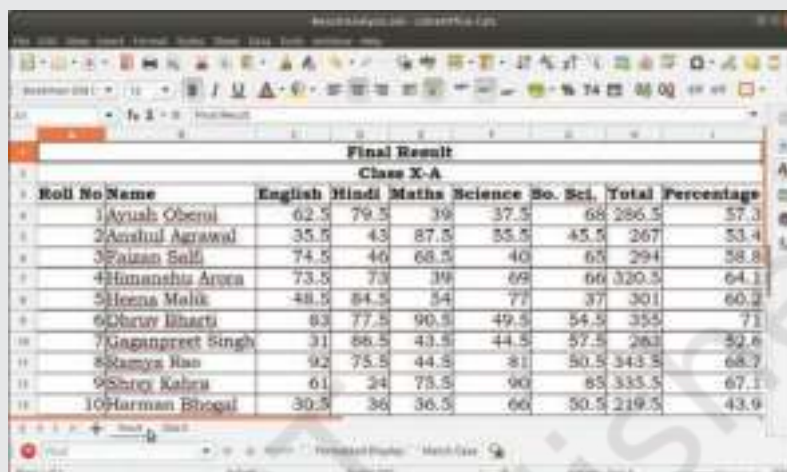


Fig. 6.10: Inserting Result sheet of Result-X-A spreadsheet into Result Analysis spreadsheet



NOTES

- Step 5. Click on the required “**Result**” sheet from the file “**Result-X-A.ods**” as shown in Fig. 6.10.
- Step 6. Check the Link checkbox to ensure that the changes made in the selected sheet “**Result**” are reflected.
- Step 7. Press **OK**. You will find the **Result** sheet added to the sheet tab as shown in Fig. 6.11.



Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total	Percentage
1	Ayush Oberoi	62.5	79.5	39	37.5	68	286.5	57.3
2	Anshul Agrawal	35.5	43	87.5	55.5	45.5	267	53.4
3	Faizan Solt	74.5	46	68.5	40	65	294	58.8
4	Himanshu Arora	73.5	73	39	69	66	320.5	64.1
5	Heena Malik	48.5	84.5	54	77	37	301	60.2
6	Divy Bhatti	83	77.5	90.5	49.5	54.5	355	71
7	Kingspreet Singh	31	86.5	43.5	44.5	57.5	263	52.6
8	Samya Ran	92	75.5	44.5	81	50.5	343.5	68.7
9	Srey Kabra	61	24	78.5	90	85	338.5	67.7
10	Harman Bhogal	30.5	36	36.5	60	50.5	213.5	42.7

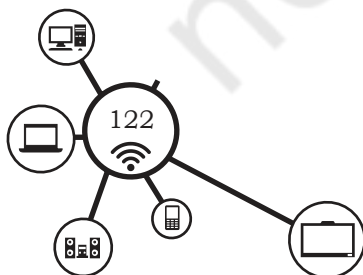
Fig. 6.11: Result sheet added to the sheet Tab of ResultAnalysis

You could have also copied and pasted data but linking a sheet allows us to always have access to “live” data from another spreadsheet. A “live” data means that the data is always the same as in the original file.

The links can be updated by selecting **Tools > Options > LibreOffice Calc > General > Updating**, as shown in Fig. 6.12, whenever the file is opened to ensure that you have access to the updated data always.



Fig. 6.12: Selecting online update option



Hyperlinks to the Sheet

Sometimes it is required to jump to a document stored at a different location from within a document. It can be done by creating a hyperlink. It is possible to jump from a sheet in the same spreadsheet, different spreadsheet or a website by creating a hyperlink.

Relative and Absolute Hyperlinks

A hyperlink can be either *absolute* or *relative*. An absolute hyperlink stores the complete location where the file is stored. So, if the file is removed from the location, absolute hyperlink will not work. For example: C:\Users\ADMIN\Downloads\try.ods is an absolute link as it defines the complete path of the file.

A *relative* hyperlink stores the location with respect to the current location. For example: Admin\Downloads\try.ods is a relative hyperlink as it is dependent on the current location and thus the folder admin is searched where the active spreadsheet is being stored. If the complete folder containing the active spreadsheet is moved the relative link will still be accessible as it is bound to the source folder where the active spreadsheet is stored.

Creating Hyperlinks

It is possible to hyperlink a sheet of other spreadsheet document in a spreadsheet. Suppose, you have to hyperlink a *Result* sheet of “Result-X-A” spreadsheet document in the “Result-X-B” spreadsheet document, then follow the following steps:

Step 1. Open the Result-X-B spreadsheet document.

Step 2. From the main menu, select and click on **Insert > Hyperlink**. An Hyperlink dialog box will open as shown in Fig. 6.13.

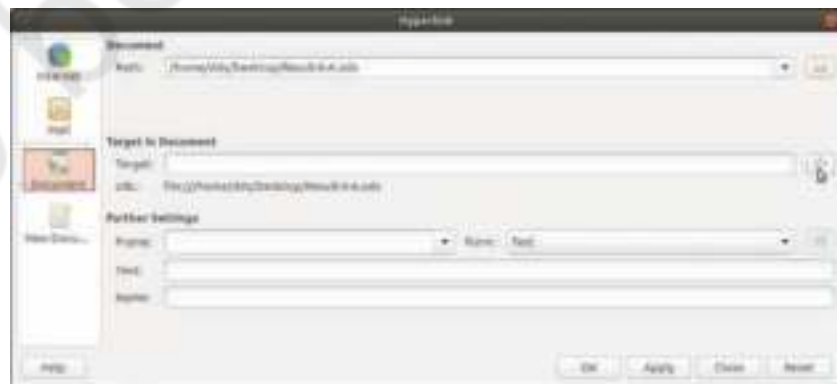
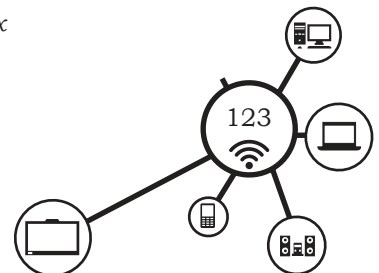


Fig. 6.13: Hyperlink dialog box



- Step 3. To insert the spreadsheet document, click on the **Document** on the left pan of dialog box, then to select the spreadsheet document, click on the button located after the Path. Select the required document. In our case we select the spreadsheet document “Result-X-A”.
- Step 4. Then click on the **Target** button to choose the sheet which is to be hyperlinked. *Target in Document* helps to specifically choose a target in the document such as sheet, tables, frames, images, headings and so on. Here in our case we will select the sheet *Result* as shown in Fig. 6.13.
- Step 5. Click on **Apply** and **Close** button to exit the Target Document window.
- Step 6. Enter the text in the Text box to assign the hyperlink to that text. In our case we have entered the text as “Result-X-A” as shown in Fig. 6.14. So the hyperlink will be assigned to the text “Result-X-A”.

