



# THE ULTIMATE EXCEL HANDBOOK

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1.

# FUNCTIONS

## i. TOP 10 FUNCTIONS

# 10 EXCEL FUNCTIONS YOU SHOULD KNOW

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## 1. =SUMIFS()

SUMIFS function adds all of its arguments that meet multiple criteria. For example, you would use SUMIFS in your financial model to sum up the sales of (1) a specific employee (2) for a specific product.

**=SUMIFS**  
(sum range (e.g. sales),  
criteria range 1 (e.g.  
employee),  
criteria 1 (e.g. Tim),  
criteria range 2 (e.g.  
Product),  
criteria 2, (e.g. Chairs))

Employee	Product	Sales
Laura	Tables	\$5,441
Mike	Chairs	\$5,110
Tim	Pillows	\$5,643
Phoebe	Tables	\$4,921
Tim	Chairs	\$4,859
Phoebe	Chairs	\$4,768
Mike	Beds	\$4,707
Laura	Beds	\$5,361
Tim	Chairs	\$3,304
Phoebe	Tables	\$4,744

Employee   Product   Sales  
Tim   =SUMIFS(\$B\$8:\$F\$12,B\$12,B21)  
=SUMIFS(sum\_range, criteria\_range1, criteria1, criteria\_range2, criteria2, criteria3, criteria3...)

Know your IFs, COUNTIFs, AVERAGEIFs and all other IFs too - after all, financial modeling is just a series of IFs that could happen in this world.

## 2. =IFERROR()

Use IFERROR function to format your financial models. The function checks for errors and returns the value specified by the user if found. The function checks for the following errors: #N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME? or #NULL!.

**=IFERROR(value, value\_if\_error)**

Month	Total Wages Allocated	Employees	Wage
Jan	\$3,200	2	\$1,600
Feb	\$1,600	1	\$1,600
Mar (shop closed)	\$0	0	=IFERROR(D10/E10,0)

No IFERROR      IFERROR(value, value\_if\_error)  
IFERROR      #DIV/0!  
IFERROR      \$0

## 4. =XNPV()

Finance is money and we all know that money today is worth more than tomorrow. Financial analysts oftentimes have to calculate the value of an investment/company/project in today's terms.

	1	2	3	4	5
Date	7/12/2021	8/11/2021	9/10/2021	10/10/2021	11/9/2021
Cash Flow	-1000	-550	750	1000	1250
Discount Rate	9%				
NPV	=XNPV(E8,E6:16,E5:15)	XNPV(date,values,dates)			

## 5. =PMT()

PMT function calculates the payment for a loan based on constant payments and a constant interest rate. You have to know the present loan value, number of periods and the interest rate. PMT, PPMT and IPMT functions are needed to figure out annuity loan repayments (e.g. mortgage).

**=PMT**(interest rate, number of periods, present value)

Present Value	\$ 2,000
Number of periods	10
Interest Rate	5%
PMT	=PMT(E8,E7,E6)
Monthly PMT	(\\$21.58)

=PMT() calculates periodic payment for a loan in total  
=PPMT() calculates the payment on the principal for a loan  
=IPMT() calculates the interest payment on the loan

Unlike IRR and NPV, XIRR and XNPV functions allow for payments at irregular intervals

## 6. =SLOPE()

If you're into investment banking, at some point you'll have to calculate the Beta of a stock, which means volatility. By using the SLOPE function in Excel, you'll find it easily by using the returns of the stock and the comparative benchmark index.

**=SLOPE**

(% of equity change range,  
% range of change of index)



## 7. =XLOOKUP()

Lookup functions are a must to know for any modeler. They are used to quickly and easily find data in a table, for example, to find the amount sold by an employee, ID number, and thousands of other things.

**=XLOOKUP**(what do you want to look up, where can it be found, what do you want to return)

Employee	Sold
Laura	\$5,000
Mike	\$4,000
Tim	\$2,900
Phoebe	\$5,120

Laura   =XLOOKUP(C14,C9:C12,D9:D12)  
XLOOKUP(lookup\_value, lookup\_array, return\_array,

## 8. =INDEX() & MATCH()

Sometimes, XLOOKUP won't do the job, as it can only compare one array with another one. Index and Match function combination can look up values in the whole table - it's 2 Dimensional.

