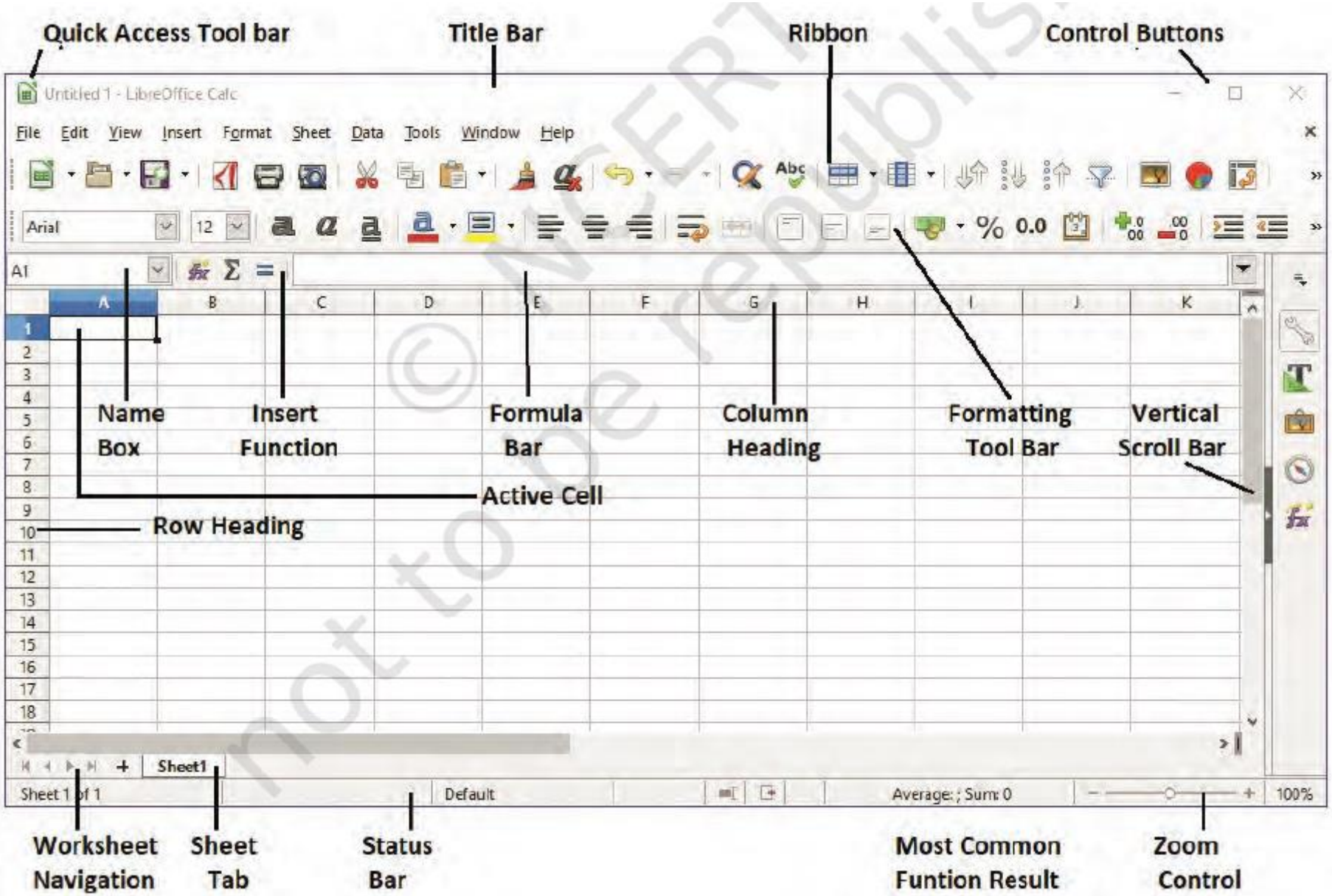
INDIAN SCHOOL AL WADI AL KABIR

UNIT 4
Electronic Spreadsheet
CLASS IX Information Technology

- A spreadsheet software can also store, manipulate and create graphical representations of data.
- LibreOffice Calc is used to perform the following activities accurately and efficiently.
  - Tabulation of data
  - Simple mathematical calculations
  - Complex calculations using formula and functions
  - Arranging data in ascending and descending order (sorting)
  - Filtering the required data
  - Check the validity of data
  - Protection of data using passwords
  - Saving for future use



