

3

Microsoft Excel

Knowledge:

Students will be able to:

- Describe the purpose and uses of spreadsheet software.
- List different spreadsheet software e.g. Excel, Google Sheets, Open Office
- Recognise and infer spreadsheet interface to create a result card, home budget, timetable, etc.

Skills:

Students will be able to:

- Create a spreadsheet (i.e. result card, home budget, timetable, etc.) using the following tools:
- Organize data in worksheets within a workbook.
- Select a range of cells.
- Add borders.
- Increase/Decrease column width and height.
- Use simple built-in functions (e.g. sum, average, minimum, maximum).
- Create simple formulae (arithmetic operations).
- Create an appropriate chart for data presentation.



Spreadsheet

In manual systems, accountants use worksheets to keep the record of each transaction of the company. They are used to arrange, calculate, and sort data in the form of a table.

Spreadsheet Software

Software that is used to create a spreadsheet on a computer is called a Spreadsheet Software. It provides a lot more advanced facilities than manual worksheets.

There are many companies that are developing spreadsheet softwares. Some examples of spreadsheet software and their developing companies are as follows:

- Microsoft Excel by Microsoft corporation for Windows, Android, Mac OS, and iPhone Operating System
- Google Sheets by Google Corporation for online users



- OpenOffice by Apache
- LibreOffice, an open-source free software

Uses of Spreadsheet:

Spreadsheets are used for numerous purposes. The most common uses are as under:

- It is used to present data in rows and columns.
- It organises and stores different types of data including numbers, text, date and time, currency, accounting, scientific and any other type of data.
- It is a powerful tool for calculation and computation of data.
- Data may be represented in different formats like graphs and charts to understand data visually.
- Different types of analysis on data can be performed also.

What is Microsoft Excel?

Microsoft Excel is the most widely used spreadsheet software developed by Microsoft Corporation. It allows you to store, organise, and analyse different types of data. It is simple to use for common users. It also provides advanced features of statistics, mathematics, and scientific use. There are many versions of Microsoft Excel. Its 2016 version provides a lot of features that are very helpful for its users.



Do You Know?

The first software to feature a toolbar was Excel.

Basics of Microsoft Excel 2016:

Following are the basic elements of Microsoft Excel 2016.

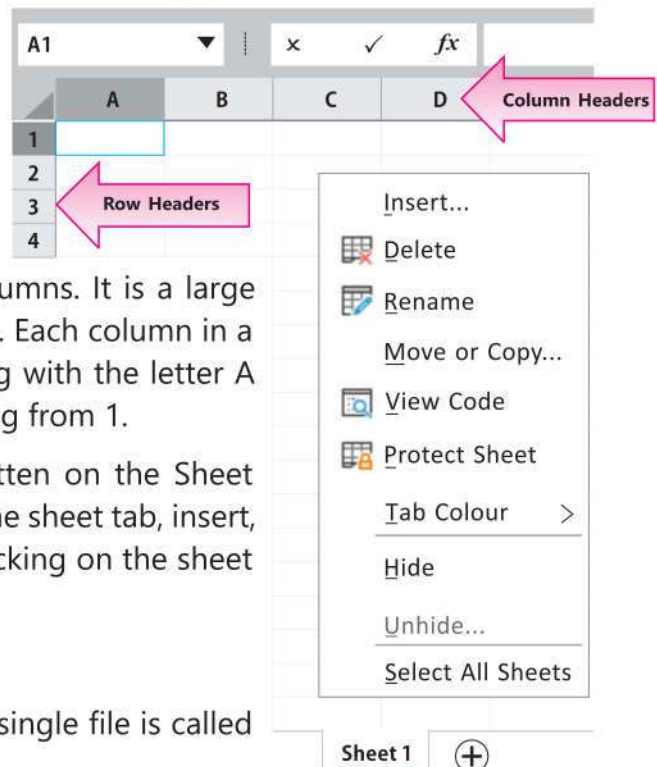
Worksheet

A worksheet is simply a grid of rows and columns. It is a large table with 1,048,576 rows and 16,384 columns. Each column in a worksheet is identified by an alphabet starting with the letter A and each row is identified by a number, starting from 1.

The worksheet is identified by the name written on the Sheet Tab. You can change the name and colour of the sheet tab, insert, delete, move, or copy a worksheet by right clicking on the sheet tab and selecting the proper option.

Workbook

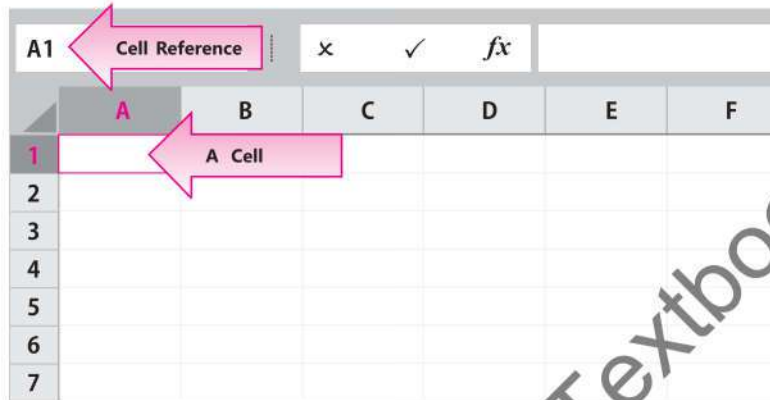
A collection of related worksheets, saved in a single file is called



a Workbook. A workbook typically contains one or more worksheets. Each worksheet in a workbook may include similar or different data.

