USE OF SPREADSHEET IN BUSINESS APPLICATIONS

Introduction

We have already seen that spreadsheet has numerous possibilities in the business world due to its easy manipulation and analysis of data. It also provides built-in functions for various financial and statistical operations besides basic arithmetical functions. Spreadsheets are put to use by business firms and the corporate world for varied purposes ranging from accounting to presentation of data in the form of graphs and charts for decision making.

Both large and small scale business firms use spreadsheet for the preparation of payroll, asset accounting and loan repayment schedule. Let us discuss how the above areas will come handy for the students of commerce, who can apply these skills in business.

3.1 PAYROLL ACCOUNTING

- The payroll accounting involves all aspects of paying compensation and benefits to employees. Let's examine the various components of pay with the help of the example given below.

Mr. Alen is employed as a clerk in Viswas Ltd. His Basic Pay is ₹ 23,000. His other allowances include :

Dearness Allowance	-	15% of Basic Pay
House Rent Allowance	-	₹ 1,500 per month
Deductions:		
Life Insurance Premium	-	₹ 1,000 per month
Provident Fund	-	8% of Basic Pay

From the example given above, can you list out the various components of salary?

- Basic Pay
- Dearness Allowance
- HRA
-

Let us discuss the components of payroll in detail.

3.1.1. Payroll Components

Earnings

- *Basic Pay (BP)* : It is the pay in the pay scale. It is the fixed amount paid to the employees by their employers based on their work. It is the core of salary and many other components are computed based on this amount.
- *Grade Pay (GP)* : It is the pay to be added to the basic pay according to the category/designation of the employee.
- *Dearness Pay (DP)* : It is that portion of dearness allowance, which has been declared and deemed to have been merged with the basic pay.
- *Dearness Allowance (DA)* : It is a compensation to make up the purchasing power of employees due to price rise. It is granted by the Government periodically as a percentage of basic pay.
- *House Rent Allowance (HRA)* : It is an amount paid to facilitate an employee to enjoy the benefit of a residential accommodation.
- *Transport Allowance (TA)* : It is an amount paid to facilitate an employee to travel between his home and place of work.
- *Other earnings*: It may include any other earnings or allowances such as education allowance, medical allowance, washing allowance, hill tract allowance etc.

Deductions

- *Professional Tax (PT)* : It is the tax levied by the State on the income earned by way of profession, trade or employment. Normally it is collected by the Local Self Government Institutions under which the place of employement falls.
- *Provident Fund (PF)* : It is a statutory deduction made as part of social security. It is decided by the Government under the Employees' Provident Fund Act and is computed as a percentage of basic pay + DA.
- *Tax Deduction at Source (TDS)* : A statutory deduction made on a monthly basis towards income tax liability of an employee.
- *Recovery of Loan Instalment* : Amount of deduction on account of any loan taken by the employee such as PF loan, house loan etc. It may include interest as well as repayment of principal amount.
- *Other deductions* : It may include other deductions not included above such as recovery of advance against salary, deductions on account of festival advance, etc.

The above explanation will light up on the various components of payroll. Now we can proceed with the calculation of Gross Pay (Gross Salary) and Net Pay (Net Salary)

• Gross Pay = The total earnings of an employee before making any deductions.

= Basic pay + Grade pay + DA + HRA + TA + Other Allowances.

• Net Pay = Amount payable to the employee after subtracting all deductions from Gross Pay

= Gross Pay – Total deductions

Total deductions = PF + PT + TDS + Loans + other dedections

Now let us compute the Gross Pay and Net Pay of Mr. Alen, in the example given at the beginning of our discussion.

The Gross Pay of Mr. Alen will be 23000+3450(i.e. 23000 x 15%) + 1500 = ₹ 27,950

Total deductions = 1,000 +1,840 (23,000 x $\frac{8}{100}$)

= ₹ 2,840

The Net Pay of Mr. Alen will be 27,950 – 2,840

= ₹ 25,110

Here, we have seen the Salary/Pay details of an employee. Thus, the Salary/Pay details of all employees of an organisation need to be prepared in the form of a statement. Such a statement is called Payroll and the process of preparing the payroll is called Payroll Accounting.

3.1.2 Template Design in Spread Sheet

Business firms normally use designed templates of spreadsheets for payroll accounting.

• What is a template and why is it designed?

It is a predefined spreadsheet having cells or columns with integrated formulae and customised formats that works according to the instructions provided. The input and output will be consistent because of pre-programming.

Templates are very useful for repetitive tasks where we can save a lot of time. It also helps to input data with better accuracy and sharing of consistent output.

Preparation of Payroll Statement

Let us consider the following example.

Toms Ltd. intends to prepare payroll statement of its employees for August 2017. The table 3.1 shows the details of salary and deductions of each employee under various categories.

> *Basic Pay Earned (BPE) – Basic Pay Earned of an employee is the Basic Pay calculated with reference to Number of Effective Days Present (NOEDP) during the month and "Number of Days in a Month" is denoted by NODM.*
>
> *BPE = BP * NOEDP/NODM*
>
> *Number of Effective Days Present (NOEDP) – is the Number of Days in a Month Minus Leave without Pay minus Unauthorised Absence.*
>
> i.e. NOEDP = Number of Days in a Month – (Leave without Pay + Unauthorized Absence).

Table 3.1 Details of Salary

Sl. No	Name	Post	Basic pay (BP)	HRA
1	IRSHAD	Manager	40000	3% of BP
2	BASIL	Technician	30000	2% of BP
3	ASWIN	Driver	25000	Nil

Dearness Allowance is 20% of basic pay

Deductions:

Provident Fund (PF) is 10% of Basic Pay

State Life Insurance (SLI) is ₹ 500 for all employees

Compute Gross Salary and Net Salary payable to the employees during August 2017 using spreadsheet.

Follow the given steps for the preparation of payroll statement.

1. Open a spreadsheet and enter headings in the cells A1 and A2 as shown in figure 3.1.

2. Give the column headings as Sl. No, Name, Post, BP, DA, HRA, Gross Salary, PF, SLI, Total deductions and Net from cells A9 to K9. Input the given data in the respective cells as shown in figure 3.1.

Fig 3.1 Payroll

3. Enter the following formulae in the respective cells as per the template given below.

Column heading	Cells	Equation	Formulas (syntax) to be enter in the cells
DA	E10	=BP * 20%	=D10*$E$3
HRA	F10	If (Post= "Manager",BP*3%,IF(Post= "Technician",BP*2%,0)	=IF(C10="Manager",D10*$E$4,IF(C10="Technician",D10*$E$5,0))
Gross Salary	G10	=BP+DA+HRA	=SUM(D10:F10)
PF	H10	=BP*10%	=D10*$E$6
SLI	I10	=500	=$E$7
Total deduction	J10	=PF+SLI	=H10+I10
Net	K10	=Gross Salary-Total Deduction	=G10-J10
Total	K13	=sum(net)	=SUM(K10:K12)

4. Select the Range E10:K12 and press Ctrl + D or select E10:K10, and drag and fill the cells E11:K12. Then findout the total values in the 13th row and save the file. See the Payroll statement given in figure 3.2.

Output

Fig 3.2 Payroll Statement

Let us see another example.

PQR Ltd., a computer distribution company wants to prepare Payroll Statement for the month of November 2017. Various components of salary for different category of employees are given in table 3.2.

Sl No	Name	Post	Basic pay(BP)	Grade pay	HRA	TRA	TDS	Loan recovery
1	Archana	Manager	30000	1000	3% of BP	150 pm	1000	3000
2	Naseem	Accountant	20000	500	2% of BP	Nil	300	1000
3	Jubna	Supervisor	16000	Nil	Nil	Nil	0	0

Table 3.2 Various components of Salary

DA is 80% of Basic Pay

Deductions:

Professional Tax (PT)- 1% of gross salary for all employees

Provident Fund (PF) -10% of basic pay for all employees

Compute Gross Salary and Net Salary payable to employees for the month of November 2017 using spreadsheet.

Follow the given procedure to prepare the Payroll Statement of the company.

1. Open a new spreadsheet and enter table headings in the cells A1 and A2 .

2. Enter the column heading and input data directly in the respective cells as shown in figure 3.3

Fig 3.3 Payroll

3. Enter the following formulae in the respective cells as per the template given below.

Column heading	Cells	Equation	Formulas (syntax) to be enter in the cells
DA	F12	=BP * 80%	=D12*$F$4
HRA	G12	If (Post= "Manager",BP*3%,IF(Post= "Accountant ",BP *2%,0))	=IF(C12="Manager",D12*$F$5,IF(C12="Accountant",D12*$F$6,0))
TRA	H12	If (Post= "Manager",150,0)	=IF(C12="Manager",$F$7,0)
TE(Total Earning) GS (gross salary)	I12	=BPE+Grade pay+DA+HRA+TRA	=SUM(D12:H12)
PT	J12	=TE*1%	=I12*$F$8
PF	K12	=BP*10%	=D12*$F$9
TD total deduction	N12	=PT+PF+TDS+LOAN	=SUM(J12:M12)
NS	O 12	=TE-TD	=I12-N12
Sum of Net salary for the month	O 15	=SUM(net salary of all employees)	=SUM(O12:O14)

4. Select the cells F12,G12,H12,**I**12,J12 and K12 together and drag and fill up to 14th row for relative cell reference. Then select the cells N12 and O12 together and drag and fill up to 14th row (*drag the formulae in unfilled area only of the given table*). Ascertain the total values in the 15th row and save the file. The output of payroll will look like as seen in figure 3.4.

