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EXCEL INTERMEDIATE TRAINING

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Apr.
2025

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Introduction:

This is my Second Book in Excel Training. It is intermediate level for those who can use the software and need to master and use it more powerfully.

The training book is so practical with examples you can try yourself step by step to learn and get your hands dirty to understand each topic

You can download all my books with the training materials from my profile repositories on **github**:

<https://github.com/saidfawzy>

You can also visit my channel on YouTube to watch the complete training of my courses in channel lists.

www.youtube.com/saidfawzy

I tried to make exercises in this book so simple and comprehensive to make the student understand the concepts and tricks they can use to make their work goes smoothly and effectively working with Excel.

By the end of each chapter there is an exam that you should try yourself. Feel free to send me your answer file to review and give you my comment on your progress

I Advise you to follow my Videos on YouTube and use this material with the accompanied Power Point presentation and files of exercise and solution and try everything yourself as you won't learn unless you get your hands dirty.

Feel free to contact me through my Linked in: www.linkedin.com/in/saidfawzy.

You can also join my channels of Power BI:

[Facebook Group](#) [WhatsApp Group](#) [LinkedIn Group](#) [Telegram Group](#)

This Book is free and feel free to share with anyone with the accompanied material. And never hesitate to contact me if you need any help.

Said Fawzy

Manager of Information Center

Arab Contractors

30 Apr. 2025

Chapter 1: Named Ranges

What are Named Ranges

Instead of specifying a cell or range of cells individually every time you want to reference the data they contain; you can name the cell or cells—in other words, create a *named range*.

Exercise 01A: Calculation Using Ranges

- Calculate the Values in the right tables using the suitable Function.

Exercise 01 Named Ranges					Average Quantity
Order #	Customer	Quantity	Price Per Unit	Total	No. of Orders
3211	Staples	27,095	£ 0.20	£ 5,419.00	Minimum Sales
2955	WH Smith	48,696	£ 0.15	£ 7,304.40	Maximum Sales
3159	The Art Supply Store	29,970	£ 0.25	£ 7,492.50	Total Sales
3004	Brush Strokes	15,667	£ 0.20	£ 3,133.40	
4534	Crafty Business	46,321	£ 0.20	£ 9,264.20	
2220	Pens and Things	47,003	£ 0.20	£ 9,400.60	
1796	Color Me Silly	41,595	£ 0.20	£ 8,319.00	
3558	Sketch & Co	41,552	£ 0.20	£ 8,310.40	
1437	The Desinger Centre	23,299	£ 0.30	£ 6,989.70	
1336	Waterstones	34,014	£ 0.15	£ 5,102.10	
2044	Painterly	43,247	£ 0.15	£ 6,487.05	
3320	J Howard and Sons	28,305	£ 0.15	£ 4,245.75	
1534	Art Attack	39,218	£ 0.20	£ 7,843.60	
3989	Doodles	30,468	£ 0.20	£ 6,093.60	

- The result must be like that:

Order #	Customer	Quantity	Price Per Unit	Total	Average Quantity	35,461
3211	Staples	27,095	\$ 0.20	£ 5,419.00	No. of Orders	14
2955	WH Smith	48,696	\$ 0.15	£ 7,304.40	Minimum Sales	\$3,133
3159	The Art Supply Store	29,970	\$ 0.25	£ 7,492.50	Maximum Sales	\$9,401
3004	Brush Strokes	15,667	\$ 0.20	£ 3,133.40	Total Sales	\$95,405
4534	Crafty Business	46,321	\$ 0.20	£ 9,264.20		
2220	Pens and Things	47,003	\$ 0.20	£ 9,400.60		
1796	Color Me Silly	41,595	\$ 0.20	£ 8,319.00		
3558	Sketch & Co	41,552	\$ 0.20	£ 8,310.40		
1437	The Desinger Centre	23,299	\$ 0.30	£ 6,989.70		
1336	Waterstones	34,014	\$ 0.15	£ 5,102.10		
2044	Painterly	43,247	\$ 0.15	£ 6,487.05		
3320	J Howard and Sons	28,305	\$ 0.15	£ 4,245.75		
1534	Art Attack	39,218	\$ 0.20	£ 7,843.60		
3989	Doodles	30,468	\$ 0.20	£ 6,093.60		

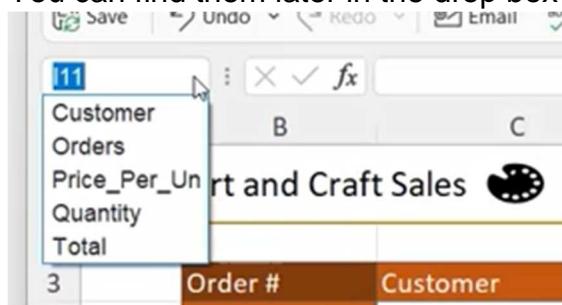
Named Ranges

- When you select a group of cells they are range and can have names
- For example, in the following figure we selected range (C5:C11) and (C5:F12)

A	B	C
Exercise 01 Named Ranges		
1		
2		
3	Order #	Customer
4	3211	Staples
5	2955	WH Smith
6	3159	The Art Supply Store
7	3004	Brush Strokes
8	4534	Crafty Business
9	2220	Pens and Things
10	1796	Color Me Silly
11	3558	Sketch & Co
12	1437	The Desinger Centre
		...

A	B	C	D	E	F	G
Exercise 01 Named Ranges B						
1						
2						
3	Order #	Customer	Quantity	Price Per Unit	Total	
4	3211	Staples	27,095	£ 0.20	£ 5,419.00	
5	2955	WH Smith	48,696	£ 0.15	£ 7,304.40	
6	3159	The Art Supply Store	29,970	£ 0.25	£ 7,492.50	
7	3004	Brush Strokes	15,667	£ 0.20	£ 3,133.40	
8	4534	Crafty Business	46,321	£ 0.20	£ 9,264.20	
9	2220	Pens and Things	47,003	£ 0.20	£ 9,400.60	
10	1796	Color Me Silly	41,595	£ 0.20	£ 8,319.00	
11	3558	Sketch & Co	41,552	£ 0.20	£ 8,310.40	
12	1437	The Desinger Centre	23,299	£ 0.30	£ 6,989.70	
13	1336	Waterstones	34,014	£ 0.15	£ 5,102.10	

- You can give the range of cells a name for later reference.
- You can find them later in the drop box on the left od the worksheet

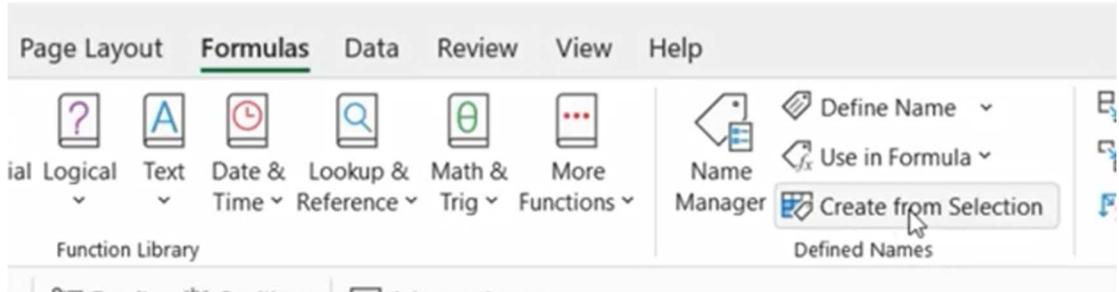


Exercise 01 B: Create Named Ranges

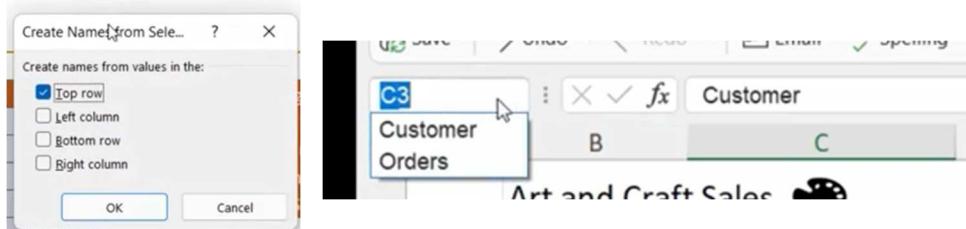
1. You can duplicate your sheet if you want to.
2. Select Range (B3:B17) and in the Name Box Name it **Orders**.

A	B	C
Art and Craft Sales		
1		
2		
3	Order #	Customer
4	3211	Staples
5	2955	WH Smith
6	3159	The Art Supply Sto
7	3004	Brush Strokes
8	4534	Crafty Business
9	2220	Pens and Things
10	1796	Color Me Silly
11	3558	Sketch & Co
12	1437	The Desinger Cent
13	1336	Waterstones
14	2044	Painterly
15	3320	J Howard and Sons
16	1534	Art Attack
17	3989	Doodles
18		

3. Make sure that Name has no space, you can only use _ .
4. Select **Customer** column (including the heading).
5. Formulas →Defined Names→Create From Selection.



6. Use Top Row as name



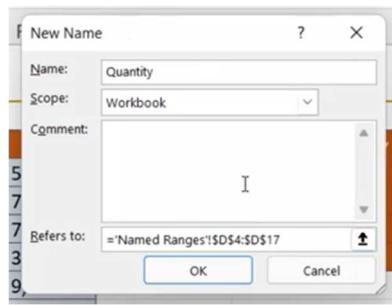
7. Click on Name Manager (Ctrl+F3)

Name	Value	Refers To	Scope	Comment
Customer	(Staples,"WH Smith",...	=Named Ranges!\$C...	Workbook	
Orders	("Order #","3211","29...	=Named Ranges!\$B...	Workbook	

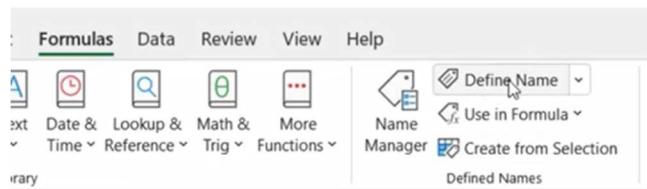
Refers to:
=Named Ranges!\$C\$4:\$C\$17

8. Click on New Button

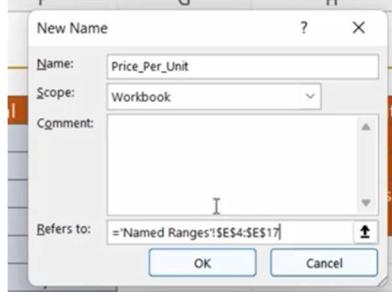
9. Name it: **Quantity** and select the range and make it available through the workbook and press OK.



10. Use Define a name to create a new **Price_Per_Unit** Range Name.
from Ribbon Data→Defined Names→Define Name.



11. Notice that the Refer Ranges are always Absolute Ranges.



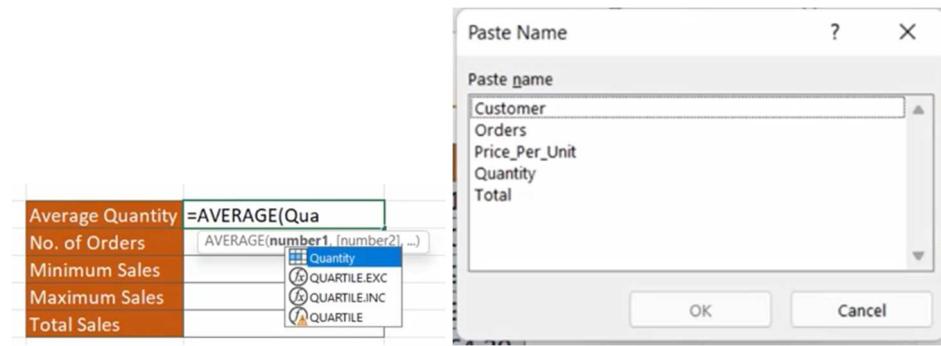
12. Use Create from Selection to create the **Total** Name range.

Using Named Ranges for Calculation

13. Now Fill the list in the right with calculation using the Named Ranges instead of Ranges as in Exercise 01 A.
14. You can use the first letter of the Named range to select from the list or press **F3** to open the list to choose from.
15. For example, write **Q** and when the Quantity appears in the list click the **tab key** to select the Quantity will be highlighted in blue and also the range will be selected in the list in blue.
16. If you have many names, you can press **F3** Key to select from the Names.

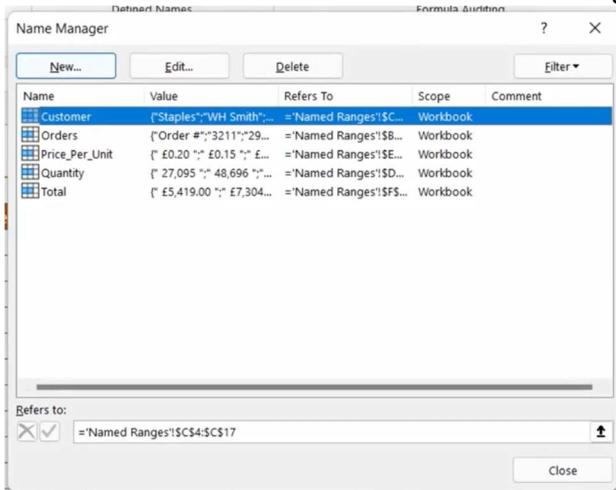
Using Named Ranges for Navigation

17. Create a new Sheet and while inside and try to Navigate to any range using the Name Box.

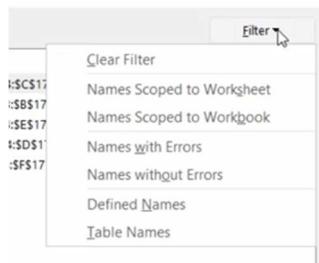


Exercise 01 C: Manage Named Ranges

1. Click on Name Manager.
2. Formulas → Defined Names → Name manager



3. It is where you can create, Edit and Delete any Name.
4. It shows the **name**, the **Values** in, what Range it **refer** to and the **scope** (Workbook or Worksheet).
5. Notice also you have a Filter button.



6. Try to rename **Quantity** to **Quantity1**.
7. Notice that Excel has corrected the formula for you in the list.
8. Delete **Total** Name.
9. You will get the name Error.

Average Quantity	35,461
No. of Orders	14
Minimum Sales	#NAME?
Maximum Sales	#NAME?
Total Sales	#NAME?

10. Create it again with the **same name** the error is corrected.
11. Get back to 1st sheet that you have used ranges in calculation.
12. Use Define Name → Apply Names, to use names instead of ranges in all formulas.

Exam 01 Named Ranges

Manage Ranges

1. Name the following data ranges:

A2:A52, "Customer_Name"
 B2:B52, "Quantity"
 C2:C52, "Price_Per_Item"
 D2:D52, "Total"
 E2:E52, "Sales_Tax"
 F2:F52, "Total_Inc_Tax"

2. Name H2:I2, "Tax_Rate"

NOTE: Try and use all of the different methods for creating named ranges.

Using Named Ranges in Formulas

1. Replace the reference to cell I2 in the 'Sales Tax' formula in column E with the named range.
2. Re-calculate the formulas in cell range I4:I8, using the named ranges instead of cell references.

Try to use Apply Names Button.

Chapter 02: Lists and Tables

Exercise 2 A: List Single Level Sorting

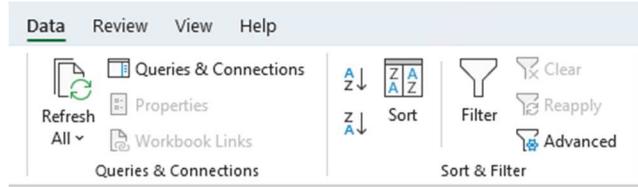
1. Single level sorting means we sort with one column only.
2. In the List I want to sort data by **Region** Column.