Cells

The intersection of row and column in a worksheet is called a Cell. Each cell is identified by its reference or address which is composed of a column head followed by a row header.

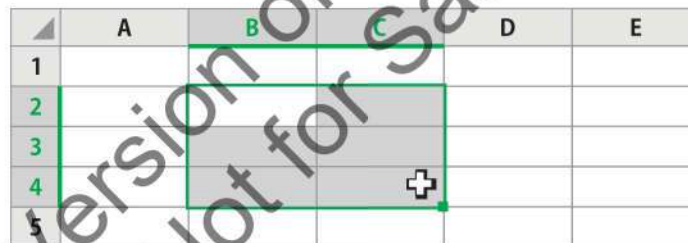


Cell Range

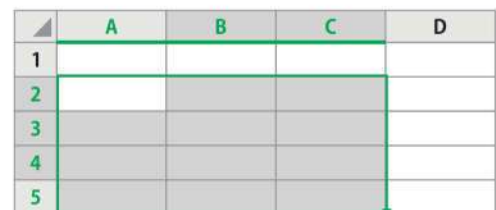
The references of adjacent cells may be denoted by cell range. It is defined by the cell reference of the first cell followed by colon (:) and then writing the reference of the last cell.

There are two methods for choosing the range of cells;

1. Click and drag cell B2 to cell C4 to choose the range B2:C4.

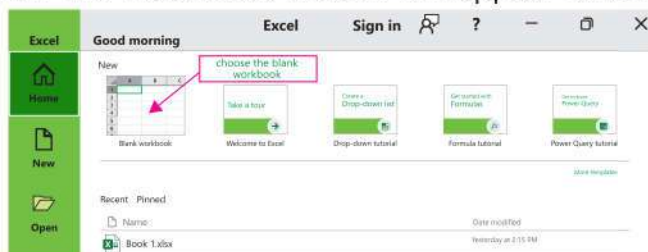


2. Click on the first cell of the range, hold down Shift Key and click on the last cell of the range. All cells between these two cells will be selected. In the following examples, the cell range is A2:C5



Excel Interface

Open Excel by selecting it from the Start menu or by double-clicking the Excel 2016 desktop icon. The Excel Start Screen will appear when you first launch Excel 2016. You can view

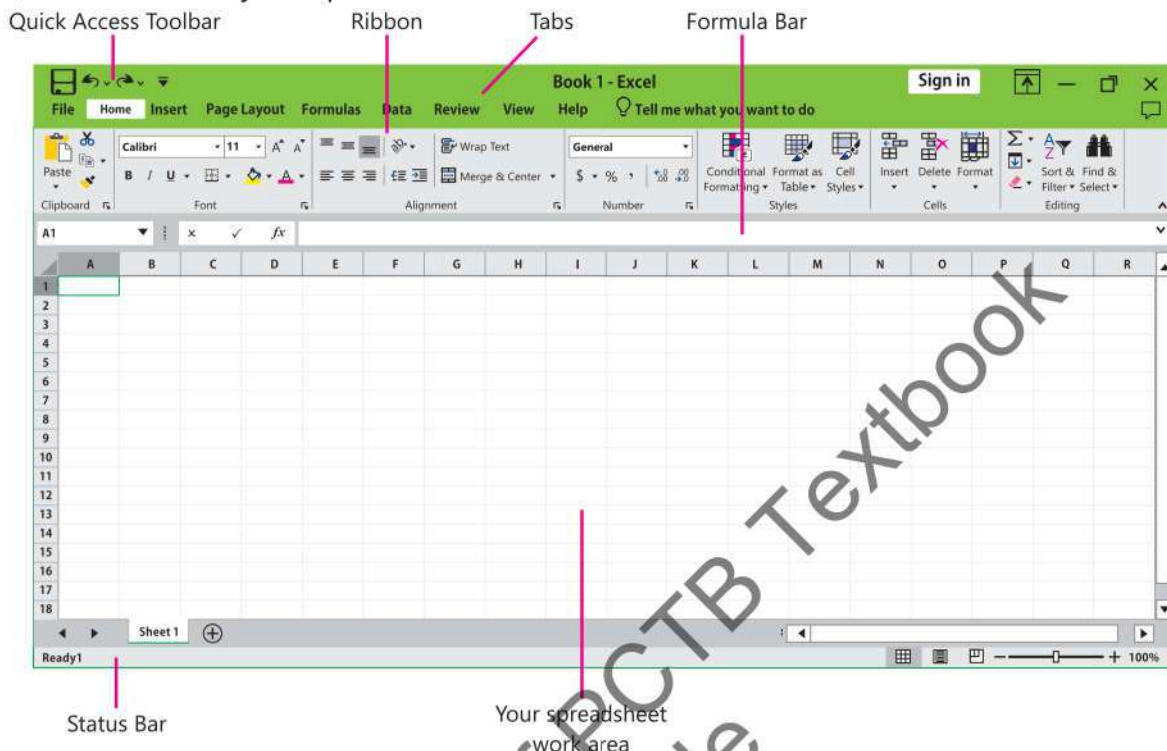


your recently opened workbooks, may create a new workbook from a template or choose to create a new blank workbook.