Output

Fig 3.4 Payroll Statement

Let's assess

1. Gross Pay (Total Earnings) includes ….
    a. BP   b. DP   c. DA   d. All of these

2. DA is 14% of Basic pay. The amount of Basic pay is entered in cell D2. Write the formula to be entered in cell D3 to calculate DA.

3. Gross salary and Total Deductions are shown in D8 and G8 respectively. Write the formula to calculate Net Salary in cell H8.

4. Shafi is working as a Manager in Sudo Services Ltd. His basic pay is ₹ 25000/- DA is @ 20% of basic pay and HRA is ₹ 1000/-. He is on Leave Without Allowance for 3 days during the month of August 2017. Calculate his BPE for the month of August 2017.

![Try yourself icon] **Try yourself**

VISHAL Ltd. has 10 employees. The salary details of the employees are entered in a spreadsheet (figure 3.5). You are required to fill in the missing columns of this payroll statement.

Fig 3.5 Payroll Statement

While giving a formula for the above illustration, keep in mind the following;

TE=BPE+ All Allowances (DA, HRA, TRA, etc.,)

NS= TE- Deductions (PF, TDS, Loan, etc.)

3.2 ACCOUNTING OF ASSETS

Accounting of assets covers the complete life cycle of an asset. Hence records relating to assets are to be maintained right from the acquisition of asset till its disposal. It involves computation of depreciation, maintenance of asset register and preparation of fixed asset schedule for reporting in the Balance Sheet.

We are familiar with the calculation of depreciation in manual accounting. When there are different classes of assets to which rates of depreciation are varying [as per Companies Act / Income Tax Act], you can imagine how complex the calculation is.

The inbuilt functions of LibreOffice Calc makes the asset accounting process more easier.

Among the different methods of calculating depreciation, Straight Line Method and Written Down Value Method are two popularly used methods. Let us discuss about these methods.

3.2.1. Straight line method (Fixed Installment Method)

Here, depreciation is calculated based on the original cost of the asset using the formula;

Depreciation = $\dfrac{\text{Acquisition cost - Scrap Value}}{\text{Estimated working Life}}$

Acquisition cost (Cost to use) = Purchase cost+ Installation expenses + other expenses till the date of installation.

Scrap Value – It is the value which is realisable at the end of its useful life.

Estimated working life – The period for which the asset can be effectively put to use.

SLN function is used for finding out the amount of annual depreciation under straight line method.

Syntax : = SLN(Cost, Salvage, Life)

Where,

Cost = Acquisition cost

Salvage = Scrap value

Life = Total life period of an asset

Consider the following example,

The cost of machinery is ₹ 10,000 and installation charges ₹ 1000/-. The salvage value after 5 years is ₹ 2,000/-. See how depreciation is calculated using SLN function in LibreOffice Calc.

Total cost of the asset = Procurement cost + installation charges

= 10000 + 1000 = ₹ 11,000/-

The amount of depreciation can be calculated easily by using SLN function in LibreOffice Calc in cell B2 as **=SLN(11000,2000,5)**. The above function returns the annual depreciation amount as ₹ 1,800 (See figure 3.6).
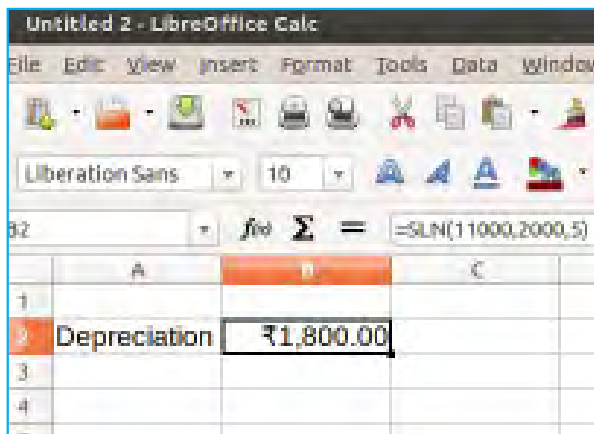

Fig 3.6 SLN Function

Let us consider another example.

Roopam Ltd. purchased various assets on 01/04/2016. Calculate the amount of depreciation and Written Down Value of assets at the end of the year, under Straight Line Method of charging depreciation (Table 3.3).

Table 3.3 Details of assets

Sl. No	Asset name	Asset ID	Purchase cost	Installation expense	Pre-operation expense	Salvage value	Life in years
1	Machinery	101	600000	20000	10000	70000	10
2	Furniture	102	100000	0	0	10000	15
3	Fixtures	103	50000	30000	10000	5000	20
4	Vehicles	104	200000	0	0	20000	10

The following steps are required for finding the result as shown in figure 3.7.

1 Enter table heading in the cells A1 and A2 in a worksheet

2 Input the necessary data in the respective cells as given in the figure 3.7

3. Enter the following formulas in the respective cells as per template given below.

Column heading	Cell Address	Equation used	Formula in cell
Cost to use	G4	Purchase cost + Installation expense+ Pre-operation expense	=D4+E4+F4
Amount of depreciation	J4	SLN(Cost,Salvage,Life)	=SLN(G4,H4,I4)
Closing balance of assets	K4	Cost to use - Amount of depreciation	=G4 – J4
Total depreciation during 2016-17 (for all assets)	J8	SUM(Amount of depreciation)	=SUM(J4:J7)
Net Block (Total closing balance of all asset)	K8	SUM(Closing balance of asset)	=SUM(K4:K7)

4. Use fill handle to copy the formula to other cells or Drag the cell G4 up to G7 and J4 : K4 up to J7 : K7.

5. The formula when applied in J8 will give us total depreciation. Similarly values of net block can be derived in K8 when the above formula is given and save the file.(Figure 3.8).

Output

Fig - 3.8 - Asset Accounting

Try yourself

1. ABC Ltd. purchased a machine on 01-01-2017 for ₹ 2,00,000 and spends ₹ 10,000 for its installation. The machinery was installed on 10-01-2017. The expected salvage value is ₹ 8,000 at the end of its useful life of 10 years. Calculate annual depreciation under Straight Line Method (SLM) using spreadsheet.

2. Given below are the details of various assets of a firm. Calculate depreciation under Straight Line Method using spreadsheet.

Asset	Cost of Purchase	Installation charges	Transportation charges	Pre-operating expense	Salvage value	Life in years
Machinery	20000	2000	4600	1200	2000	10
Furniture	40000	3500	1500	500	3000	8

3.2.2. Written Down Value (WDV) Method

It is also called Reducing Balance Method or Declining Balance (DB) Method or Diminishing Balance Method. This method uses current book value as the base for computing the depreciation for the next period. Under this method depreciation is calculated on opening balance of asset each year. DB function is used for calculating depreciation under this method.

Syntax: **= DB(Cost, Salvage, Life, Period, month)**

Where,

Cost = Acquisition cost

Salvage = Scrap value

Life = Life (in years) of the asset.

Period = Period (year) for which depreciation is calculated.

Month = number of months in the first year. (It is required only if the asset is put to use during part of an year in the first year of its commissioning.)

Consider the following example:

A machinery is purchased on 1st August 2014 for ₹ 40,000 and installation charges is ₹ 2,000. The salvage value after 5 years will be ₹ 3,000. Ascertain the amount of depreciation of third year using DB function in Calc., assuming that the books are closed on 31st March every year.

Cost - ₹ 42,000 (₹ 40,000 + ₹ 2,000)

Salvage - ₹ 3,000

Life - 5

Period - 3

Months - 8 (from 1/8/2014 to 31/3/2015)

Enter the formula in cell B2 **= DB(42000, 3000,5,3,8)**.

On applying this function, the cell will return the amount of depreciation as ₹ 7,382.79 (Figure 3.9)
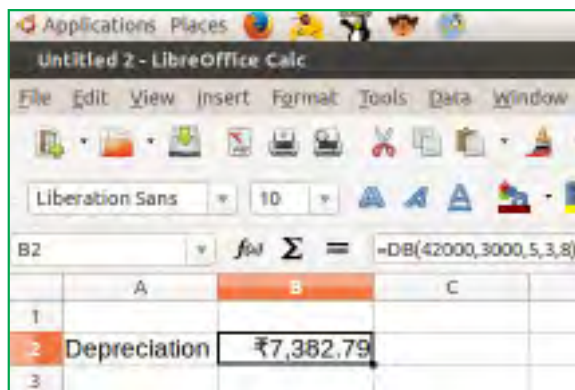

Fig 3.9 DB Function

Let us see one more example:

The table 3.4 shows the details of fixed assets purchased by Gayathri Ltd. Calculate the amount of depreciation and the Written down value of assets at the end of the year 2016-17 (i.e. after 2 years of purchase).

