Annexure 2
(Refers to Para 2 of Appendix A)

PRIMER

MDP ORSA: FEB 2026

MS EXCEL (BASICS)

General

1. Excel is an electronic spreadsheet program that is used for storing, organizing and manipulating data. **Data is stored in individual cells** that are usually organized in **a series of columns and rows** in a worksheet; this **collection of columns and rows is referred to as a table**.

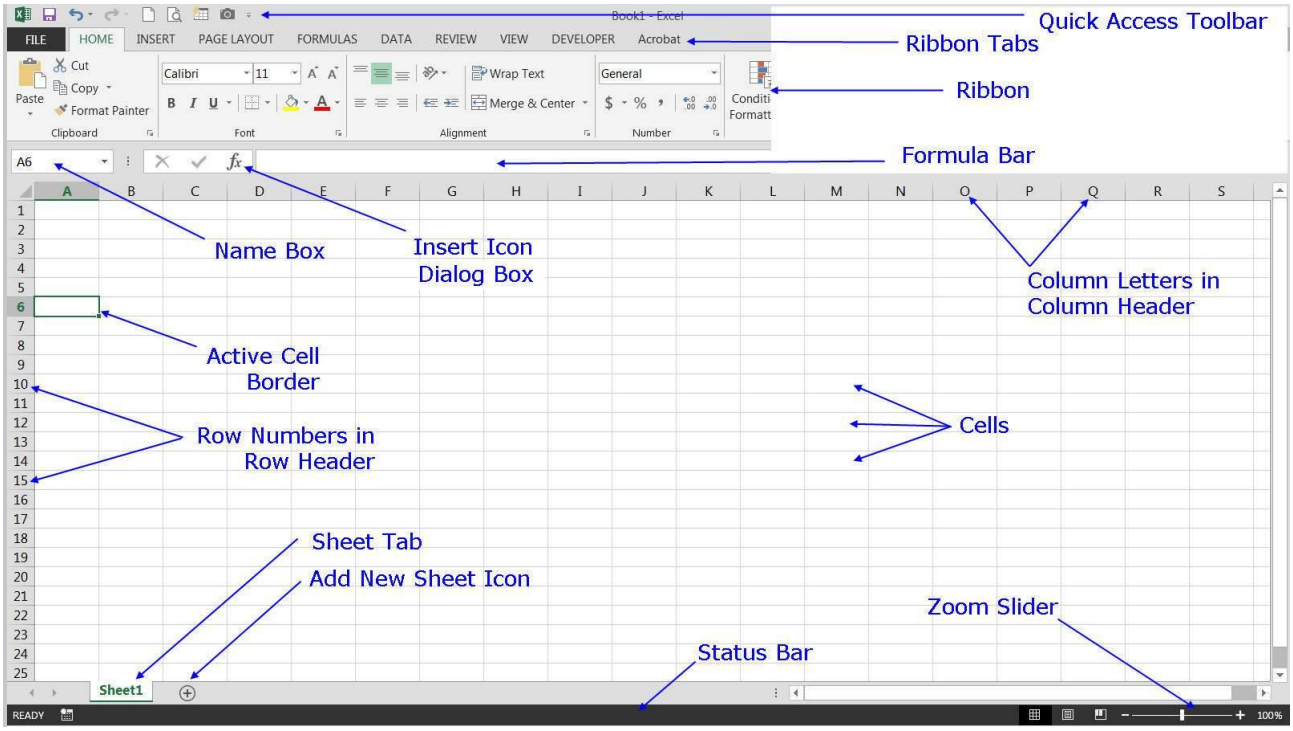
2. Spreadsheets programs can also perform calculations on the data using formulas. To help make it easier to find and read the information in a worksheet, Excel has a number of formatting features that can be applied to individual cells, rows, columns, and entire tables of data.

3. Since each worksheet in recent versions of Excel contains billions of cells per worksheet, **each cell has an address known as a cell reference** so that it can be referenced in formulas, charts, and other features of the program.

4. **Active Cell**. The **active cell** is recognized by its green outline. Data is always entered into the active cell. Different cells can be made active by clicking on them with the mouse or by using the arrow keys on the keyboard.

5. **Add Sheet Icon**. Clicking on the **Add sheet icon** next to the Sheet tab at the bottom of the screen adds another worksheet. (You can also use two keyboard shortcuts to add a new worksheet: **Shift**+**F11** and **Alt**+**Shift**+**F1**).