Locate and choose the Blank

worksheet from the Excel Start Screen to proceed to the Excel interface.

The Excel interface contains many components like Ribbon, Quick Access Toolbar, Formula Bar, Status Bar and your spreadsheet work area.



1. Quick Access Toolbar

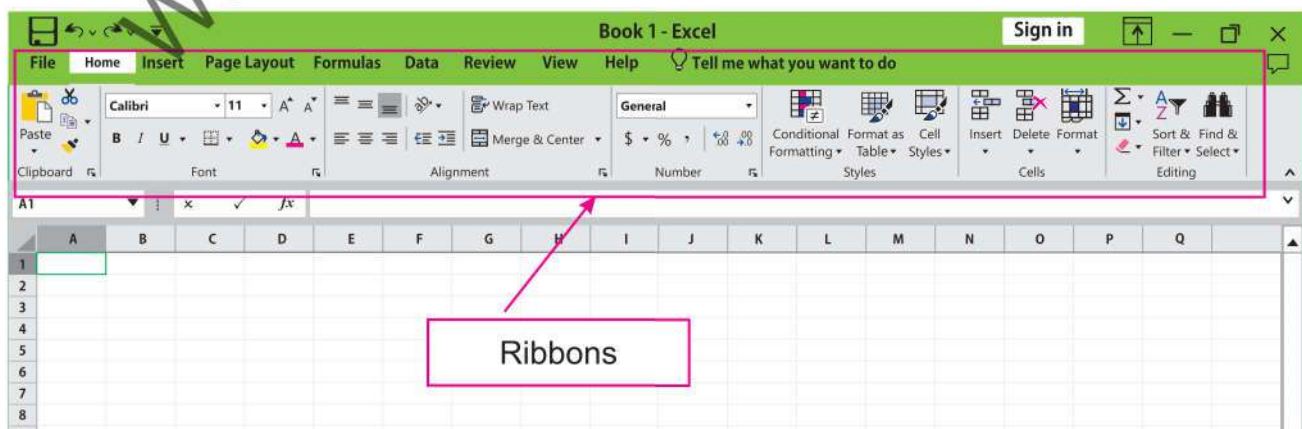
Frequently used commands of Excel are available here. You can add or delete different tools in Quick Access Toolbar.

2. Ribbon

The ribbon contains the icons (or toolbars) for commands. These commands are grouped in different tabs based on their functionality. A brief introduction of these tabs is as under:

Ribbon Tabs

The following are some of the ribbon tabs of Excel.



- **Home Tab**

It is used to apply formats to worksheet cells which include editing, clipboard, font, alignment, number, and cells. It is used to carry out common commands like bold, underline, copy, and paste.

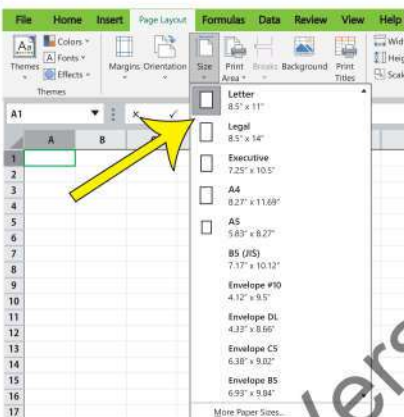
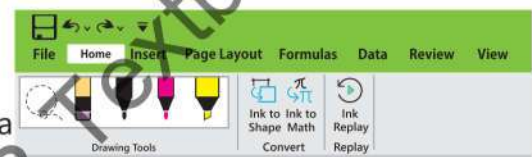
- **Insert Tab**

Insert Tab is used to insert different objects. These objects might include images, hyperlinks, symbols, headers, footers, etc.



- **Draw Tab**

This tab lets you draw with the help of a mouse, digital pen, etc. depending on what device you are using.

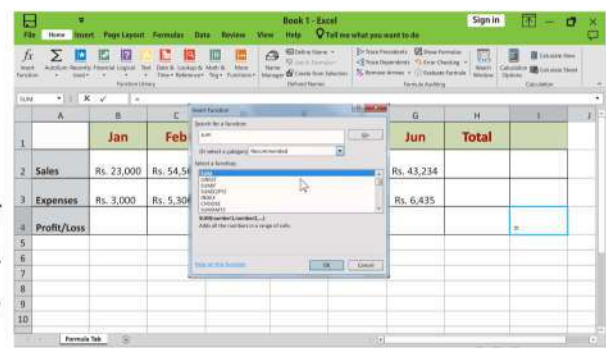


- **Page Layout**

It helps in changing the appearance of the worksheet. It is done in both onscreen and printed form. It includes gridlines, margins, theme settings, etc.