Table 3.4 Details of fixed assets

Sl. No	Asset name	Purchase date	Purchase cost	Installation expense	Pre-operation expense	Salvage value	Life in years
1	Machinery	1/5/2015	600000	20000	10000	70000	10
2	Furniture	1/6/2015	100000	0	0	10000	15
3	Fixtures	1/4/2015	50000	30000	10000	5000	20
4	Vehicles	1/7/2015	200000	0	0	20000	10

The following steps are required for preparing the statement showing depreciation.

1   Enter table heading in the cells A1 and A2 by merging the cells of a worksheet.

2   Enter the column headings and input the given data as shown in figure 3.10.

Fig 3.10 Asset Accounting

[Note:column "J" and "K" can be calculated by using IF & AND function but here it is directly entered in to the respective columns.]

*   *The Value of column 'J' indicate the period of depreciation to be computed, say 1 year, 2 year, etc.*

*   *Column 'K' indicates the number of months the asset was actually held in that year.*

3.   Enter the following formulae in the respective cells as per the template given below:

Column heading	Cell Address	Equation used	Formula in cell
Cost to use	G4	Purchase cost + Installation expense+ Pre-operation expense	=D4+E4+F4
Amount of depreciation	L4	DB(Cost,Salvage,Life,Period,month)	=DB(G4,H4,I4,J4,K4)
Closing balance of assets	M4	Cost to use - Amount of depreciation	=G4 – L4
Total depreciation during 2016-17 (for all assets)	L8	SUM(Amount of depreciation)	=SUM(L4:L7)
Net Block(Total closing balance of all asset)	M8	SUM(Closing balance of asset)	=SUM(M4:M7)

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4. For copying the formula to other cells use fill handle or drag the cell from G4 to G7. Select L4 : M4 and drag to L7:M7. Ascertain the total depreciation and total value of all assets in the respective columns as per the formula given above and save the file.(See figure 3.11)

Output

Fig 3.11 Asset accounting

3.2.3. Schedule forming part of the Balance Sheet

As part of balance sheet we have to prepare a schedule showing gross block, accumulated depreciation and net block

The following was extracted from the books of Ragam Ltd. The rate of depreciation is 10% per annum. Prepare a schedule showing gross block, accumulated depreciation and net block as on 31st March 2017.

SL No.	Asset name	as on 1-04-2016	Additions on Sept 30th	Deductions on Sept 30th
1	Machinery	100000	20000	5000
2	Furniture	50000	5000	2000
3	Fixtures	20000	6000	3000
4	Building	200000	0	0
5	Vehicles	40000	3000	1000

The following steps are required to prepare the schedule:

1. Enter table heading in the cells A1 and A2.

2. Label the column headings and input the data as shown in the figure 3.12

Fig 3.12 Schedule of Assets

3. Enter the following formulae in the respective cells as per table given below:

Column heading	Cells	Required Equation	Formulas in cells
Gross Block As on 31/03/17	F5	Block assets as on 1-04-2016+ Additions on Sept 30th – Deductions	=C5+D5-E5
Depreciation as on 1-04-2016	G5	Gross Block As on 1-04-2016 date*10%	=C5 * 0.1
Depreciation of Additions on Sept 30th	H5	Additions on Sept 30th * 10%* 6/12	=D5 * .1 * 6/12
Depreciation on Deductions as on Sept 30 th	I5	Deduction as Sept 30th * 10% * 6/12	=E5*0.1 *6/12
Total depreciation as on 31/03/17	J5	Depreciation as on 1-04-2016 + Depreciation for Additions on Sept 30th – Depreciation for Deductions on Sept 30th	=G5+H5-I5
Net Block As on 31/03/17	K5	Gross Block As on 31/03/2017 - Depreciation as on 31/03/2017	=F5 - J5

4. Select the cells F5 to K9, click fill down from edit tab or use <CTRL> + D button. Use SUM function to arrive at the totals in cells C10 to K10 and save the file.(See figure 3.13)

Output

Fig 3.13 Schedule of Assets

POINTS TO REMEMBER

Acquisition cost (Cost to use)=Purchase cost+ Installation expenses+ pre-operation expenses.

SLN function used for calculating depreciation under Straight Line Method.

Syntax of SLN : = SLN(Cost,Salvage,Life)

DB function used for calculating depreciation under Diminishing Balance Method

Syntax of DB : = DB(Cost,Salvage,Life,Period,Month)

Net Block= Gross block - Accumulated depreciation

Try yourself

1. *A machinery was purchased on 1 st April 2013 for ₹ 2,00,000. Its estimated life is 10 years with salvage value of ₹ 20,000. Accounting year is 1st April to 31st March every year. Calculate depreciation under the Diminishing Balance method for 5 years in spread sheet.*

2. *The following are the details of plant and machinery. Ascertain depreciation under Written Down Value method using spreadsheet.*

Name of Asset	PLANT & MACHINERY
Date of Purchase	10/07/2012
Date of installation	20/07/2012
Cost	₹ 4,00,000
Installation Cost	₹50,000
Pre-operating cost	₹ 20,000
Salvage Value	₹ 10,000
Expected Life of Asset	10 years
Closure of Accounts	31/03/2013
Period	1st year

3.3. LOAN REPAYMENT SCHEDULE

In order to tide over the financial constraints, individuals, may depend on loans from banks or other financial institutions. Similar situation may arise in business also. Loan is a sum of money borrowed for a specific period. This liability will carry interest at a prescribed rate. These loans are to be repaid either in lump sum or in instalments along with interest over the loan repayment period.

• How can we compute the total liability including interest on a loan?

• How can we fix the Equated Monthly Instalments[EMI] ?

Equated Monthly Instalment (EMI) Calculation

Equated monthly instalment is a fixed amount payable by a borrower to a lender at a specified date of each calender month. The EMI of a loan is determined by factors like, principal amount (actual sum of money borrowed), rate of interest, loan tenure and method of computation.

Let us see the procedure for preparing an EMI calculation statement showing interest, installment amount, period of loan, etc.

PMT function available in Calc can be used for calculating periodic instalments.

Let us go through an example.

Punjab National Bank has given loans to their customers for diverse needs. Loan amount, date of loan and rate of interest is given in the following table. Compute monthly installment amount on each loan given by the bank.

Name of customer	Date of loan	Loan amount ₹	Period of loan	Rate of interest
SARATH	1/4/2013	500000	3	11%
NANDAN	1/1/2012	800000	4	12%
SRIDYA	1/7/2011	400000	5	09%
NIMNA	1/5/2014	300000	2	13%
ROBIN	1/9/2013	100000	3	12%

The following steps will lead you to the preparation of a loan repayment schedule.

1. Assign suitable headings in cells A1 and A2 and merge and centre cells A1 to H1 and A2 to H2.
2. Enter the column labels and input the data in the respective cells as shown in figure 3.14.

Fig 3.14 Loan Repayment Schedule - EMI Calculation

3. Enter the following formulae in the respective cells as per the table given below:

Column heading	Cells	Equation	Formulas in cells
Yearly installment	G5	=PMT(rate,Nper,PV,FV,Type)	=PMT(E4,D4,C4,F4,0)
Monthly installment	H5	=PMT(rate/12,Nper*12,PV,FV,Type)	=PMT(E4/12,D4*12,C4,F4,0)

4. Select cells G4 : H4 and drag and fill the cells G5:H8 and save the file.(See figure 3.15)

Output

Fig - 3.15 - Loan Repayment Schedule

Try yourself

Mr. Lalu took a loan of ₹ 2,00,000 from a Indian bank, at an interest of 10% per annum. The loan is repayable over a period of 10 years in equated monthly installments .Prepare a loan repayment schedule by showing outstanding balances for the first year.

Preparation of Loan Repayment Schedule

The Loan Repayment Schedule is a complete table of periodic loan repayments, showing the amount of principal and interest components in each instalment until the loan is fully paid off. This schedule also shows the outstanding balance of loan amount after the payment of each instalment. It is also called Loan Amortization Schedule. The payment will be made in Equated Monthly Instalments (EMI), the interest component forms the major portion in initial periods and the principal component forms major portion in later periods. The totals of interest, principal and amount paid are also depicted in this schedule.

For splitting the instalment into the interest and principal, we may use IPMT and PPMT functions respectively. The principal amount in the periodic instalment is deducted from the opening balance for arriving at the closing balance. The opening balance of each month will be the closing balance of the previous month.

POINTS TO REMEMBER

Functions used for the preparation of Loan Repayment Schedule.

PMT function used for calculating equated monthly instalment

=PMT(Rate,Nper, PV, FV, Type)

PPMT function used for the calculating Principal portion in the instalment

=PPMT(Rate, Period, Nper,PV, FV,Type)

IPMT function used for calculating Interest portion in the instalment

=IPMT(Rate, Period,Nper,PV, FV, Type)

Consider the following example

Vanasree Agencies took an advance of ₹ 60,000 for 6 months from Indian Bank @ 14% interest for that period. Prepare a Loan Repayment Schedule.