Excel Screen Elements



6. **Column Letters**. Columns run vertically on a worksheet, and each one is identified by a letter in the column header like A, B, ….. Z, AA, AB and so on.

7. **Row Numbers**. Rows run horizontally in a worksheet and are identified by a number starting from 1 in the row header.

8. **Cell**. Cells are the rectangular boxes located in the central area of a worksheet.

8.1 Data entered into a worksheet is stored in a cell. Each cell can hold only one piece of data at a time.

8.2 **A cell is the intersection point of a vertical column and a horizontal row**.

8.3 Each cell in the worksheet can be identified by a **cell reference**, which is a **combination of letters (column reference) and numbers (row reference)** such as A1, F456, or AA34. Here A1 cell refers to Column A and Row 1.

9. **Formula Bar**. Located above the worksheet, this area displays the contents of the active cell. The **formula bar** can also be used for entering or editing data and formulas.

10. **Name Box**. Located next to the formula bar, the **Name Box** displays the cell reference or the **name** of the active cell.

11. **Quick Access Toolbar**. It allows you to add frequently used, commands, click on the down arrow at the end of the toolbar to display available options.

12. **Ribbon**. The **Ribbon** is the strip of buttons and icons located above the worksheet. When clicked on, these buttons and icons activate the various features of the program.

13. **Ribbon Tabs**. They are part of the horizontal ribbon menu that contains links to various features of the program. Each tab – such as **Home**, **Page Layout**, and **Formulas** contains a number of related features and options that are activated by clicking on the appropriate icon.

14. **File Tab**. Clicking on the File tab opens a drop-down menu on the left side of the screen.

14.1 This tab contains items that are mostly related to file and document management, such as opening new or existing worksheet files, saving, and printing.

14.2 The Options item, which is also located on the menu, is used to alter the look of the program as a whole by choosing which screen elements to display, such as scroll bars and gridlines; it also contains options for activating a number of settings including automatic recalculation of worksheet files and choosing which languages to use for spell check and grammar

15. **Sheet Tabs**. By default, there is one worksheet in an Excel 2013 file, but you can add additional sheets. The **Sheet tab** at the bottom of a worksheet tells you the name of the worksheet, such as Sheet1 or Sheet2.

15.1 Renaming a worksheet or changing the tab color can make it easier to keep track of data in large spreadsheet files.

15.1 Switching between worksheets can be done by clicking on the tab of the sheet you want to access. (You can also switch between worksheets with the keyboard shortcut to change between worksheets: **Ctrl**+**PgUp** and **Ctrl**+**PgDn***)*

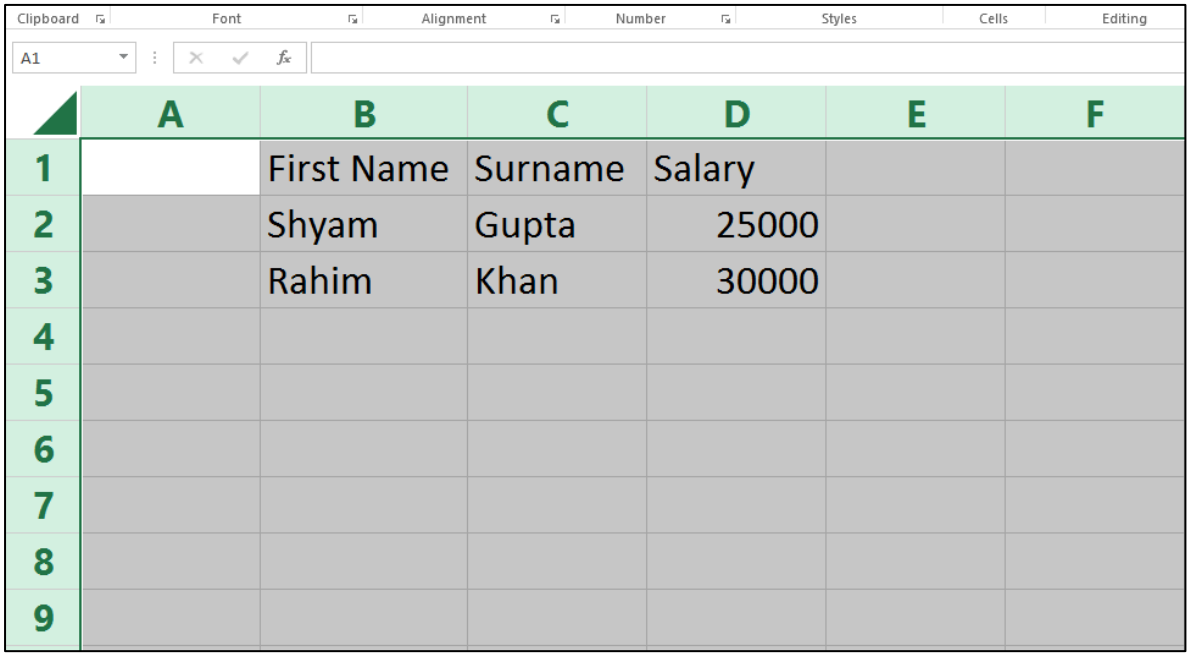
16 **Status Bar**. It runs horizontally along the bottom of the screen, can be customized to display a number of options, most of which give the user information about the current worksheet, data the worksheet contains, and the user's keyboard.