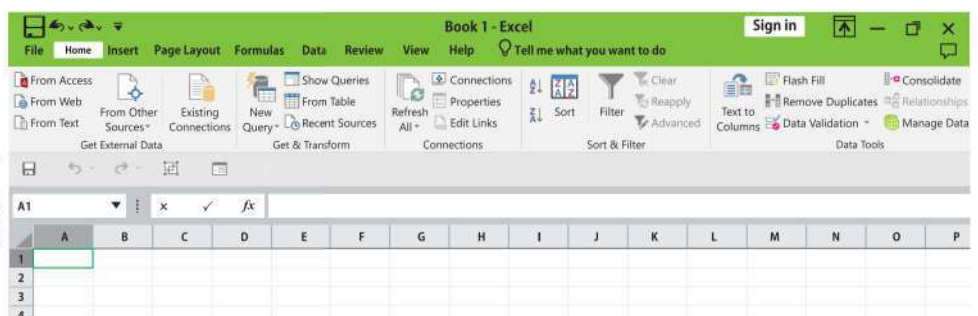
- **Formulas Tab**

Formulas Tab contains practical features for adding different calculations to the worksheet. It is used to insert functions, specify names, establish name ranges, review formulas, etc.



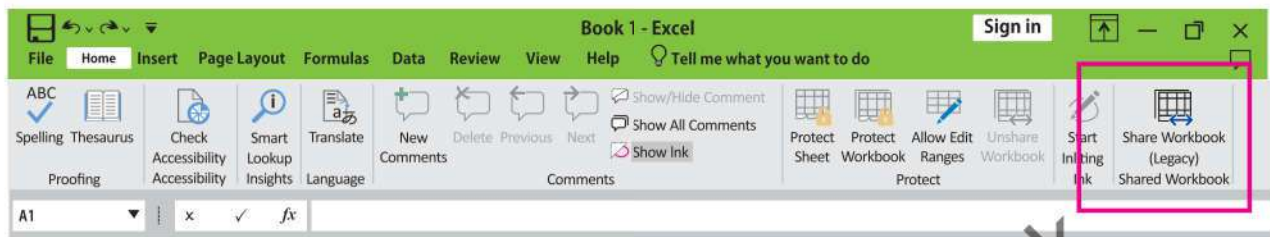
- **Data Tab**

Options for filtering, sorting, and modifying data are mostly found on the data tab.



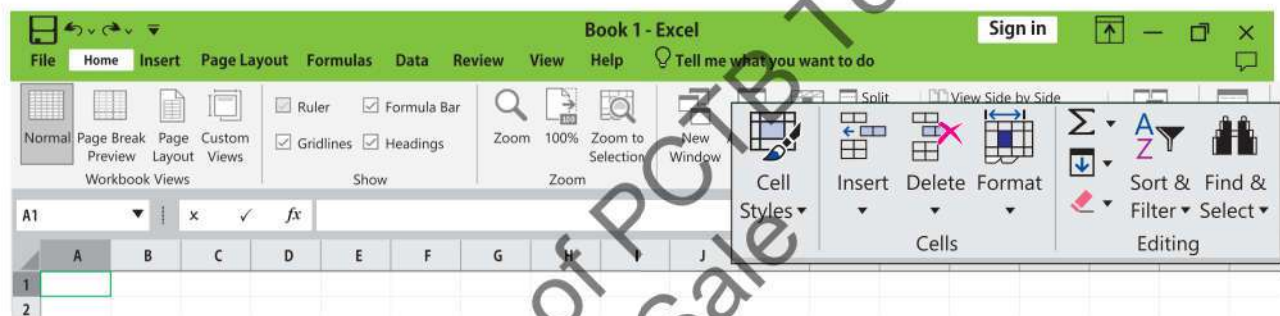
• Review Tab

It helps in reviewing the information like checking the spellings, translation, adding comments, etc. it also helps to protect and share the worksheet and workbook.



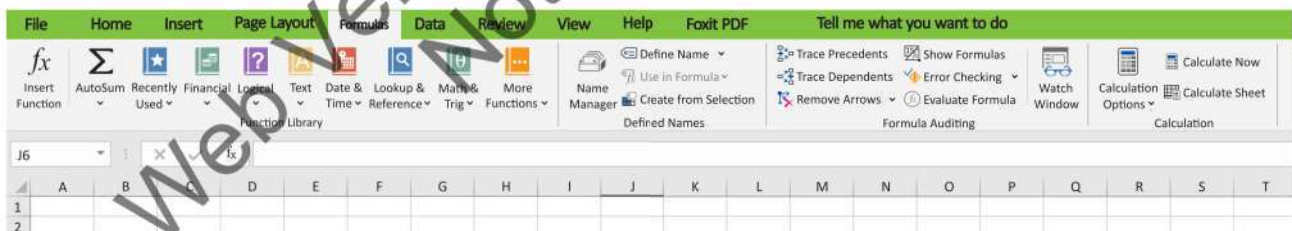
• View Tab

It includes commands that help in switching between the view of workbooks, freezing panes, adding macros, etc.