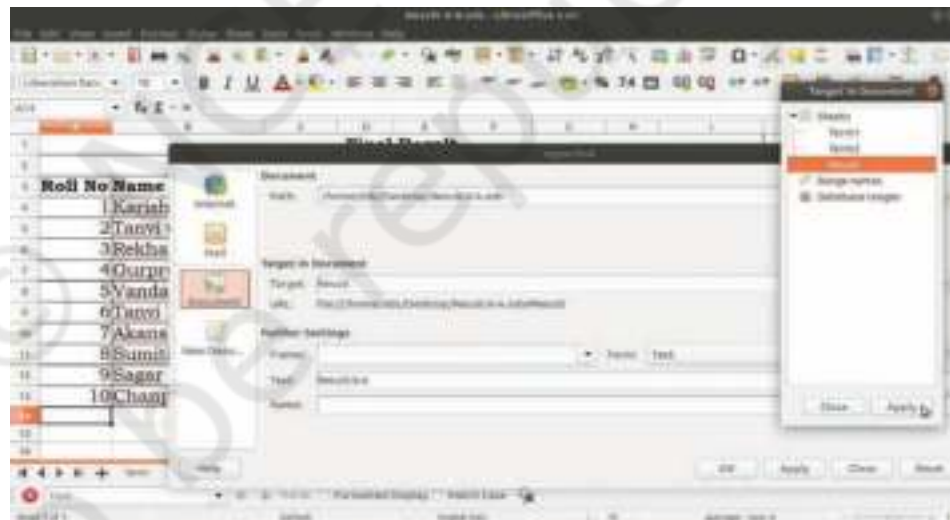
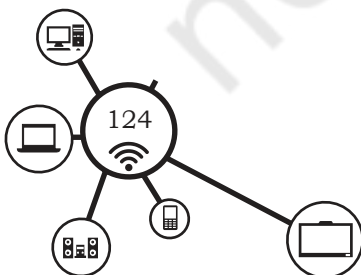


Fig. 6.14: Specifying Target and Text for inserting a Hyperlink

- Step 7. Click on **Apply** and **Close** button to confirm the changes and exit the Hyperlink dialog box.
- Step 8. Observe that the hyperlink is assigned to the word “Result-X-A” as shown in Fig. 6.15.



Final Result							
Class X-B							
Roll No	Name	English	Hindi	Maths	Science	So. Sci. Total Percentage	
1	Karishma	62.5	97	54	72	96.181.5	76.1
2	Tamni Chawla	35.5	49	78	44	55.264.5	52.9
3	Hekha Bahu	74.5	45	77	52	56.305.5	61.1
4	Gaganpreet Kaur	73.5	79	65	69	67.153.5	70.7
5	Vandana Bama	48.5	88	56	78	52.322.5	64.5
6	Tamni Bhoja	83	76	58	43	76.338	67.6
7	Akansha Alori	31	78	93	49	95.346	69.2
8	Sumit Kacharia	92	61	65	48	84.350	70
9	Sagar Mehra	61	41	47	39	68.256	51.3
10	Harpreet Singh	30.5	76	56	51	75.288.5	57.3

Fig. 6.15: Hyperlink inserted in the spreadsheet

Step 9. To open the hyperlinked sheet, press the **Ctrl** key and click on the hyperlinked word “Result-X-A”, the sheet will be opened in the new window as shown in Fig. 6.16.

Final Result Class X-A								
Roll No	Name	English	Hindi	Maths	Science	So. Sci.	Total	Percentage
1	Ayush Oberoi	62.5	79.5	38	37.5	68	266.5	57.5
2	Anshul Agrawal	35.5	43	87.5	55.5	45.5	267	53.4
3	Pranav Sethi	74.5	46	66.5	40	65	294	58.8
4	Himanshu Arora	73.5	73	39	69	66	320.5	64.1
5	Sijerna Malik	48.5	84.5	54	77	37	301	60.2
6	Charvi Bhatia	83	77.5	90.5	49.5	54.5	355	71
7	Gaganpreet Singh	31	86.5	43.5	44.5	57.5	263	52.6
8	Ramya Rao	92	75.5	44.5	81	50.5	343.5	68.7
9	Shrey Kakra	61	24	75.5	90	85	335.5	67.1
10	Haman Bhoja	30.5	36	36.5	66	50.5	219.5	43.9

Fig. 6.16: Hyperlinked sheet open in new window

Let's Practice

Create a Hyper link to Result Analysis spreadsheet.

Editing a Hyperlink

To edit an existing link, place the cursor anywhere in the link and right click the hyperlink. A context menu will be displayed as shown in Fig. 6.17.

Click on **Edit Hyperlink...**, the Hyperlink dialog box will be displayed, where you can make changes to the hyperlink.