16.1 Information includes whether the **Caps Lock**, **Scroll Lock**, and N**um Lock** keys are turned on or off.

16.2 The status bar also contains the **Zoom slider**, which allows users to alter the magnification of a worksheet.

17 **Zoom Slider**. Located in the bottom right corner of the Excel screen, the **Zoom slider** is used to change the magnification of a worksheet when you drag the **slider box** back and forth or click on the **Zoom Out** and **Zoom In** buttons located at either end of the slider.

Entering Data into Your Worksheet



18 Entering data into **worksheet** cells is always a three-step process; these steps are as follows:

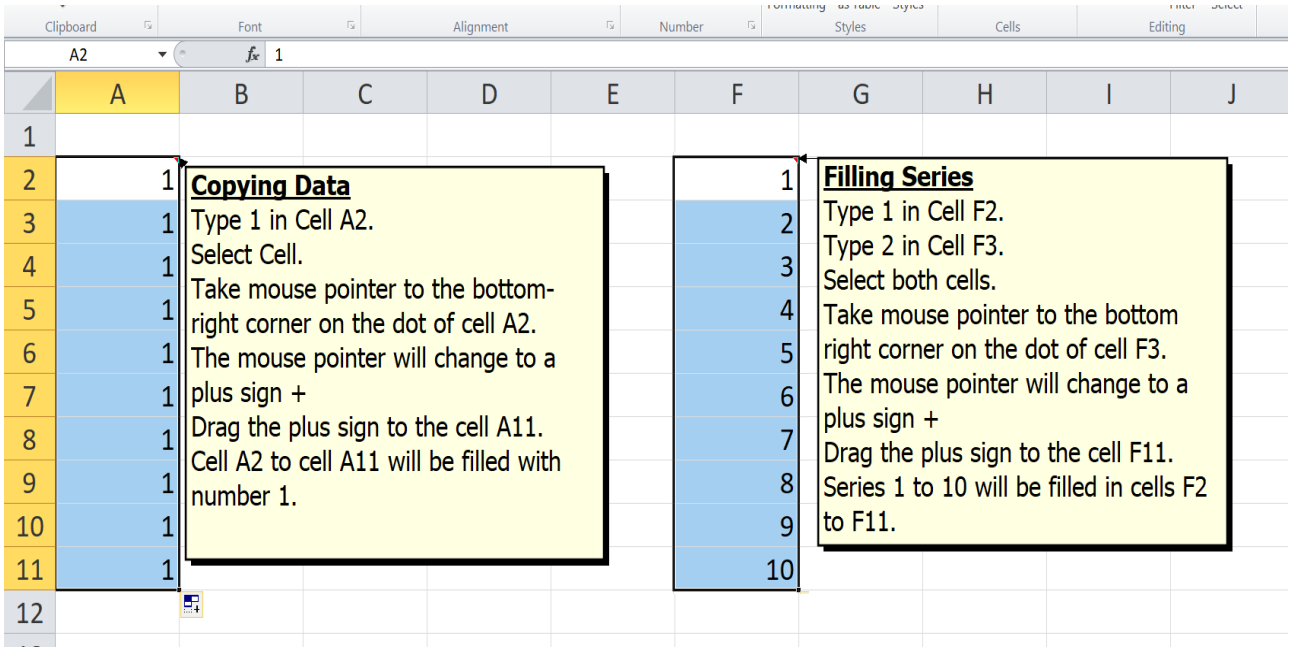
18.1 Click on the **cell** with mouse or navigate through the keyboard arrow keys where you want the data to go (click on cell B2).