**=INDEX**  
(what you want to return,  
**=MATCH**  
(what are you looking  
for, where can it be found)

Select:	Player	Stage	Points
=INDEX(\$B\$7:\$G\$10,MATCH(\$B\$3,\$B\$7:\$B\$10,0),MATCH(\$C\$3,\$B\$7:\$G\$7,0))			
			[MATCH]lookup_value, lookup_array, [match_type])
	Diarmuid Early	Stage 3	830

Player	Stage 1	Stage 2	Stage 3	Stage 4	Total
Laurence Lau	1000	957	1000	959	3916
Diarmuid Early	821	1000	830	1000	3651
Andrew Ngai	847	899	815	838	3399

## 9. =EOMONTH()

EOMONTH function finds the last day of the month after you add a specific number of months to a date. It's useful for calculating maturity dates or due dates that fall on the last day of the month. It also aids in setting up your financial model.

**=EOMONTH**

(start\_date,  
months you want  
to add/subtract)

=EDATE() will aid in  
adding months to a  
specified start date

Today Date of the last day  
of the month, 12  
months after today  
7/12/2022 =EOMONTH(C7,12)  
[EOMONTH(start\_date,months)]  
7/31/2023

Jan Feb Mar =EOMONTH(H13,1)  
[EOMONTH(start\_date,months)] Jul

## 10. =SEQUENCE()

The SEQUENCE function allows you to generate a list of sequential numbers in an array. SEQUENCE function works great if you need to generate a list of 10,000 numbers in a column.

**=SEQUENCE**(number of rows you want to generate, number of columns you want to generate, starting point, step)

	3	4	5
SEQUENCE(rows, [columns], [start], [step])	9	10	
11	12	13	14
16	17	18	19
21	22	23	24

1.

# FUNCTIONS

## ii.TEXT SPLITTING FUNCTIONS

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# TEXT TO COLUMNS

---

Allows to split text in Excel based on delimiters like commas or spaces.

Simply select the cell or range of cells, go to "Data => Text to Columns", and insert the required settings.

Alternatively, use the shortcut "Alt + A + E".

Remember, that this function replaces the text in the cell you chose to operate with.

Alt + A + E

Alt + A + E

Alt + A + E

# LEFT/RIGHT/MID

These functions are a simple yet effective way to extract a specific number of characters from a cell, starting from either the left, right, or middle side.

It's useful for shortening text, such as creating a country code or taking the first letter of a name.

The syntax is as follows: "=LEFT (cell to extract from, number of characters to extract)".

For MID need to mention from which character to start and how many to retrieve.

=LEFT(D2,2)	
D	E
FMWC	FM

=MID(D2,2,2)	
D	E
FMWC	MW

RIGHT(text, [num\_chars])

RIGHT(text, [num\_chars])

# TEXTAFTER/TEXTBEFORE

A function is a useful tool for retrieving text that comes after or before a specific delimiter, such as a space, comma, symbol, word, or phrase.

The syntax is "=TEXTAFTER (cell to extract from, "delimiter", serial number of delimiters to start with)".

Function TEXTBEFORE works in a similar but opposite way.

=TEXTBEFORE(D2,"W")	
D	E
FMWC	FM

=TEXTAFTER(text,delimiter,[instance\_num], [match\_mode], [match\_end], [if\_not\_found])

# TEXTSPLIT

A function that returns text divided into rows or columns based on some specific delimiters.

Syntax is “=TEXTSPLIT (cell you are working with, “delimiter to divide into columns”, “delimiter to divide into rows”).

=TEXTSPLIT(D2,"W")		
D	E	F
FMWC	FM	C

=TEXTSPLIT(text,col\_delimiter,[row\_delimiter],  
[ignore\_empty], [match\_mode], [pad\_with])

# FLASH FILL

---

A function that retrieves information from nearby cells based on your example.

It uses some sort of AI to understand which pattern you follow and will fill other required cells in a similar way.

Use the shortcut “Ctrl + E”!

Ctrl + E

Ctrl + E

Ctrl + E



2.

# CONDITIONAL FORMATTING

# DEPRECIATION METHODS

*How to find out an asset's depreciation expense  
in a given year under each method?*

## STRAIGHT - LINE depreciation

The most common and easiest method to calculate depreciation. To use this method of depreciation, you need to divide the cost of an asset by the useful life of an asset (in years).

$$\frac{\text{Cost}}{\text{Useful Life}}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	80000	60000	40000	20000
<b>Depreciation</b>	20000	20000	20000	20000	20000
<b>Ending Book Value</b>	80000	60000	40000	20000	0

## DECLINING BALANCE depreciation

The declining balance depreciation is used to calculate large depreciation expenses. It is also good to use for assets that quickly lose their value.