- **(a) Title bar:** The Title bar, located at the top, shows the name of the current spreadsheet. When the spreadsheet is newly created, its name is Untitled X, where X is a number. The first created spreadsheet takes the name as Untitled 1, second is Untitled 2 and so on.
- **(b) Menu bar:** Menu bar is located just below the Title bar. It contains the menus with commands for various tasks. Each menu item has a submenu called pull-down menu. The various menu items are briefly explained below.
- (i) File: contains commands applied to entire document — *Open, Save, Wizards, Export as PDF, Print, Digital Signatures and so on*.
- (ii) Edit: contains editing commands — *Undo, Cut,Copy, Paste, Select, Find & Replace and so on*.
- (iii) View: contains commands for modifying the user interface — *Toolbars, Column & Row Headers, Full Screen, Zoom and so on*.
- (iv) Insert: contains commands for inserting elements into a spreadsheet — *Image, Media, Chart, Object, Shapes, Date, Time, Headers and Footers*.
- (v) Format: contains commands for modifying the layout of a spreadsheet — *Cells, Rows, Columns, Page, Styles and Formatting, Alignment and so on*.
- (vi) Styles: for managing styles.
- (vii) Sheet: contains commands to insert and delete cell, rows and columns, insert sheet, rename sheet, fill cell, etc.
- (viii) Data: contains commands for manipulating data — *Define range, sort, and so on*.
- (ix) Tools: contains various functions to check and customise spreadsheet — *Spelling, Language, Gallery, Macros and so on*.
- (x) Window: contains commands window — New Window, Split and so on.
- (xi) Help: contains links to the help system included in the software and other miscellaneous functions — Help, License Information, Check for Updates and so on.

- **Toolbars:** The Calc opens with the Standard and Formatting toolbars at the top of the workspace by default. These toolbar provide a wide range of common commands and functions. Placing the mouse cursor over any icon displays a small box called a tooltip. It gives a brief explanation of the icon function.
- (i) Standard toolbar: The standard tool bar shows the icons for most common operations, such as editing, arranging, filtering, etc., used while working on the spreadsheet.
- (ii) Formatting toolbar: Formatting toolbar has the most common operation related to formatting datasheet. It includes buttons for font selection, size of text, alignment, cell value formatting and indentation, etc.
- (iii) Formula toolbar: It allows entering and editing the formula in the cell. Formula bar consists of the following:
  - **Name box:** shows the cell reference, for example A1.
  - **Functions wizard:** search the function from the list of available functions.
  - **Sum:** used to total the numbers in the cells above the selected cell. The sum is placed in the selected cell.
- **Function:** clicking on the Function icon inserts an equals (=) sign into the selected cell and the Input line allow formula to be entered.
- • **Input line:** displays the contents of the selected cell (data, formula, or function) and allows editing the cell contents. To edit inside the **Input line** area, click in the area, then type the changes. To edit within the current cell, just double-click in the cell.
- **Worksheet:** The worksheet in Calc is also referred to as spreadsheet. The spreadsheet can have many sheets. Each sheet can have many individual cells arranged in rows and columns. The sheet tab shows its default name as Sheet1, Sheet2, Sheet3, ….