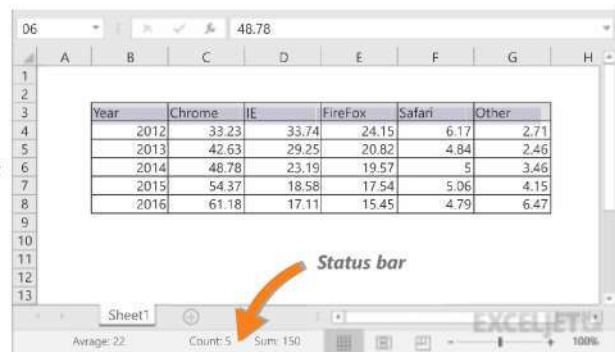
3. Formula Bar

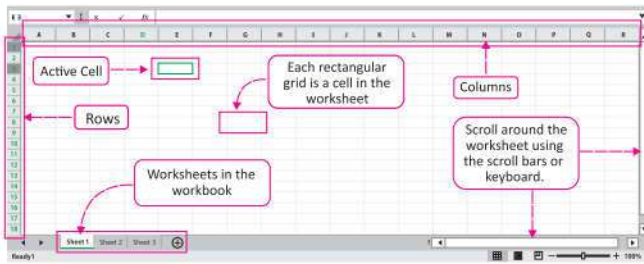
Right above the spreadsheet is the formula bar. When you enter a formula or function in the cell, it appears here in the formula bar. The result of the calculation is shown in the cell.



4. Status Bar

It is used to display information. Different function e.g. sum, count, average of the cells, etc. may be displayed in the status bar. A lot of other information may be displayed in Status bar by right clicking and choosing the options.





5. Spreadsheet Work Area

It is the place where the main work is done on the data in Excel.

Different Operations in Excel 2016

In Excel, you may perform many actions related to the appearance and organisation of data in worksheets. Some of them are explained here:

Resize Columns

1. Choose a column or a selection of columns.
2. Choose Format > Column Width from the Home menu (or Row Height).
3. Enter the column width, then click OK.

Formatting Cells

To format a cell or group of cells, follow the steps given below:

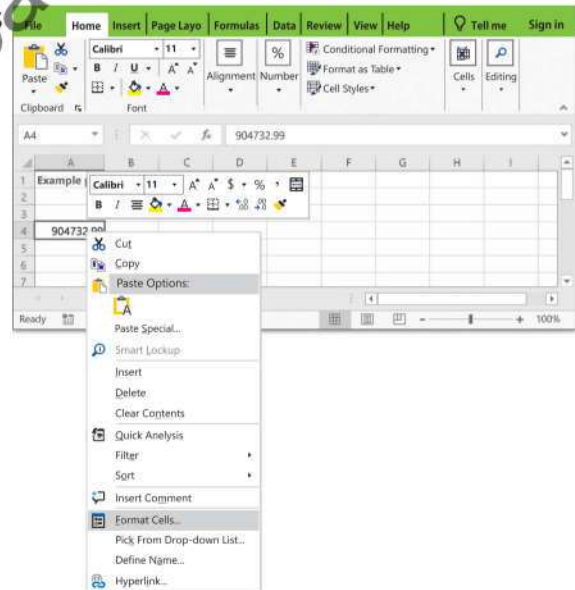
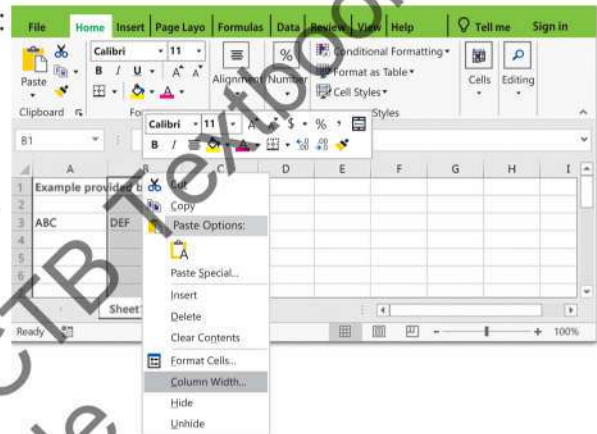
Step 1: Select the cells to be formatted and click on the Format button on Home tab.

Step 2: Click on Format Cells.

Step 3: Select the appropriate option from the Number tab like Date for displaying date, currency format for showing currency, and so on.

Step 4: In the Alignment tab, we can change the alignment of the text. Alignment refers to the placement of your text or numbers in a cell.

Step 5: You can change the font of the content of the cells by selecting the font size, font family and other formats for font specification.



Step 6: The Border tab allows you to draw different types of borders to the selected cells.

Step 7: You can apply different colours to the cells using the options available in the Fill tab.