To use this method, you have to firstly find out the depreciation rate and then multiply it by its current book value. Remember that book value goes over the useful life!

$$\frac{\text{Opening book value} * \text{Depreciation rate (\%)} }{100\% \text{ Useful Life of asset}}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	80000	64000	51200	40960
<b>Depreciation rate</b>	0.2	0.2	0.2	0.2	0.2
<b>Depreciation</b>	20000	16000	12800	10240	8192
<b>Ending Book Value</b>	80000	64000	51200	40960	32768

## DOUBLE DECLINING BALANCE depreciation

Double declining balance method implies a larger depreciation value in the first years of buying an asset. It is done to reflect the productivity of assets (they are more productive in their early years) and the fact that assets typically lose more value in the first years of use. The method differs from regular declining balance depreciation only in the fact that depreciation rate is multiplied by 2.

$$\frac{\text{Opening book value} * \text{Depreciation rate (\%)} }{100\% \text{ Useful Life of asset}^* 2}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	60000	36000	21600	12960
<b>Depreciation rate</b>	0.4	0.4	0.4	0.4	0.4
<b>Depreciation</b>	40000	24000	14400	8640	5184
<b>Ending Book Value</b>	60000	36000	21600	12960	7776

# SUM - OF - THE - YEARS DIGITS depreciation

This is an accelerated depreciation method, which makes the depreciation expense higher in the early years and lower in the latter years of an asset. To calculate depreciation using this method, you need to multiply the cost of an asset by its useful life over the sum of the years digits.

$$\text{Cost} * \frac{\text{Useful life}}{\text{Sum of the years digits}}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	66667	40000	20000	6667
<b>Remaining Life</b>	5	4	3	2	1
<b>Depreciation</b>	33333	26667	20000	13333	6667
<b>Ending Book Value</b>	66667	40000	20000	6667	0

## ADJUSTED MACRS depreciation

Modified Accelerated Cost Recovery System (MACRS) allows a business to recover capitalized costs of assets that lose its value over time. To use this method, you have to find out property class of an asset, as MACRS system puts assets into classes with specific depreciation periods and assigns specific pre-defined % of each year for different asset classes.

$$\text{Opening BV} * \text{Depreciation rate}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	60000	36000	21600	10800
<b>Depreciation rate</b>	40.0%	24.0%	14.4%	10.8%	10.8%
<b>Depreciation</b>	40000	24000	14400	10800	10800
<b>Ending Book Value</b>	60000	36000	21600	10800	0

## SERVICE HOUR depreciation

Service hour depreciation method is mainly used for transport vehicle depreciation since it takes into consideration “running time” of the asset. To calculate depreciation using this method, you have to divide asset's net cost by its service life and multiply by its ours used in a year.

$$\text{hours used in a year} * \frac{\text{Cost}}{\text{Service life}}$$

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Opening Book Value</b>	100000	84000	72000	60000	52000
<b>Hours used in a year</b>	2000	1500	1500	1000	800
<b>Cost of 1 machine hour</b>	8	8	8	8	8
<b>Depreciation</b>	16000	12000	12000	8000	6400
<b>Ending Book Value</b>	84000	72000	60000	52000	45600



# 3. **DATA TABLE**

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# Financial Modeling in Excel

## 5 Excel features you should know

### Data Table

A great tool for your what-if analysis. A range of cells in which you can change values in some of the cells and come up with different answers to a problem.

#### How to create it?

##### Instructions

1. Write down input data

2. Calculate the value you want to find out

3. Write down additional input data you want to test

4. Go to Data -> What-If Analysis -> Data Table

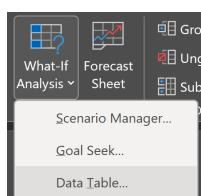
5. Put in row and column input cell that corresponds to the layout you have created in step #3 and press OK

##### Example

Interest rate, number of periods and starting amount if you want to see how your savings amount would differ under different scenarios

Savings amount from the initial input data

Changes in interest rate, starting amount



Row input cell - interest rate from initial input data;

Column input cell - starting amount from initial input data

Interest Rate	7%
Number of Periods	3
Starting Amount	\$ 2,000

By changing the initial input data, your data table will update too!