- **e) Rows and columns:** Each sheet can have a maximum of **1,048,576 (220)** rows and **1024 (210)** columns. The rows are numbered as 1,2,3,4,… and columns are numbered as *A, B, C, D, …., Z, AA, AB,AC, …., AZ, BA to BZ, CA,…., AMJ*.
- **(f) Cell and cell address:** The intersection of a row and column is called a cell. It is the basic element of a spreadsheet. It holds data, such as text, numbers, formulas and so on. A cell address is denoted by its column (letter) and row number. For example, D4, E9, Z89
- (i) Active cell: When we position the mouse cursor on a cell, it gets selected, and is ready to take data from the user. This selected or activated cell is called as ctive cell. It is always highlighted, with a thick border. The address of the active cell is displayed in the name box.

Excercise 1

- Write the cell address of the following

1. Seventh column and tenth row …….
2. Tenth column and nineteenth row ……..
3. The cell address LK89 is situated in row number……. and column letter …..

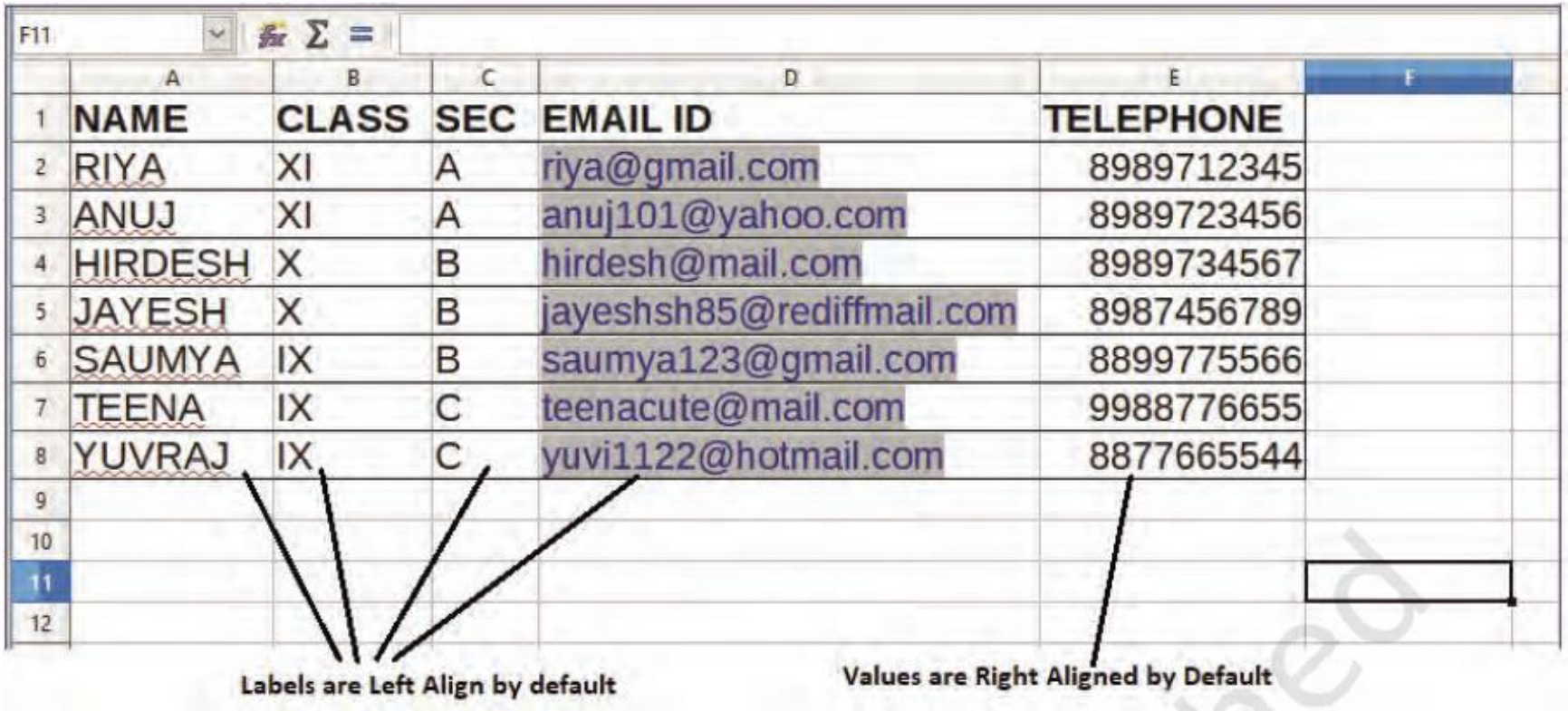
(ii) Range of cells: A block of adjacent cells in a worksheet which is highlighted or selected is called a range of cells.