18.2 Type the **data** into the cell (Type Shyam).

18.3 Press the **Enter** key on the keyboard or click on another cell with the mouse.

18.4 To enter multiple data, after typing data in cell B2, use either mouse to go to a particular cell or use navigation arrow keys to move to adjacent cells. For e.g. after typing Shyam in cell B2, use right arrow navigation key to move to cell C2 and type Gupta.

Auto-Completing a Series



Excel Math Functions

Quickly Sum Columns or Rows of Numbers in Excel

19 **The SUM Function Syntax and Arguments**.

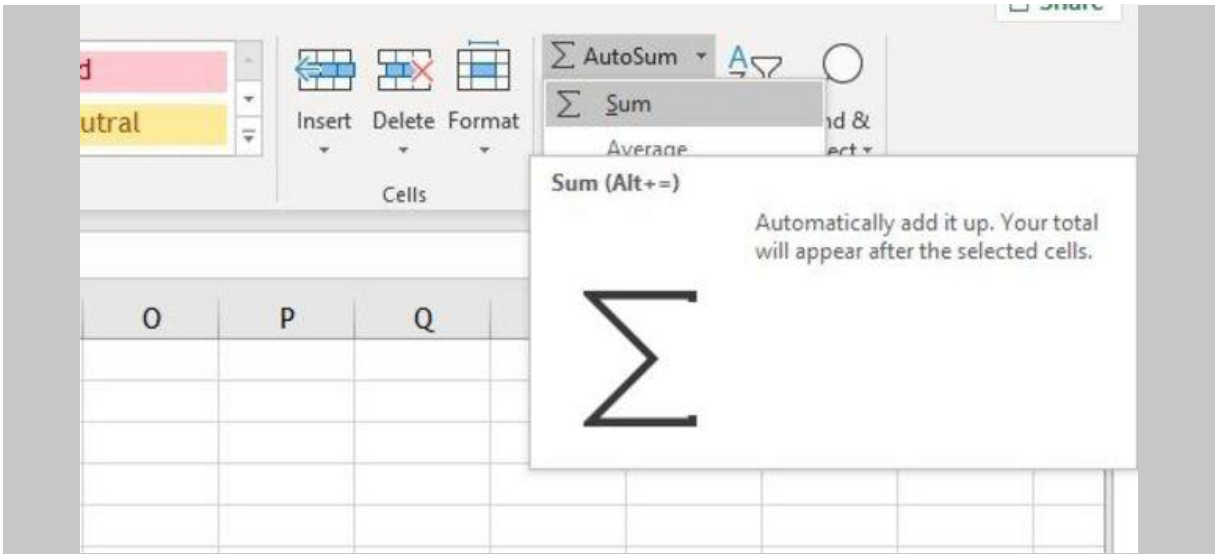
19.1 A function's **syntax** refers to the layout of the function and includes the function's name, brackets, and **arguments**. The syntax for the SUM function is:

19.2 `=SUM(Number1,Number2,...Number255)`

19.3 **Number1** (required) is the first value to be summed. This argument can contain the **data** you want to sum up, or it can be a **cell reference** to the location of the data in the **worksheet**.

19.4 **Number2, Number3, ... Number255** (optional) is the additional values to be summed up to a maximum of 255.

20 **Sum Data in Excel Using AutoSUM**.



20.1 Use the **AutoSUM** shortcut located on the Home tab of the ribbon to complete the formula without having to type.

20.2 The "Auto" part of the name AutoSUM refers to the method automatically selecting what it believes is the range of cells to be summed by the function. The selected range is shaded and surrounded by an animated border known as marching ants.