SORTING A LIST - Single Level Sorting					
Region	Country	Department	Sales Period	Sales Amount	
Europe	Germany	Clothing	Jan	£ 7,738	
Europe	Germany	Home	Feb	£ 5,641	
Europe	Germany	Accessories	Mar	£ 3,023	
Europe	Germany	Electrical	Apr	£ 6,439	
Europe	Germany	Clothing	May	£ 5,328	
Europe	Germany	Home	Jun	£ 6,608	
Europe	France	Accessories	Jan	£ 4,243	
Europe	France	Electrical	Feb	£ 8,171	
Europe	France	Clothing	Mar	£ 7,408	
Europe	France	Home	Apr	£ 5,556	
Europe	France	Accessories	May	£ 6,714	
Europe	United Kingdom	Electrical	Jan	£ 8,065	
Europe	United Kingdom	Clothing	Feb	£ 4,207	
Europe	United Kingdom	Home	Mar	£ 6,937	
Europe	United Kingdom	Accessories	Apr	£ 7,074	
Asia	China	Home	Jan	£ 4,301	

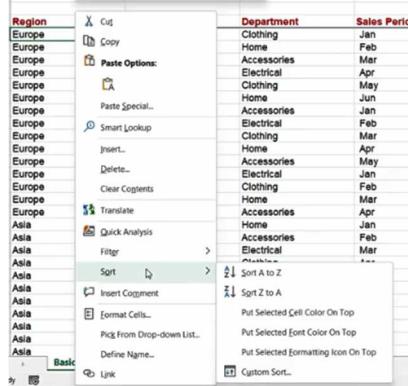
3



b. Data Ribbon → Sort and Filter → Sort

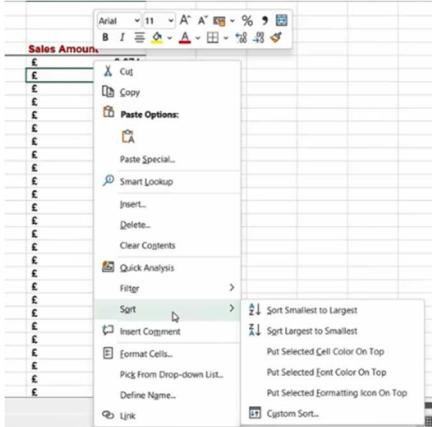


c. Right click the column and select Sort



4. Click Sort A→Z.
5. You will have Asia then Europe then North America.
6. Now Sort A→Z in the column of Country.
7. Remember the single sort can only sort by one column.
8. Notice that two sorts we have done were **Text Fields**.

9. I want now to sort by Sales Amount (Numerical Value).



10. Notice here we have (Smallest to Largest) or (Largest to Smaller).

11. Sort Heights Sales First.

Sort Using Color

12. Go and shade some rows with a same color

A	B	C	D	E	
1	SORTING A LIST - Single Level Sorting				
2					
3					
4	Region	Country	Department	Sales Period	Sales Amount
5	Europe	France	Electrical	Feb	8,171
6	Europe	United Kingdom	Electrical	Jan	8,065
7	Europe	Germany	Clothing	Jan	7,738
8	Europe	France	Clothing	Mar	7,408
9	Europe	United Kingdom	Accessories	Apr	7,074
10	Europe	United Kingdom	Home	Mar	6,937
11	Europe	France	Accessories	May	6,714
12	Europe	Germany	Home	Jun	6,608
13	Europe	Germany	Electrical	Apr	6,439
14	Europe	Germany	Home	Feb	5,641
15	Europe	France	Home	Apr	5,556
16	Europe	Germany	Clothing	May	5,328
17	Asia	Singapore	Clothing	May	4,756
18	Asia	Singapore	Accessories	Nov	4,708
19	Asia	Singapore	Accessories	Mar	4,705
20	North America	Mexico	Clothing	Mar	4,690
21	Asia	Japan	Accessories	Feb	4,677
22	North America	Canada	Home	Mar	4,630
23	Asia	Japan	Clothing	Apr	4,573
24	Asia	Singapore	Electrical	Aug	4,542
25	North America	Canada	Clothing	Feb	4,541
26	Asia	China	Electrical	Jul	4,444
27	Asia	Japan	Electrical	Nov	4,420
28	North America	USA	Home	Jan	4,310
29	Asia	China	Home	Jan	4,301

13. Click on one cell that has a color.

14. Right click and select ➔ Put selected color on top.



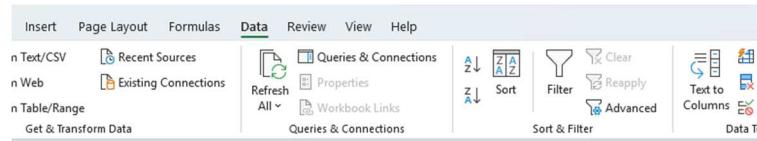
15. Put the color shade all to No Color.

16. Try now the same steps but with Front Color.

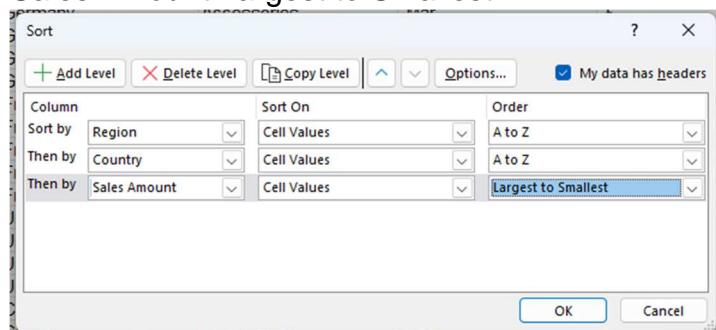
17. Right click and select **Put Selected Font on Top**.

Exercise 2 B: Multi-Level Sorting

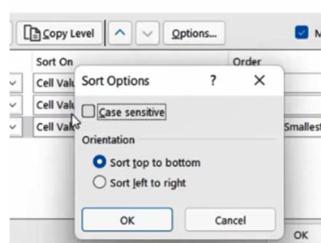
1. Suppose I want to sort the list in 3 levels: Region, Country and Sales.
2. Click anywhere in your list.
3. Data → Sort and Filter → Sort.



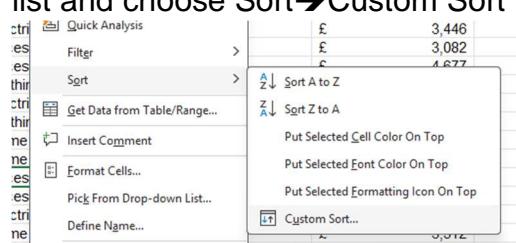
4. Make sure that check box **My Data has headers** is selected.
5. Add 3 levels of sorting:
 - a. Region A→Z.
 - b. Country A→Z.
 - c. Sales Amount Largest to Smallest.



6. Check the options you have in that box:
 - a. Delete level.
 - b. Copy level.
 - c. Up and Down Arrows.
 - d. Options.



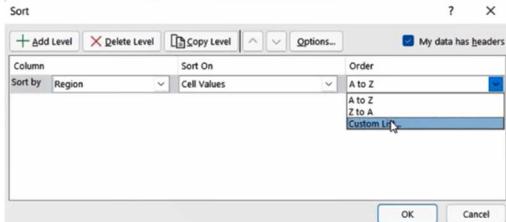
7. Click OK and see the sort result.
8. You can also find the dialogue box if you right click any cell in the list and choose Sort→Custom Sort



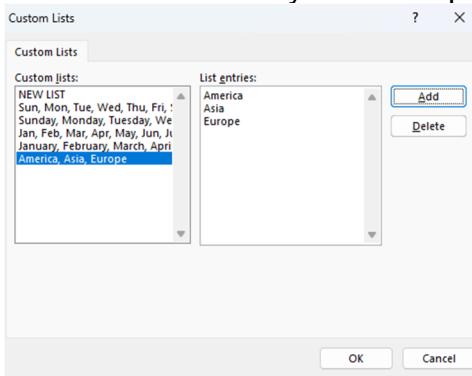
Exercise 02 C: Sort Using Custom List

1. Suppose I want to sort in the order: **North America, Asia, Europe**.

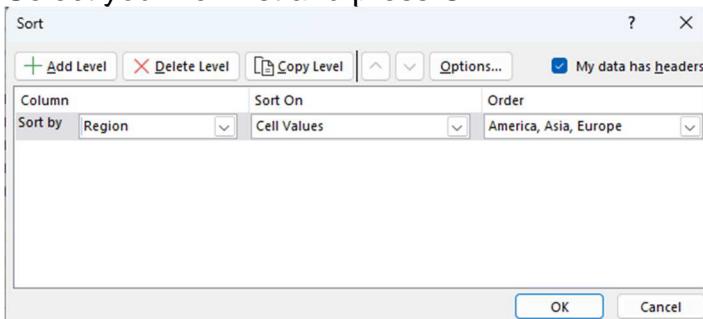
2. You can use your own list in this time.
3. Click anywhere in your data.
4. Open Sort Dialogue box.
5. Select Region and in order select **Custom List...**



6. The Custom List dialogue box appears.
7. Notice that we have many custom lists recorded in our Excel.
8. In Custom Lists select **NEW LIST**.
9. In List Entries type: **North America, Asia, Europe**.
10. Make sure that every item is separated by ", "(Comma then Space).



11. Click Add button to add the list.
12. Select your new list and press OK.



13. Click OK on the Sort Dialogue Box.
14. Now your data is sorted using your custom list.

Create a Unique Custom List

15. If you want have Custom List for sorting Countries.
16. Use Unique Function to create a unique list of countries you have.

SORTING A LIST - Custom Sort

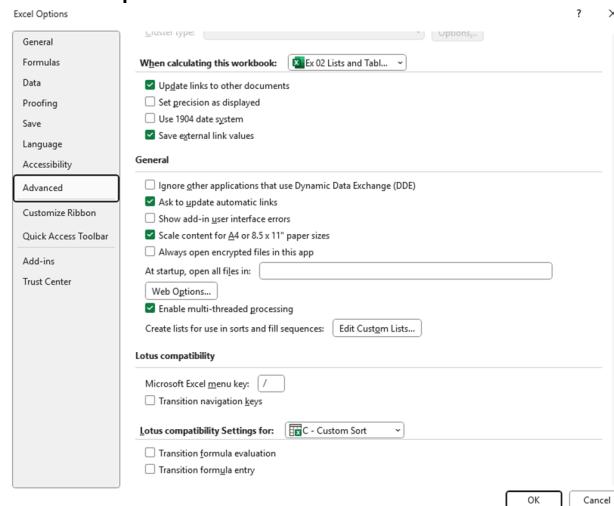
Region	Country	Department	Sales Period	Sales Amount	
USA	China	Home	Jan	£ 4,301	
USA	China	Accessories	Feb	£ 4,290	
USA	China	Electrical	Mar	£ 3,446	
USA	China	Clothing	Apr	£ 3,861	
USA	China	Home	May	£ 4,175	
USA	China	Accessories	Jun	£ 3,082	
USA	China	Electrical	Jul	£ 4,444	
USA	China	Clothing	Aug	£ 4,116	
USA	Japan	Home	Jan	£ 3,517	
USA	Japan	Accessories	Feb	£ 4,677	=UNIQUE(B5:B59)
USA	Japan	Electrical	Mar	£ 3,190	
			Apr	£ 4,279	

17. Select the created list **Copy** and the **Past Values** over the list with Dynamic Formula.

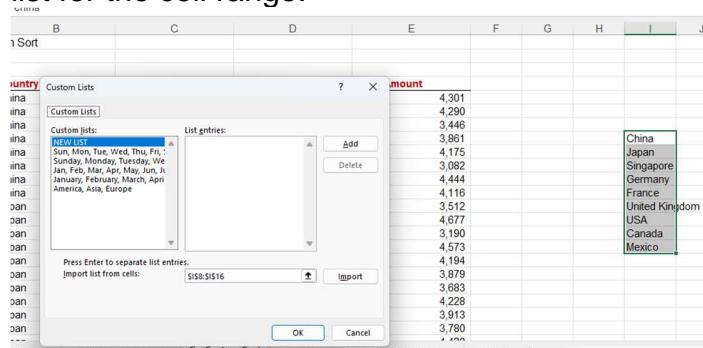
China
Japan
Singapore
Germany
France
United Kingdom
USA
Canada
Mexico

18. To add the list to your Excel.

19. File → Options → Advanced → General → Edit Custom List.



20. The dialogue box this time has import option you can use to get your list for the cell range.

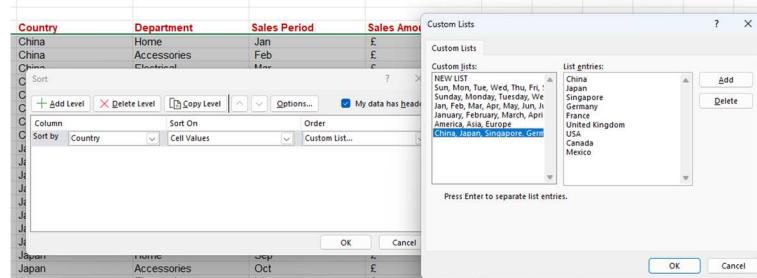


21. Select your country list.

22. Click Import then OK then OK again in the advanced Option window.

23. You can now delete your country cell range if you want to.

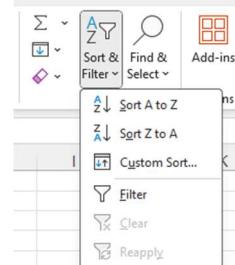
24. Go to Sort Dialogue box and chose your country custom list.



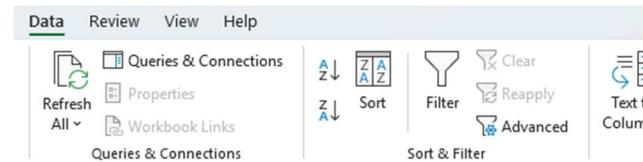
Exercise 02 D: Auto Filter

1. Select any cell in your data list.
2. You can reach **auto filter** in many ways:

a. Home ribbon → Sort and Filter → Filter



b. Data ribbon → Sort & Filter → Filter.

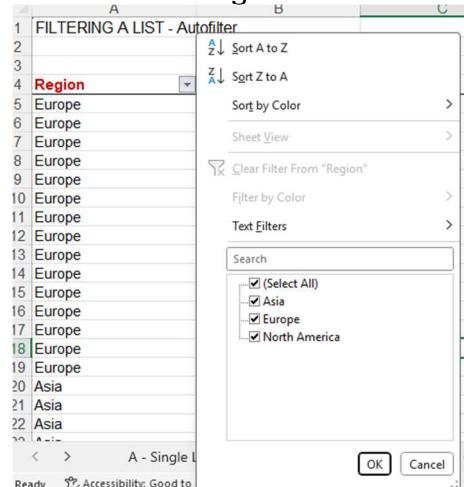


c. Use shortcut **Ctrl + Shift + L**

3. Notice you have drop down arrows in the top or your list.

Region	Country	Department	Sales Period	Sales Amount
Europe	Germany	Clothing	Jan	£ 7,738
Europe	Germany	Home	Feb	£ 5,641
Europe	Germany	Accessories	Mar	£ 3,023
Europe	Germany	Electrical	Apr	£ 6,439
Europe	Germany	Clothing	May	£ 5,328
Europe	Germany	Home	Jun	£ 6,608

4. You can toggle auto filter on and off clicking on the Funnel icon.
 5. Now you can filter using one column or many columns.
 6. Click on the Region filter arrow.

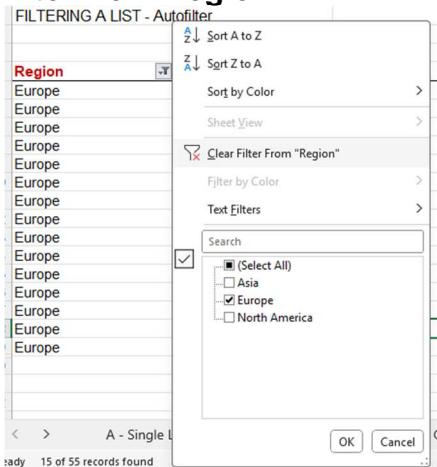


7. Notice you have **sort** option here.
 8. Deselect anything but Europe from the list so you filter for only Europe.

Region	Country	Department	Sales Period	Sales Amount
Europe	Germany	Clothing	Jan	£ 7,738
Europe	Germany	Home	Feb	£ 5,641
Europe	Germany	Accessories	Mar	£ 3,023
Europe	Germany	Electrical	Apr	£ 6,439
Europe	Germany	Clothing	May	£ 5,328
Europe	Germany	Home	Jun	£ 6,608
Europe	France	Accessories	Jan	£ 4,243
Europe	France	Electrical	Feb	£ 8,171
Europe	France	Clothing	Mar	£ 7,408
Europe	France	Home	Apr	£ 5,556
Europe	France	Accessories	May	£ 6,714
Europe	United Kingdom	Electrical	Jan	£ 8,065
Europe	United Kingdom	Clothing	Feb	£ 4,207
Europe	United Kingdom	Home	Mar	£ 6,937
Europe	United Kingdom	Accessories	Apr	£ 7,074

9. Notice that we have only **Europe** and a **funnel** instead of down arrow in the region column.
 10. Also notice that the **Row Numbers has turned into blue**.