Key or Key Combination	Result of Key or Combination
Arrow keys (←↑→↓)	Move a single cell in arrow direction
Ctrl + Arrow Keys	Moves the cell to the end of the data range in a particular direction
Home	Moves to column A along the row where the active cell is
Ctrl + Home	Moves the cell to A1 position
Ctrl + End	Moves to bottom right cell of the data range
Page Up	Moves the worksheet one screen up
Page Down	Moves the worksheet one screen down

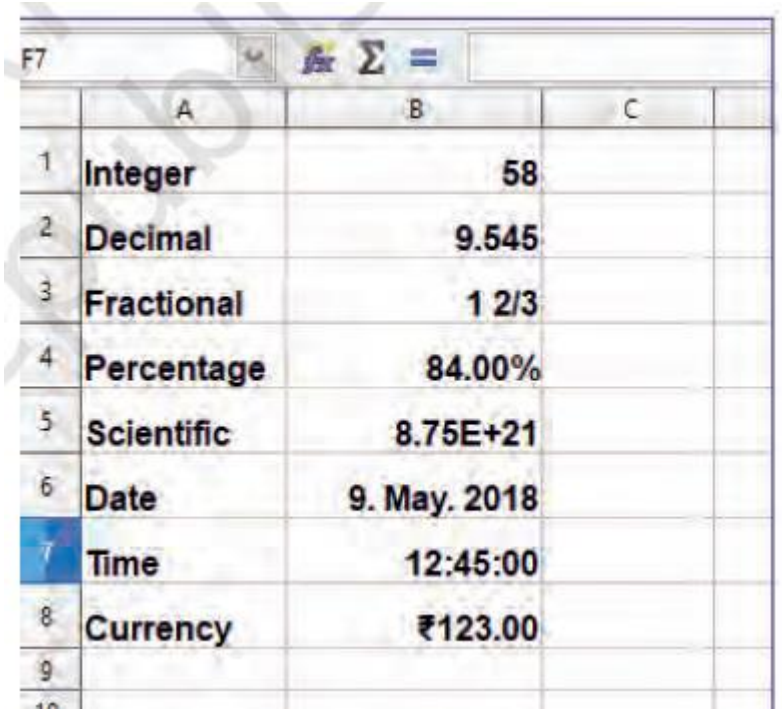
- The ***column range*** is the number of cells spread across the column.example C2:C7
- The ***row range*** is the number of cells spread across the row.example B3:D3
- The ***row and column range*** is the number of cells spread across the row and columns. Example B2:C7
- The control key is used to select more than one ‘range of cells’ in a worksheet.

Entering data

- The data to be entered can be the label, values or formula.
- **(a) Label:** Label is the any text entered by using a keyboard. It may combine with letters, numbers, and special symbols.
- Excercise2:



- **(b) Values:** The numerical data consisting of only numbers are called values. By default values are right aligned. There are various forms of values, such as integer, decimal and so on.
- **(c) Formulae:** Any expressions that begins with an equals '=' is treated as formula. In the expression, the '=' followed by values, cell address and functions are called as formula.