	\$6,430	5.50%	6.00%	6.50%	7.00%	7.50%	8.00%	8.50%
\$ 1,500	\$ 4,752	\$ 4,775	\$ 4,799	\$ 4,822	\$ 4,846	\$ 4,870	\$ 4,893	
\$ 1,600	\$ 5,069	\$ 5,094	\$ 5,119	\$ 5,144	\$ 5,169	\$ 5,194	\$ 5,220	
\$ 1,700	\$ 5,386	\$ 5,412	\$ 5,439	\$ 5,465	\$ 5,492	\$ 5,519	\$ 5,546	
\$ 1,800	\$ 5,702	\$ 5,730	\$ 5,759	\$ 5,787	\$ 5,815	\$ 5,844	\$ 5,872	
\$ 1,900	\$ 6,019	\$ 6,049	\$ 6,079	\$ 6,108	\$ 6,138	\$ 6,168	\$ 6,198	
\$ 2,000	\$ 6,336	\$ 6,367	\$ 6,398	\$ 6,430	\$ 6,461	\$ 6,493	\$ 6,524	
\$ 2,100	\$ 6,653	\$ 6,686	\$ 6,718	\$ 6,751	\$ 6,784	\$ 6,817	\$ 6,851	
\$ 2,200	\$ 6,970	\$ 7,004	\$ 7,038	\$ 7,073	\$ 7,107	\$ 7,142	\$ 7,177	
\$ 2,300	\$ 7,286	\$ 7,322	\$ 7,358	\$ 7,394	\$ 7,430	\$ 7,467	\$ 7,503	
\$ 2,400	\$ 7,603	\$ 7,641	\$ 7,678	\$ 7,716	\$ 7,754	\$ 7,791	\$ 7,829	
\$ 2,500	\$ 7,920	\$ 7,959	\$ 7,998	\$ 8,037	\$ 8,077	\$ 8,116	\$ 8,156	



4.

# PIVOT TABLE

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# Financial Modeling in Excel

## 5 Excel features you should know

### Pivot Table

A PivotTable is a powerful tool to calculate, summarize, and analyze data that lets you see comparisons, patterns, and trends in your data.

#### How to create it?

##### Instructions

1. Have an Excel table with data
2. Go to Insert -> PivotTable and choose a table or a range you want to analyze
3. Choose fields to summarize the data by
4. Go to PivotTable Analyze or Design tabs to customize the Pivot Table

##### Example

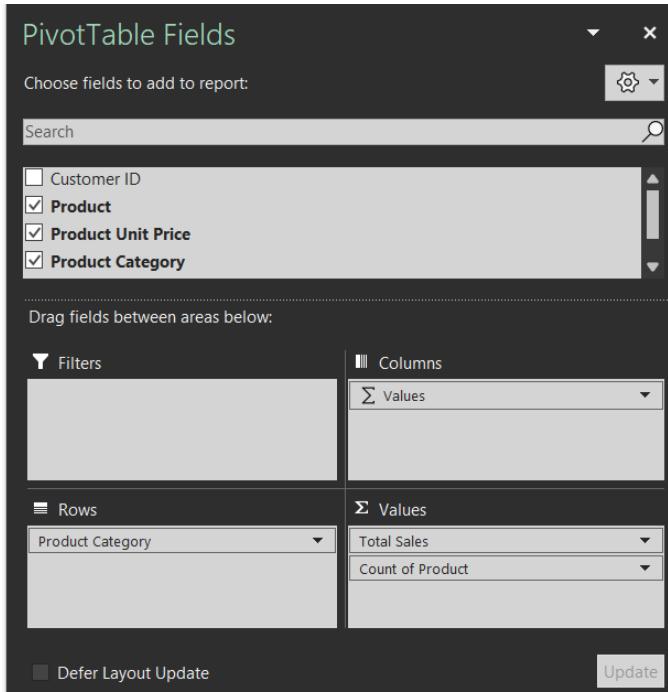
Store order history with customer ID, product ID, product price and product category

Choose the table from step 1

Look at the total sales and count of products bought by product categories. Choose columns, Rows, Filters, Values – everything is customizable and you can play with the report!