11. All these means I have filter on this column.
 12. If you want to clear the filter, click on the small funnel then select **Clear filter from Region**.



13. You can also select “**Select All**” to clear the filter then press **OK**.

Filter Multiple columns

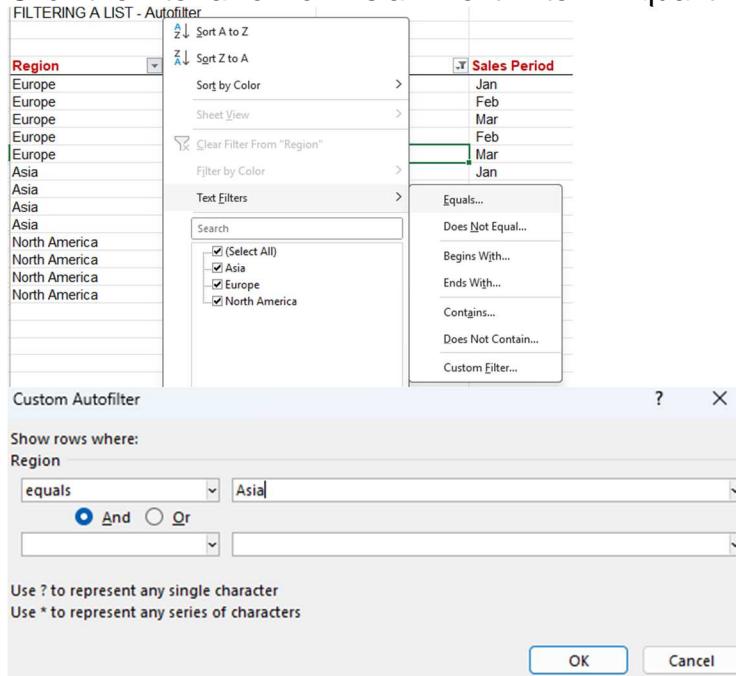
14. You can filter on many column try this:
- Filter department on: **Clothing** and **Home**.
 - Filter Sales Period on: **Jan, Feb, Mar.**

15. You have now two filters applied to your data.

Region	Country	Department	Sales Period	Sales Amount
Europe	Germany	Clothing	Jan	£ 7,738
Europe	Germany	Home	Feb	£ 5,641
Europe	France	Clothing	Mar	£ 7,408
Europe	United Kingdom	Clothing	Feb	£ 4,207
Europe	United Kingdom	Home	Mar	£ 6,937
Asia	China	Home	Jan	£ 4,301
Asia	Japan	Home	Jan	£ 3,512
Asia	Singapore	Clothing	Jan	£ 3,951
Asia	Singapore	Home	Feb	£ 3,087
North America	USA	Home	Jan	£ 4,310
North America	Canada	Clothing	Feb	£ 4,541
North America	Canada	Home	Mar	£ 4,630
North America	Mexico	Clothing	Mar	£ 4,690

Text Filter

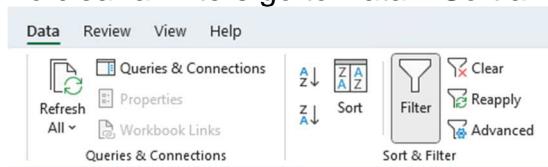
16. Click the filter arrow on Asia → Text Filter → Equal the write Asia.



17. Clear the filter from the region.

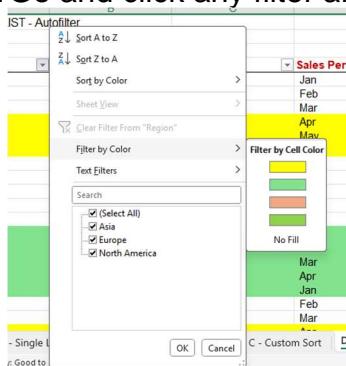
Number Filter

18. The same way filter on the Sales Amount Column to values > 7000
(Use Number Filter → Greater Than.....)
19. To clear all filters go to Data → Sort and Filter → Clear Button.



Filter in Colors

20. Change the back ground color of some rows to 3 different colors.
21. Go and click any filter arrow and chose Filter by Color

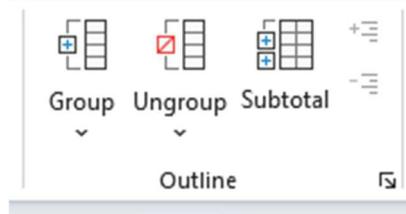


22. Choose the color you want to filter on.

Region	Country	Department	Sales Period	Sales Amount
Europe	United Kingdom	Electrical	Jan	8,065
Europe	United Kingdom	Clothing	Feb	4,207
Europe	United Kingdom	Home	Mar	6,937
Europe	United Kingdom	Accessories	Apr	7,074
Asia	China	Home	Jan	4,301
Asia	China	Accessories	Jun	3,082
Asia	China	Electrical	Jul	4,444
Asia	China	Clothing	Aug	4,116
Asia	Japan	Home	Jan	3,512
Asia	Japan	Accessories	Feb	4,677

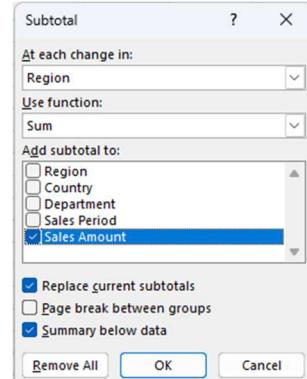
Exercise 02 E: Subtotals in a List

1. I want to see subtotal after every change in the Range.
2. The easiest way is to use subtotal button in the Data ribbon.
3. Data → Outline → Subtotal



4. Select:
 - a. In each change in: **Region**.
 - b. Use Function: **Sum**.
 - c. Add subtotal to: **Sales Amount**.
 - d. Unselect **Page break between groups**.

5. Click OK.



Region	Country	Department	Sales Period	Sales Amount
Europe	Germany	Clothing	Jan	7,738
Europe	Germany	Home	Feb	5,641
Europe	Germany	Accessories	Mar	3,023
Europe	Germany	Electrical	Apr	6,439
Europe	Germany	Clothing	May	5,328
Europe	Germany	Home	Jun	6,608
Europe	France	Accessories	Jan	4,243
Europe	France	Electrical	Feb	8,171
Europe	France	Clothing	Mar	7,408
Europe	France	Home	Apr	5,556
Europe	France	Accessories	May	6,714
Europe	United Kingdom	Electrical	Jan	8,065
Europe	United Kingdom	Clothing	Feb	4,207
Europe	United Kingdom	Home	Mar	6,937
Europe	United Kingdom	Accessories	Apr	7,074
Europe Total				93,152
Asia	China	Home	Jan	4,301
Asia	China	Accessories	Feb	4,200
Asia	China	Electrical	Mar	3,446
Asia	China	Clothing	Apr	3,861
Asia	China	Home	May	4,175
Asia	China	Accessories	Jun	3,082

6. You will see subtotal rows for each region.
7. Also 3 vertical bars 1 – 2 – 3 on the left.
8. Click 1 → Grand Total
9. Click 2 → Subtotal for each region.

10. Click 3 → Expand all.

11. You can do it also clicking (+, -) signs.

Remove Subtotal

12. Click on the Subtotal button again and select **Remove All**.

Create Subtotals Using Formula

13. Insert a row below each region.

14. Write **Europe Subtotal** in 1st Cell then (CTRL+B) to make it bold.

15. In the Sales Amount cell enter the formula for Subtotal Function

16. Select 9. Sum for function Number to use

£	7,074
=SUBTOTAL(
£	SUBTOTAL(function_num, ref1, ...)
£	(...)1 - AVERAGE
£	(...)2 - COUNT
£	(...)3 - COUNTA
£	(...)4 - MAX
£	(...)5 - MIN
£	(...)6 - PRODUCT
£	(...)7 - STDEVS
£	(...)8 - STDEV.P
£	(...)9 - SUM Selected
£	(...)10 - VAR.S
£	(...)11 - VAR.P
£	(...)101 - AVERAGE
£	4,194

Sales Amount	
£	7,738
£	5,641
£	3,023
£	6,439
£	5,328
£	6,608
£	4,243
£	8,171
£	7,408
£	5,556
£	6,714
£	8,065
£	4,207
£	6,937
£	7,074
=SUBTOTAL(9, E5:E19)	
£	SUBTOTAL(function_num, ref1, [ref2], ...)
£	4,290

17. Repeat that for each region and for Grand Total

18. Make the line shaded color different.

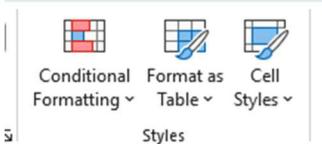
CREATING SUBTOTALS				
Region	Country	Department	Sales Period	Sales Amount
5 Europe	Germany	Clothing	Jan	£ 7,738
6 Europe	Germany	Home	Feb	£ 5,641
7 Europe	Germany	Accessories	Mar	£ 3,023
8 Europe	Germany	Electrical	Apr	£ 6,439
9 Europe	Germany	Clothing	May	£ 5,328
10 Europe	Germany	Home	Jun	£ 6,608
11 Europe	France	Accessories	Jan	£ 4,243
12 Europe	France	Electrical	Feb	£ 8,171
13 Europe	France	Clothing	Mar	£ 7,408
14 Europe	France	Home	Apr	£ 5,556
15 Europe	France	Accessories	May	£ 6,714
16 Europe	United Kingdom	Electrical	Jan	£ 8,065
17 Europe	United Kingdom	Clothing	Feb	£ 4,207
18 Europe	United Kingdom	Home	Mar	£ 6,937
19 Europe	United Kingdom	Accessories	Apr	£ 7,074
Europe Subtotal				£ 93,152
21 Asia	China	Home	Jan	£ 4,301

Exercise 02 F: Format as a Table

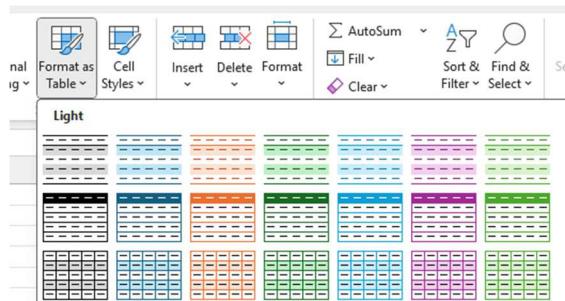
1. Let's start with the ribbon button.

2. Select any cell in the list.

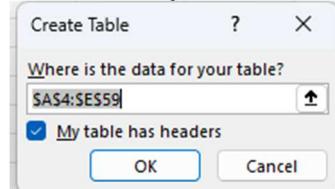
3. Home → Styles → Format as a table.



4. Select the style you want.



5. Make sure you select my table has headers.

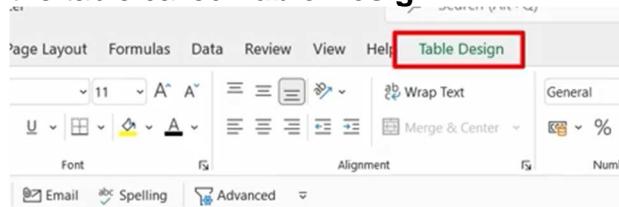


6. Click OK.

7. Notice that you have filter arrows on each row.

Region	Country	Department	Sales Period	Sales Amount
Sort A to Z	Clothing	Jan	£ 7,738	
Sort Z to A	Home	Feb	£ 5,641	
Sort by Color	Accessories	Mar	£ 3,023	
Sheet View	Electrical	Apr	£ 6,439	
Clear Filter From "Region"	Clothing	May	£ 5,328	
Filter by Color	Home	Jun	£ 6,608	
Text Filters	Accessories	Jan	£ 4,243	
Search	Electrical	Feb	£ 8,171	
(Select All)	Clothing	Mar	£ 7,408	
Asia	Home	Apr	£ 5,556	
Europe	Accessories	May	£ 6,714	
North America	Electrical	Jun	£ 8,065	
	Clothing	Feb	£ 4,207	
	Home	Mar	£ 6,937	
	Accessories	Apr	£ 7,074	
	Home	Jan	£ 4,301	
	Accessories	Feb	£ 4,290	
	Electrical	Mar	£ 3,446	
	Clothing	Apr	£ 3,861	
	Home	May	£ 4,175	
	Accessories	Jun	£ 3,082	
	Electrical	Jul	£ 4,444	
	Clothing	Aug	£ 4,116	
	Home	Jan	£ 3,512	
	Accessories	Feb	£ 4,677	
	Electrical	Mar	£ 3,190	

8. Notice that you have a new contextual ribbon tab when you are inside the table called **Table Design**.



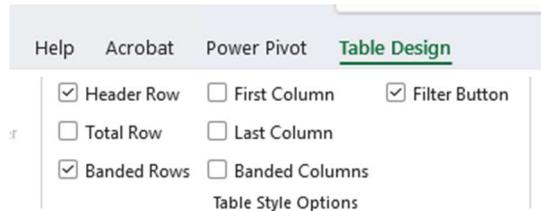
9. Click outside the table the tab disappears.

10. Undo the table using the Undo button (**CTRL+Z**).

11. Create the table again using the shortcut key (**CTRL+T**).

12. Notice that when you scroll down the table the column header stayed on top.

Table Style Options



- a. **Header Row:** Remove and add Header.

- b. **Total Row:** Add Total Row at the bottom of the table.

- c. **Banded Rows:** make the even rows with different colors.
 - d. **Banded Columns:** Make even columns in different colors.
 - e. **Last Column:** Display different format for last column.
 - f. **First Column:** Display different format for first column.
 - g. **Filter Button:** show or hide filter button.
13. Create a meaningful name for your table.
14. Table Design → Properties → Table Name.
15. Name it : **Sales_Data** (There must be no space).

Expand Table

- 16. You can Expand the table adding new data in rows or add new columns.
- 17. Copy and paste the data from the Sheet: **Extra Data**.
- 18. Paste the data at the bottom of the table.
- 19. Use **(CTRL+A)**, **(CTRL+C)**, **(CTRL+↓)**, **(CTRL+V)**.
- 20. Delete the copied header row.
- 21. The table is extended with the new data.
- 22. Create a new column Sales with Tax.
- 23. In the 1st cell of the column create a formula: **Sales Amount * 1.2**

Region	Country	Department	Sales Period	Sales Amount	Sales with Tax'
Europe	Germany	Clothing	Jan	£ 7,738	=[@[Sales Amount]]*1.2
Europe	Germany	Home	Feb	£ 5,641	

24. The whole table is propagated with the new formula.

Region	Country	Department	Sales Period	Sales Amount	Sales with Tax'
Europe	Germany	Clothing	Jan	£ 7,738	£ 9,285.6
Europe	Germany	Home	Feb	£ 5,641	£ 6,789.2
Europe	Germany	Accessories	Mar	£ 3,023	£ 3,627.6
Europe	Germany	Electrical	Apr	£ 6,439	£ 7,726.8
Europe	Germany	Clothing	May	£ 5,328	£ 6,393.6
Europe	Germany	Home	Jun	£ 6,608	£ 7,929.6
Europe	France	Accessories	Jan	£ 4,243	£ 5,091.6
Europe	France	Electrical	Feb	£ 8,171	£ 9,805.2
Europe	France	Clothing	Mar	£ 7,408	£ 8,889.6
Europe	France	Home	Apr	£ 5,556	£ 6,667.2
Europe	France	Accessories	May	£ 6,714	£ 8,056.8
Europe	United Kingdom	Electrical	Jan	£ 8,065	£ 9,678.0
Europe	United Kingdom	Clothing	Feb	£ 4,207	£ 5,048.4
Europe	United Kingdom	Home	Mar	£ 6,937	£ 8,324.4
Europe	United Kingdom	Accessories	Apr	£ 7,074	£ 8,488.8
Asia	China	Home	Jan	£ 4,301	£ 5,161.2
Asia	China	Accessories	Feb	£ 4,290	£ 5,148.0

Exam 02: Lists and Tables

FORMAT AS A TABLE

1. Select the data on the worksheet 'Customer_Invoices'.
2. Format the data as a table (any table style).
3. Name the table, '**Invoices_2020**'

2

SORTING DATA

4

5

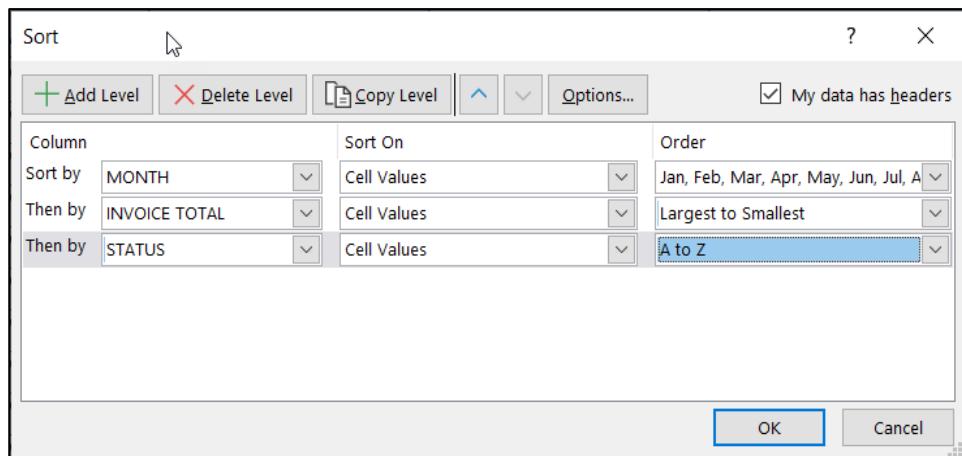
1. Sort the 'Invoices_2020' table data by '**Month**', '**Invoice Total**' and '**Status**'.
2. Use a Custom List for the '**Month**' Order.