Steps for the preparation of Loan repayment schedule is given below:

1. Enter the headings in cells A1 and A7 as shown in figure 3.16.

2. Enter the details in respective cells as shown in figure 3.16.

Fig 3.16 Loan Repayment Schedule

3. Enter the formulae in respective cells as shown below:

A9:A14	1 to 6	B9	=B2
C9	=PPMT($B$3/$B$5,A9,$B$4,$B$2,0,0)	D9	=IPMT($B$3/$B$5,A9,$B$4,$B$2,0,0)
E9	=PMT($B$3/$B$5,$B$4,$B$2)	F9	=B9+C9
B10	=F9	C15	=SUM(C9:C14)
D15	=SUM(D9:D14)	E15	=SUM(E9:E14)

4. Select B10 and drag up to B 14
5. Select cells C9:F9 and drag upto the cells C14:F14 and save the file. The output will be as shown in the figure 3.17.

	A	B	C	D	E	F
1	**Vanasree Agencies**					
2	Loan amount	60000				
3	Rate	14.00%				
4	Period in months	6				
5	No of instalments	6				
6						
7		**Loan Repayment Schedule**				
8	Month	Opening Balance	Principal	Interest	Instalment	Closing Balance
9	1	60000	-₹9,432.36	-₹1,400.00	-₹10,832.36	₹50,567.64
10	2	₹50,567.64	-₹9,652.45	-₹1,179.91	-₹10,832.36	₹40,915.19
11	3	₹40,915.19	-₹9,877.67	-₹954.69	-₹10,832.36	₹31,037.52
12	4	₹31,037.52	-₹10,108.15	-₹724.21	-₹10,832.36	₹20,929.37
13	5	₹20,929.37	-₹10,344.01	-₹488.35	-₹10,832.36	₹10,585.37
14	6	₹10,585.37	-₹10,585.37	-₹246.99	-₹10,832.36	₹0.00
15		Total	-₹60,000.00	-₹4,994.15	-₹64,994.15	
16						

Fig 3.17 Loan Repayment Schedule

Output

Try yourself

DC industries took a 6 months advance of ₹ 30,000/- @ 15% for the period and repayable in 6 equal instalments. Prepare the Loan Repayment Schedule.

Summary

- Payroll is a statement or schedule showing various components and various deductions of salary of all employees in a business organization. DA, HRA, TA, etc., are earnings and PF, Loan, GIS etc., are deductions. Net pay can be calculated by subtrating total deductions from Gross earnings.
- Depreciation accounting is used to estimate the amount of depreciation charged to an asset and closing balance of asset. The two important methods for calculating depreciation are Straight Line Method and Diminishing Balance Method . The financial function used for this purpose is SLN and DB respectively.
- Loan Repayment schedule is the schedule showing interest, total liability, instalment, etc. This schedule is prepared with the help of PMT function.

I can

- describe the concept of payroll accounting and apply the knowledge in the development of spreadsheet application for computing employee's gross pay and net pay.
- narrate the concept of Computerised Asset Accounting and apply the knowledge in the development of Spread sheet application for computing depreciation under Straight Line Method and Written Down Value method.
- describe the concept of calculating interest and repayment of loan and apply the knowledge in the development of Loan Repayment Schedule using spreadsheet.
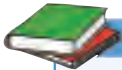
TE QUESTIONS

1. Which financial function is used for preparing a loan repayment schedule?
2. State the financial function used for calculating Straight Line method of depreciation?
3. Write the equation used for finding gross salary and net salary, if Basic pay, DA, HRA, PF and SLI are given as salary components and deductions..
4. Write the syntax for following functions
   SLN,   DB,   PMT
5. Describe various components of salary and deductions in relation to payroll accounting.
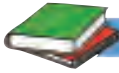
1. Salary details of Vertex Ltd, a bag manufacturing company is given below. Prepare payroll statement for the month of Aug 2017. Also ascertain total net salary payable for this month.

Sl No	Name	Post	Basic pay (BP)	Grade pay	HRA	TA
1	Kareeb	CEO	50000	2000	3% of BP	200 p m
2	Bhama	Manager	40000	1500	2% of BP	100 p m
3	Jinu	Foreman	22000	Nil	1% of BP	Nil
4	Panchami	Manager	38000	2000	2% of BP	100 p m
5	Harshad	Foreman	20000	1000	1% of BP	Nil
6	Shahsin	Foreman	15000	Nil	1% of BP	Nil

DA is 20% of basic pay.
Deduction from salary are :-
Professional tax (PT)- 1% of gross salary for all employees.
Provident Fund (PF) -10% of basic pay for all employees.

2. Viswas Ltd. purchased various assets . Calculate the amount of depreciation at the end of the year 2016-17 as per the details below under Straight Line Method and Diminishing Balance Method.

Sl No	Asset Name	Purchase date	Purchase cost	Installation expense	Pre-operation expense	Salvage value	Life in years
1	Machinery	1/1/2015	800000	30000	50000	100000	12
2	Furniture	1/1/2015	500000	0	0	20000	14
3	Fixtures	1/1/2015	100000	10000	20000	10000	8
4	Vehicles	1/1/2015	300000	0	0	40000	15
5	Loose tools	1/1/2015	20000	0	0	1000	5

3. The following details are taken from the books of SBT, Kalpetta regarding an outstanding loan . Compute monthly installment on each loan given by the bank.

Name of customer	Date of loan	Loan amount	Period of loan	Rate of interest
Harsha Vardhan	1/1/2011	700000	5	0.09
Shiny	1/1/2013	50000	3	0.11
Abin L	1/9/2010	350000	6	0.14
Ajeesh Billy	1/12/2009	520000	7	0.13
Clenz Geoge	1/11/2012	250000	4	0.15

APPENDIX

Lab work - 1 (Payroll Accounting)

Wale Ltd. wants to prepare payroll of its employees for the month of November 2017. The details of salary and deductions of each employee under various categories are given in the table.

Sl. No.	Name	Post	Basic pay (BP)	Grade pay	HRA	TA	No. of days not worked	Deduction-TDS	Deduction-Loan recovery
1	Remesh	Manager	30000	1000	3% of BP	150 pm	2	1000	3000
2	Joseph	Accountant	20000	500	2% of BP	Nil	3	300	1000
3	Hisham	Supervisor	16000	Nil	Nil	Nil	1	0	0

DA is 80% of basic pay earned (BPE)

Other deduction from salary is given bellow:-

Professional tax (PT)- 1% of gross salary for all employees.

Provident Fund (PF) -10% of basic pay earned (BPE) for all employees.

Compute gross salary and net salary payable byWale Ltd. for each employee in for the month of November 2017 using spreadsheet.

Procedure:

Follow the steps given below.

1. Give suitable headings by merging cells A1 and A2.

2. Provide column headings and input the given data directly in the respective cells (see figure 3.18)

Fig 3.18 Payroll

3. Enter the following formulae in the respective cells as per template given below.

Column heading	Cells	Required Equation	Formulas (syntax) to be enter in the cells
NOEDP (No of Effective days present)	F12	NODM- Deduction days (NODM means Number Of Days in the Month)	=$F$3-D12
BP Earned (BPE)	G 12	BP*NOEDP/NODM	=E12*F12/$F$3
DA	I 12	BPE * 80%	=G12*$F$4
HRA	J 12	If (Post= "Manager",BPE*3%,IF(Post= "Accountant ",BPE *2%,0))	=IF(C12="Manager",G12*$F$5,IF(C12="Accountant",G12*$F$6,0))
TA	K12	If (Post= "Manager",150,0)	=IF(C12="Manager",F$7,0)
Gross Salary	L12	BPE+Grade pay+DA+HRA+TA	=SUM(G12:K12)
PT	M12	Gross Salary *1%	=L12*$F$8
PF	N12	BPE*10%	=G12*$F$9
Total deductions	Q12	PT+PF+TDS+LOAN	=SUM(M12:P12)
Net Salary	R12	Gross Salary – Total Deductions	=Round(L12-Q12,0)
Sum of Net salary for the month	R15	Sum net salary of all employees	=SUM(R12:R14)

4. Select and drag the cells F12,G12,I12,J12,K12,L12,M12,N12,Q12 and R12. Up to 14th row (drag the formulae in Unfilled area only of the given table). Then find out the total values in the 15th row and save the file. The output is shown in figure 3.19.

Fig 3.19 Payroll Statement

Lab work 2 (Depreciation - SLN Function)

Calculate depreciation of the assets given below for the financial year 2016-17 under Straight Line Method.

Sl No	Asset name	Purchase cost	Installation expenses	Salvage value	Life in years
1	Mounting Machine	12,00,000	20,000	30,000	10
2	Assembling Machine	7,50,000	5,000	15,000	7

Procedure

Follow the steps mentioned below.

1. Enter column heading and insert values directly in the respective cells as given in figure 3.20.
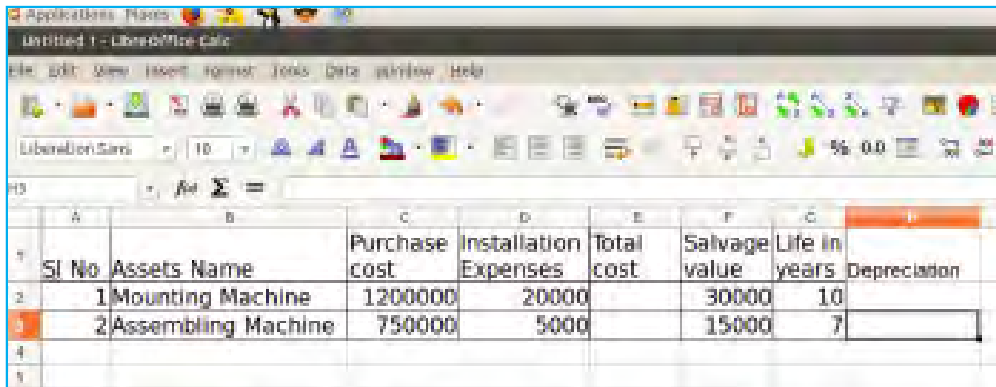
Fig 3.20 Depreciation Statement

2. Following formulae are to be entered in the respective cells as per template given below. Calculate total cost and amount of depreciation.