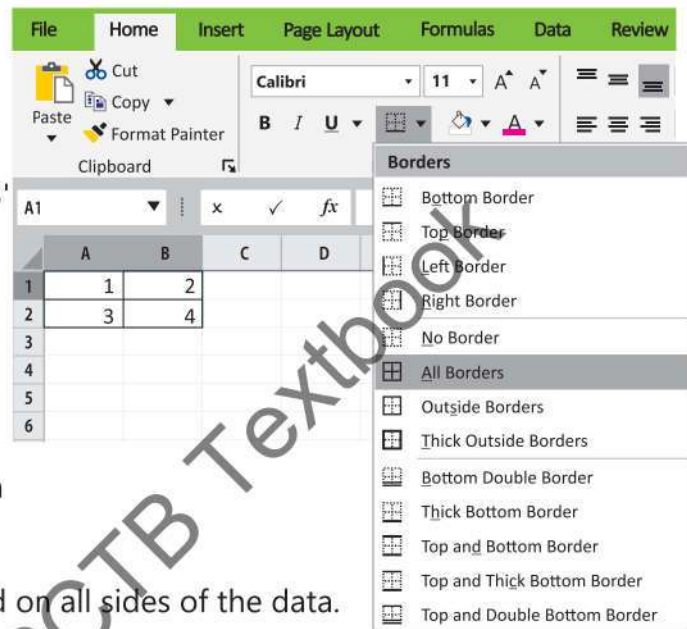
Applying Borders:

Let us create the following sheet in Excel.

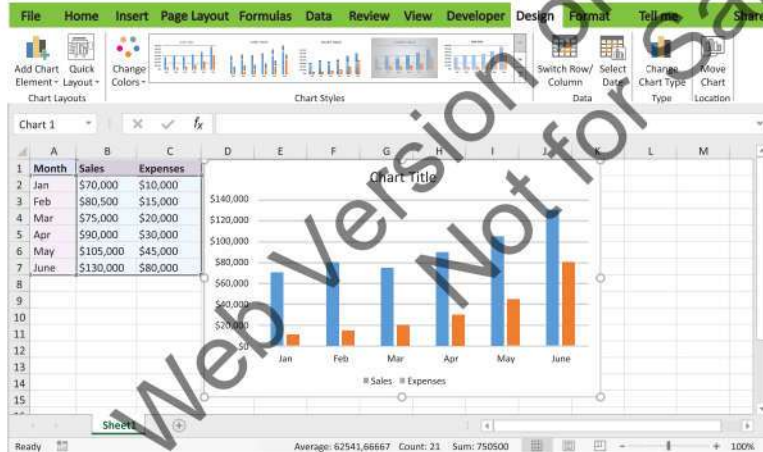
Step 1: Open MS Excel and write '1', '2', '3' and '4' in four separate cells as shown.

Step 2: Select the cells and then click on the Border icon on the Home tab. A list will appear and then click on All Borders.

We can see that a border has been created on all sides of the data.



Generating Charts



A chart is data from a worksheet that is represented visually and can be better understood than data that is only seen as numbers. It is also commonly known as a Graph. It is used for the representation or comparison of data.

We can generate charts of the data entered in a sheet. Let us create a chart for the sheet generated in the previous section.

Step 1: Select the data for which the chart is to be generated. In the sheet below, select cell D11 to cell I14.

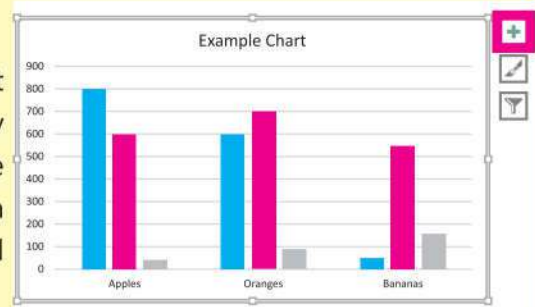
Step 2: From the Insert tab, select the Chart icon. Now click on the 2-D clustered Column chart in the list that appears.

We can see that a chart is created with different colours and legends.



Do You Know?

Legend is found on the right side of the graph or chart and is encircled by a border. The data that is graphically represented in the plot area of the chart is linked to the legend. Simply, legends are a short visual representation of the data series on the chart. The legends on Excel charts explain the data used for a chart.



After you have created the chart, a new chart tool will appear in the menu. You can use the chart tool to modify the chart's properties as you wish.

Formulas in Excel

To perform mathematical computations, an Excel formula is used. It is an expression that calculates a cell's value.

The equal sign (=) and your calculation are always typed in the cell at the beginning of a formula. The equal sign indicates that you are going to enter a formula in the cell. If you do not enter the equal sign, Excel will treat your entry as text and the calculation will fail.

Formulas use references of cells for calculations. It means we have to provide the references of the cell on which the formula will be applied.

For example, if we want to add two values entered in cells A1 and A2 and want to display the result in cell A3, we will use the following formula:

=A1+A2

When you press enter, cell A3 will show you the result.