6

7

8

9



FILTERING DATA

1. Filter the data to show all invoices over '\$3000.00' that have a status of 'Past Due'.

MONTH	INVOICE NO.	DATE	INVOICE TOTAL	DUUE DATE	STATUS
Feb	INV-00016	2/25/2020	\$3,938.00	2/24/2020	Past Due
Apr	INV-00009	4/18/2020	\$3,175.00	2/17/2020	Past Due
Sep	INV-00028	9/12/2020	\$3,035.00	10/12/2020	Past Due

SUBTOTALS

1. Apply **Subtotals** to the data on the 'Customer_Invoices_Subtotal' worksheet.
2. At each change in '**Month**', add the subtotal to the '**Invoice Total**'.
3. Collapse up the subtotals to show only the totals for each month.

MONTH	INVOICE NO.	DATE	INVOICE TOTAL	DUUE DATE	STATUS
Jan Total			\$16,320.00		
Feb Total			\$11,568.00		
Mar Total			\$6,780.00		
Apr Total			\$9,133.00		
May Total			\$9,564.00		
Jun Total			\$4,536.00		
Jul Total			\$9,384.00		
Aug Total			\$5,607.00		
Sep Total			\$10,085.00		
Oct Total			\$11,616.00		
Nov Total			\$7,350.00		
Dec Total			\$10,656.00		
Grand Total			\$112,599.00		

Chapter 03: Looking Up Information

Exercise 03 A: VLOOKUP Function Using Exact matching

1. You can find VLOOKUP in the Formulas tab ribbon under Formula and references.

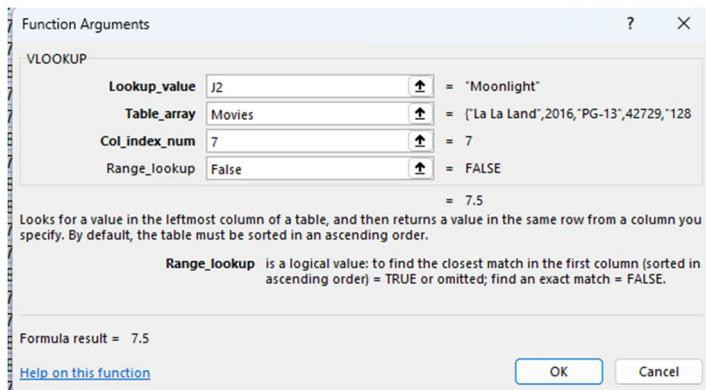


2. Now go and create VLookup Function in the right table to get the information of the Film you typed in Film Cell.
3. Try to get Year using Range of Data.
4. Convert the List into table and name it movie to use in the Formula to get Certificate and Drama.
5. Try to Use the fx (Insert Function) to write your function.

Film	Moonlight
Year	=VLOOKUP(J2,A1:G1212,2,FALSE)
Certificate	[VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])]
Genre	
Rating	

Film	Moonlight
Year	2016
Certificate	=VLOOKUP(J2,Movies,3,FALSE)
Genre	[VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])]
Rating	

Film	Moonlight
Year	2016
Certificate	R
Genre	=VLOOKUP(J2,Movies,6,False)
Rating	[VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])]



6. Now try to write other movies to get its information

Film	Moonlight
Year	2016
Certificate	R
Genre	Drama
Rating	7.5

Film	La La Land
Year	2016
Certificate	PG-13
Genre	Drama
Rating	8.1

Exercise 03 B: VLookup Approx. Match

1. I want to get the app for each user I have but that near the age in the table.

User	Age	App Preference	Hours per day
David Clark	56	=VLOOKUP(B16,\$A\$4:\$D\$12,3,TRUE)	
Jane March	22		
Lucy Bell	15		
Andrew Smith	37		
Brian Baker	78		

Low End	High End	App	Hours per day (Average)
0	10	GROM	1.5
11	20	TikTok	2
21	30	Instagram	3.5
31	40	Twitter	5
41	50	Twitter	4.75
51	60	Facebook	6
61	70	Facebook	1
71	Above	Facebook	0.3

User	Age	App Preference	Hours per day
David Clark	56	Facebook	
Jane March	22		
Lucy Bell	15		
Andrew Smith	37		
Brian Baker	78		

2. Do not forget to fix the table range using **F4**.
3. Fill down the formula for the rest of users.
4. Now let us use a **Named Range** for that List we have.
5. Name it **SocialMedia**.
6. Use it now to get the Hours per day column.
7. Press **F3** to get the Name of the Range you created while you create the Formula.

8. You can replace **TRUE** with **1** (0 is for FALSE).

Hours per day
=VLOOKUP(B16,SocialMedia,4,1)
VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])
(... TRUE - Approximate match
(... FALSE - Exact match

9. You have now full information.

User	Age	App Preference	Hours per day
David Clark	56	Facebook	6
Jane March	22	Instagram	3.5
Lucy Bell	15	TikTok	2
Andrew Smith	37	Twitter	5
Brian Baker	78	Facebook	0.3

Exercise 03 C: Error Handling

1. You have a table with **Part Number** and you want to get the description and unit price from the list in the sheet **Parts_Catalogue**.
2. We have Created **Named Range** for you **Parts_Catalogue** you can press **F3** to choose it while you are creating your formula.
3. Use **0** for the exact match.

2	<input type="button" value="X"/> <input type="button" value="√"/> <input type="button" value="fx"/> =VLOOKUP(A2,Parts_Catalogue,2,0)	
A	B C	
Part Number	Part Description	Unit Price
6602	=VLOOKUP(A2,Parts_Catalogue,2,0)	
8981		
8770	VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])	
	(... TRUE - Approximate match	Approximate match - the values in the fi
	(... FALSE - Exact match	

4. Fill down the column you will get NA Error.

A	B		C
1	Part Number	Part Description	Unit Price
	6602	Door Handles : Door Packs Modern : Urfic Door Pack Constance Satin Nickel	
2	8981	Door Handles : Lever On Backplate Modern : Bordeaux Lever Latch Satin Nickel	
3	8770	Door Handles : Mortice Sets Traditional : Jedo Fluted Door Knob Black Nickel 56mm	
4	1234	#N/A	
5		Radiator Valves : Thermostatic Radiator Valves (TPV) - Dimple Thermostatic Radiator Valve Chrome TPV	

5. That means the part number is not found.

User IFNR Function

6. IFNR only deals with NA Error.
7. Handle the error and wrap the IFNR for VLOOKUP.

<input type="button" value="X"/> <input type="button" value="√"/> <input type="button" value="fx"/>	=IFNA(VLOOKUP(A2,Parts_Catalogue,2,0),"Part Not Found")
---	---

	8981	Door Handles : Lever On Backplate Modern : Bordeaux Lever Latch Satin Nickel
3	8770	Door Handles : Mortice Sets Traditional : Jedo Fluted Door Knob Black Nickel 56mm
4	1234	Part Not Found
5	3500	Radiator Valves : Thermostatic Radiator Valves (TRVs) : Pegler Terrier II White & Chrome TRV
6	7506	Switches & Sockets : Crabtree Polished Brass LP : Crabtree 13A Sw FCU Polished Brass Flat Plate
7	6511	Part Not Found
8	A275	Floor Paints : Standard Floor Paints : No

Use IFERROR Function

8. Create Vlookup for Unit Price column.

9. You also have NA errors.

10. Handle the error the same way But Use the General Function
IFERROR

```
=IFERROR(VLOOKUP(A2,Parts_Catalogue,3,FALSE),"Price Not Found")
```

EXAM 03: Looking Up Information

LOOKING UP INFORMATION

- On the 'Test_Scores' worksheet, format the data as a table.
- Name the table 'Test_Scores'.
- Create a **VLOOKUP** formula to lookup the Physics, Biology and Chemistry test scores for the student selected in cell M4.
- Test that the formula is working by selecting a different student from the data validation drop-down list in cell M4.

STUDENT	Mandy Chapman
PHYSICS	27
BIOLOGY	22
CHEMISTRY	67

- On the 'Student_Grades' worksheet, use **VLOOKUP** to find the Grade for each students average score for Science.
- Copy the formula down for all students.
- Notice any errors that appear in the cells.
- Modify the formula so that instead of an error, the formula returns the text "Fail".

STUDENT	PHYSICS	BIOLOGY	CHEMISTRY	AVERAGE		GRADE
Alice Pierce	23	84	71	59		D
Dolores Parker	73	98	83	85		B
Mandy Chapman	27	22	67	39		Fail
Jeff James	45	48	69	54		E
Jerry Sparks	38	56	49	48		E
Alfonso Wagner	61	41	66	56		D
Clinton Greer	82	94	23	66		C

Chapter 04: Logical Functions

Logical Test



Condition	Operator
Equal to	=
Greater than	>
Less than	<
Greater than or equal to	>=
Less than or equal to	<=
Not equal to	<>

Logical Operators

Try those to get False or True.

Exercise 04 A: Basic Logical

1. We want to approve only the ones > 1000.
2. Use F4 to lock the value in Cell G5.

EXPENSES		Expenses over the following threshold:
Total	Approval Required?	
£ 800	=B5>=\$G\$5	Threshold: £ 1,000
£ 1,200		
£ 1,000		
£ 750		
£ 500		
£ 800		
£ 1,300		

EXPENSES		
Name	Total	Approval Required?
Deb Ashby	£ 800	FALSE
Adam Lacey	£ 1,200	TRUE
Mike Smith	£ 1,000	TRUE
Sarah Oxted	£ 750	FALSE
Lucy Jones	£ 500	FALSE
Claire Fisher	£ 800	FALSE
Sam Cox	£ 1,300	TRUE

3. Now replace the formula with IF statement.

EXPENSES			Expenses over the following threshold
Total	Approval Required?		
£ 800	=IF(B5>=\$G\$5,"Approval","No Approval")	Threshold	£ 1,000
£ 1,200			

EXPENSES		
Name	Total	Approval Required?
Deb Ashby	£ 800	No Approval
Adam Lacey	£ 1,200	Approval
Mike Smith	£ 1,000	Approval
Sarah Oxted	£ 750	No Approval
Lucy Jones	£ 500	No Approval
Claire Fisher	£ 800	No Approval
Sam Cox	£ 1,300	Approval

Exercise 04 B: Examples on IF Statement

1. Try example 1 to test if the Student Pass or Not.

IF EXAMPLE 1			
Name	Score	Result	Pass Mark
Deborah	93	=IF(B4>=\$F\$3,"Pass","Fail")	85
Adam	65		
Brooke	85		
James	79		
Rob	90		
Kata	60		

IF EXAMPLE 1			
Name	Score	Result	Pass Mark
Deborah	93	Pass	85
Adam	65	Fail	
Brooke	85	Pass	
James	79	Fail	
Rob	90	Pass	
Kata	60	Fail	

2. In Example 2 Use IF to make calculation

IF EXAMPLE 2				
Product	Weight (kgs)	Price	Shipping Fee	Weight Shipping Fee
Office Chair	25	£ 500.00	=IF(B14>=\$H\$13,C14*\$H\$14.00	30 20%
Oak Desk	50	£ 450.00		
Storage Unit	30	£ 250.00		
Filing Cabinet	20	£ 175.00		
PC	5	£ 600.00		

IF EXAMPLE 2				
Product	Weight (kgs)	Price	Shipping Fee	Weight Shipping Fee
Office Chair	25	£ 500.00	£ -	30
Oak Desk	50	£ 450.00	£ 90.00	20%
Storage Unit	30	£ 250.00	£ 50.00	
Filing Cabinet	20	£ 175.00	£ -	
PC	5	£ 600.00	£ -	

3. Try to Know How AND Function works in Example 3

19	AND			
20				
21	Name	Score 1	Score2	Result
22	Claire	93	80	=AND(B23>=\$H\$22,C23>=\$H\$23)
23	Julie	65	91	
24	Max	50	72	
25	Ben	78	93	
26	Courtney	38	30	
27				
			Test 1	75
			Test 2	65

AND				Test 1	75
Name	Score 1	Score2	Result	Test 2	65
Claire	93	80	TRUE		
Julie	65	91	FALSE		
Max	50	72	FALSE		
Ben	78	93	TRUE		
Courtney	38	30	FALSE		

4. Now try to make the result meaningful using IF with AND

AND				Test 1	75
Name	Score 1	Score2	Result	Test 2	65
Claire	93	80	Pass		
Julie	65	91	Fail		
Max	50	72	Fail		
Ben	78	93	Pass		
Courtney	38	30	Fail		

5. In Example 4 Find out How OR function works and combine with IF to get the result.

OR				Test 1	75
Name	Score 1	Score2	Result	Test 2	65
Claire	93	80	=IF(OR(B32>=\$H\$31,C32>=\$H\$32),"Pass","Fail")		
Julie	65	91			
Max	50	72			
Ben	78	93			
Courtney	38	30			

OR				Test 1	75
Name	Score 1	Score2	Result	Test 2	65
Claire	93	80	Pass		
Julie	65	91	Pass		
Max	50	72	Pass		
Ben	78	93	Pass		
Courtney	38	30	Fail		

Exercise 04 C: IF Statement

Use IF to perform logical test to calculate Shipping for orders over 1500.

Total Cost	Shipping	Total	For orders over:	1500
£ 1,449.75	=IF(F4>\$K\$3,F4*\$K\$4,0)		Shipping Charge (% of cost)	2%
£ 659.90	IF(logical_test,[value_if_true],[value_if_false])			
£ 454.65				
it	Shipping	Total	Total	
75	£ -	£ 1,449.75		
90	£ -	£ 659.90		
65	£ -	£ 454.65		
35	£ -	£ 419.85		
40	£ -	£ 779.40		
96	£ 52.00	£ 2,651.96		
50	£ -	£ 649.50		
98	£ -	£ 1,299.98		
70	£ 29.59	£ 2,019.29		

EXAM 04: Logical Functions

LOGICAL DECISIONS

1. On the '**Christmas_Party**' worksheet, use a formula to calculate which venue meets all required conditions.
2. In column G, calculate which venues can accommodate 400 or more attendees. Output the text "**Yes**" for a true result and "**No**" for a false result.
3. In column H, calculate which venues can accommodate 400 or more attendees **AND** are \$4000 or less. Output the text "**Yes**" for a true result and "**No**" for a false result.
4. The last logical test will produce one venue that matches both conditions. Input the name of the venue to cell G22 by linking the cell.

VENUE	CAPACITY	AVAILABILITY	PRICE
The White Rooms	100	Available	\$2,000
Fitzrovia House	500	Available	\$10,000
The Belgrave	150	Available	\$1,000
Waldorf Function Rooms	250	Available	\$1,000
One Hotel	400	Available	\$8,000
The Madison Lounge	220	Not Available	\$3,000
Anderson Centre	650	Available	\$9,000
The Marquee	700	Available	\$7,000
Summertime House	400	Available	\$3,000
Cranleigh Gardens	200	Available	\$1,000
White Leaf Function Rooms	120	Available	\$1,500
The Bell and Hound	50	Not Available	\$750
Trident Place	75	Not Available	\$800
Oak View Gardens	300	Available	\$1,200
The Sky Garden	200	Available	\$2,000
One Viewpoint Tower	150	Available	\$1,500

Chapter 5: Date Functions

Exercise 05 A: Date Functions

Enter a dynamic Updated Date and Time

1. In the up left table, we want to enter today date.

2. Use **TODAY()** Function (It uses no arguments).

A	B
Date:	=TODAY()
Date and Time:	

3. The Date is Dynamic and will always be updated when you open your worksheet.
 4. If we want to enter date and time use **Now()** Function.