Add a slicer, insert timeline, add subtotals and other things

Summarized Data			
Product Category	Total Sales	Count of Product	
Clothing	\$ 687	3	
Furniture	\$ 845	6	
Home & Garden	\$ 319	4	
Pet Supplies	\$ 174	2	
<b>Grand Total</b>	<b>\$ 2,025</b>	<b>15</b>	



The screenshot shows the 'PivotTable Fields' dialog box. At the top, it says 'Choose fields to add to report:' with a search bar and a settings icon. Below is a list of fields: Customer ID (unchecked), Product (checked), Product Unit Price (checked), and Product Category (checked). The bottom section, 'Drag fields between areas below:', includes four sections: Filters (empty), Columns (Values), Rows (Product Category), and Values (Total Sales, Count of Product). A 'Defer Layout Update' checkbox is at the bottom left, and an 'Update' button is at the bottom right.



5.

# DATA VALIDATION

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# Financial Modeling in Excel

## 5 Excel features you should know

### Data Validation

Use data validation to restrict the type of data or the values that users enter into a cell. One of the most common data validation uses is to create a drop-down list.

#### How to create it?

##### Instructions

1. Select the cell you want to create a drop-down list in

2. Select Data -> Data Validation

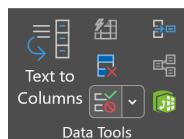
3. Choose what will the users be able to choose (numbers, dates, time, custom text, etc.)

4. Create Input Message so that users know what they are choosing

5. Link other data in your model to this dropdown list, so that values update automatically

##### Example

On your input data Excel sheet, create a cell where users will be able to choose between different store locations



Offer to choose from a list of store locations such as "USA, Spain, UK, Australia, Japan, Germany"

"Select Store Location"

Link profit and loss statements to geographical location of the stores from the dropdown by using "IF" statements

Store	USA	Year	2021
P&L Projections			
Sales	[\$] 78,000,000	88,627,500	93,783,659
Domestic Sales	[\$] 70,000,000	72,467,500	75,021,979
Foreign Sales	[\$] 8,000,000	16,160,000	18,761,679
Manufacturing Costs	[\$] 56,500,000	63,240,000	66,585,600
Materials	[\$] 20,900,000	23,449,800	24,709,500
Direct Labor	[\$] 25,300,000	28,386,600	29,911,500
Other Direct Costs	[\$] 8,800,000	9,873,600	10,404,000
Indirect Manufacturing Costs	[\$] 1,500,000	1,530,000	1,560,600
Gross Profit	[\$] 21,500,000	25,387,500	27,198,059
SG&A Costs	[\$] 7,560,000	7,892,550	8,118,073
Marketing Costs	[\$] 1,560,000	1,772,550	1,875,673
			1,915,500
			2,047,035
			2,196,777



6.

# GROUP DATA

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# Financial Modeling in Excel

## 5 Excel features you should know

### Group Data

If you have a list of data you want to group and summarize, you can create an outline of up to eight levels. Very important for financial models to switch between different levels of data complexity. Group data instead of hiding rows/columns!

#### How to do it (right)?

##### Instructions

1. Select rows/columns to group

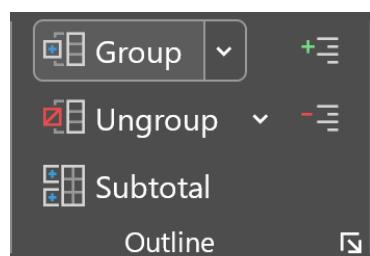
2. Go to Data -> Group -> Group

3. Group again, if you want to go into more detail

4. Press “-” to collapse the groups

##### Example

Level 1 – for top level management, Level 3 or 4 – for accountant in-depth data review



		A	B	C	D	E
1	2	3				
4	1					
5	2					
6	3					
7	4					
8	Period Start					
9	5					
10	Period End					
11	6					
12	Period #					
13						
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15						
16						
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7.

# POWER QUERY

# Financial Modeling in Excel



# 5 Excel **features** you should know

# Power Query

Power Query (known as Get & Transform in Excel) is a great tool for minimizing repetitive daily tasks. You can import or connect to external data and then shape this data. For example, remove a column, change a data type, or merge tables in ways that meet your needs. Then, you can load your query into Excel to create charts and reports.