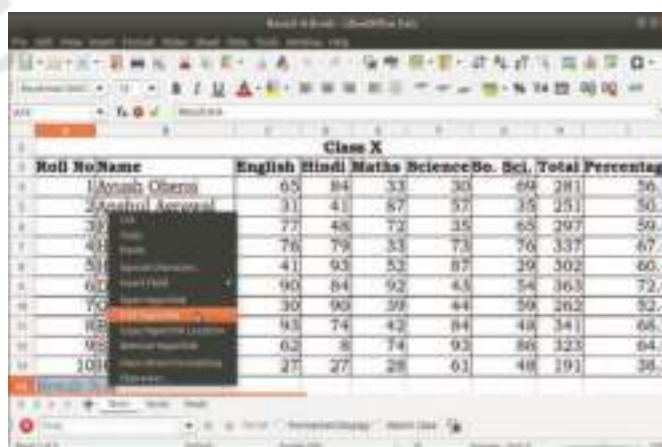
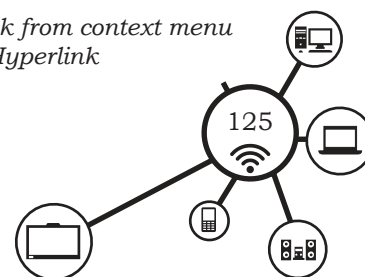


Fig. 6.17: Selecting Edit Hyperlink from context menu on right clicking the Hyperlink



On clicking the **Remove Hyperlink** option, the link will be removed from the text and thus it will not point to any other location.

Linking to External Data

Internet is a rich source of information, which is stored in the form of web pages. The web pages are written in HTML documents. Data on a web page can be stored in the form of tables.

The versatility of a spreadsheet allows us to insert tables from HTML documents into Calc. To insert the tables from a HTML document, we can use the External Data Dialog box. The steps for the same are given below.

- ✓ Step 1. Open the spreadsheet where external data is to be inserted.
- ✓ Step 2. Select the cell to store the first cell of the table in the external data.
- ✓ Step 3. Select **Sheet > Link to External Data**.
- Step 4. **The External Data dialog box** is displayed as shown in Fig. 6.18. Type the URL of the source document or select it from the drop-down list if it is listed and press enter.
- Step 5. A dialog box is displayed to select the language for import as shown in Fig. 6.18. Selecting Automatic shows data in the same language as in the webpage.



Fig. 6.18: Selecting language to import for the webpage

Let us Practice

✓ Create a Hyper link to Result Analysis spreadsheet.

From the Available Tables/Ranges list, choose the desired table. If you choose HTML_all option, then the entire HTML document is selected. Here in our example suppose we select HTML_10 table to insert as shown in Fig. 6.19.

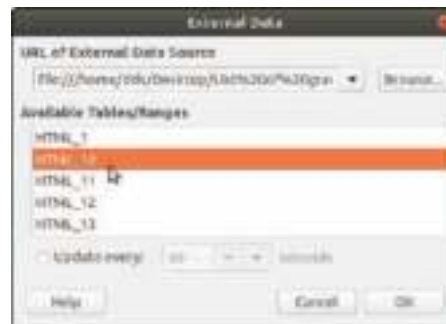
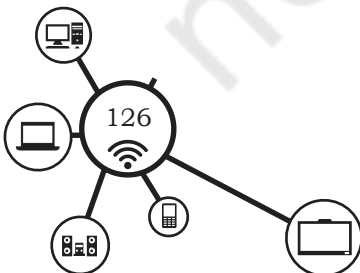


Fig. 6.19: Inserting a table from a webpage

DOMESTIC DATA ENTRY OPERATOR – CLASS X



The table is inserted in the spreadsheet as shown in Fig. 6.20.

[illegible]

Fig. 6.20: *HTML_10* table inserted from the webpage https://en.wikipedia.org/wiki/List_of_gravitationally_rounded_objects_of_the_Solar_System#Planets

Linking to Registered Data Sources

LibreOffice Calc allows us to link spreadsheet documents with databases and other data sources. The data source needs to be registered with LibreOffice. Registration is a means to inform LibreOffice about the type of data source and the location of the file. We will restrict our discussion to LibreOffice Base. The extension of LibreOffice Base is **.odb**. You will learn about LibreOffice Base in detail in Unit 3. You can access a variety of databases and other data sources and link them to Calc documents. To register a data source that is in *.odb format, follow the steps given below.

- Step 1.** Select **Tools > Options > LibreOffice Base > Databases.** The **Options - LibreOffice Base-Databases** dialog box appears.
- Step 2.** Click the New button to open the **Create Database Link** dialog box as shown in Fig. 6.21.

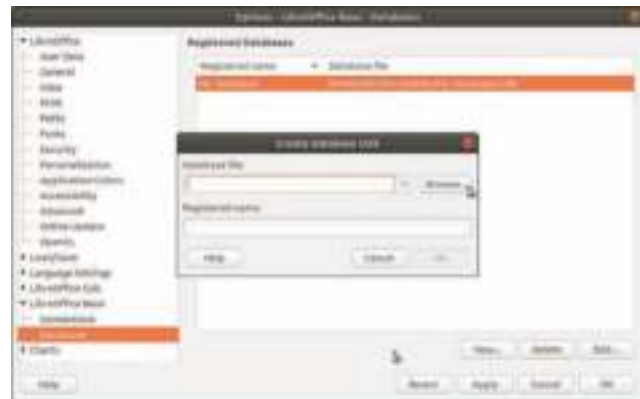
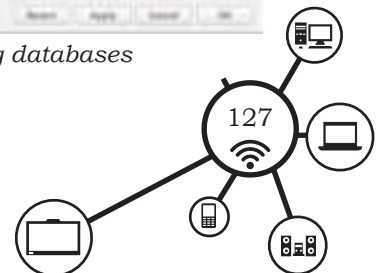


Fig. 6.21: Registering databases



NOTES

Step 3. Enter the location of the database file, or click **Browse** to open a file browser and select the database file.

Step 4. Type a name to use as the registered name for the database and click **OK**. The database is added to the list of registered databases.

Note – The **OK** button is enabled only when both fields are filled in.