A	B
1 Date:	4/28/2025
2 Date and Time:	4/28/2025 12:09

Enter Hard Coded Date and Time

5. If you want to put the date with no Update, use the shortcut (**CTRL+;**).
 6. This will enter the date of today and never update.
 7. To enter the date and time : (**CTRL+;**), Space, (**CTRL+SHIFT+;**).

WORKDAY Function

8. If you have table of your tasks and its start date and the working days of each and you want to know when the Finish date is excluding the weekends.

Task Name	Start Date	Working Days	Finish Date
Research	01/01/2020	5	
Book Venue	07/01/2020	1	
Order Wedding Dress	09/01/2020	3	
Order Bridesmaids Dress	11/01/2020	3	
Book Caterer	13/01/2020	2	

9. You can use the WORKDAY function
 10. It takes two arguments, the start date and the working days

Start Date	Working Days	Finish Date
01/01/2020	5	=WORKDAY(B6,C6,
07/01/2020	1	WORKDAY(start_date, days, [holidays])
09/01/2020	3	

11. Optionally you can add range of Holidays you want to exclude.

B	C	D	E	F	G
10/12/2021					
10/12/2021 15:19					
Start Date	Working Days	Finish Date			
01/01/2020	5	=WORKDAY(B6,C6,\$G\$5:\$G\$14	01/01/2020	New Y	
07/01/2020	1	WORKDAY(start_date, days, [holidays])	02/04/2020	Good I	
09/01/2020	3		05/04/2020	Easter	
11/01/2020	3		03/05/2020	May D	
13/01/2020	2		31/05/2020	Spring	
17/01/2020	2		30/08/2020	Summ	
20/01/2020	1		25/12/2020	Christr	
23/01/2020	1		26/12/2020	Boxing	
25/01/2020	4		27/12/2020	Christr	
27/01/2020	8		28/12/2020	Boxing	
28/01/2020	4				

NETWORKDAYS Function

12. You can calculate the working days.

Start Date	End Date	No of Working Days
01/01/2020	03/04/2020	=NETWORKDAYS(B20,C20,\$G\$5:\$G\$14
07/01/2020	14/01/2020	NETWORKDAYS(start_date, end_date, [holidays])
09/01/2020	13/01/2020	

Use WORKDAY.INTL and NETWORKDAYS.NTL

13. You can use those function to specify which days is your weekend

```
0 =WORKDAY.INTL(B6,C6,7,$G$5:$G$14)
0 WORKDAY.INTL(start_date, days, [weekend], [holidays])
```

14. From the list select the number corresponding to your country weekend.

For example, 7 for Fri and Sat.

Exercise 05 B: More Date Formula

1. In the table you must fill the columns using date functions to get the result from the **Date** column.

Date and Time Formulas								
Date	Invoice Total	DayNum	DayName	MonthNum	MonthName	Year	Weekday	Is Weekend?
10/12/2020	£ 5,095							
15/01/2020	£ 5,484							

2. Use function DAY

Date	Invoice Total	DayNum	Day
10/12/2020	£ 5,095	=DAY(A4)	
15/01/2020	£ 5,484	DAY(serial_number)	
18/12/2020	£ 9,134	21	

Date	Invoice Total	DayNum	Day
10/12/2020	£ 5,095	10	
15/01/2020	£ 5,484	15	
18/12/2020	£ 9,134	18	
20/07/2020	£ 6,162	20	

3. Use TEXT Function to get the day

Date	Invoice Total	DayNum	DayName	Month
10/12/2020	£ 5,095	10	=TEXT(A4,"ddd")	
15/01/2020	£ 5,484	15	TEXT(value, format_text)	
18/12/2020	£ 9,134	18		

Date	Invoice Total	DayNum	DayName	Month
10/12/2020	£ 5,095	10	Thu	
15/01/2020	£ 5,484	15		
18/12/2020	£ 9,134	18		

4. ddd → Mon dddd → Monday

5. Get Month Number using MONTH Function

Date	Invoice Total	DayNum	DayName	MonthNum	Month
10/12/2020	£ 5,095	10	Thu		
15/01/2020	£ 5,484	15	Wed		
18/12/2020	£ 9,134	18	Fri		

Date	Invoice Total	DayNum	DayName	MonthNum	Month
10/12/2020	£ 5,095	10	Thu		
15/01/2020	£ 5,484	15	Wed		

6. Use **TEXT** Function to get the Month Name.

Month	MonthName	Year
12	=TEXT(A4,"mmmm")	
1	TEXT(value, format_text)	

7. MMM → Jan MMMM → January.
 8. Use **YEAR** function to get the year.

Year	Week
=YEAR(A4)	YEAR(serial_number)

9. Use a **WEEKDAY** Function to get the day of the week.

Weekday	Is Weekend?
020	=WEEKDAY(A4,
020	WEEKDAY(serial_number, [return_type])
020	(...1 - Numbers 1 (Sunday) through 7 (Saturday))
020	(...)2 - Numbers 1 (Monday) through 7 (Sunday)
020	(...)3 - Numbers 0 (Monday) through 6 (Sunday)
020	(...)11 - Numbers 1 (Monday) through 7 (Sunday)
020	(...)12 - Numbers 1 (Tuesday) through 7 (Monday)
020	(...)13 - Numbers 1 (Wednesday) through 7 (Tuesday)
020	(...)14 - Numbers 1 (Thursday) through 7 (Wednesday)
020	(...)15 - Numbers 1 (Friday) through 7 (Thursday)
020	(...)16 - Numbers 1 (Saturday) through 7 (Friday)
020	(...)17 - Numbers 1 (Sunday) through 7 (Saturday)

10. Choose from the list which one is Day Number 1.
 11. For example, I would choose 2 for (Mon to Sun).
 12. As the first day of the week is Monday.
 13. Use the resulting number to decide if it was a **weekend**?
 14. In our case check if the weekday > 5 it is a weekend.

Weekday	Is Weekend?
20	4 =IF(H4>5,"Yes","No")
20	3 IF(logical_test, [value_if_true], [value_if_false])
20	5

Exercise for you:

15. Try again with the first day of the week, Saturday.

Chapter 6 Hyperlinks and 3D Reference

Exercise 6 A: 3D Reference

1. If you have sheets that have **EXACTLY** the same structure in your workbook, you can use the 3D reference to facilitate Calculations.

2. In this workbook we have as you can see:

	Sales	
4	Jan	£ 4,512.00
5	Feb	£ 9,300.00
6	Mar	£ 7,908.00
7	Apr	£ 6,275.00
8	May	£ 4,067.00
9	Jun	£ 6,350.00
10	Jul	£ 4,336.00
11	Aug	£ 3,699.00
12	Sep	£ 7,732.00
13	Oct	£ 8,541.00
14	Nov	£ 9,507.00
15	Dec	£ 7,691.00
16	Total	£ 79,918.00

- 3. 4 worksheets for **UK, USA, Japan, China** with the same table structure.
- 4. We want to sum all data in the **Total Sales** sheet.
- 5. Open the **Total Sales** sheet and calculate the total sales.
- 6. I want total sales for **January** across all countries.
- 7. Create SUM Calculation.

	Total Sales	Average Sales
Jan	=SUM(
Feb		SUM(number1, [number2], ...)
Mar		

- 8. Click on **UK** worksheet.
- 9. Notice that the formula has added the UK to your calculation.

	A1	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
Total		£ 79,918.00		

- 10. Now select the value for Jan (B4).

	X	✓	fx	=SUM(UKIB4

- 11. Hold **SHIFT** Key and Select **China** Worksheet.
- 12. That would select all the worksheets of countries.

	UK	USA	Japan	China	Total Sales	

13. Notice that the function has changed to say select B4 for all worksheets from UK to China.

=SUM('UK:China'!B4)

14. Press Enter to complete the calculation.

15. You can fill the rest of the columns cell even for **Total** cell.

16. Try again with AVERAGE Function.

=AVERAGE('UK:China'!B4)

	Total Sales	Average Sales
Jan	£ 25,172.00	£ 6,293.00
Feb	£ 31,010.00	£ 7,752.50
Mar	£ 23,338.00	£ 5,834.50
Apr	£ 20,818.00	£ 5,204.50
May	£ 25,544.00	£ 6,386.00
Jun	£ 19,971.00	£ 4,992.75
Jul	£ 16,997.00	£ 4,249.25
Aug	£ 26,572.00	£ 6,643.00
Sep	£ 25,040.00	£ 6,260.00
Oct	£ 28,485.00	£ 7,121.25
Nov	£ 26,506.00	£ 6,626.50
Dec	£ 29,316.00	£ 7,329.00
Total	£ 298,769.00	£ 74,692.25

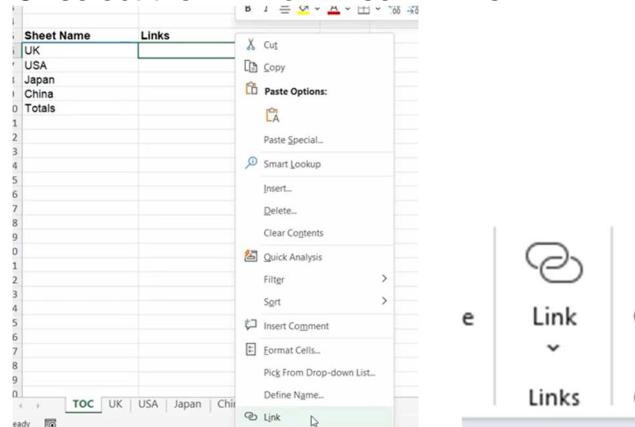
Exercise 06 B: Inserting Hyperlinks to Worksheets

1. Create a new worksheet TOC before the countries worksheets like the one in figure.

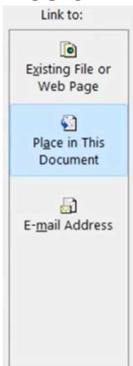
A	B	C
1	Table of Contents	
2		
3		
4		
5	Sheet Name	Links
5	UK	
7	USA	
7	Japan	
7	China	
0	Totals	
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		
	TOC	UK USA Japan China Total Sales

2. We want to make it simple for anyone to navigate through.
 3. We will create hyperlinks for every worksheet.
 4. Right click the cell **B6** and select Link.

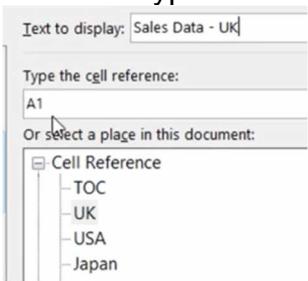
5. Or select the link from **Insert** → **Links** → **Link**



6. You can also use the key shortcut (**CTRL+K**).
 7. Notice that you can insert link for this workbook or other workbooks or files or mail.



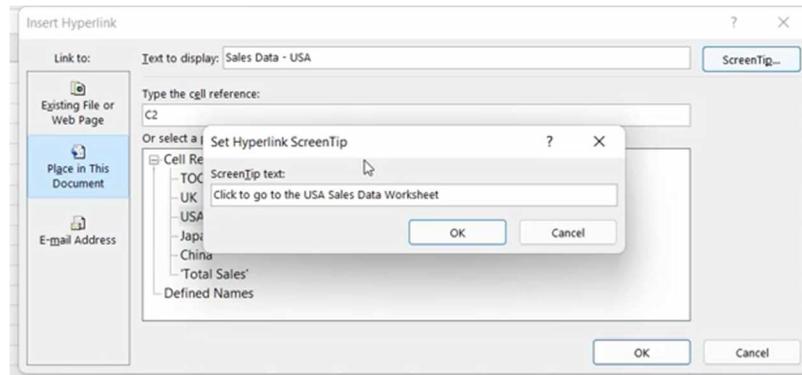
8. Select Place in this document.
 9. Create a hyperlink for UK Sales.



10. You have a clickable hyperlink.

Sheet Name	Links
UK	Sales Data - UK
USA	
Japan	
China	
Totals	

11. Click to test.
 12. Create a Hyperlink to USA Sales make the cell reference C2 and click **screen tip** button to create a tool tip to the link when user hover.



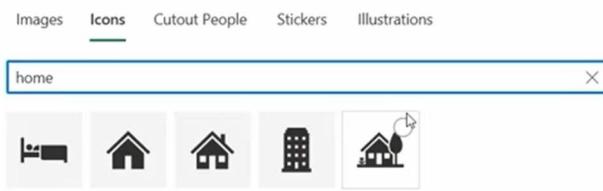
13. Notice the tooltip when you hover over the link.

Sheet Name	Links
UK	Sales Data - UK
USA	Sales Data - USA
Japan	
China	
Totals	
1	

14. Click on the link and notice that your cursor is on **C2** of USA worksheet.
 15. Complete all other links to other pages and test them.

Using Image as Hyperlink

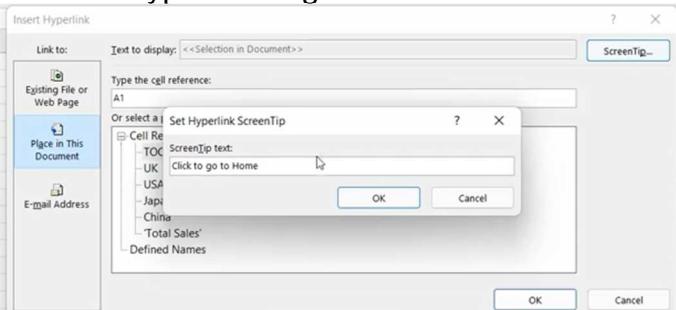
16. You can use pictures, Shape or icon as a hyperlink.
 17. I want to put an icon that get the user back to **TOC** worksheet.
 18. Insert → illustrations → Icons.
 19. Search with **Home** word.



20. Insert the icon and notice you have a new tab in the ribbon **Graphic Format**.

21. Change the icon color to light blue.
 22. Select the icon then press **CTRL+K**.

23. Create a hyperlink to get back to TOC.



24. Copy the icon to all other worksheets.

Exam 5: 3D References

3D REFERENCING

1. Use 3D Referencing to complete the summary table on the '**Total_Sales**' worksheet.

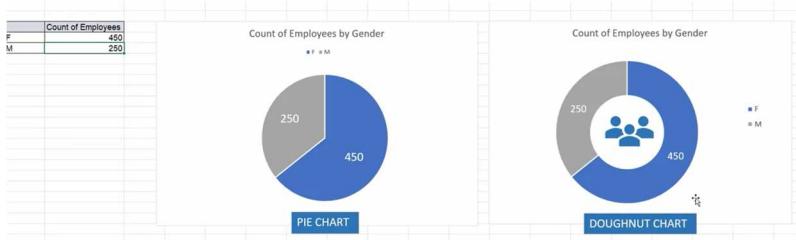
TOTAL SALES (JAN - APR 2019)				
	North	South	East	West
Jan	\$48,279	\$50,759	\$47,063	\$45,893
Feb	\$40,173	\$36,003	\$44,219	\$49,253
Mar	\$46,637	\$45,988	\$48,998	\$35,176
Apr	\$51,834	\$45,274	\$54,787	\$52,495