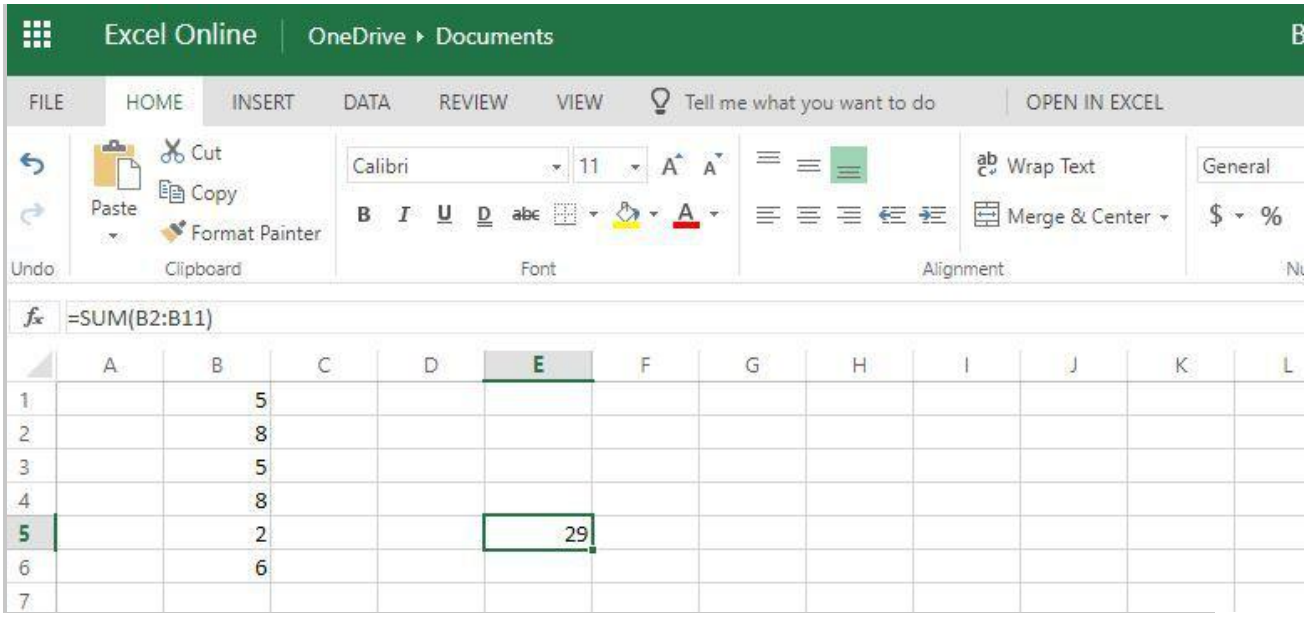
20.3 The AutoSUM function should be input at the bottom of a column of data or the right end of a row of data. If you put the AutoSUM function in another spot on the spreadsheet, the range of cells selected as the function's argument may be incorrect. To change the selected range, use the mouse pointer to highlight the correct range before pressing the **Enter** key to complete the function

21 To use AutoSUM

21.1 Click the cell where you want the result to display and click the **AutoSUM** icon on the ribbon.

21.2 Check to see that the selected range, which will form the function's argument, is correct. If it's accurate, press the **Enter** key on the keyboard to complete the function. The answer will display in the cell. When you click on the cell containing the solution, the completed SUM function appears in the formula bar above the worksheet.

22 Using the SUM Function Dialog Box



23 Most functions in Excel can be entered using a dialog box, which allows you to input the arguments for the function on separate lines. The dialog box also takes care of the function's syntax, such as the opening and closing parentheses and the commas used to separate individual arguments. Although individual numbers can be entered directly into the dialog box as arguments, it is usually best to enter the data into worksheet cells and enter the cell references as arguments for the function.

24 To enter the SUM function using the dialog box:

24.1 Click the cell where the results will be displayed.

24.2 Click on the **Formulas** tab of the ribbon menu.

24.3 Choose **Math & Trig** from the ribbon to open the function drop-down list.

24.4 Click **SUM** in the list to bring up the function's dialog box.

24.5 Click the **Number1** line in the dialog box.

24.6 Highlight at least one cell reference or a range of references.

24.7 Click **OK** to complete the function and close the dialog box.

Using Excel's PRODUCT Function

25 **Numbers, Arrays, or Ranges of Values**. The product is the result of a multiplication operation. The numbers shown in cells A1 to A3 of the example below can be multiplied together using one of two methods

25.1 A formula containing the multiply (*****) mathematical operator (see row 5 for an example).

25.2 The PRODUCT function as shown in row 6.

	A	B	C
1	5	2	TRUE
2	10	4	FALSE
3	15	6	
4	Formula	Result	Description
5	=A1*A2*A3	750	Multiplies the numbers in cells A1 through A3 by using a formula
6	=PRODUCT(5,10,15)	750	Multiplies the numbers 5, 10, and 15 together
7	=PRODUCT(A1:A3)	750	Multiplies the numbers in cells A1 through A3
8	=PRODUCT(A1:A3,0.5)	375	Multiplies the numbers in cells A1 through A3, and then multiplies the result by 0.5
9	=PRODUCT(A1:A3,B1:B3)	36000	Multiplies each range A1:A3 and B1:B3 and then multiplies results: (750*48=36,000)
10	=PRODUCT({5,10,15},{2,4,6})	36000	Multiplies the arrays {5,10,15} amd {2,4,6} and then multiplies results: (750*48=36,000)
11	=PRODUCT(A1:B1,"text")	#VALUE!	Text data entered into function returns an error value
12	=PRODUCT(A2:B2,FALSE)	0	Boolean value (FALSE) set to 0, therefore, formula is: (10*4*0=0)
13	=PRODUCT(A2:B2,C2)	40	Boolean value (FALSE) in cell C2 is ignored, therefore, formula is (10*4=40)
14			
15			
16			