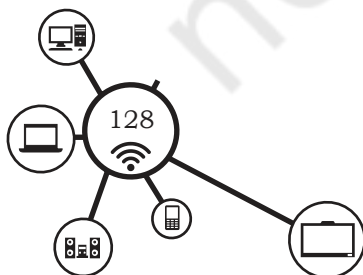
Check Your Progress

A. Multiple choice questions

1. Insert Sheet dialog can be invoked from _____.
(a) sheet
(b) insert
(c) tools
(d) Windows
2. _____ refers to cell G5 of sheet named My Sheet.
(a) \$My Sheet.'G5'
(b) \$My Sheet_'G5'
(c) \$ 'MySheet'.G5
(d) \$ 'MySheet'_G5
3. The path of a file has _____ forward slashes.
(a) four
(b) three
(c) two
(d) one
4. Which of the following feature is used to jump to a different spreadsheet from the current spreadsheet in LibreOffice Calc?
(a) Macro
(b) Hyperlink
(c) connect
(d) Copy

B. Fill in the blanks

1. A relative hyperlink stores the location with respect to the _____ location.
2. While inserting tables from a webpage _____ selects the entire HTML document.
3. The extension of LibreOffice base is _____.
4. _____ are used to enclose sheet names as there might be a space within sheet names.
5. The From file option of _____ Dialog box allows to insert sheet from another file.



C. State whether the following statements are True or False

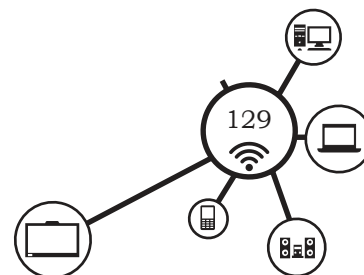
1. A sheet can only be added before the current sheet.
2. If 'sales' sheet has a reference to 'cost' sheet then any changes made to 'cost' sheet will be reflected in the sales sheet as well.
3. It is not possible to link a sheet as a reference in another sheet.
4. We can insert data from a table created on a web page into a spreadsheet.
5. A hyperlink once created on a sheet cannot be deleted.

D. Answer the following questions

1. Name the two ways to link the sheets in a LibreOffice Calc.
2. Differentiate between Relative and Absolute Hyperlink.
3. Write steps to extract a table from a web page in a spreadsheet.
4. Write steps to register a data source that is in *.odb format.
5. State advantages of extracting data from a web page into spreadsheet.

Lab Exercises

1. Create three sheets named Jan, Feb and March. In each sheet store the attendance of employees for a month. Apply count function to count the number of days the employees were present by counting P.
2. Add another sheet named 'Consolidated Attendance' that stores total attendance of three months and calculates the percentage.
3. Create a spreadsheet containing the list of Prime ministers of India with their tenure from the website <https://knowindia.gov.in/general-information/prime-ministers-of-india.php>. Perform steps to extract the table from the website into a Calc Sheet and display the count of Prime Ministers of India till date.



INTRODUCTION

In LibreOffice Calc, one spreadsheet can be used by more than one user at a time by sharing it. A shared spreadsheet is a same sheet that can be accessed by more than one user and can allow them to make changes simultaneously on it. It saves the trouble of keeping track of multiple copies of the same spreadsheet. Sharing allows working in collaboration so that everyone can contribute, make changes and view it.

Sharing Spreadsheet



Fig 7.1: Share Document dialog window

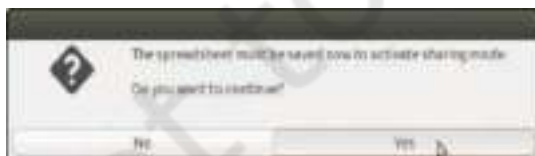


Fig. 7.2: Confirmation dialog window for sharing a spreadsheet

Sharing a spreadsheet is just like a teamwork to work in collaboration with other users. The following are the steps to share the spreadsheet.

Step 1. Open a new spreadsheet and save it with some name.

Step 2. Select and click on **Tools > Share Spreadsheet** from main menu bar. This will open the Share Document dialog window as shown in Fig. 7.1 which can be used to enable or disable sharing option.

Step 3. Click on the checkbox “Share this spreadsheet with other users” to share the spreadsheet and click on **OK** button. This will open the confirmation dialog window as shown in Fig. 7.2 to save the spreadsheet to activate the shared mode.

- Step 4. Click on **Yes** to continue.
- Step 5. Once the spreadsheet is saved, the name of the spreadsheet in the title bar will display (shared) along with the name of the spreadsheet.

NOTES

Practical Activity 7.1

Create a spreadsheet and save it with the name Test_1.ods

- Step 1. Create the spreadsheet with the data and save it with Test.ods, as shown in Fig. 7.3.



Sr	Name	Email
1	Abhi	abc@gmail.com
2	Diya	def@yahoo.com
3	Mona	lmn@hotmail.com
4	Riya	rst@yahoo.com
5	Sia	stu@gmail.com

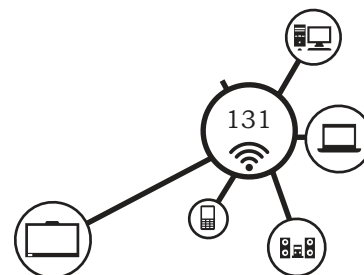
Fig. 7.3: Contents of spreadsheet Test.ods

- Step 2. Select and click on **Tools > Share Spreadsheet** from main menu bar. This will open the Share Document dialog window as shown in Fig. 7.1. Put the check-mark on the check box, “Share this spreadsheet with other users”, as shown in the Fig. 7.1.
- Step 3. Click on the checkbox and then on **OK** button. It will display the Confirmation dialog window to activate the sharing mode as shown in Fig. 7.2. Click Yes to continue.
- Step 4. Observe that shared is added with the name of the document in the title bar as shown in Fig. 7.4.



Sr	Name	Email
1	Abhi	abc@gmail.com
2	Diya	def@yahoo.com
3	Mona	lmn@hotmail.com
4	Riya	rst@yahoo.com
5	Sia	stu@gmail.com

Fig. 7.4: Title bar showing the spreadsheet changed to shared



Opening and Saving a Shared Spreadsheet

Opening a Spreadsheet



Fig. 7.5: Message box while opening shared spreadsheet

To open a shared spreadsheet, follow the following steps.