## How to create it?

## Instructions

- ## 1. Connect to Data

Go to Data -> Get Data

- ## 2. Transform Data

Do all kinds of changes to your data while the original dataset stays the same

- ### 3. Combine Data

Add other datasets and make connections between them to get more insights

- ## 4. Load Data

Load the transformed and combined data to your worksheet and enjoy the clean dataset

## Example

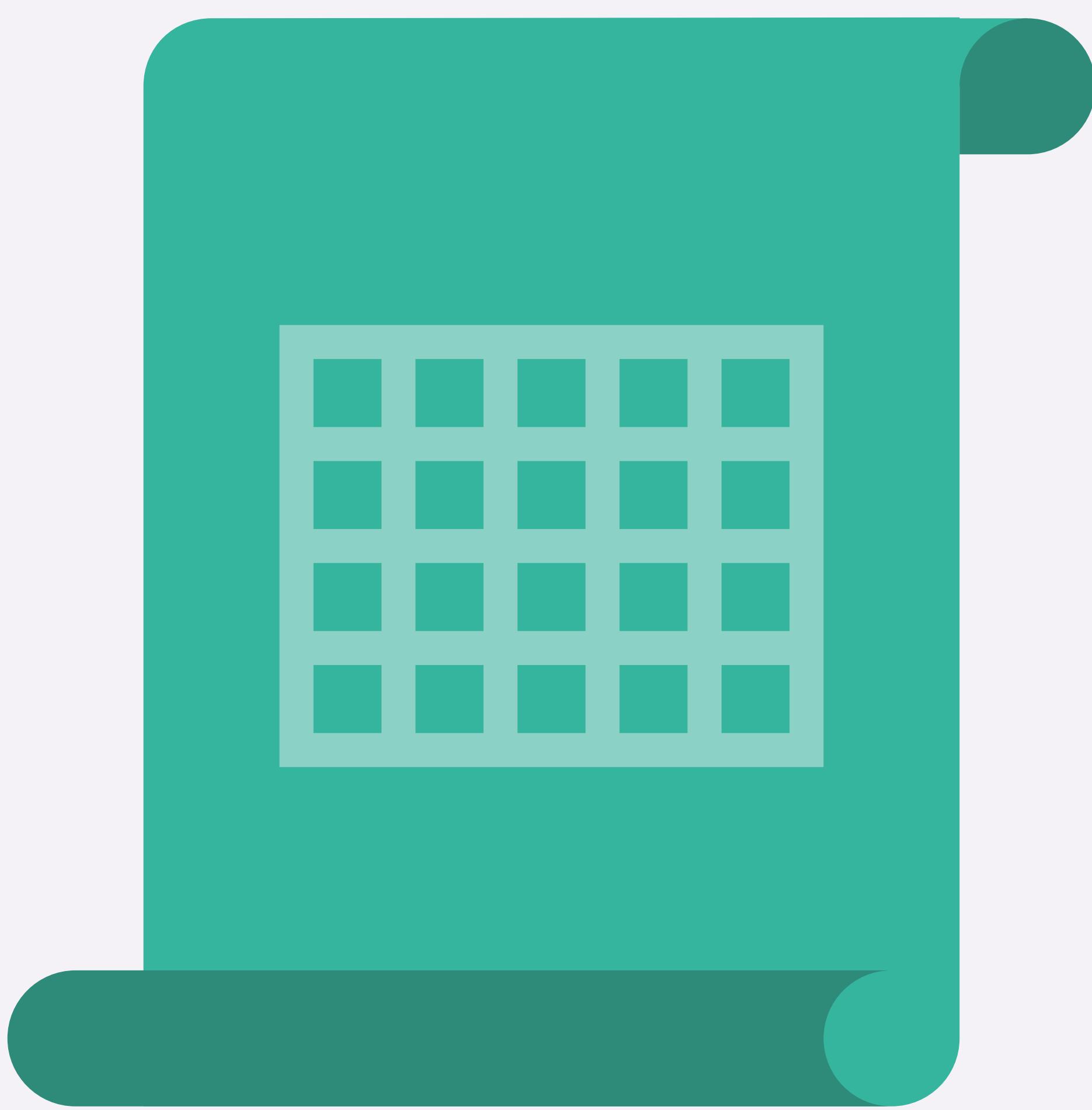
Pull in data from a different Excel file that contains participant names and stage points

Clean Data - remove unneeded columns, assign data types, rename columns for better understanding, etc.

Pull in another data source on the background of the participants - country, company, age group, etc. Append Queries.

Load the appended query into the Excel file. After each stage, add information on the points and refresh dataset.

8.