Chapter 7: Charts

Demo 7 A: Choosing the right chart

1. Charts are a great way to represent Data.
2. You must decide which type of chart suits the data you want to analyze.

Pie and Donut Charts



3. Good if you have small data segments.

4. Not suitable with more segments.

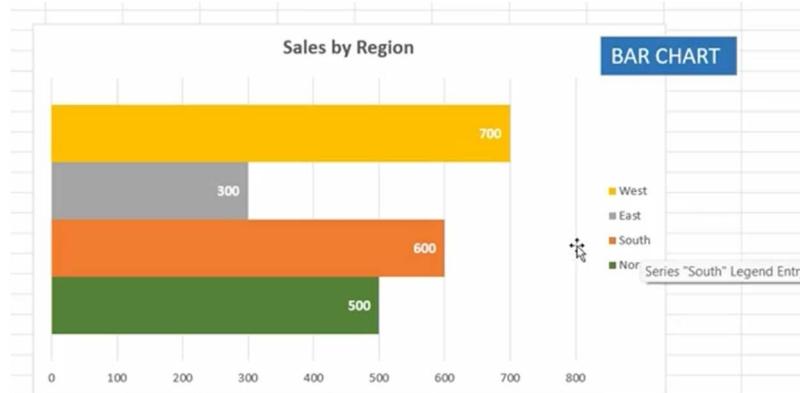
Line Chart

5. Suitable to represent trends and changes in values over time.
 6. It works best for time series data.



Column and Bar Charts

7. Suitable and clear for most data types.



Stacked column Chart

8. Part of column chart family.
 9. Good for comparing values.
 10. Good for data with 2 dimensions.

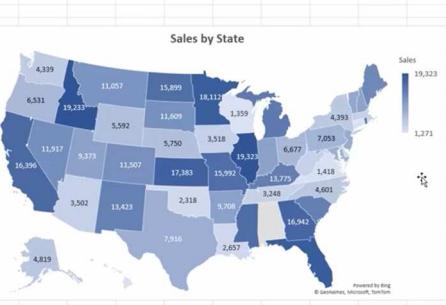


Field Map Chart

11. Effective way to display geographical data.

12. The shade depends on the values.

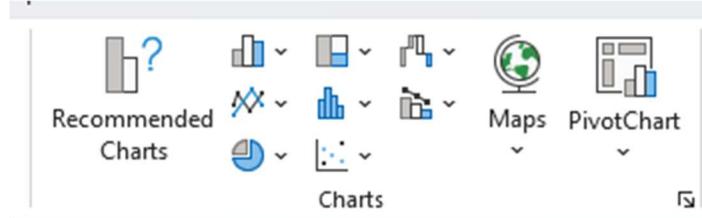
State	Code	Sales
Alaska	AK	4,819
Arizona	AZ	3,502
Arkansas	AR	9,708
California	CA	16,365
Colorado	CO	11,507
Connecticut	CT	1,271
Delaware	DE	2,276
District of Columbia	DC	12,056
Florida	FL	18,338
Georgia	GA	16,942
Hawaii	HI	1,319
Idaho	ID	19,233
Illinois	IL	19,323
Indiana	IN	9,415
Iowa	IA	3,518
Kansas	KS	17,893
Kentucky	KY	13,776
Louisiana	LA	2,657
Maine	ME	12,534
Maryland	MD	7,673
Massachusetts	MA	3,408
Michigan	MI	14,474



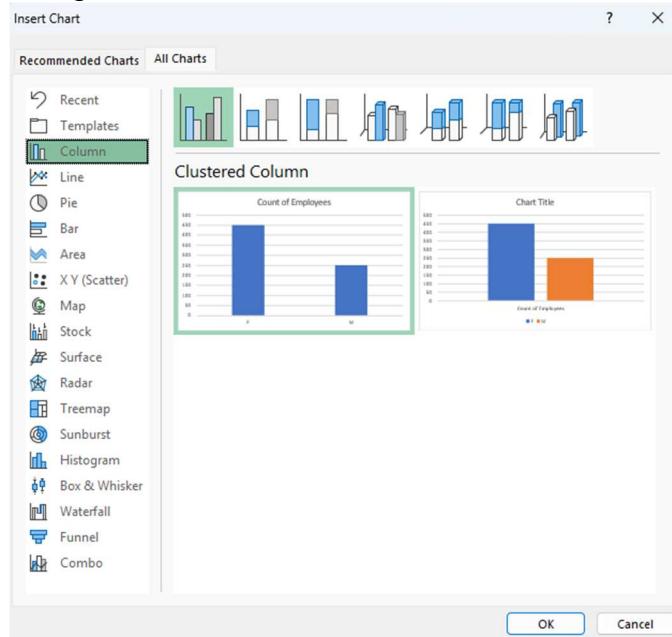
13. The darker the shading the higher the sales.

14. You can find many chart types available in Excel.

15. Insert ➔ Charts



16. Click on the small arrow in bottom right to get all the charts by categories.



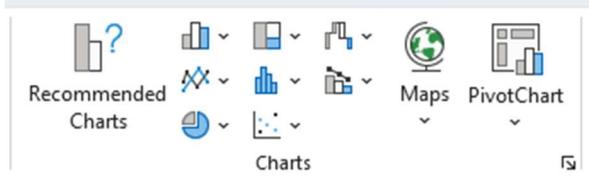
Exercise 07 A Creating Charts

1. In this exercise we will create charts.

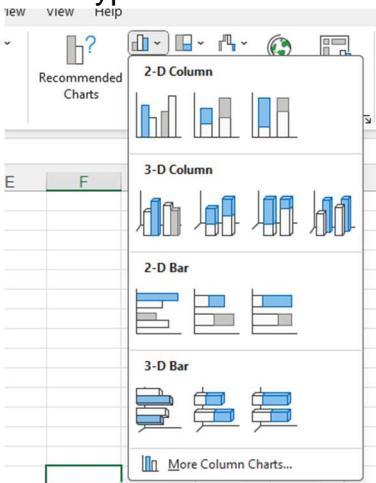
Pie Chart

2. We have data divided into the number male and female employees.
3. It is better to use pie chart to present.
4. Select your data set.

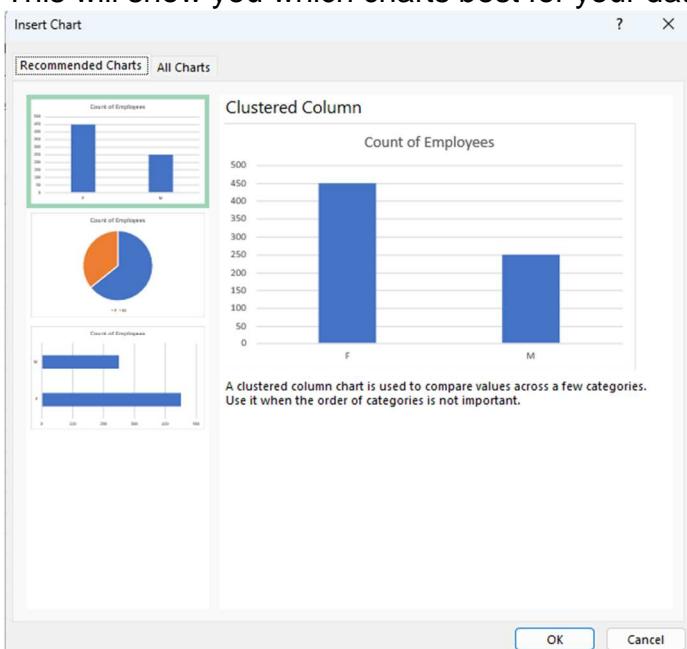
5. In the insert ribbon tab in Charts group, you have many chart types grouped into categories.



6. If you click any small arrow before any of them it will show you more chart types.

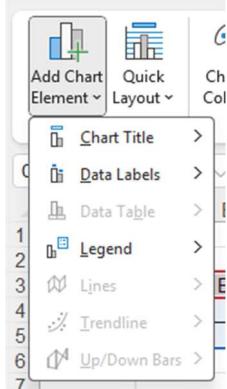


7. If you are not sure which chart type suitable for your data you can click on the **Recommended Charts** button.
8. This will show you which charts best for your data.

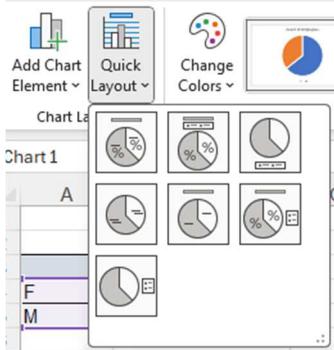


9. Select Pie Chart and click OK.
10. A pie chart inserted into your worksheet and 2 contextual ribbon tabs appears (**Chart Design** and **Format**).
11. In Chart Design you can:

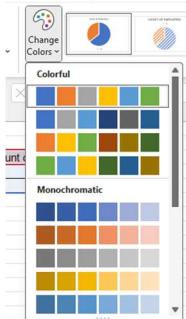
a. Add chart elements.



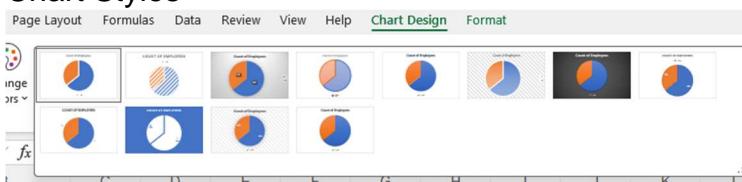
b. Quick layout to create chart with some elements



c. Change color scheme

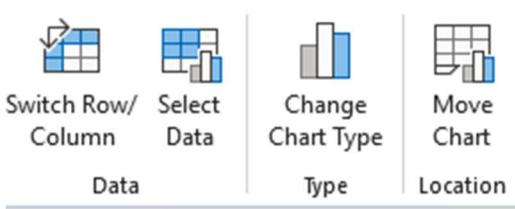


d. Chart Styles



it is predefined format. Try them to see by yourself

e. You also have buttons to



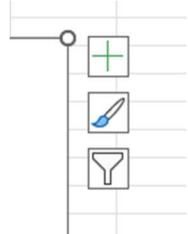
switch row/column , select data , change chart type and move the chart to another worksheet.

12. In the Format ribbon you will have all option to format your chart.



13. Select Female section in the Pie chart and change it to Green.

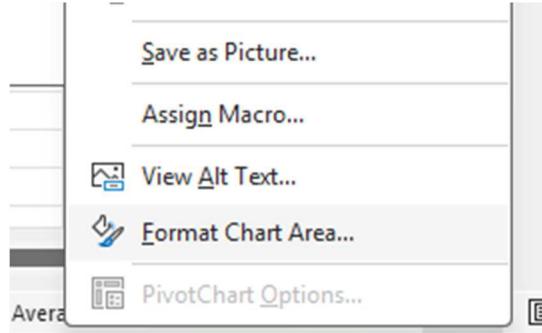
14. Use Shape Style → Shape Fill.



15. With every chart you will find 3 icons on the top right of the chart.

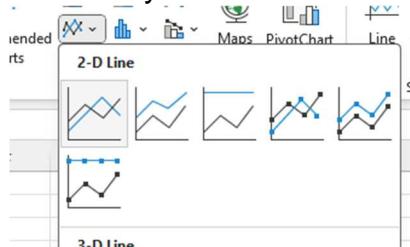
- a. Chart Elements.
- b. Chart Styles.
- c. Chart Filter.

16. If you right click your chart, you can reach format window on the right to format elements you selected.



Line Chart

17. Select any cell in data and select 2D Chart.



Column Chart and Bar Chart

18. Select your data.

19. Insert 2D clustered chart.

20. Select the chart and use shortcut Key **CTRL+D** to duplicate the chart.

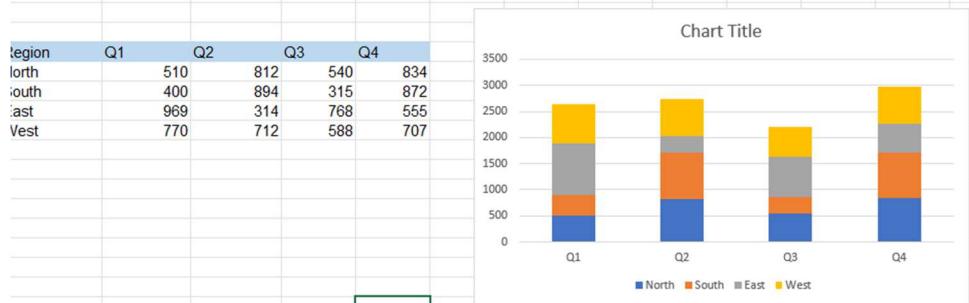
21. Select the second chart and from the Chart design → Type → Change Chart Type and change it to Bar Chart.



Stacked Column Chart

22. Select Data.

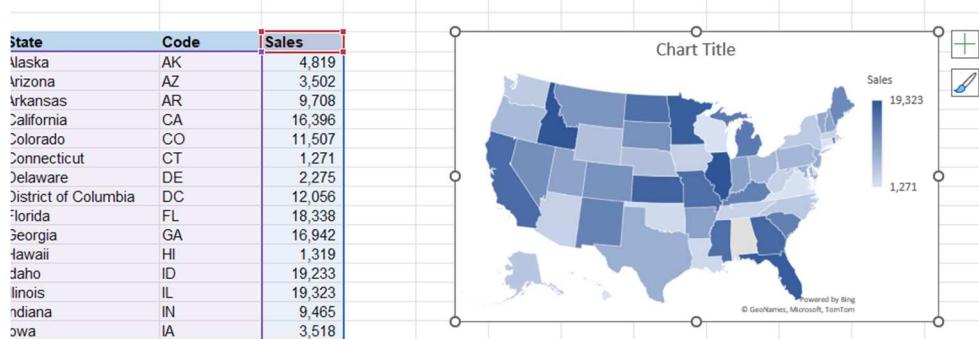
23. Create Stacked Column Chart.



Filled Map Chart

24. You must be sure that name of cities and states or countries are written correctly.

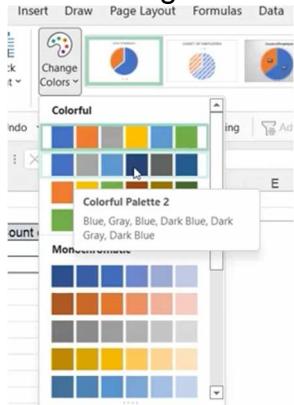
25. You must be connected to the internet.



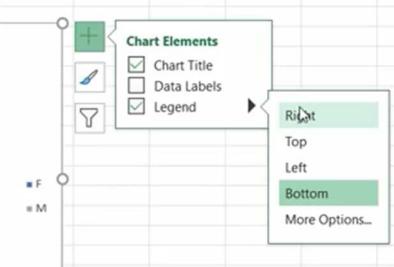
Exercise 07 B: Format Charts

Format Pie Chart

1. Chart Design → Change Colors → Colorful Pallet 2



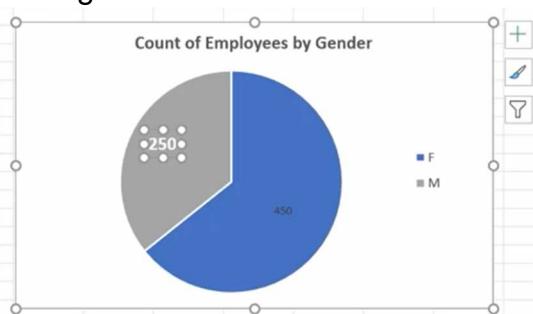
2. Change title to: **Count of employees by gender**.
3. Select title, **CTRL+B** to make it bold.
4. Move legend to the right.



5. You can click on legend and move it to the place you want.
6. Increase the font size of the legend.
7. Add Data labels.



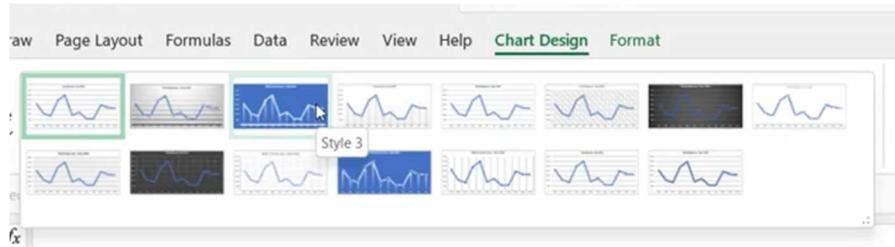
8. Make the labels at the end and then select each label and move.
9. Make label Font size bigger.
10. Change the font color to white and make it bold.



Format Line Chart

11. Change Title: **Total Sales Jan-Dec 2020** and make them bold.

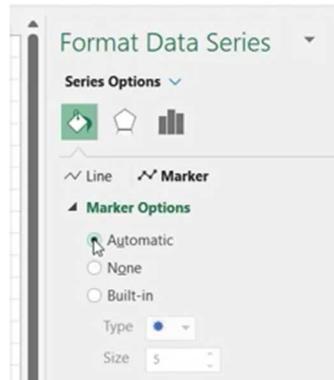
12. In Chart Design try every style hover to see the result before you choose.



13. Choose Style 4.

14. I want add markers.

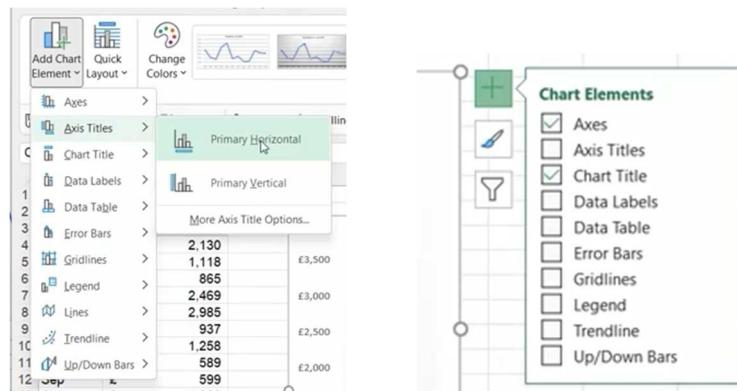
15. Click on the line, right click → **Format Data Series** to open format panel.