Mathematical operators used in formulae:

Mathematical Operators		Operator precedence	
+	addition	First	( )
-	subtraction	Second	^
*	multiplication	Third	/, *
/	division	Fourth	+ , -
^	exponentiation (power)		

Exercise 3:

Evaluate the following equations using operator precedence and then test the result in the spreadsheet

1. 8-4/2
2. 5*5+8
3. 3+5*4
4. 2^5+8
5. 3+2^2
6. 5+6*2^2
7. 8/4*4
8. -4/2+2
9. 1+2^2-2
10. 4*3/2

Formulae with cell addresses and operators:

Exercise 4: create a simple spreadsheet to prepare a shopping bill of stationary of the following items.

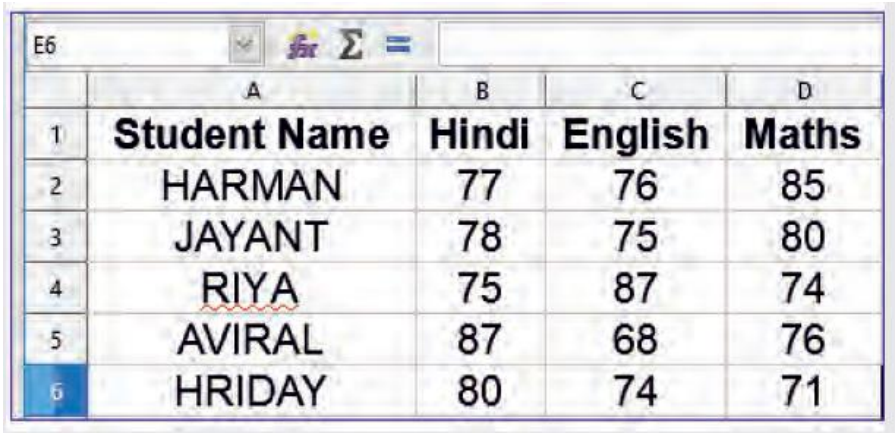
Item	Quantity	Unit Price
Register	3	40
Single Rule Copy	12	25
Notebook	6	30
Pencil Box	1	50
Color Box	1	120
Notebook Cover	20	3

The results obtained from a formula (based on cell addresses) always get updated automatically when the values of these cells mentioned in the formula change.

Use of functions to do calculations:

Function	Syntax	Use
SUM	=SUM(Number1,Number2,.....)	Adds the values contained in a range of cells.
AVERAGE	=AVERAGE(Number1,Number2,....)	Finds out the average of the values contained in a range of cell
MAX	=MAX(Number1,Number2,.....)	Finds out the largest value contained in a range of cells.
MIN	=MIN(Number1,Number2,.....)	Finds out the smallest value contained in a range of cells.
COUNT	=COUNT(Number1,Number2,.....)	Counts the number of cells within a range of cells.

- Exercise 5:The Figure shows marks scored by students in three different subjects.



	A	B	C	D
1	Student Name	Hindi	English	Maths
2	HARMAN	77	76	85
3	JAYANT	78	75	80
4	RIYA	75	87	74
5	AVIRAL	87	68	76
6	HRIDAY	80	74	71

- 1. Write the formula in E2 to find the total marks scored by HARMAN.
- 2. Copy the formula entered in E2 for other students.
- 3. Write the formula in F2 to find the average marks scored by HARMAN?
- 4. Copy the formula entered in F2 for other students.
- 5. Write the formula in cell B7 to find the highest score in Hindi.
- 6. How will you find the highest score in English and Maths?
- 7. Write the formula in cell B8 to find the total number of students who appeared in Hindi?
- 8. Write the formula in cell B9 to find the lowest score in Hindi.
- 9. How will you find the lowest score in English and Maths?
- 10. How will you find the highest score in Hindi, English and Maths?