# EXCEL CHEATSHEETS

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# EXCEL SHORTCUTS CHEATSHEET



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## GENERAL

<b>Ctrl</b> <b>P</b>	Print
<b>Ctrl</b> <b>S</b>	Save Workbook
<b>Ctrl</b> <b>C</b>	Copy
<b>Ctrl</b> <b>X</b>	Cut
<b>Ctrl</b> <b>V</b>	Paste
<b>Ctrl</b> <b>Z</b>	Undo
<b>Ctrl</b> <b>Y</b>	Redo
<b>Ctrl</b> <b>E</b>	Flash Fill
<b>Ctrl</b> <b>K</b>	Insert Hyperlink
<b>Ctrl</b> <b>N</b>	New workbook
<b>Ctrl</b> <b>O</b>	Open workbook
<b>F11</b>	Chart in new worksheet
<b>F4</b>	Repeat
<b>Ctrl</b> <b>W</b>	Close workbook
<b>Alt</b> <b>F4</b>	Close Excel

## NAVIGATION

<b>Alt</b> <b>PgDn</b>	One screen right
<b>Alt</b> <b>PgUp</b>	One screen left
<b>PgUp</b>	One screen up
<b>PgDn</b>	One screen down
<b>Ctrl</b> <b>→</b>	Right edge of data region
<b>Ctrl</b> <b>←</b>	Left edge of data region
<b>Home</b>	Beginning of row
<b>Ctrl</b> <b>End</b>	Last cell
<b>Ctrl</b> <b>Home</b>	First cell
<b>Ctrl</b> <b>Tab</b>	Switch Worksheets
<b>Alt</b> <b>U</b> , <b>V</b>	Toggle Full Screen

## WORKBOOK

<b>Shift</b> <b>F11</b>	New worksheet
<b>Ctrl</b> <b>PgDn</b>	Next worksheet
<b>Ctrl</b> <b>PgUp</b>	Previous worksheet
<b>F6</b>	Next pane
<b>Shift</b> <b>F6</b>	Previous pane
<b>Ctrl</b> <b>Tab</b>	Next workbook
<b>Ctrl</b> <b>Shift</b> <b>Tab</b>	Previous workbook
<b>Ctrl</b> <b>F9</b>	Minimize workbook
<b>Ctrl</b> <b>F10</b>	Maximize workbook
<b>Ctrl</b> <b>F6</b>	Switch Between Open Workbooks

## FORMATTING

<b>Alt</b> <b>H</b> <b>A</b> <b>C</b>	Align center
<b>Alt</b> <b>H</b> <b>A</b> <b>L</b>	Align left
<b>Alt</b> <b>H</b> <b>A</b> <b>R</b>	Align right
<b>Alt</b> <b>H</b> <b>F</b> <b>G</b>	Increase font size
<b>Alt</b> <b>H</b> <b>F</b> <b>K</b>	Decrease font size
<b>Ctrl</b> <b>Shift</b> <b>\$</b>	Currency Format
<b>Ctrl</b> <b>Shift</b> <b>%</b>	Percentage Format
<b>Ctrl</b> <b>Shift</b> <b>^</b>	Scientific Nb Format
<b>Ctrl</b> <b>Shift</b> <b>#</b>	Date Format
<b>Ctrl</b> <b>Shift</b> <b>@</b>	Time Format
<b>Ctrl</b> <b>Shift</b> <b>!</b>	Number Format
<b>Ctrl</b> ;	Insert Current Date

## FORMATTING

<b>Ctrl</b> :	Insert Current Time
<b>Ctrl</b> <b>B</b>	Bold
<b>Ctrl</b> <b>I</b>	Italic
<b>Ctrl</b> <b>U</b>	Underline
<b>Ctrl</b> <b>Shift</b> <b>C</b>	Format Painter
<b>Ctrl</b> +	Insert Rows/Columns
<b>Ctrl</b> -	Delete Rows/Columns
<b>Ctrl</b> 1	Format Cells Dialog Box
<b>Ctrl</b> D	Autofill Down
<b>Ctrl</b> R	Autofill Right
<b>Ctrl</b> <b>Shift</b> 7	Apply Cell Borders
<b>Ctrl</b> <b>Shift</b> -	Remove Borders