Step 1. While opening a spreadsheet which is a shared spreadsheet, a message will appear as shown in Fig. 7.5 that the spreadsheet is in shared mode and some of the features are not available to use in this spreadsheet.



Fig. 7.6: Edit menu of shared spreadsheet

Step 2. Click on **OK** button to open the spreadsheet in shared mode.

Step 3. If you don't want this warning option to be displayed again, then check the mark in the checkbox 'Do not show warning again'.

Step 4. Once the spreadsheet is saved in shared mode, some of the features will become unavailable for used.

Step 5. Observe the Edit menu on the main menu bar as shown in Fig. 7.6, that shows Undo, Redo, Repeat, Paste, Links to External files, ImageMap, Object are not available for use.

Saving a Shared Spreadsheet

Follow the steps given below to save a shared spreadsheet:

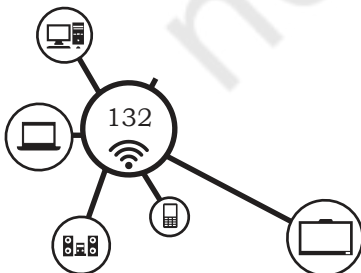
Step 1. After making the changes in the shared spreadsheet, you need to save it before closing the spreadsheet.

Step 2. If two or more users are working at the same time and the changes do not conflict, then the message will appear stating that the spreadsheet has been updated with changes saved by other users.

Step 3. If there is any conflict for the changes, then resolve conflict dialog window will appear.

Step 4. No other user can save the shared spreadsheet when you are resolving the conflicts.

Step 5. If another user is trying to save the shared document and resolve conflicts, then you will be notified with a message that the file is locked. Now, you cannot save it.



Recording Changes

This feature of LibreOffice Calc provides different ways to record the changes made by one or other users in the spreadsheet. While recording the changes, the spreadsheet will turn off its shared feature. Follow the following steps for recording changes:

Step 1. To enable the Record changes, first disable the shared mode of spreadsheet.

Step 2. To disable the shared mode, open the spreadsheet “Test.ods”.

Step 3. Select and click on **Tools > Share Spreadsheet** from main menu bar. This will open the Share Document dialog window. Remove the check-mark on the check box, “Share this spreadsheet with other users”, and click on **OK** button. It will display the Confirmation dialog window to disable the sharing mode. It will give warning to disable the shared mode of a spreadsheet as shown in Fig. 7.7. Click Yes to continue.

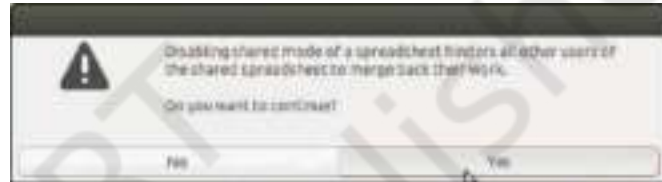


Fig. 7.7: Confirmation dialog window to disable sharing mode of spreadsheet

Step 4. Observe that (shared) word from the name of the spreadsheet has disappeared from the title bar of the spreadsheet.

Step 5. The feature of **Track Changes > Record** under **Edit** menu is turned ON as shown in Fig. 7.8, which was disabled and not working in the shared spreadsheet.



Fig. 7.8: Recording Track changes under Edit menu enabled

Step 6. Now to record track changes, click on **Edit > Track Changes > Record** as shown in Fig. 7.8.

Step 7. Now change name Sia to Sita in cell B5 as shown in Fig. 7.9. Observe that the border colour of the cell in which data has been changed turns to red. Also, the changed cell will display the description if the cursor moves to the changed cell.

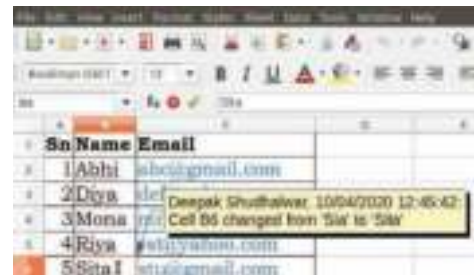
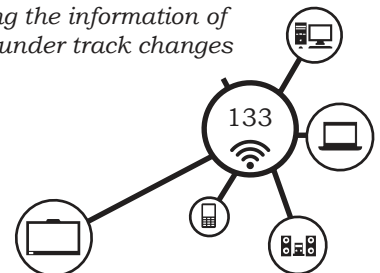


Fig. 7.9: Displaying the information of changes recorded under track changes



Step 8. Thus, by looking at the spreadsheet, other users can easily know the changes made in the cell and the changes made by whom.

Practical Activity 7.2

Assume that you are captain of your school cricket team. Prepare the budget in the spreadsheet for the current academic year. Turn ON the feature **Track Changes > Record** and ask other team members to make necessary changes in the spreadsheet.

Add, Edit and Format the Comments

In Calc, the comments are automatically added. Also, the author or reviewer can add their own comments as well. Follow the following steps to add your comments:

Step 1. Select from main menu bar and click on **Edit > Track Changes > Comment** as shown in Fig. 7.10, to add your own comments.

Step 2. This will open the Add comment window. Enter your comments. Fig. 7.11 shows the comments entered.

Step 3. Now to view the entered comment, click on the cell B6 as shown in Fig. 7.12. It shows the complete description of the comments entered.