26 The PRODUCT function comes into play when multiplying the data in many cells. For example, in row 9 in the image, the formula:
=PRODUCT(A1:A3,B1:B3) is equivalent to the formula: **=A1*A2*A3*B1*B2*B3**

27 **Syntax and Arguments**. The syntax for the PRODUCT function is:

=PRODUCT(Number1,Number2,...,Number255)

27.1 **Number1** (required) is the first number or array that you want to multiply. This argument can be the actual numbers, cell references, or the range of the location of data in the worksheet.

27.2 **Number2, Number3,...,Number255** (optional) are additional numbers, arrays, or ranges up to a maximum of 255 arguments.

28 **An Example of the PRODUCT Function**. The PRODUCT function is entered into an Excel worksheet by either typing the complete function into the Formula Bar or by using the Function Arguments dialog box. To find the product when multiplying cells A1, A2, and A3, you could type the formula. Select an empty cell, such as A4, and type the function:

=PRODUCT(A1:A3) ; Press **Enter**.

29 Although it is possible to enter the complete function manually, it is easier to use the dialog box because it takes care of adding the function's syntax, such as brackets and comma separators between arguments.

30 **To enter the PRODUCT function using the Function Arguments dialog box**:

30.1 Select cell **A4** to make it the active cell.

30.2 On the ribbon, go to **Formulas**.

30.3 Select **Math & Trig**.

30.4 Select **PRODUCT**.

30.5 In the **Function Arguments** dialog box, place the cursor in the **Number1** text box.

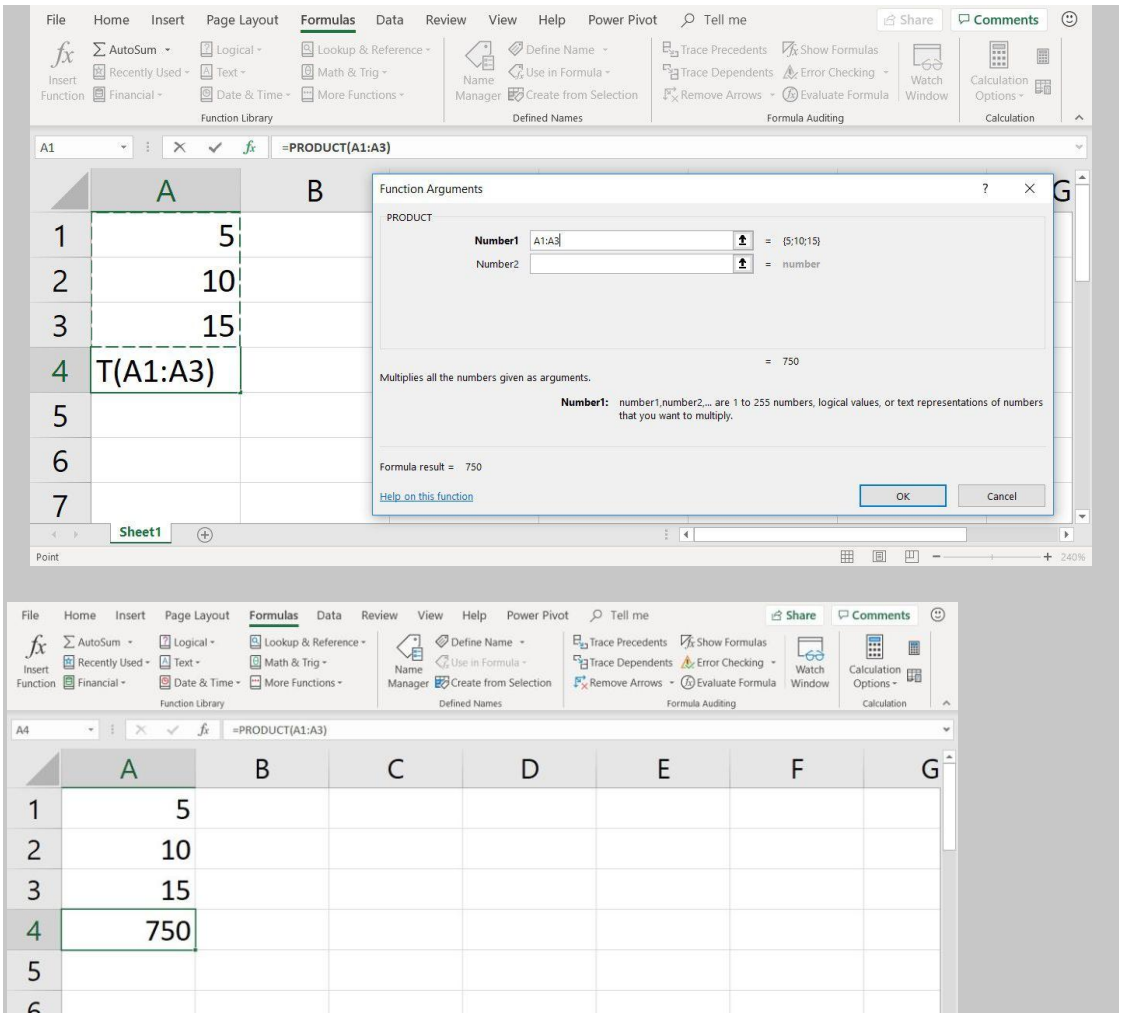
31 If the active cell is directly beneath a group of cells, Excel may automatically add the cell references. If you don't want to use these cell references, delete the references.