Column heading	Cells	Equation	Formulas to be entered in the cells
Total cost	E2	Purchase cost + Installation Expenses	= C2+D2
Depreciation	H2	SLN(Cost,Salvage,Life)	=SLN(E2,F2,G2)

3. Copy cell E2 to E3 and Cell H2 to H3. The output will be as shown in figure 3.21.

Output
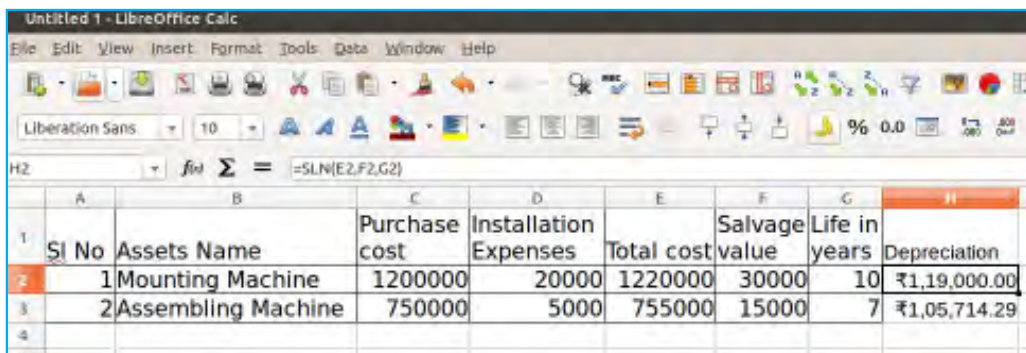
Fig 3.21 Depreciation Statement

Lab work 3 (Depreciation - DB function)

Calculate depreciation for the following assets for the financial year ending 31st March 2018 under Diminishing Balance Method using spreadsheet.

Sl. No	Asset Name	Purchase date	Installation Date	Purchase cost	Pre-operating expenses	Installation Expenses	Salvage value	Life in years
1	Machinery	19-01-2014	21-01-2014	8,00,000	30,000	20,000	25,000	10
2	Plant	06-05-2015	15-05-2015	5,00,000	20,000	5,000	15,000	6

Procedure

Follow the given steps for calculating depreciation under WDV Method

1 Open a spreadsheet and enter table heading in the cells A1 and A2.

2 Enter the column heading from A3 to L3 and input values directly in the respective cells.(See figure 3.22)

Fig 3.22 Depreciation Statement

3. Enter the following formulae in the respective cells as per table given below.

Column heading	Cells	Equation	Formulae to be entered in the cells
Financial year ending date	E2		31/03/2018
Cost to use	F4	Purchase cost + Installation Expenses + Pre-operating Expenses	= C4+D4+E4
Period	J4	Closing financial year – Installation Year	=YEAR($E$2)-YEAR(I4)
Months in 1st Year	K4	Total months used in first year	=IF(MONTH(I4)>=3,12-MONTH(I4)+4, 4-(MONTH(I4)))
Depreciation	L4	= DB(Cost, Salvage, Life, Period, Month)	=DB(F4,G4,H4,J4,K4)

4.   Copy the cell F4 to F5 and cells J4:L4 to J5:L5 (drag the formulae in unfilled area only of the given table) and save the file. The output will be as shown in figure 3.23.

Output

Fig 3.23 Depreciation statement

Lab work 4 (Loan Repayment Schedule)

Krishna Associates Ltd. took the following loans for the acquisition of different assets. Prepare a loan repayment schedule for the company

Loan amount (₹)	Date of Loan	Period of Loan	Rate of Interest
₹ 2,00,000	12/8/2015	3	12%
₹ 12,00,000	01/10/2016	5	10%
₹ 8,00,000	01/01/2017	8	14%
₹ 5,00,000	19/01/2017	2	15%

Procedure

The steps given are to be followed:

1   Open a spreadsheet and enter headings in cells A1 and A2.

2   Give column heading and enter values directly in the respective cells.(See figure 3.24)

Fig 3.24 Loan Repayment Schedule

3.   Enter the following formulae in the respective cells as per the given table.

Column heading	Cells	Equation	Formulae to be entered in the cells
Yearly Installment Amount	F4	= PMT(Rate, Nper, PV, FV, Type)	=PMT(D4,C4,-A4,E4,1)
Monthly Installment	G4	= Yearly Installment Amount/12	=F4/12

4.   Drag the cells F4 : G4 to F7 : G7 (drag the formulae only in the Unfilled area of the given table). Now loan repayment schedule will be displayed in figure 3.25.

Output

Fig 3.25 Loan Repayment Schedule

Lab work 5

Vinayaka Saree Designers took a loan amounting to ₹ 1,00,000/- from SBI for a period of 1 year with an interest @ 12% p.a. and repaid in 12 equal monthly instalments. Prepare Loan Repayment Schedule.

1. Enter the detials in a Spread Sheet as shown in figure 3.26.

Fig 3.26 Loan Repayment Schedule

2. Enter the formula in respective cells as per template given below.

Cell Address	Content
A9:A20	1 to 12
B9	=B2
C9	=PPMT($B$3/$B$5,A9,$B$4*$B$5,$B$2,0,0)
D9	=IPMT($B$3/$B$5,A9,$B$4*$B$5,$B$2,0,0)
E9	=PMT($B$3/$B$5,$B$4*$B$5,$B$2)
F9	=B9+C9
B10	=P9
C21	=SUM(C9:C20)
D21	=SUM(D9:D20)
E21	=SUM(E9:E20)

3. Select cell B10, then drag to B20, and Select C9 : F9 and drag to C20 : F20.

Save the file. The output will be as shown in figure 3.27.

Output

	A	B	C	D	E	F
1	**Vinayaka Saree Designers**					
2	Loan amount	100000				
3	Rate	12.00%				
4	Period in year	1				
5	No of instalments in an year	12				
6						
7			**Loan Repayment Schedule**			
8	Month	Opening Balance	Principal	Interest	Instalment	Closing Balance
9	1	100000	-₹7,884.88	-₹1,000.00	-₹8,884.88	₹92,115.12
10	2	₹92,115.12	-₹7,963.73	-₹921.15	-₹8,884.88	₹84,151.39
11	3	₹84,151.39	-₹8,043.36	-₹841.51	-₹8,884.88	₹76,108.03
12	4	₹76,108.03	-₹8,123.80	-₹761.08	-₹8,884.88	₹67,984.23
13	5	₹67,984.23	-₹8,205.04	-₹679.84	-₹8,884.88	₹59,779.19
14	6	₹59,779.19	-₹8,287.09	-₹597.79	-₹8,884.88	₹51,492.11
15	7	₹51,492.11	-₹8,369.96	-₹514.92	-₹8,884.88	₹43,122.15
16	8	₹43,122.15	-₹8,453.66	-₹431.22	-₹8,884.88	₹34,668.49
17	9	₹34,668.49	-₹8,538.19	-₹346.68	-₹8,884.88	₹26,130.30
18	10	₹26,130.30	-₹8,623.58	-₹261.30	-₹8,884.88	₹17,506.72
19	11	₹17,506.72	-₹8,709.81	-₹175.07	-₹8,884.88	₹8,796.91
20	12	₹8,796.91	-₹8,796.91	-₹87.97	-₹8,884.88	₹0.00
21		Total	-₹1,00,000.00	-₹6,618.55	-₹1,06,618.55	

Fig 3.27 Loan Repayment Schedule

GRAPHS AND CHARTS FOR BUSINESS DATA

Introduction

We know that huge volume of data is processed by different departments of an organisation and these data have to be presented in the form of reports to various stakeholders.

For instance, the sales volume of four different products of a company for the last five years is given. It will not give a clear picture on:

- Which product is performing well?

- In which year the sales volume is higher?

How can we present these data in a more meaningful and intelligent manner? Think in terms of displaying the information in charts and graphs! Graphs and charts help us to convey information tactfully and promote interpretation of data. This also facilitates comparison and understanding changes over a period of time. You are already aware of the basic features of spreadsheet and its use in accounting. In this unit, we will discuss how spreadsheet can be used to present the raw data in the form of charts and graphs.