16. Data Fill → Marker → Automatic.

17. Fill → Solid Fill (Orange).

18. I want add an access title.



19. You can use + Sign or Chart Design → Add Chart elements.

20. Add **Primary Horizontal** and **Primary Vertical**.

21. Or simply click + → Access Titles.

22. Change Access Titles to **Months** and **Sales**.

23. I want to add an outline for the chart.

24. Format → Shape Outline.



25. Add black outline.

Format Column Chart

26. Change Column Chart Title to: **Sales by Regions**.

27. Select Bars.

28. Change bars to green Format → Shape Fill.

29. I want to decrease the gaps between bars.

30. Right click bars and select **Format Data Series**.

31. In series options decrease the **Gap Width**.

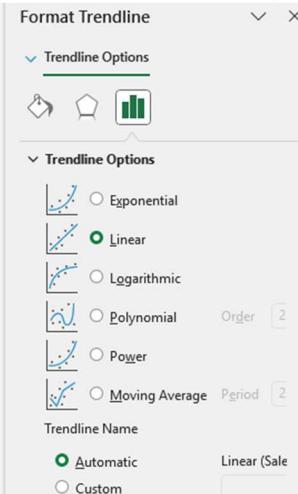


32. Add Data labels + → Data Labels.

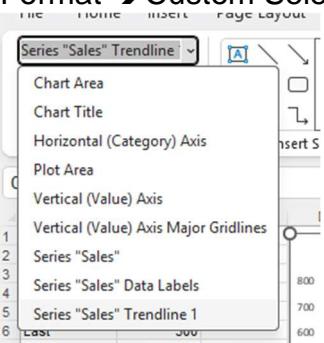
33. Make labels inside end, increase font size and make it **white** and **Bold**.

34. Add trend line + → Trend line.

35. Select trend line, right click, format trend line.



36. You can get the parts of your chart to select if you cannot click through Format → Custom Selection.



37. Select grid lines and change their color.



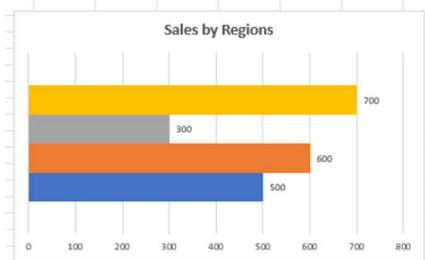
Format Bar Chart

38. Add title: **Sales by Region**.

39. Add Legend and move it to the top.

40. Add data labels outside end.

41. Select the Y access title and remove.



Format Stacked Column Chart

42. Add title: **Sales by Region and quarters.**

43. Add Data labels.

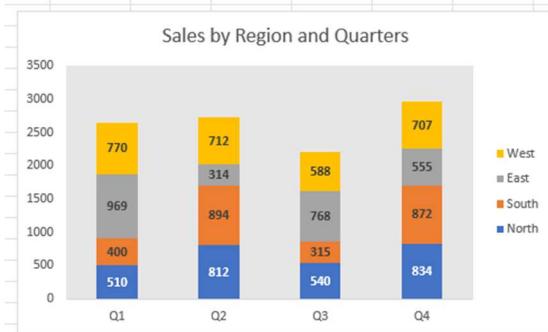
44. Make all data labels bold.

45. Move legend to the right.

46. Select plot area

47. Format → Shape Fill and choose a **light grey** color.

48. Turn off **Grid lines**.



Format Map Chart

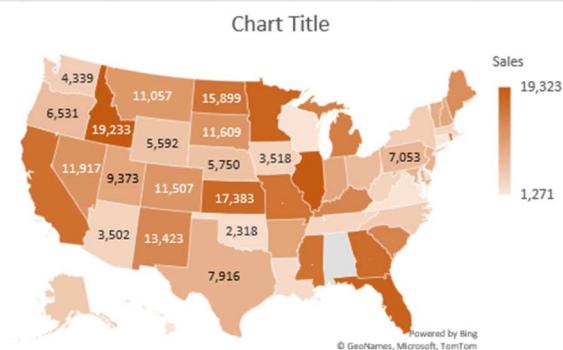
49. Change title: **Sales by State.**

50. Try the **styles** you have in **Chart Design** tab.

51. Add data labels.

52. Change color pallet.

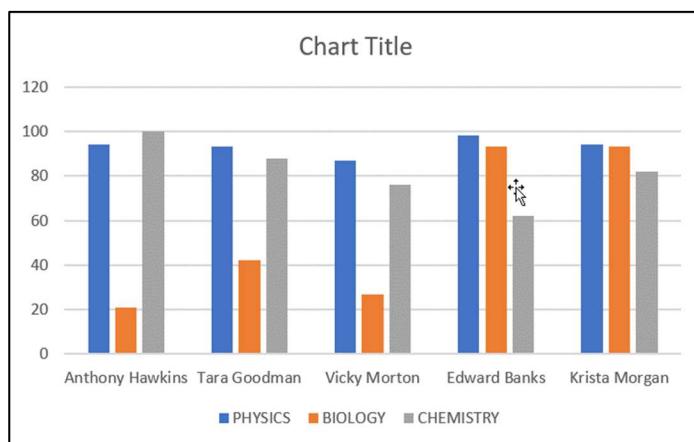
53. Chart Design → Change Color → Color pallet 3.



Exam 06: Charts

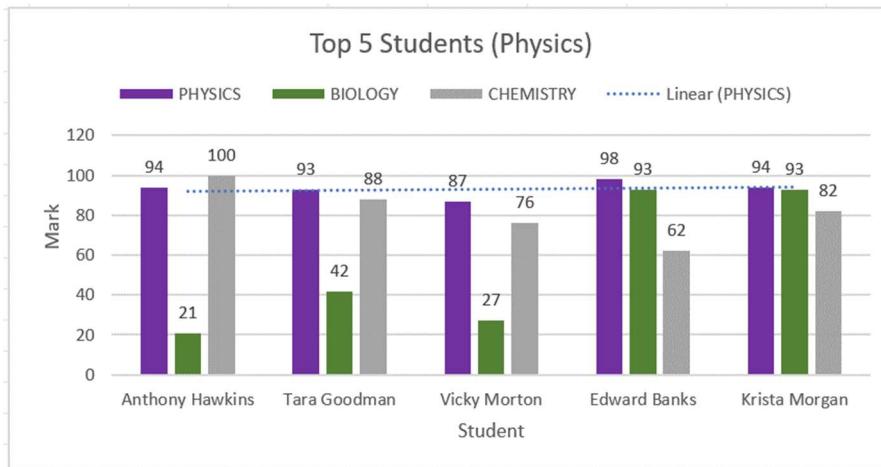
CREATING A CHART

1. On the '**Charts**' worksheet, format the data as a table.
2. Name the table '**Top_5_Physics**'.
3. Apply a filter to the '**Physics**' column to show the Top 5 students.
4. Create a '**2D Clustered Column**' chart.



EDITING A CHART

1. Add the Chart Title '**Top 5 Students (Physics)**'
2. Move the '**Legend**' to the top.
3. Add '**Axis Labels**' to the horizontal and vertical axis.
4. Add '**Data Labels**' to the outside edge.
5. Change the color of the data bars.
6. Add a trendline to show the trend of the '**PHYSICS**' mark.



Chapter 8 Advanced Logical Functions

Exercise 08 A: Nested IF

1. It is IF statement inside other IF Statement.
2. We want to add bonuses to employees according to their job rating.
3. You have a table on the right for bonus amount for each job rating.

Nested Ifs						
Employee Name	Building	Department	Hire Date	Years	Salary	Job Rating
Page, Lisa	West	ADC	12/24/2001	20	\$ 60,981.00	1
Taylor, Hector	West	ADC	2/3/2014	7	\$ 60,915.00	4
Dawson, Jonathan	West	ADC	2/16/2010	11	\$ 97,071.00	5
Duran, Brian	Taft	ADC	8/13/2015	6	\$ 115,421.00	3

Job Rating	Bonus
5	3000
4	1500
3	900
2	100
1	0

4. So, I need to perform multiple logical tests.
5. Now go step by step creating the logic

The screenshots illustrate the construction of a nested IF formula. The formula being built is:

```
=IF(G4=$J$4,$K$4,IF(G4=$J$5,$K$5,IF(G4=$J$6,$K$6,IF(G4=$J$7,$K$7,IF(G4<=$J$8,$K$8,0,100,900,1500,3000)))
```

The formula uses absolute cell references (\$J\$4, \$K\$4, etc.) to ensure the logic applies to all rows in the 'Bonus' column.

6. Add 4 closing brackets.

`fx =IF(G4=J4,K4,IF(G4=J5,K5,IF(G4=J6,K6,IF(G4=J7,K7,IF(G4<=J8,K8,0))))`

7. It is so complex

ary	Job Rating	Bonus
.981.00	1	-
.915.00	4	1,500
.071.00	5	3,000
.421.00	3	900
.547.00	4	1,500
.212.00	2	100
.198.00	1	-
.635.00	5	3,000

8. If you see errors, select all the column CTRL+SHFT+↓.

9. Select ignore error.

Exercise 08 B: IFS Statement

- In sheet **IFS Example 1** you have the same problem.
- Let us try to solve it using **IFS** function.

H	I	J	K
Bonus		Job Rating	Bonus
=IFS(G4=\$J\$4,\$K\$4		5	3000
[Logical test1, value_if_true1, [logical_test2, ...]		4	1500
		3	900
		2	100
		1	0
H	I	J	K
Bonus		Job Rating	Bonus
=IFS(G4=\$J\$4,\$K\$4, G4=\$J\$5,\$K\$5,		5	3000
[Logical test1, value_if_true1, [logical_test2, value_if_true2], [logical_test3, value_if_true3], ...]			1500
		3	900
		2	100
		1	0

3. In sheet **IFS Example 2**.

A	B	C
Day of the Week		
Sunday		
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Day Number		
Day		

- I have list of Days Sunday to Saturday (1 to 7).
- I want if I put the day number I get the name of the day.
- For example, 1 gives me Sunday and 7 gives me Saturday.

7. Let us create a formula for that.

	Day Number	Day
1	=IFS(A11=1,A2,A11=2,A3,A11=3,A4,A11=4,A5,A11=5,A6,A11=6,A7,A11=7,A8	
2		IFS(logical_test1,value_if_true1,[logical_test2,value_if_true2],[logical_test3,value_if_true3],[logical_test4,value_if_true4],[logical_test5,value_if_true5],[logical_test6,value_if_true6],[logical_test7,value_if_true7],[logical_test8,...])
9		
10	Day Number	Day
11	2	Monday

8. Notice that you have an error **NA** when you enter number > 7 or leave the cell empty.
 9. You can handle this with **IFNR** or **IFERROR** function or add a **TRUE** value for the last check in the **IFS** statement.

Exercise 08 C: Conditional IF

COUNTIF, SUMIF, AVERAGEIF

1. We have a table of Sales team member names with their companies' job titles and total sales.

Sales Team	Company	Job Title	Total Sales
Angelina Webb	Computech	Sales Rep	\$ 7,270.00
Alison Bryant	MicroWorld	Sales Manager	\$ 9,250.00
Jenna Norman	MicroWorld	Sales Rep	\$ 6,201.00
Abel Hoffman	Computech	Sales Manager	\$ 7,480.00
Ervin Ray	MicroWorld	Sales Rep	\$ 7,139.00

2. We want the total sales according to some conditions.

CRITERIA		SUMIF(S)
MicroWorld		Total Sales for MicroWorld
MicroWorld	Sales Rep	Total Sales for all Sales Reps at MicroWorld
MicroWorld	>7000	Total Sales for all Sales Reps at MicroWorld with more than 7000 in \$

3. For example, Total Sales for **MicroWorld** company.
 4. So we want to **SUM** total sales but only **IF** the company in the company column = **MicroWord**.
 5. So, we will use **SUMIF** function

SUMIF Function

6. It needs **2** required arguments and **1** optional.

=SUMIF(
 SUMIF(range, criteria, [sum_range])

7. MUST= **Range** to check in and **Criteria** to check.
 8. OPTIONAL = **SUM Range** , that we want to sum.
 9. In our case the
 - Range = Company Range.
 - Criteria = MicroWord
 - Sum_range = Total Sales.

Company	Job Title	Total Sales		CRIERIA	SUMIF(S)
Computech	Sales Rep	\$ 7,270.00		MicroWorld	=SUMIF(B6:B17,F6,D6:D17) [SUMIF(range, criteria, [sum_range])]
MicroWorld	Sales Manager	\$ 9,250.00		MicroWorld Sales Rep	
MicroWorld	Sales Rep	\$ 6,201.00		MicroWorld Sales Rep >7000	
Computech	Sales Manager	\$ 7,480.00			
MicroWorld	Sales Rep	\$ 7,139.00			
MicroWorld	Sales Manager	\$ 7,781.00			

=SUMIF(B6:B17,F6,D6:D17)

COUNTIF Function

10. In table 2 on the right, I want to count the total Number of employees in CompuTech company.
 11. Use COUNTIF function

Company	Job T		CRIERIA	COUNTIF(S)
Computech	Sales			
MicroWorld	Sales			
MicroWorld	Sales			
Computech	Sales			
MicroWorld	Sales			
MicroWorld	Sales			
Computech	Sales			
Computech	Sales		Computech	=COUNTIF(B6:B17,F14) [COUNTIF(range, criteria)]
MicroWorld	Sales		Computech Sales Manager	
Computech	Sales		Computech Sales Manager <9000	
MicroWorld	Sales			

=COUNTIF(B6:B17,F14)

AVERAGEIF

12. I want to know average sales of computech.

	CRIERIA	AVERAGEIF(S)
Computech		=AVERAGEIF(B6:B17,F20,D6:D17)
Computech Sales Rep		AVERAGEIF(range, criteria, [average_range])

Exercise 08 D: Multiple Conditional IFS

1. What if we want to use more than one Criteria?

SUMIFS

2. I want total sales of Reps at MicroWorld company.

=SUMIFS()
SUMIFS(sum_range, criteria_range1, criteria1, ...)

- a. First we give the range we want to sum
- b. Then we give the Criteria Range1 , and Criteria 1
- c. Criteria Range 2 and Criteria 2
- d. And so on

MicroWorld	Sales Rep	=SUMIFS(D6:D17,B6:B17,F7,C6:C17,G7)
------------	-----------	-------------------------------------

Company	Job Title	Total Sales
Computech	Sales Rep	\$12,000.00
MicroWorld	Sales Manager	\$18,000.00
MicroWorld	Sales Rep	\$12,000.00
Computech	Sales Manager	\$18,000.00
MicroWorld	Sales Rep	\$12,000.00
MicroWorld	Sales Manager	\$18,000.00
Computech	Sales Manager	\$18,000.00

3. For 3 conditions:

MicroWorld	Sales Rep	>7000	=SUMIFS(D6:D17,B6:B17,F8,C6:C17,G8,D6:D17,H8)
------------	-----------	-------	---

COUNTIFS

Computech	Sales Manager	=COUNTIFS(B6:B17,F15,C6:C17,G15)
Computech	Sales Manager	<9000
=COUNTIFS(B6:B17,F16,C6:C17,G16,D6:D17,H16)		

COUNTIFS(criteria_range1, criteria1, [criteria_range2, criteria2], ...)

AVERAGEIFS

Computech	Sales Rep	=AVERAGEIFS(D6:D17,B6:B17,F21,C6:C17,G21)
AVERAGEIFS(average_range, criteria_range1, criteria1, [criteria_range2, criteria2], ...)		

Try Yourself:

MINIFS, MAXIFS

Exam 07 Advanced Logical Functions

Ex 01

EXERCISE 01 - Logical Functions

Athlete Name	Country	Gender	Medal	Prize Money		
Page, Lisa	USA	F	Bronze			
Taylor, Hector	USA	M	Gold			
Dawson, Jonathan	Canada	M	Gold			
Duran, Brian	USA	M	Silver			
Weber, Larry	UK	M	Silver			
Pratt, Erik	UK	M	Bronze			
O'Connor, Kent	South Africa	M	Bronze			
Spencer, Lucy	Australia	F	Gold			
Wiggins, Frank	Australia	M	Silver			
Tanner, Claire	Australia	F	Gold			
Strickland, Rajean	USA	M	Bronze			
Chase, Susan	UK	F	Bronze			

Using Nested IFs or IFS, complete the 'Prize Money' field in the table.

Using Nested IFs or IFS, complete the 'Prize Money' field in the table.