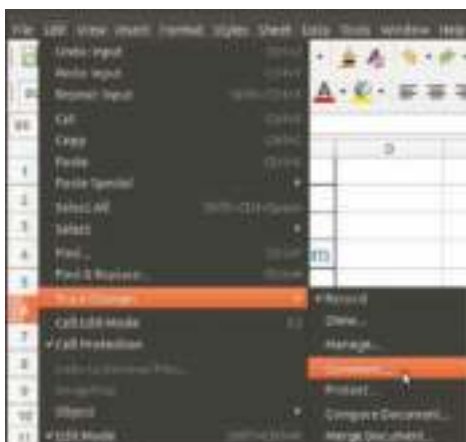


Fig. 7.10: Selecting Comment under Track Changes

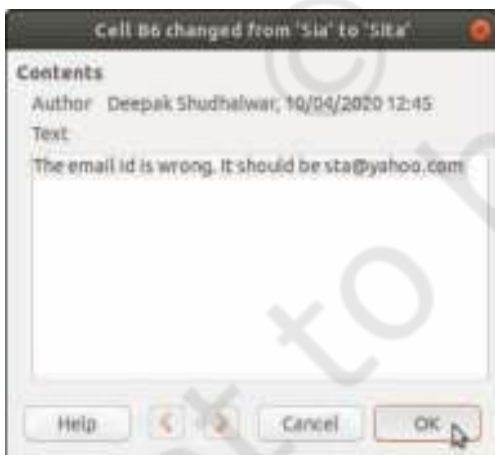


Fig. 7.11: Entering text in Comment dialog window

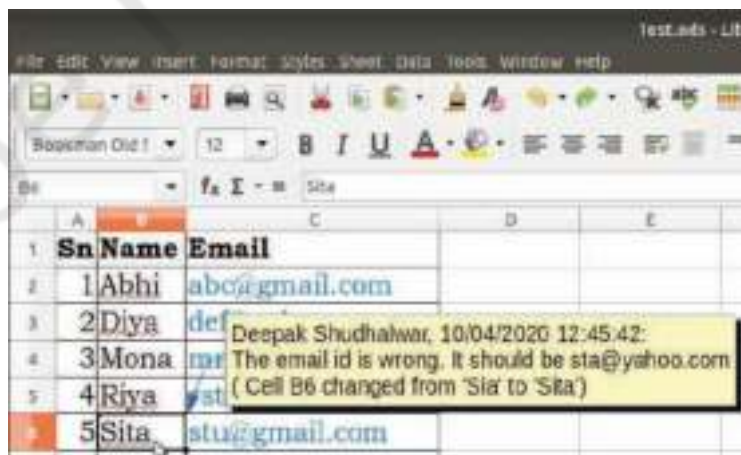
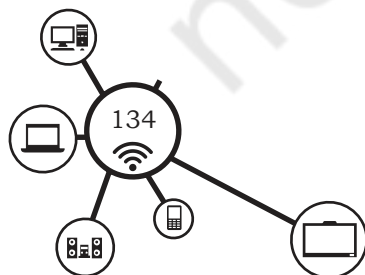


Fig. 7.12: Comment displayed with full description



Step 4. You can also insert comments to a cell. Click on the cell where you want to insert comments. Then select from main menu **Insert > Comment** as shown in Fig. 7.13.

Step 5. This type of comments is known as notes or suggestions in the spreadsheet. The box will appear to write the comment as shown in Fig. 7.14. The comment box shows the comments entered as “Contains only alphabets”. Once this text is typed in the text box, you can observe a coloured dot in the upper-hand corner of the cell where the comment is added using insert comment.

Step 6. Once the comment is added, you can display, edit or delete it. To perform these operations, right click on the cell where you have inserted the comments as shown in Fig. 7.15. Observe the options under pop up menu.

Step 7. Select the “Edit Comment” option to edit the comments. It will take you again to the comment textbox to make any changes.

Step 8. Select “Delete Comment” option to delete the comment.

Step 9. Select the “Show Comment” to view the comment. By selecting this option, the comments will be displayed. Again when you right click on the cell, you will observe that “Hide Comment” option will be activated in place of “Show Comment”. This is because when you are displaying the comments it is already in show mode, which has to be hide.

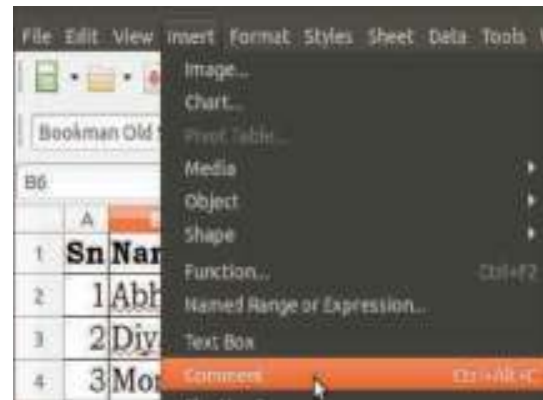


Fig. 7.13: Insert Comment

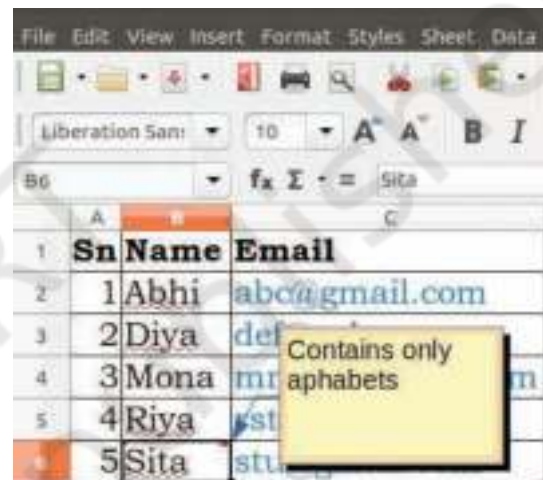
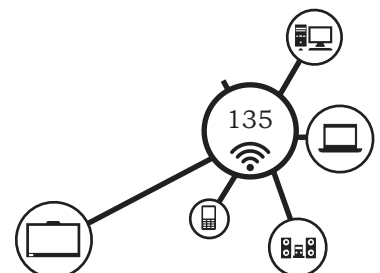