4.1 GRAPHS AND CHARTS

The term graphs and charts are often used synonymously. Let us try to bring some clarity on this. Graphs are mainly used to represent variation in values over a period of time. e.g., movement of stock market index say, NIFTY from the year 2000 to

2017. Here time (year) is represented on X axis and value (NIFTY) is represented in Y axis. Charts are used to give information about the frequency of different quantities in a single pictorial representation, for instance, budget allocation to different heads. See figure 4.1. The figure given in the left represents graph and that given in the right is chart.
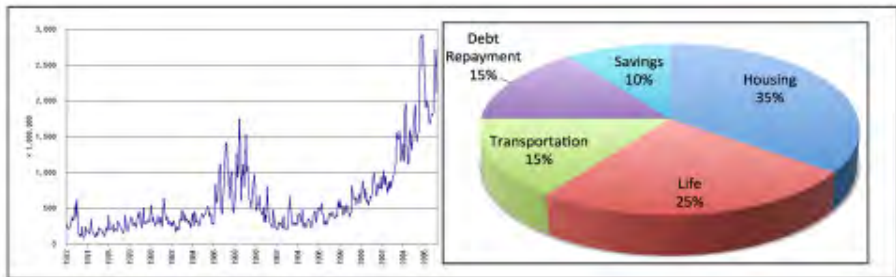
Fig 4.1 Graphs and Charts

Types of Graphs and Charts

LibreOffice Calc provides various types of charts to display data in different ways as per the need of the users. We can create a new chart or change the existing chart from the wide range of chart types. The chart types are illustrated with the help of given example.

The sales figure of different products of an electronic goods manufacturing firm for a particular month is given below:

Laptop- 12,000, Desktop-10,000, Tablets - 14,000 & Mobile phones - 4,000.

- **Column Chart**

Column charts are used to compare several items in a specific range of values. Column charts are ideal if you need to compare a single category of data (sales) among individual sub-items(products). Data is represented through bar diagrams with vertical bars. The height of each bar is proportional to its value. The X - axis shows categories of products and the Y - axis shows the value for each category, i.e in column chart, categories are displayed horizontally and values are displayed vertically, as can be seen in figure 4.2

Fig 4.2 Column Chart

- **Bar Chart**

Bar charts are ideal for visualising the distribution or proportion of data items when there are different categories. Bar charts with horizontal bars are the most suitable form to visualise these data. The length of each bar is proportional to its value. The Y - axis shows

Fig 4.3 Bar chart

categories of products. The X - axis shows the value for each category (figure 4.3). Both the Bar and the Column charts display data using rectangular bars where the length of the bar is proportional to the data value. Both are used to compare two or more values. However, their difference lies in their orientation. A Bar Chart is oriented horizontally whereas the Column chart is oriented vertically.

• **Line Chart / Graph**

It is used to display trends over a period of time which can be used as a vertical analysis tool. The values of each data series can be connected by a line as shown in figure 4.4. It is also called a 'run chart'.
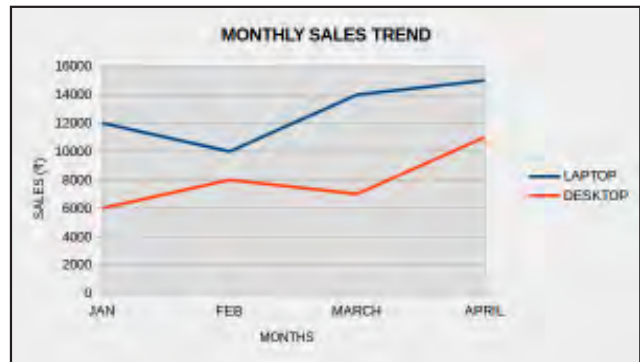
• **Pie Chart**

Pie charts are generally used to show percentage or proportional data when one element of data is having more significance (compositional importance) than the other

Fig 4.4 Line chart

and usually the percentage represented by each category is provided next to the corresponding slice of pie.   It contains only one data series. A pie chart shows values as circular sectors of the total circle. The length of the arc or the area of each sector is proportional to its value. The pie chart has the following chart sub types:

a)	**Normal Pie Chart** : This sub type of pie chart shows sectors as coloured areas of the total pie for one data column only (Figure 4.5).

Fig 4.5 Normal Pie Chart

b) **Exploded Pie Chart** : It is a kind of pie chart in which one or several slices are separated from the other. It is useful because it makes the highlighted portion more visible (Figure 4.6).

<p style="text-align:center">Fig 4.6 Exploded pie Chart</p>

c) **Donut Chart** : A Donut or Doughnut chart is a pie chart, with two exceptions: It has a hole in the middle and it can display more than one series of data. Doughnut charts display data in rings, where each ring represents a data series. The first data series is displayed in the centre of the chart (Figure 4.7).

<p style="text-align:center">Fig 4.7 Donut Chart</p>

d) **Exploded Donut Chart** : It is a Donut chart with all slices exploded. It shows the outer sectors already separated from the remaining Donut (Figure 4.8).

<p style="text-align:center">Fig 4.8 Exploded Donut Chart</p>

• **Area Chart**

Area chart shows values as points on the Y axis. The X axis shows categories. The values of each data series are connected by a line. The area bounded by the lines is filled with a colour. The area chart's focus is to emphasise the changes from one category to the next. Area Charts are like Line Charts except that the area below the plot line is solid (Figure 4.9).

Fig 4.9 - Area Chart

• **XY (Scatter) Chart**

XY charts are also known as Scatter charts. The point of difference between XY charts and other types of charts is that in XY charts both axis display values. Such type of charts is generally used to show the relationship among two variables. It is commonly used for scientific, statistical, and engineering data. A typical XY chart is presented in figure 4.10.

Fig 4.10 XY Chart

• **Radar Chart**

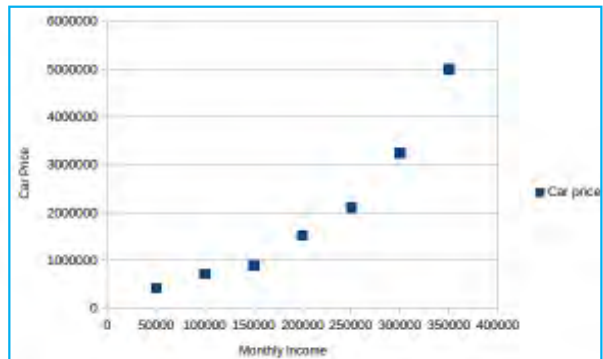A Radar chart is a two dimensional chart showing three or more variables in the form of a cobweb. It is also known as net chart, web chart, spider chart, star chart, polar chart etc. It has a separate axis for each variable, and the axes extend outward from the centre of the chart. The value of each data point is plotted on the corresponding axis as shown in figure 4.11.

Fig 4.11 Radar Chart

Utility of different types of charts

Area Chart	An area chart is generally used to highlight the proportion of individual items over total items.
Column Chart	A column chart is used to emphasise comparison of data items within a specified time period.
Line Chart	A line chart is a type of graph that displays data trends at regular intervals
Scatter Chart	It depicts the relationship among numerical values across different data series.
Pie Chart	The main purpose of the pie chart is to show part-whole relationships.
Bar Chart	A bar chart is used to demonstrate comparison among individual items.
Net Chart	A net chart is used for comparing the actual with standards and to analyse the degree of variances.

Let's assess

Select the chart type that best suits for the data given below:

Nature of Data	Chart/ Diagram that best suits
Sales performance of Product 'A' against Product 'B' in 5 regions	?
Individual product sales as a percentage of whole revenue.	?
Total sales of the company over a period of 15 years	?
Relation between advertisement and sales	?

4.2. STEPS TO CREATE GRAPH / CHART

As we discussed earlier, data when visually presented enables clear understanding and is more appealing. Creating charts/graphs is not a cumbersome task in LibreOffice Calc. Navigating through the steps given, you can easily master this skill.

1. **Open LibreOffice Calc**

   Applications → Office → LibreOffice Calc.

2. **Data entry**

   Input the necessary data into spreadsheet manually or we can import the data from other sources.

3. **Data selection**

   Select the cells which contain the data where chart is to be prepared. Here we can

select the entire data or a part of the data as per our requirement by using 'Ctrl key' and 'the mouse'.

4.   Plotting the chart

To plot the chart in a spreadsheet, click on Insert menu , select the Chart option from the menu, choose a chart type from the chart wizard. Select 'finish' button. (Figure 4.12)

Insert → Chart → Chart Wizard → Chart Type → Finish
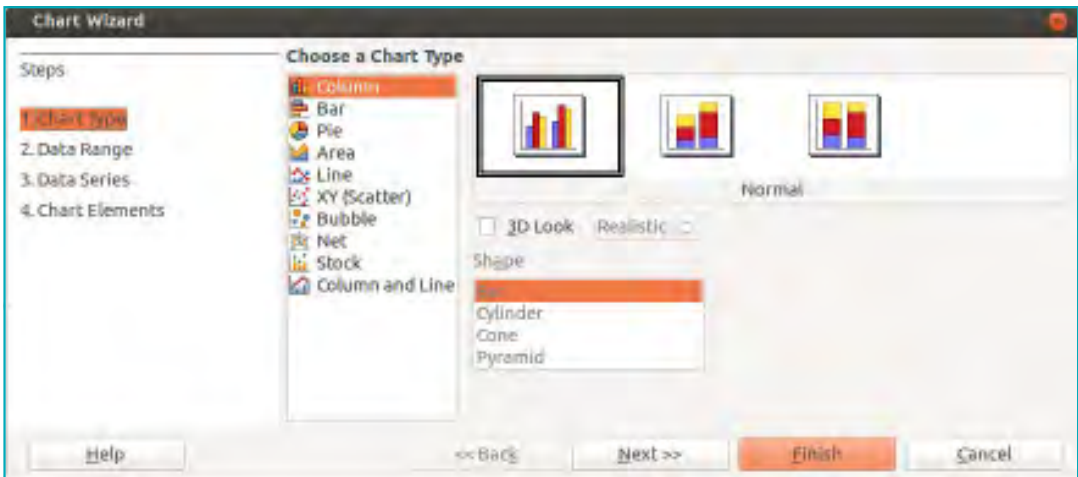
Fig 4.12 Chart Wizard - Chart Type

Procedure for plotting charts

To plot a chart in LibreOffice Calc you have to follow the sequence on the left pane of the Chart Wizard window.

a)   **Chart Types:** Here the user can select the desired chart type from 'Choose a Chart Type' list (Figure 4.12).

b)   **Data Range:** This option is useful for selecting and changing the data ranges and axes labels (Figure 4.13).