31.1 On the worksheet, highlight cells **A1** to **A3** to add this range to the dialog box.

31.2 In the **Function Arguments** dialog box, select **OK** to complete the function and to close the dialog box.

31.3 The answer 750 appears in cell A4 because 5*10*15 equals 750.

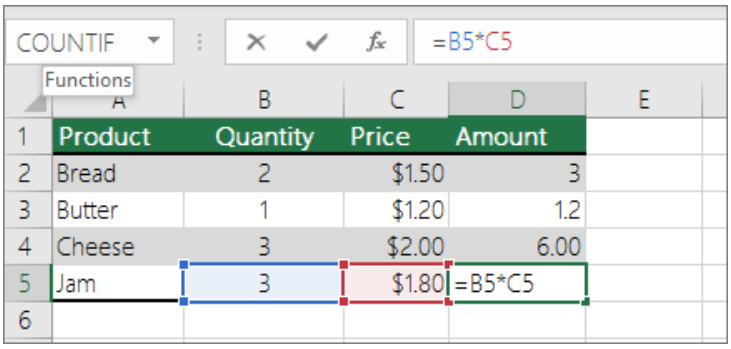
31.4 Select cell **A4** to view the complete function in the Formula Bar above the worksheet.



Video for Multiplication -
https://www.youtube.com/watch?v=BjvoT2wQ9MA
Video for excel basic arithmetic operations (add, subtract, multiply and divide)
https://www.youtube.com/watch?v=1naiWCWfSt4

Switch between Relative, Absolute, and Mixed References

32 By default, a cell reference is a relative reference, i.e. the reference is relative to the location of the cell. As an example, if you copy the formula **=B4*C4** from cell D4 to D5, the formula in D5 adjusts to the right by one column and becomes **=B5*C5**. To maintain the original cell reference when you copy it, make the cell reference absolute by preceding the columns (B and C) and row (2) with a dollar sign (**$**). Then, when you copy the formula **=B4*C4** from D4 to D5, the formula stays exactly the same.



33 Absolute and relative cell references can be mixed by preceding either the column or the row value with a dollar sign—which fixes either the column or the row (for example, $B4 or C$4).

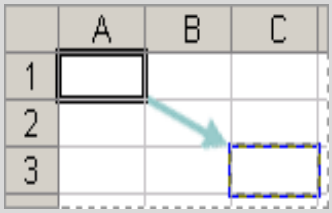
34 **To change the type of cell reference**

34.1 Select the cell that contains the formula.

34.2 In the formula bar , select the reference that you want to change.

34.3 Press F4 to switch between the reference types.

35 The table below summarizes how a reference type updates if a formula containing the reference is copied two cells down and two cells to the right.