Ex 02

Athlete Name	Country	Gender	Medal	Prize Money	Criteria	Result
Page, Lisa	USA	F	Bronze	\$ 100	Number of Athletes from the USA	
Taylor, Hector	USA	M	Gold	\$ 500	Number of Athletes from Australia and Female	
Dawson, Jonathan	Canada	M	Gold	\$ 500	Number of Athletes from the UK, Male, Silver	
Duran, Brian	USA	M	Silver	\$ 250		
Weber, Larry	UK	M	Silver	\$ 250		
Pratt, Erik	UK	M	Bronze	\$ 100		
O'Connor, Kent	South Africa	M	Bronze	\$ 100		
Spencer, Lucy	Australia	F	Gold	\$ 500		
Wiggins, Frank	Australia	M	Silver	\$ 250		
Tanner, Claire	Australia	F	Gold	\$ 500		

Criteria	Result
Total Prize Money for USA	
Total Prize Money for all Female, Canadian Athletes	
Total Prize Money for North America	

Complete the results column using the criteria.

Chapter 9 Advanced Lookup Information Techniques

Exercise 09 A: Lookups with INDEX and MATCH

1. VLookup must lookup in the first row of the table you give.
2. What if the column you want to lookup in is not the 1st one in table?
3. There is more than work around this one of them is using INDEX and MATCH functions.
4. In our example we want to look in **App** Column (Column 2) and get back values from **Category** (column 1), **Profit** (column 4) and **Revenue** (Column 3).

Category	App	Revenue	Profit	Select App:	Google Docs
Game	Temple Run	\$ 11,649.00	\$ 802.00	Category	
Game	Candy Crush	\$ 7,718.00	\$ 876.00	Profit	
Game	Doom	\$ 15,033.00	\$ 469.00		
Game	Bejewelled	\$ 18,700.50	\$ 984.90		
Productivity	Office Lens	\$ 14,432.00	\$ 240.00	Revenue	
Productivity	Google Docs	\$ 17,990.00	\$ 1,166.00		
Productivity	OneDrive	\$ 11,022.00	\$ 550.00		
Social Media	Twitter	\$ 17,760.00	\$ 800.00		
Social Media	Instagram	\$ 30,399.60	\$ 786.80		
Social Media	Facebook	\$ 20,400.00	\$ 614.40		
Social Media	TikTok	\$ 60,000.00	\$ 10,000.00		

5. Before we use them, both let us know what each one do alone.

INDEX Function

6. It Takes: **Array (Range)** and the **row index**
7. It Returns: The **value** in this Row
8. For example, if you give INDEX the **Category** column array and **8** it will return **Social Media**.
9. Let us try it:

Category
Game
Game
Game
Game
Productivity
Productivity
Productivity
Social Media
Social Media
Social Media
Social Media

=INDEX(A6:A16,8)
INDEX(array, row_num, [column_num])

10. But I do not know the Number of Row to give?
11. That is the rule of MATCH Function

MATCH Function

12. It takes: A **value** to lookup and **Array (Range)** to look in.

13. It Returns: The **Index** of this Value in the Array.

14. Let us try it

The screenshot shows a Microsoft Excel interface. In the formula bar, the formula `=MATCH("Twitter",B6:B16,0)` is entered. Below the formula bar, a tooltip displays the formula as `MATCH(lookup_value, lookup_array, [match_type])`. To the right of the formula bar, there is a vertical list of items labeled "App" at the top. The list contains the following items: Temple Run, Candy Crush, Doom, Bejewelled, Office Lens, Google Docs, OneDrive, Twitter, Instagram, Facebook, and TikTok. The "Twitter" item is highlighted with a blue selection bar.

15. If I gave it **Twitter** and give it the **App** Range it will return **8**.

16. Now I can use both function:

a. Give Value to **MATCH** to get back the **Index**.

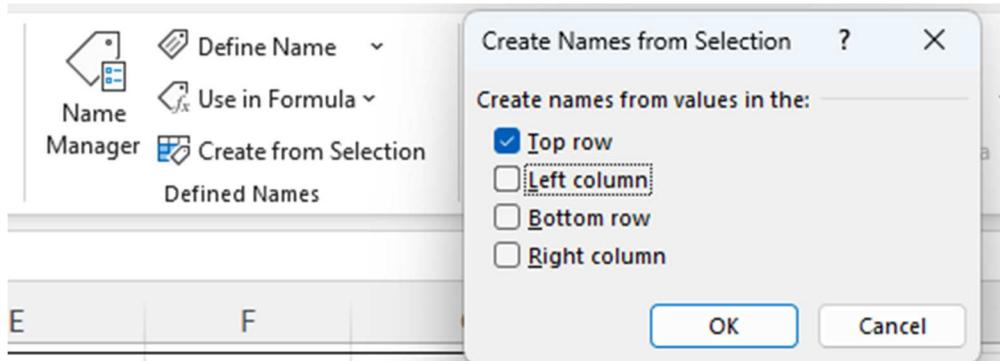
b. Give the Index I got to **INDEX** to get the value corresponds.

17. Let us now solve our Problem this way:

18. First Convert all Column Ranges to **Named Ranges** to make it easier to work with.

19. Select the whole table.

20. Formulas → Defined Names → Create from Selection.



21. Use Top Row.

22. Check now the Named ranges in the Name drop box.



23. Now let us use it in our calculation.

24. Find Category correspond to App Selected:

Select App:	Google Docs
Category	=INDEX(Category,MATCH(H5,App,0))
Category	App
Game	Temple Run
Game	Candy Crush
Game	Doom
Game	Bejewelled
Productivity	Office Lens
Productivity	Google Docs
Productivity	OneDrive
Social Media	Twitter
Social Media	Instagram
Social Media	Facebook
Social Media	TikTok

Select App:	Google Docs
Category	Productivity
Profit	
Revenue	

25. Find Revenue correspond to App selected:

Select App:	Google Docs
Category	Productivity
Profit	=INDEX(Profit,MATCH(H5,App,0))
Revenue	

26. Find Revenue correspond to App Selected.

Revenue	=INDEX(Revenue,MATCH(H5,App,0))
Revenue	

27. Check your result

Select App:	Google Docs
Category	Productivity
Profit	\$ 1,166.00
Revenue	\$ 17,990.00
Productivity	Google Docs
Revenue	\$ 17,990.00
Profit	\$ 1,166.00

Exercise 09 B: XLOOKUP

1. It is a brand new function in Excel 2021.
2. Let us solve the same problem again.

XLOOKUP

3. Get Category corresponding to selected App:

4. Start writing the XLOOKUP function.

Select App:	Google Docs
Category	=XLOOKUP()
Profit	XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

5. The 1st Argument is **Lookup_value** the one I want to look up by which H5 cell that contain the **App Name**.
6. 2nd argument is the **lookup_array**, the column that it will search in which is the range (B6:B15) the App Column.
7. 3rd argument is the **return_array** the column it will return the value from, here it is range (A6:A16) the **Category** column.
8. If you press enter after closing the barathreas it will work.

Select App:	Google Docs
Category	=XLOOKUP(H5, B6:B16, A6:A16)
Profit	XLOOKUP(lookup_value, lookup_array, return_array,

Select App:	Google Docs
Category	Productivity

9. But the new function has new 3 options let us explore.

[if_not_found], [match_mode], [search_mode])

- a. **If_not_found** : what value should retune if the search return nothing.
- b. **Match_mode**
 - i. Exact Match,
 - ii. Exact Match or nearest smaller item
 - iii. Exact Match or nearest larger item
 - iv. Wild character match.
- c. **Search_Mode**:
 - i. Search last-to-first.
 - ii. Search first-to-last.
 - iii. Binary search ascending.
 - iv. Binary search Descending.

10. Get the Profit value.
11. Let us make it easier and convert your data set into table.
12. Name table **App_List**.
13. Now create the XLookup function:
14. Start with first argument H5
15. In second argument write the name of your table the [
16. The would open the list of table column to select from
17. Select App column. (**App_List[App]**)

18. For the 3rd argument use App_List[Profit]

Select App:	Google Docs
Category	Productivity
Profit	=XLOOKUP(H5,App_List[App],App_List[Profit],,0,1) XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

19. Use (,) to bypass the **not_found** argument.

20. Use **0** form **match_mode** for exact match.

21. Use **1** for **search_mode** to search from top to bottom.

Select App:	Google Docs
Category	Productivity
Profit	\$ 1,166.00

22. Get Revenue

23. Try to write the formula the same way.

24. But this time select the column from table when you write 2nd and 3rd argument.

25. You will get the same formula automatic instead of writing the name of the table first then [].

26. Your formula should look like this.

Revenue	=XLOOKUP(H5,App_List[App],App_List[Revenue],,0,1) XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])
Select App:	Google Docs
Category	Productivity
Profit	\$ 1,166.00
Revenue	\$ 17,990.00

27. What if **Google Docs** repeated in the App column in the table?

28. Add the following column to the end of your table.

Utility	Google Docs	\$ 50,000.00	\$ 40,000.00
---------	-------------	--------------	--------------

29. Now your table has two Google Doc.

30. Notice that all values in our XLOOKUP functions did not change, as all use the **search_mode is from top to bottom** (Default mode).

31. Now go to revenue formula and change the **search_mode** from 1 to -1.

Revenue	=XLOOKUP(H5,App_List[App],App_List[Revenue],,0,-1) XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])
Revenue	\$ 50,000.00

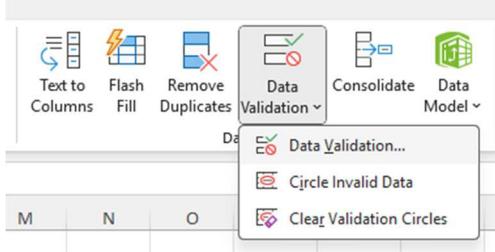
32. Notice now that the result reflect the last value of Google Doc.

Exercise 09 C: Create Drop Down List

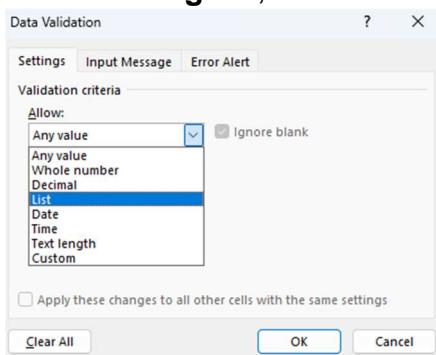
- I have some data about employees, and I want to create a drop-down list on the small table on the right so I can choose to get the information of each employee.

Name	Department	Salary		Name	
Sarah Jones	IT	\$ 55,328		Department	
Lucy Edwards	Sales	\$ 26,567		Salary	
Mike Woods	Sales	\$ 49,938			
Carl Taylor	Marketing	\$ 35,228			
Michael Parks	Marketing	\$ 30,716			
Vin Patel	Finance	\$ 33,361			
Ming Sia	IT	\$ 31,815			
Phillip Lim	IT	\$ 34,222			
Olivia Porter	Finance	\$ 33,219			
Sam Spencer	Sales	\$ 55,619			
Marcus Green	Marketing	\$ 50,441			

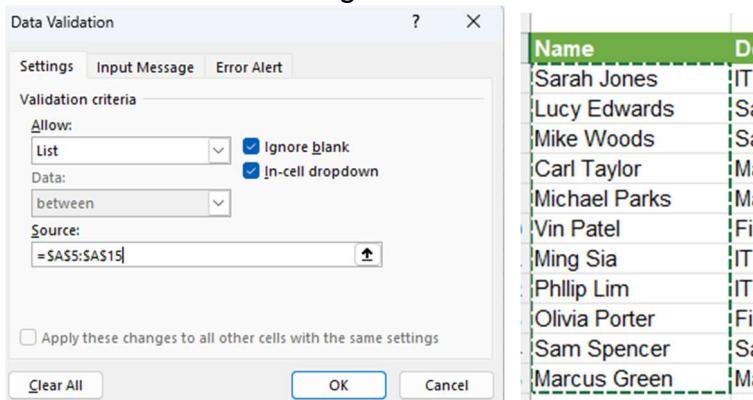
- Data → Data Tools → Data Validation → Data Validation...



- In the **Setting** tab, in the **Allow**, select **List**.



- In source select the range that contains the names.



- Click OK.

6. Now you have the list to select from.

Name	Sarah Jones
Department	Lucy Edwards
Salary	Mike Woods
Carl Taylor	Michael Parks
Vin Patel	Ming Sia
Philip Lim	Olivia Porter
Sam Spencer	Marcus Green

Do it Yourself:

7. Create Lookup functions to retrieve **Department** and **Salary** for each employee.
8. Use **VLOOKUP** or **XLOOKUP** or **INDEX + MATCH**.

Name	
Department	=XLOOKUP(I4,A5:A15,B5:B15,,0,1)
Salary	XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode], [search_mode])

Name	Sarah Jones
Department	IT
Salary	=INDEX(C5:C15,MATCH(I4,A5:A15,0))

9. Now try your drop-down list.
10. Notice you have **NA** error when you do not select any employee.
11. Handel the error using **IFNA** or **IFERROR** functions.

Handle Duplicate in the list

12. What if there is a duplicate in the employee's name?
13. Add the same name at the end of the employees' list.
14. Notice that the new employee does not appear on the list.
15. Go and update the range in the **Data Validation** windows.

16. Notice that the new employee appears on the list only once.

The image shows two screenshots of Excel. The left screenshot displays a list of names in column A, with some names appearing multiple times. The right screenshot shows a dropdown menu where only unique names from the list are listed, demonstrating the function's ability to filter out duplicates.

Name
Sarah Jones
Lucy Edwards
Mike Woods
Carl Taylor
Michael Parks
Vin Patel
Ming Sia
Phillip Lim
Olivia Porter
Sam Spencer
Marcus Green
Said Fawzy
Said Fawzy
Said Fawzy
Marcus Green
Marcus Green
Michael Parks

Name	Sarah Jones
Sarah Jones	
Lucy Edwards	
Mike Woods	
Carl Taylor	
Michael Parks	
Vin Patel	
Ming Sia	
Phillip Lim	
Olivia Porter	
Sam Spencer	
Marcus Green	
Said Fawzy	

17. In the new versions of Excel, they have solved the problem for you, and you do not have to take any action.

18. If you have an old version of Excel, use UNIQUE Function at any cell in the worksheet or another hidden worksheet.

The image shows a screenshot of Excel. The formula bar at the top shows the formula =UNIQUE(A5:A18). Below it, a tooltip displays the function definition: UNIQUE(array, [by_col], [exactly_once]). The main part of the screenshot shows a list of names in column A. The names 'Sarah Jones' and 'Lucy Edwards' are selected. To the right, a second list of names is shown, which includes only the unique entries from the first list: Sarah Jones, Lucy Edwards, Mike Woods, Carl Taylor, Michael Parks, Vin Patel, Ming Sia, Phillip Lim, Olivia Porter, Sam Spencer, Marcus Green, Ming Sia, Ming Sia, and Ming Sia.

Name
Sarah Jones
Lucy Edwards
Mike Woods
Carl Taylor
Michael Parks
Vin Patel
Ming Sia
Phillip Lim
Olivia Porter
Sam Spencer
Marcus Green
Ming Sia
Ming Sia
Ming Sia

19. Use the new list as the range of your data validation.

20. You can **hide** this list or move it to another worksheet.

21. Delete the new list and you will notice that the data was deleted from the drop-down list.

Handle the update of new values

22. What if your list is always updated?

23. You can convert your data into a table

24. Click **CTRL+T** and convert your data into a table.

25. Try to add new data to the table, it will expand.

26. Now go and select the range of the new column in Data Validation list.

27. Now as soon as you add a new record it will appear on the list.

Exam 08 Advanced Lookup information

Lookup Functions					
Athlete Name	Bib Number	Event	Route	Position	Athlete
Page, Lisa	1012	Full Marathon	East Loop	8	
Duran, Brian	1491	Full Marathon	East Loop	6	Bib Number
O'Connor, Kent	1858	Full Marathon	East Loop	10	Route
Spencer, Lucy	1920	Full Marathon	East Loop	1	Position
Tanner, Claire	1789	Full Marathon	East Loop	2	
Wilkins, Jesse	1997	Full Marathon	East Loop	4	
Holland, Donald	1090	Full Marathon	East Loop	7	
Burton, Cam	1958	Full Marathon	East Loop	3	
Todd, Steven	1471	Full Marathon	East Loop	5	
Thompson, Gloria	1615	Full Marathon	East Loop	9	

In the worksheet:

1. Create a **data validation** drop-down list in cell **H3** that lists the athletes.
 2. Using a lookup function of your choice, return the results in column H.
 3. Add error checking to the formula to account for any #N/A errors that may occur