Fig 4.13 Chart Wizard - Data Range

c) **Data Series:** By using this option, we can add new data series to an existing chart or remove existing data series in edit mode, if required. For example, the sale of different products for the month of February is a new data series. (Figure 4.14).
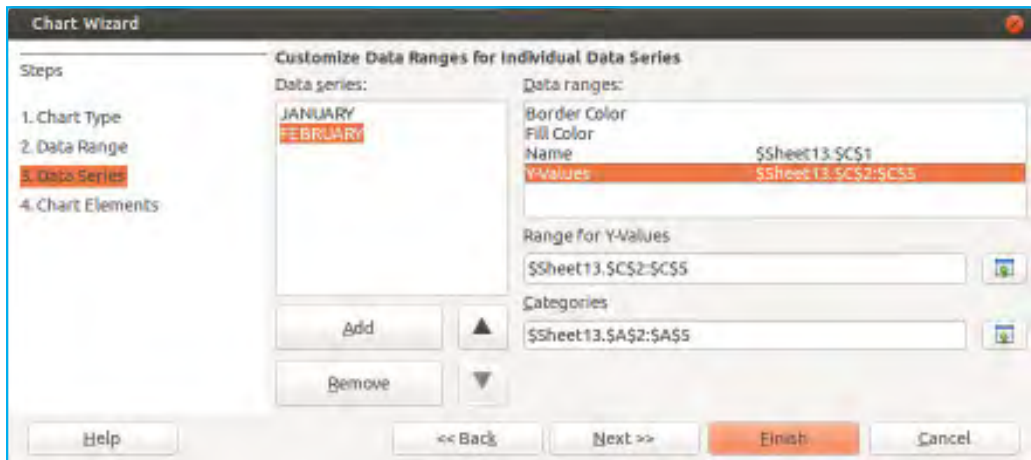
Fig 4.14 Chart Wizard - Data Series

d) **Chart Elements:** The title of chart, legend and grid settings are available on this page (Figure 4.15). After entering the above details, press 'Finish' button, and resulting output is shown in figure 4.16.
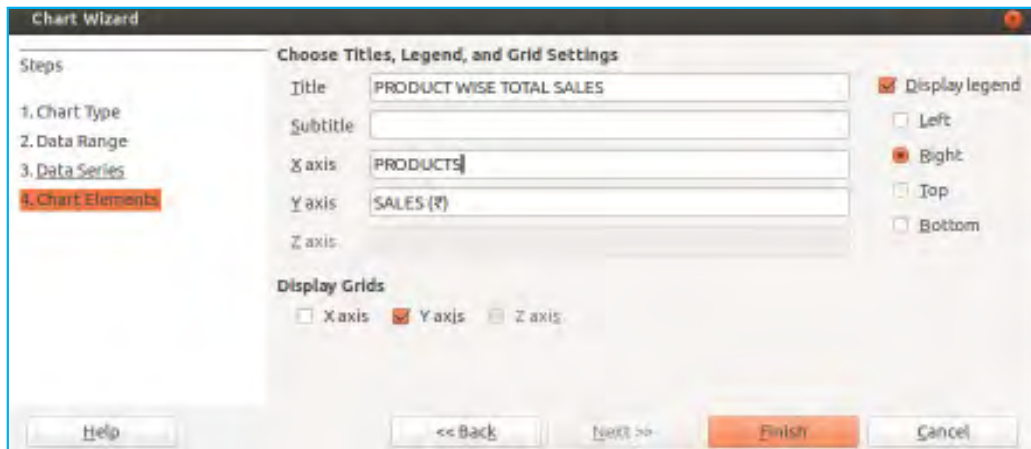
Fig 4.15 Chart Wizard - Chart Elements

Fig 4.16 Chart Wizard - Output

4.3. ELEMENTS OF A CHART/GRAPH

There are different elements in a chart/graph that give more clarity to the data. These parts that make up a chart are referred as chart elements. Figure 4.17 shows different elements of a chart.

1. **The chart area:** The entire area of a chart , including all elements is called the chart area. In other words, the chart area is bounded by the outer border.

2. **The plot area:** In a 2-D chart, the area is bounded by the X and Y axes . In a 3-D chart, the area is bounded by the three (X, Y and Z) axes. It is also called chart wall. This area can have its own border as well as a background colour.

3. **Chart floor:** The chart floor is the lower area on which the data points are placed. It can be seen only in 3D charts.

4. **Chart main title:** This is the explanatory heading at the top of the chart.

5. **Chart subtitle:** This title identifies the purpose of a chart.

6. **X axis:** Horizontal axis in a chart is called X axis. It is also called Category axis.

7. **Y axis:** This is the vertical axis of a chart. It is also called Value axis.

8. **Z axis:** In case of 3D chart Z axis will also be there, which represent the depth.

9. **Axis Titles:** This mention the name or title for X, Y and Z axes. See '9A' and '9B' marked in figure 4. 17.

Fig 4.17 Elements of a Chart

10. **Data points:** The individual values plotted in a chart and represented by bars, columns, lines, pies or various other shapes are called Data point or Data marker. It is a symbol on the chart that represents one value of data series.

11. **Data series:** Data markers of the same colour or pattern are called data series. The data series are related data points that are plotted in the chart/graph. It is a collection of data points or markers and normally corresponds to the data within a single row or column.

12. **Legend:** It is an identifier of a piece of information shown in the chart/graph. Generally, these legends are attached to a symbol or colour or pattern that is associated with data series of the chart. It is used to distinguish one data series from the another.

13. **Data Label:** The value of the data series plotted in a chart is known as data label. This provides additional information about a data marker to identify the details of data point in a data series - either values as a number or percentage.

14. **Grid lines:** These are the vertical and horizontal lines that appear in a chart. They are displayed in the chart wall. It increases the readability of a chart.

4.4. FORMATTING CHARTS

Why formatting is significant in charts and graphs?

Charts and graphs not only provide a visual delight but also it exemplifies the trends and patterns that the viewers can pick up. Here our intention is to enhance the appearance of a chart which is already created.

The format menu is used for making changes in the chart. Double-click the chart so that it is enclosed by a gray border indicating edit mode; then, select the chart element that we want to format. Choose Format from the menu bar, or right-click to display a context menu relevant to the selected element (Figure 4.18).
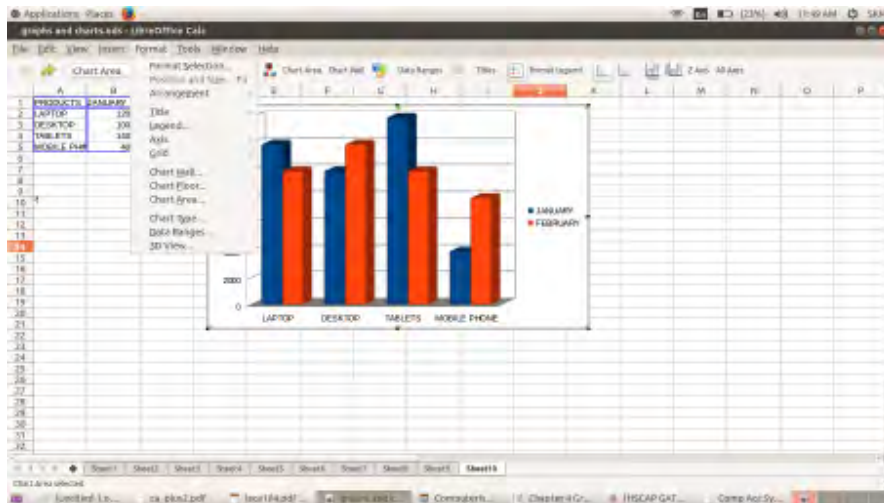
Fig 4.18 Formatting Chart

The following changes can be made in a chart with the help of Format menu:

1. **Format Selection:** It opens a dialog box in which we can specify the area fill, borders, transparency, characters, font effects, and other attributes of the selected element of the chart. This option will be enabled only when we select the chart wall.

2. **Position and Size:** It opens a dialog box by which we can rearrange the position and size of the graph. This option will be activated only when the chart wall is selected.

3. **Title:** This option is active only when there is a title on the chart and it helps to format the tittle of the chart and its axes.