	A	B	C
1	28		
2	25		
3	=A1+A2		
4			

Functions

Functions are formulas with a name. Most of the functions are provided by Excel itself. These functions are called built-in functions. They perform calculations on the values, called arguments. All of Excel's functions are located on the ribbon's formulas tab.

For example, if we want to perform the calculation in the above example with a function, we have to write in cell A3 as:

=sum(A1:A2)

It will show the same result as was calculated by formula =A1+A2

	A	B
1	25	
2	35	
3	=sum(A1:A2)	
4		

	A	B
1	25	
2	35	
3	60	

Some of the most common functions include:

Textual Features

LEFT	MID	RIGHT	LOWER	UPPER	LEN
------	-----	-------	-------	-------	-----

Logical

AND	OR	NOT			
-----	----	-----	--	--	--

Date & Time

DATE	TIME	NOW	TODAY		
------	------	-----	-------	--	--

Maths & Trig

SQRT	ABS	MOD	SIGN		
------	-----	-----	------	--	--

Statistical

SUM	COUNT	MAX	MIN	AVERAGE	
-----	-------	-----	-----	---------	--

Examples of Simple Built-in Functions:

- The SUM formula for adding four numbers from cell B2 to B6 will be written as

=SUM(B2:B6)

	A	B
1	7	
2	22	
3	78	
4	23	
5	56	
6	10	
7	33	
8	44	
9	92	
10	50	
11	=AVERAGE(A1:A10)	

• AVERAGE

It provides the mean average of the values falling within the given range.

=AVERAGE(A1:A10)

• MIN/MAX

MIN function returns the lowest value discovered in a group of values.

=MIN(A1:A5)

MAX function returns the highest value discovered in a group of values.

=MAX(A1:A5)

	A	B	C	D	E	F	G
1	Item	Jan	Feb	Mar			
2	Apples	\$120	\$320	\$200			
3	Oranges	\$200	\$190	\$0			
4	Lemons	\$220	\$210	\$220			
5	Grapes	\$180	\$170	\$240			
6	Peaches	\$300	\$310	\$190			
7	Total	=SUM(B2:B6)					
8		SUM(number1,[number2],...)					

	A
1	12
2	17
3	25
4	17
5	23
6	=MIN(A1:A5)

	A
1	12
2	17
3	25
4	17
5	23
6	=MAX(A1:A5)

Introducing the IF Function

The IF function is used to test if a certain condition in a worksheet is true or false.

What does the IF function look like?

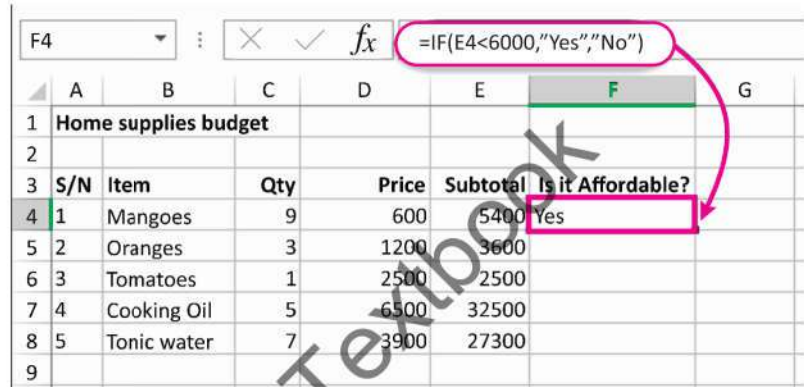
IF (logical_test, value_if_true, value_if_false)

Here is what they mean:

Logical_test: what do you want to test for?

Value_if_true: what do you want to do if the answer is YES?

Value_if_false: what do you want to do if the answer is NO?



	A	B	C	D	E	F	G
1	Home supplies budget						
2							
3	S/N	Item	Qty	Price	Subtotal	Is it Affordable?	
4	1	Mangoes	9	600	5400	Yes	
5	2	Oranges	3	1200	3600		
6	3	Tomatoes	1	2500	2500		
7	4	Cooking Oil	5	6500	32500		
8	5	Tonic water	7	3900	27300		
9							

Most Used Formulas in Excel

Let us try some commonly used formulas in Excel.

Create the following sheet in Excel.

1. To calculate the average number of students in a class, we can use the average function. Write the formula `= AVERAGE (C7:F7)` in cell G7 and press Enter.
2. To calculate the total number of students, use the sum function. Write `=SUM (C7:F7)` in cell H7 and press Enter. Drag the fill handle to fill in the values in the cells below.
3. To find the Max value, write `= MAX (C7:F7)` in cell I7 and drag the Fill handle to fill the values in the cells below.
4. To find the minimum value, we can use the MIN function in the same way as we used the functions given previously.

Mathematical Formulas

Excel can be used to calculate and analyse numerical information with the help of various mathematical formulas. A formula is an equation that performs a calculation using values in the worksheet.