Fig. 7.14: Comments inserted in comment box



Fig. 7.15: Right click menu options after inserting comments



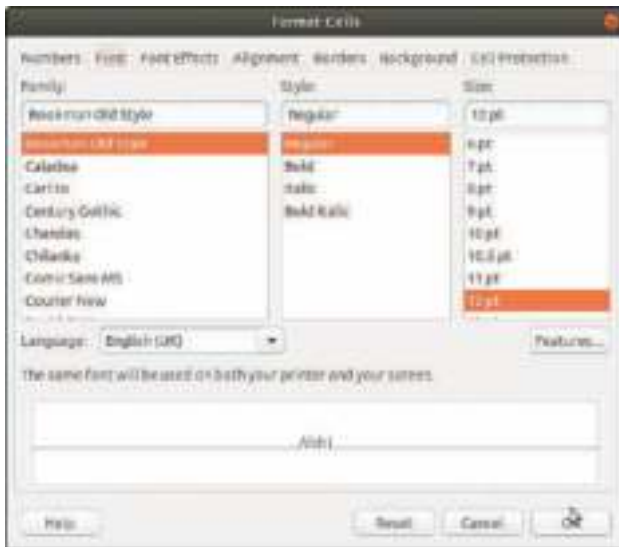


Fig. 7.16: Format Cells dialogue box

Formatting Comment

You can format the comment box, just like formatting the cell contents. It means changing the background colour, border style, and transparency of a comment. Follow the following steps to format the comment.

Step 1. Right click on the cell where the comment is added.

Step 2. Select the option “Format cell”, which will display the **Format Cells** dialogue box as shown in Fig. 7.16.

Step 3. You can apply the various formatting features from its tab such as Font, font Effects, Alignment, Borders, Background and Cell Protection. Change the font, text colour, fill colour, line colour for the comment box as desired and click on OK button to apply the changes. Observe the desired formatting features applied to the comment box.

Let's Practice — Save the spreadsheet with some other name. Turn off the shared feature. Now, make some changes in the spreadsheet. Also, add comments into the changed cells. Try editing comments and format it with different colours.

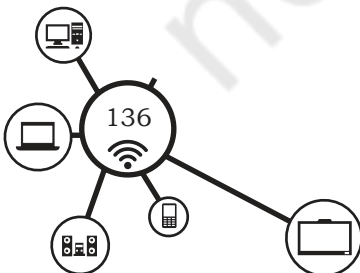


Fig. 7.17: Show Changes Dialog window

Reviewing Changes – View, Accept or Reject Changes

Once the spreadsheet is edited by all the members of the team. It is the final stage before submitting the spreadsheet. In this stage, we will go through the changes to accept or reject to prepare the final spreadsheet after looking at all the changes made by the team members. Follow the following steps to review changes.

Step 1. Select and click on **Edit > Track Changes > Show**. It will open the *Show Changes* dialog window as shown in Fig. 7.17.



- ✗ Step 2. This is used to plan what all changes are to be displayed while reviewing the spreadsheet.
- ✗ Step 2. Click on **Edit > Track Changes > Manage** to accept or reject the changes. It will display the Manage Changes dialog window as shown in Fig. 7.18.
- ✓ Step 3. In this dialog window, click on the line and click on **Accept** or **Accept All** or **Reject All** button to review the changes.
- ✓ Step 4. Click on **Close** button once the review is done.



Fig. 7.18: Manage Changes dialog window to accept or reject changes

Let's Practice — As the changes done by other team members in the Practical Exercise 7.4 has been recorded by the feature in Calc, now you just review those changes and accept or reject the necessary changes done by other team members.

Merging and Comparing

If the same spreadsheet is reviewed by different team members and you have two different versions of the same spreadsheet file. Follow the following steps to merge document.

Practical Activity 7.3

Merge two files

To work on our earlier created spreadsheet Test.ods, save the file Test.ods with another name say Test1.ods and make some changes in the spreadsheet Test1.ods. Now, we have two files that are to be merged.

Step 1. Open the spreadsheet file *Test.ods*. Note the contents of spreadsheet Test.ods in Fig. 7.19. Also note the contents of spreadsheet Test1.ods before merging in Fig. 7.20.



Fig. 7.19: Contents of Test.ods before merging

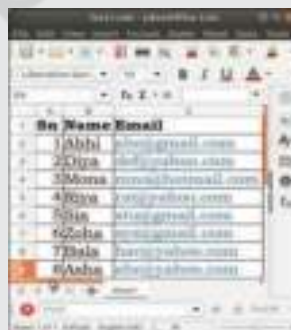
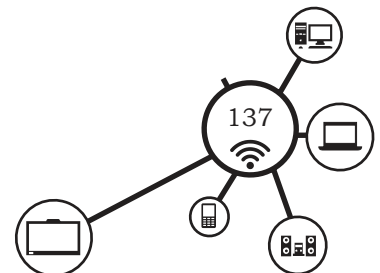


Fig. 7.20: Contents of Test1.ods before merging



NOTES

Step 2. Click on **Edit > Track Changes > Merge Document** as shown in Fig. 7.21.



Fig. 7.21: Selecting Merge Document option

Step 3. Select the spreadsheet file Test1.ods from the **Merge With** dialog window to open the spreadsheet *Test1.ods* to merge with *Test.ods* and Click on **Open** button as shown in Fig. 7.22.

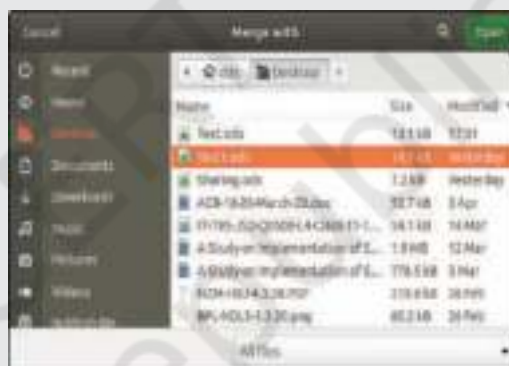


Fig. 7.22: Open the Test1.ods from Merge With dialog window

Step 4. This will open **Manage Changes** dialog window as shown in Fig. 7.23.