Formatting the worksheet

The Format cells dialog box can be opened using ***Format→cells*** using the Format menu, or from context menu opened through right clicking the cell. ***Format Cell*** dialog box can be opened by pressing the shortcut key ***Ctrl+1***

S.No.	Tool	Details
1.	Font	Apply different font types on a worksheet
2.	Font Size	Apply different font sizes on a worksheet
3.	Bold	Make the selected text bold
4.	Italic	Italicize the selected text
5.	Underline	Underline the selected text
6.	Left Alignment	Align text in a cell to the left
7.	Center Alignment	Align text in a cell to the center
8.	Right Alignment	Align text in a cell to the right
9.	Increase decimal places	Show more precise value by showing more decimal places
10.	Decreased decimal places	Show less precise decimal places

Formatting a range of cells with decimal places

Following are the steps to format a cell to the required number of decimal places:

- Select the range of cells.
- Open the ‘format cells dialog’ box
- Click the ‘Number’ tab
- Select the ‘Number’
- Change the decimal places as required

Formatting a range of cells to be seen as labels

- while entering the telephone number with the STD code the first digit zero (‘0’), disappears from the telephone number. This is because the telephone number is stored as a numeric value, and the numeric value does not have a preceding zero. If you make these numeric values as text, then the complete telephone number will appear with a preceding zero.
- Select the range of cells
- Open the ‘format cells dialog’ box
- Click the Number tab
- Select Text
- Click ‘OK’
- Enter numbers

Formatting of a cell range as scientific

- In a spreadsheet, by default the date format is in American Format; (mm/dd/yyyy) (mm-month, dd-date, yyyy-year). The date 12/09/2018 means that it is the 09th day of December 2018. In a spreadsheet application, the user can change this Date in many different formats (Figure 4.26). To do these follow the below steps.
- Select the range of cells.
- Open the ‘Format cells dialog’ box
- Click the ‘Number’ tab
- Select the ‘Date’ category
- Select the date format
- Click ‘OK’

Formatting a range of cells to display times

- Time is indicated in a computer as 10:35:53 AM. The common format of this is hh:mm:ss AM/PM (Figure 4.27). Here, hh means hours, mm means minutes and ss means second. Follow the steps below to format a range of cells to display the time.

- Select the cell range
- Open the 'format cells dialog' box
- Click the 'Number' tab
- Select the 'Time' category
- Select category Time should be displayed
- Click 'Ok'

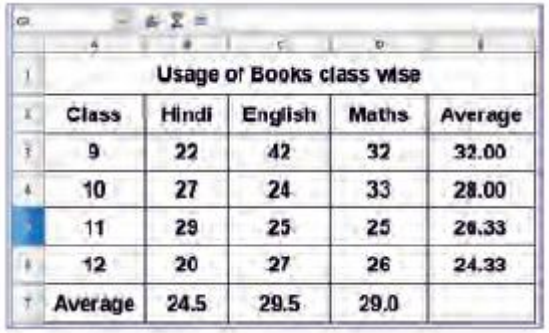
Formatting alignment of a cell range

- The labels and values can be aligned to the left, center or right of a cell range by using the alignment icons

- (Left, Right, Center) on the standard toolbar.

- Select the range of cells
- Open the 'format cells dialog' box
- Click the 'Alignment' tab
- Select left, right or center
- Click 'OK'

Exercise 6 :Create the worksheet as shown in Figure using formatting tools and formulae.



Usage of Books class wise				
Class	Hindi	English	Maths	Average
9	22	42	32	32.00
10	27	24	33	28.00
11	29	25	25	26.33
12	20	27	26	24.33
Average	24.5	29.5	29.0	

- Center align row 1.
- Make row 1 and row 2 Bold.
- Italicise cells A3, A4, A5.
- Use function AVERAGE in cell E3 to calculate the average of Hindi (B3) English (C3) and Maths (D3).
- Copy this formula by dragging it from E3 to E6.
- Use function AVERAGE and write a formula in B7 to calculate the average of Class 9 (B3), Class 10 (B4), Class 11 (B5), Class 12 (B6) for the subject Hindi.
- Copy this formula by dragging it from B7 to D7 and use them to calculate the average for English and Maths.