4. **Legend**: This option allows us to format the location, borders, background, and type of the legend.

5. **Axis** : It allows us to format the lines that create the chart as well as the font of the text that appears on both the X and Y axis .

6. **Grid** : Here we can make changes in the lines that create a grid for the chart.

7. **Chart Type** : This facility enables us to change the type of chart to two dimensional or three dimensional.

8. **Data Ranges**: This option helps us to change the data range of a chart according to the need of the user.

9. **3D View** : This option is active only on 3D charts. Here necessary changes to the perspective, appearance and illumination of the chart can be done using the option.

4.5 MOVING CHART ELEMENTS

If we want to move or resize individual chart element, follow the steps given below:

1) Double-click the chart.

2)   Click on any of the elements - e.g., the title, the legend, etc.

3)   Click and drag the element to be moved to the desired location.

Changing the Chart Type

The chart type can be changed using 'Format' menu as and when the situation demands. Suppose if we want to change a bar chart to a column chart, this can be done with the following steps.

1.   Select the chart by double-click.

2.   Then do any of the following alternatives

      Format - Chart Type from the menu bar.

      Click the Chart Type icon on the Formatting toolbar.

      Right-click on the chart and choose Chart Type.

3.   Select the new chart type and click OK.

Let us see an example

Prepare a column chart showing the sales report from the following details of M/s Arya Agencies by using spreadsheet.

Year	2012	2013	2014	2015	2016
Sales in (₹)	25000	37000	40000	35000	30000

In order to create a column chart, the steps mentioned under are to be followed:

1.   Open spreadsheet.

2.   Enter the details given in appropriate cells.

3.   Select the cells containing the data.

4.   Select the option Chart from Insert menu.

5.   Choose the Chart Type from chart wizard and click 'Next'.

6.   In Data Range option enable the radio button Data series in rows; check the boxes for **First row as label** and **First column as label**.

7.   Go to Chart Elements option in Chart Wizard, give appropriate title for chart (Arya Agencies), sub title (Sales Report), X axis (Year) and Y axis (Sales in Rupees) Labels and click Finish button.

8.   Save the spreadsheet by clicking on the 'Save' icon or press Ctrl+S keys and the resulting output is shown in figure 4.19.

Fig 4.19 Column Chart

4.6. 2D-3D CHARTS/GRAPHS

● Have you experienced watching a 3D movie with 3D glasses on?

● How was it different from 2D film that you regularly watch in theatres?

The term 2D and 3D are used to indicate dimensions. 2D stands for Two-Dimensional, whereas 3D stands for Three-Dimensional. 2D represents an object in just two dimensions in X and Y axes as shown in figure 4.20 while 3D represents it in three dimensions in X, Y and Z axes as shown in figure 4.21
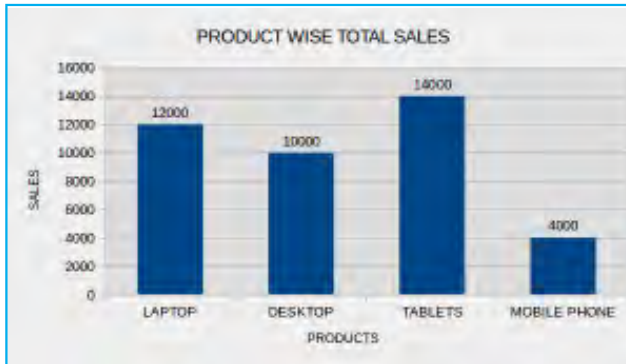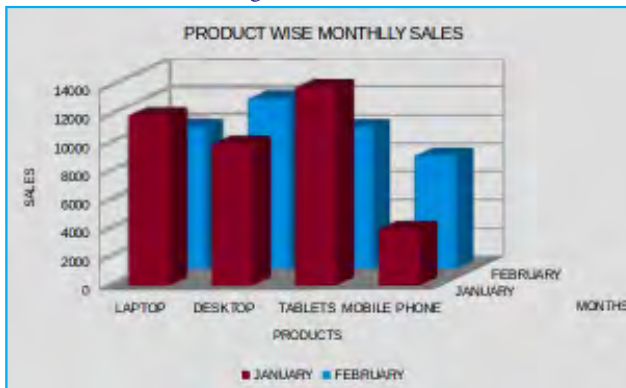

Fig 4.20 2D chart

Fig 4.21 3D Chart

4.7. ADVANTAGES OF CHARTS AND GRAPHS

You have came across various components of graphs/ charts in the previous sections. The concepts you have learnt so far help you to list the advantages of graphs/ charts like:

● The message conveyed visually can be easily grasped by the audience

● A great deal of details that can be easily incorporated within short span of time

●

To conclude, charts and graphs help to draw quicker and easier conclusions and to identify the relationships of variables among one another rather than paging through raw data. The following are its advantages :

It helps to ;

● create visual appeal

● read the data easy

● analyse and interact the data quickly

● know the trends easily

● grasp the data quickly

● present huge volume of data easily and within limited space

Summary

● Graph is a pictorial representation of data. Graphs are usually two dimensional. Sometimes three dimensional graphs are also used.

● Commonly used charts are Column chart, Bar chart, Pie chart, Line chart, Area chart, etc.

● Each and every element of chart such as plot area, axes, data, titles, labels, legends, grid lines, etc. can be formatted using format menu or format tool bar.

● The size of chart can be changed as per our requirements.

● Graphs and charts help to visualise the trends in presented data than textual information, so that they can be comprehended more easily.

I can

- illustrate the data in graphical form in charts and diagrams using spread sheet
- state and apply the techniques of changing lay out, types and models of graphs and charts for representing business data using spread sheet
- describe the use of accounting / business data for graphical representation
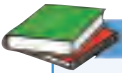
TE QUESTIONS

1. Line chart is used to display:
   a. information about the frequency of different quantities
   b. trends over a period of time
   c. percentage of data
   d. data in vertical bars

2. To fill the chart area, double-click the chart and select:
   a. Chart wall
   b. Data Range
   c. Chart area
   d. Titles

3. Find the odd one out:
   a. Normal pie chart
   b. Donut chart
   c. Exploded donut chart
   d. Bar chart

4. Explain the suitability of a column chart.
5. Show the steps for creating a chart.
6. Illustrate and explain the elements of a chart.
7. Compare 2D chart and 3D chart.
8. List out the advantages of charts and graphs in business applications.
9. Mr. Abhijith wants to move the title of a chart to a new location, can you help him in this regard.
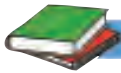
PE QUESTIONS

1. Total sales of Kiran Shoe Mart and Afsal Footwears for the year 2013 to 2017 are given below:

(Sales in ₹)

Year	Kiran Shoe Mart	Afsal Footwears
2013	120000	140000
2014	140000	130000
2015	125000	135000
2016	110000	117000
2017	140000	150000

   a) Present the data in a column chart.

   b) Change the chart type to a line chart.

2. Prepare a pie chart from the following data of family expenditure for the month of January 2018:

(Amount in ₹)

Vegetables	Fish and Meat	Telephone	Electricity	Grocery	Others
5000	12000	2000	1500	8000	6000

3. Draw a column chart for the following data and give a title "Age wise details".

Age	12	13	14	15	16	17
No. of students	50	60	70	90	150	160

APPENDIX

Lab work-1

Total sales of XY Agencies and Ready Bros for the year 2011 to 2015 are given below: (Sales in ₹)

Year	XY Agencies	Ready Bros
2011	40000	38000
2012	32000	48000
2013	51000	42000
2014	72000	81000
2015	60000	58000

   a) Present the data in a column chart.

Procedure

In order to create a column chart the steps mentioned under are to be followed:

1. Open spreadsheet.
2. Enter the details given in appropriate cells.
3. Select the cells containing the data.
4. Select the option Chart from Insert tab.
5. Choose the Chart Type from chart wizard and click 'Next'.
6. In Data Range option enable the radio button Data series in columns; check the boxes for First row as label and First column as label.
7. Go to Chart Elements option in Chart Wizard, give appropriate title for chart (Sales Report), X axis (Year) and Y axis (Sales in Rupees) Labels and click Finish button.
8. Save the spreadsheet by clicking on the 'Save' icon or press Ctrl+S keys.

Output:

Fig 4.22 - Column Chart

Lab work-2

2. Prepare a pie chart from the following data of PTA expenditure for the month of December 2017:

(Amount in ₹)

Repairs & Maintenance	Lab Items	Library	Electricity	Telephone	Others
5000	12000	2000	1500	8000	6000

Procedure

In order to create a column charts the steps mentioned under are to be followed:

1. Open spreadsheet.
2. Enter the details given in appropriate cells.
3. Select the cells containing the data.
4. Select the option Chart from Insert tab.
5. Choose the Chart Type from chart wizard and click 'Next'.
6. In Data Range option enable the radio button Data series in rows; check the boxes for First row as label and First column as label.
7. Go to Chart Elements option in Chart Wizard, give appropriate title for chart (PTA Expenditure), sub title (December 2017), X axis (Year) and Y axis (Sales in Rupees) Labels and click Finish button.
8. Save the spreadsheet by clicking on the 'Save' icon or press Ctrl+S keys.

Output

Fig 4.23 Pie Chart