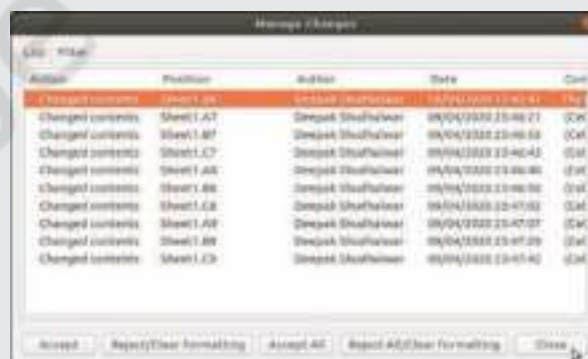
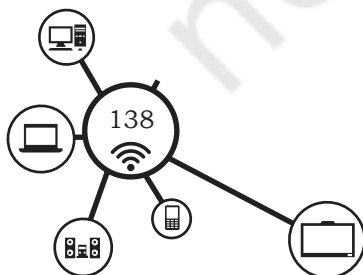


Fig. 7.23: Manage Changes dialog window

Step 5. Click on Accept All as shown in Fig. 7.23. to accept all the changes which is done in the *Test1.ods* spreadsheet to the *Test.ods*.



Step 6. Now open the first spreadsheet Test.ods after merging and observe its contents as shown in Fig. 7.24. Observe that Fig. 7.24 shows the contents of Test.ods and Test1.ods merged.



Sl. No	Name	Email
1	Abhi	abhi@gmail.com
2	Dora	dora@gmail.com
3	Mona	mona@gmail.com
4	Riya	riya@gmail.com
5	Sara	sara@gmail.com
6	Zoha	zoha@gmail.com
7	Bala	bala@yahoo.com
8	Asha	asha@yahoo.com

Fig. 7.24: Contents of Test.ods after merging

Comparing Documents

Instead of merging two spreadsheets, one can compare the two spreadsheets by comparing the documents. Follow the following steps to compare the documents. Let us compare the two earlier created spreadsheets Test.ods and Test1.ods

Step 1. Open the spreadsheet file Test.ods. Click on **Edit > Track Changes > Compare Document** as shown in Fig. 7.25.

Step 2. This will open the **Compare to** dialog window, which will allow to open the spreadsheet to be compared. Select the spreadsheet file Test1.ods and click on **Open** button as shown in Fig. 7.26.

Step 3. This will open the **Manage Changes** dialog window to accept/reject the changes. Click on Accept as shown in Fig. 7.27.

Step 4. Finally click on **Close** button to close the Manage Changes dialog window as shown in Fig. 7.28.



Fig. 7.25: Selecting Compare Document option

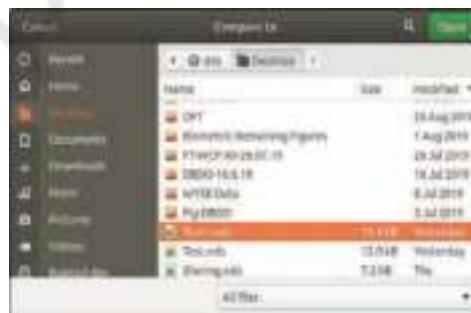


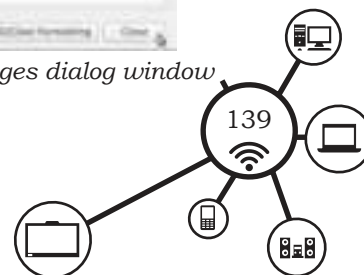
Fig. 7.26: Open Test1.ods from Compare to dialog window



Fig. 7.27: Accepting Manage Changes



Fig. 7.28: Closing Manage Changes dialog window



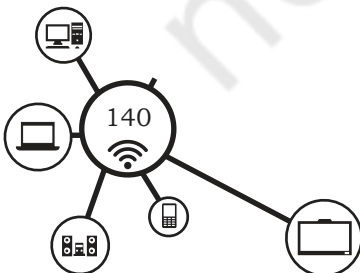
Check Your Progress

A. Multiple choice questions

- Sharing allows to edit the spreadsheet by
 - single user
 - different users simultaneously
 - one by one users
 - one after other users
- Sharing spreadsheet feature allows to save the changes in
 - multiple sheets
 - user's sheet
 - in a same sheet
 - in different sheet
- The Recording Changes feature of LibreOffice Calc provides different ways to record the changes made by _____ in the spreadsheet.
 - one user
 - other user
 - the user
 - one or other users
- In Calc, the comments are added
 - automatically
 - by author
 - by reviewer
 - all of above
- The changes by team members in the spreadsheet can be accepted or rejected by
 - the team members
 - any of the user
 - owner
 - other users

B. State whether the following statements are True or False

- Spreadsheet cannot be shared to work with more than one user?
- Some of the features becomes unavailable when the spreadsheet is in shared mode.
- You can record changes in the spreadsheet when the spreadsheet is opened in shared mode.
- File menu is used to Record changes for the spreadsheet.
- You can add a note or suggestion in the spreadsheet using Insert Comment.
- Formatting comment can be used to change the font colour of the comment.



C. Fill in the blanks

1. The title bar of the document shows _____ along with the filename for the shared mode of the spreadsheet.
2. The shared mode spreadsheet allows _____ users to access and edit the spreadsheet at the same time.
3. Recording changes automatically _____ the shared mode of a spreadsheet.
4. Click on Edit menu, Track Changes and then select _____ to record the changes in the spreadsheet.
5. The border color of the changed cell will be _____.
6. _____ is used to add notes or suggestions to a cell in a spreadsheet.
7. The comment box can be formatted just like formatting the _____ (cell contents).

D. Answer the following questions

1. Define the terms
 - (a) Sharing Spreadsheet
 - (b) Record changes
2. Write the commands to perform
 - (a) Sharing Spreadsheet
 - (b) Record changes
3. Which menu is used to perform the functions
 - (a) Track Changes
 - (b) Saving Spreadsheet
4. What do you understand by reviewing the changes in the spreadsheet?
5. Differentiate between Merging and Comparing Spreadsheet.

Lab Exercise

Anushka and Niyaz have been made the class representative. Anushka has been asked to collect the class assignments for the various subjects. Create a spreadsheet to store the roll number, name of the students and subject names. Perform the following operations so that Niyaz can access the file:

1. Enable Track changes
2. Add comment to show the date on which the assignment has been submitted.
3. Share the document with the class teacher.