Creating a simple formula that adds two numbers

1. Click the cell where the formula will be defined (e.g. C5)
2. Type '=' to let Excel know the formula is being defined.
3. Type the first number to be added (e.g. 1500)

4. Type '+' to let Excel know that an addition is to be performed.
5. Type the second number to be added (e.g. 200)
6. Press Enter on the formula bar to complete the formula.



Project time

- Write a subtraction formula using the point and click method.
- Write a multiplication formula using cell references.
- Write a simple division formula.

Do you remember formatting and formulas?

Formatting

Once you have entered information into a spreadsheet, you can format it with the help of some formatting elements.

Formatting is used to:

- Change the font style of your text.
- Change the size of your text.
- Make your text appear in BOLD.
- Give the *italics* effect to your text.
- Underline your text.
- Fill the cell with different colours.
- Change the text colour.

Examples of formatting:

- Select a cell and format the number or text in it so that it appears in bold.
- Add a border to a row.
- Change the fill colour of two or more cells.
- Select two or more cells and format their text to italics.

Glossary

manual	physically done by hands	built-in	original part of something
grid	a pattern made by horizontal and vertical lines	computation	doing mathematical calculation
intersection	the point where two or more points cross	format	the arrangement or design
reference	to refer to		



LET'S HAVE A LOOK

- Microsoft Excel is a spreadsheet software developed by Microsoft Corporation.
- Built-in functions perform calculations on the values, called arguments.
- Each cell is identified by its reference or address which is composed of a column head followed by a row header.
- A formula is an equation that performs a calculation using values in the worksheet.
- The IF function is used to test if a certain condition in a worksheet is true or false.

Exercise

A. Multiple Choice Questions: Tick the correct answer.

1. The intersection of row and column in a worksheet is called a _____.
a. cell b. table c. spreadsheet d. none of these
2. A _____ typically contains one or more worksheets.
a. spreadsheet b. workbook c. workspace d. office
3. Data may be represented in different formats like _____ and charts to understand data visually.
a. cells b. graphs c. formulas d. calculations
4. Functions are formulas with a _____.
a. heading b. sign c. name d. none of these
5. All of Excel's functions are located on the Ribbon's _____ tab.
a. Data b. Home c. Formula d. Function
6. In a cell, _____ sign and calculations are always used at the beginning of a formula.
a. + b. # c. / d. =
7. Excel comes with built-in _____, which are predefined formulas.
a. formulas b. functions c. format d.
8. Which of the following allows you to make logical comparisons between a value?
a. For Function b. IF Function c. Else Function d. None

9. The IF function is used to test if a certain condition in a worksheet is ____ or false.
- a. one b. yes c. zero d. true
10. ____ are also commonly known as graphs.
- a. Cells b. Charts c. Functions d. Formulas

B. Write 'T' for True and 'F' for False in the boxes

1. MS Excel is spreadsheet software.
2. You cannot change the background colour of a cell.
3. Any formula in excel should be preceded by an equal sign.
4. An average function of Excel requires reference to the address of cells.
5. You cannot merge two cells of an Excel sheet.
6. Status Bar is used to display colours.
7. The ribbon does not contain the icons (or toolbars) for commands.

C. Answer the following short questions:

1. What is the difference between a workbook and worksheet?
2. How can you resize a column in MS Excel?
3. Give examples of any three built-in functions.
4. What are some ways formatting is used in MS Excel?
5. Perform a calculation using SUM and AVERAGE functions.
6. Create a chart in MS Excel to show the sales of a store per month.

D Answer the following long questions:

1. Define all Ribbon Tabs.
2. Explain the main components of the MS Excel interface.



Learning Activities

Lab / Computer Activity 1:

Speed drill – The teacher can call out simple addition, subtraction, multiplication, and division questions, and the students need to solve the questions using the data handling software. The student who can solve it the fastest time wins.

Lab / Computer Activity 2:

Create graphs by adding data to a computer. The instructor can conduct a demonstration by collecting data from the class and listing it down in data handling software. The data question for students could be “What is your birthday month” or “Out of these five food items name your favorite”. There should be a spreadsheet with the answer choices on the left and the number of results next to them, e.g.:

Month	# of students
Jan	
Feb	
etc.	

Favorite Food	# of students
Food item 1	
Food item 2	
etc.	

The data table should then be used to create a graph, and the results interpreted by the students.

Lab / Computer Activity 3 (follow on from activity 2):

The instructor can ask the students to create their own survey questions, collect results from the class, and create a chart to display the results.

Lab / Computer Activity 4:

The instructor can locate some open-source data tables through internet research or find published financial accounts from company annual report publications and ask students to re-create simple additions/subtraction/multiplication/division formulas in their data handling software to see if they get the same results when they input the numbers.

Lab / Computer Activity 5:

Create a table in Excel to calculate the marks of 10 students in 5 subjects.

For the above query, colour the student's name cell 'red' for those subjects in which the student has failed.



Bibliography

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Answers

A: Tick the correct option.

1	a	2	b	3	b	4	c	5	c
6	d	7	b	8	b	9	d	10	b

B: True and False

1	T	2	F	3	T	4	T	5	F
6	F	7	F						