For a formula being copied:	If the reference is:	It changes to:
	A1 (absolute column & absolute row)	A1 (the reference is absolute)
	A$1 (relative column & absolute row)	C$1 (the reference is mixed)
	$A1 (absolute column & relative row)	$A3 (the reference is mixed)
	A1 (relative column & relative row)	C3 (the reference is relative)

SUMPRODUCT Function

36 The **SUMPRODUCT** function returns the sum of the products of corresponding ranges or arrays. The default operation is multiplication, but addition, subtraction, and division are also possible.

37 **Syntax**. To use the default operation (multiplication):

=SUMPRODUCT(array1, [array2], [array3], ...)

38 The SUMPRODUCT function syntax has the following arguments:

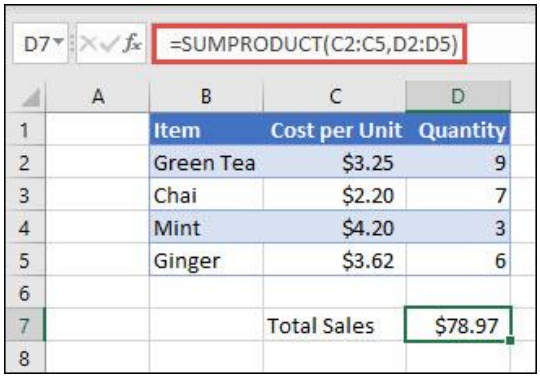
Argument	Description
array1 Required	The first array argument whose components you want to multiply and then add.
[array2], array3], Optional	Array arguments 2 to 255 whose components you want to multiply and then add.

39 **To perform other arithmetic operations.** Use SUMPRODUCT as usual, but replace the commas separating the array arguments with the arithmetic operators you want (*, /, +, -). After all the operations are performed, the results are summed as usual.

40 The array arguments must have the same dimensions. else, SUMPRODUCT returns the #VALUE! error value. For example, =SUMPRODUCT(C2:C10,D2:D5) will return an error as the ranges aren't the same size.

SUMPRODUCT treats non-numeric array entries as if they were zeros.
Tutorial on **SUMPRODUCT** function :
https://www.youtube.com/watch?v=Lc52EQrztcc

Example



To create the formula using sample list given, **type** in formula bar **=SUMPRODUCT(C2:C5,D2:D5)** and press **Enter**. Each cell in column C is multiplied by its corresponding cell in the same row in column D, and the results are added up. The total amount for the groceries is $78.97.

MMULT function (Matrix Multiplication)

41 The **MMULT** function returns the matrix product of two arrays. The result is an array with the same number of rows as array1 and the same number of columns as array2. The formula must be entered as an array formula by first selecting the output range, entering the formula in the top-left-cell of the output range, and then pressing **CTRL+SHIFT+ENTER** to confirm it. Excel inserts curly brackets at the beginning and end of the formula for you.

42 **Syntax**
MMULT(array1, array2)
Argument - array1, array2 Required (The arrays you want to multiply).

43 **Remarks**.

43.1 The number of columns in array1 must be the same as the number of rows in array2, and both arrays must contain only numbers.

43.2 Array1 and array2 can be given as cell ranges, array constants, or references.

43.3 MMULT returns the #VALUE! error when

43.3.1 Any cells are empty or contain text.

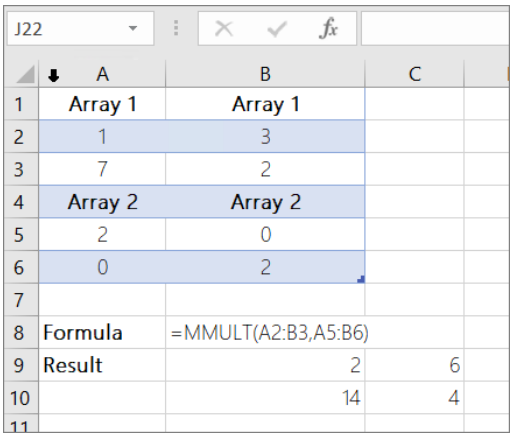
43.3.2 The number of columns in array1 is different from the number of rows in array2.

44 The matrix product array a of two arrays b and c is:

44.1 $$a_{ij} = \sum_{k=1}^{n} b_{ik} c_{kj}$$

where i is the row number, and j is the column number.

Example



Video for MMULT Function

https://www.youtube.com/watch?v=Vu8ONniwY-A

Additional material on the usage of MS Excel may be accessed at https://support.office.com/en-us/article/excel-for-windows-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb.

Basic tutorial on excel may be viewed at https://www.youtube.com/watch?v=rwbho0CgEAE