Speeding up data entry

- The most important ability of a spreadsheet is to drag and drop the contents of one cell to another by using a mouse.
- **Using the fill handle:** The Calc Fill Handle tool is used to fill the next cells till you drag it with the next predefined value.
- **Fill handle of a cell:** The small black square in the bottom-right corner of the selected cell or range is called a fill handle

Uses:

- **a) For number series:** Type the numbers 1, 2 in two consecutive cells and select them using a mouse. Click on the right down corner of the selected cells, hold down the first button of mouse and drag downward till you want to continue
- **b) Copying a formula:** If you wish to apply the same formula to the number of cells in the rows or columns, a formula can be copied.

Use of copy and paste commands for copying formulae

Uses of fill handle for copying formulae

- Exercise 7 **Create the worksheet as shown in Figure**

	A	B	C	D	E
1	Day Name	Month Name	Natural Number	Even Number	Odd Number
2	Sunday	January	1	2	1
3	Monday	February	2	4	3
4	Tuesday	March	3	6	5
5	Wednesday	April	4	8	7
6	Thursday	May	5	10	9
7	Friday	June	6	12	11
8	Saturday	July	7	14	13
9	Sunday	August	8	16	15
10	Monday	September	9	18	17
11	Tuesday	October	10	20	19
12	Wednesday	November	11	22	21
13	Thursday	December	12	24	23
14	Friday	January	13	26	25
15	Saturday	February	14	28	27

Referencing

- Referencing is the way to refer the formula or function from one cell to the next cell along the row or column.
- There are three types of referencing.
  a) Relative referencing
  b) Mixed referencing
  c) Absolute referencing

Thumb rule for referencing

Types of Cell Reference

Example	Type of reference
A1	Relative reference
$A1	Mixed reference (Column letter is absolute)
A$1	Mixed reference (Row number is absolute)
A1	Absolute reference (No change)

(a) **Relative Referencing:** When you drag any formula in any row or column in any direction, the formula gets copied in the new cell with the relative reference. Almost all spreadsheet applications use relative referencing by default.

(b) **Mixed referencing:** As we have seen, when we drag the formula, row number or column name get change in relative reference. In **Mixed Referencing**, the $ sign is used before row number or column name to make it constant. In **mixed referencing** one cell address name is variable and one cell address is constant.

(c) **Absolute referencing:** In Absolute referencing, a $ symbol is used before the column name as well as row number to make it constant. For example, C12, D5, etc. In this case, even if you drag your formula in any direction, the cell name remains constant. This type of referencing is used in higher classes.

Creation of Charts Using Spreadsheets

Let us use the worksheet below to create a **column chart**.

- Follow the steps given below to create charts.
- Select the range of data (A1:F7)
- *Insert → Chart*
- Select the type of chart
- Select the chart (Column Chart)
- Click finish.

Table 4.10: Types of charts

Types	Purpose
Column Chart	Comparing classes of data items in group. Group comparison
Bar Chart	Comparing classes of data items in group. Group comparison
Line Chart	Comparing classes of data items in group. Group comparison
Pie Chart	Comparing classes of data items as percentage.
XY Scatter Chart	Comparing data in pairs

Exercise 8:Quadratic function chart of the equation Y= X^2-5X-3 is given in the Figure.

1. Enter the values 2 to 7 in axis as shown in worksheets.
2. Enter the formula below in cell B2. = B1^2-5*B1-3
3. Copy the formula entered in B2 upto K2
4. Mark A1:A2 a data range
5. Insert → Chart → XY Scatter

	A	B	C	D	E	F	G	H	I	J
1	X	-2	-1	0	1	2	3	4	5	6
2	Y	11	3	-3	-7	-9	-9	-7	-3	3
3										

Home Work

- Collect the electricity bill of your home for each month from January to December (12 months). Create a worksheet with the data of Name of the Month and Bill Amount as below. Enter the data in a worksheet and develop the chart of various types. Conclude your result that which type of chart will be more appropriate for such type of data.

Month	Bill Amount
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	