## DATA ANALYSIS

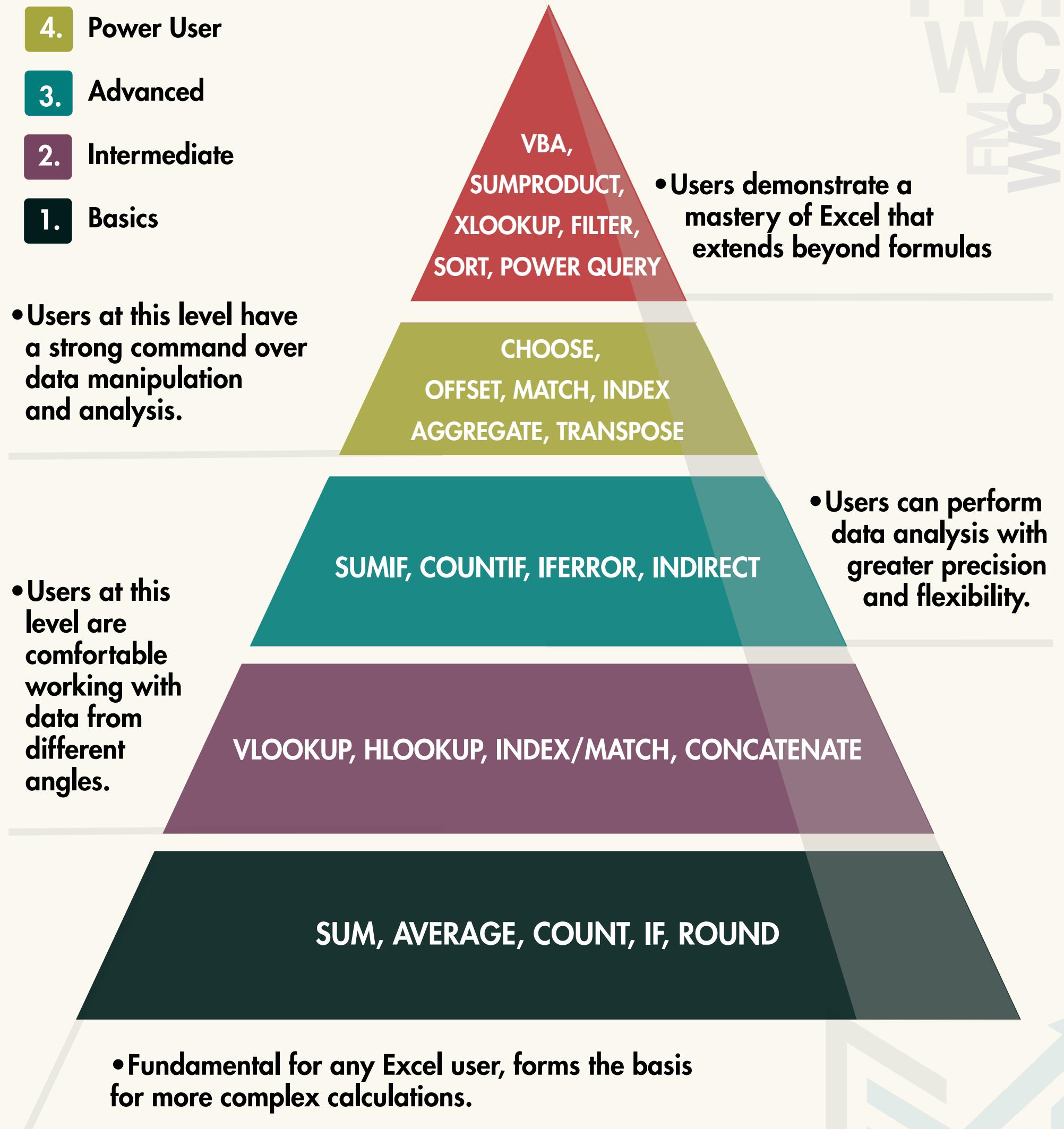
<b>Alt</b> <b>D</b> , <b>T</b>	Data Table
<b>Alt</b> <b>A</b> , <b>S</b> , <b>G</b>	Goal Seek
<b>Alt</b> <b>T</b> , <b>I</b>	Solver Add-in
<b>Alt</b> <b>A</b> , <b>B</b>	Subtotal Function
<b>Alt</b> , <b>L</b>	Consolidate Data
<b>Ctrl</b> Q	Autofill Right
<b>Alt</b> <b>A</b> , <b>C</b>	Remove Filter

# EXCEL FORMULAS PYRAMID

5. Expert
4. Power User
3. Advanced
2. Intermediate
1. Basics

• Users at this level have a strong command over data manipulation and analysis.

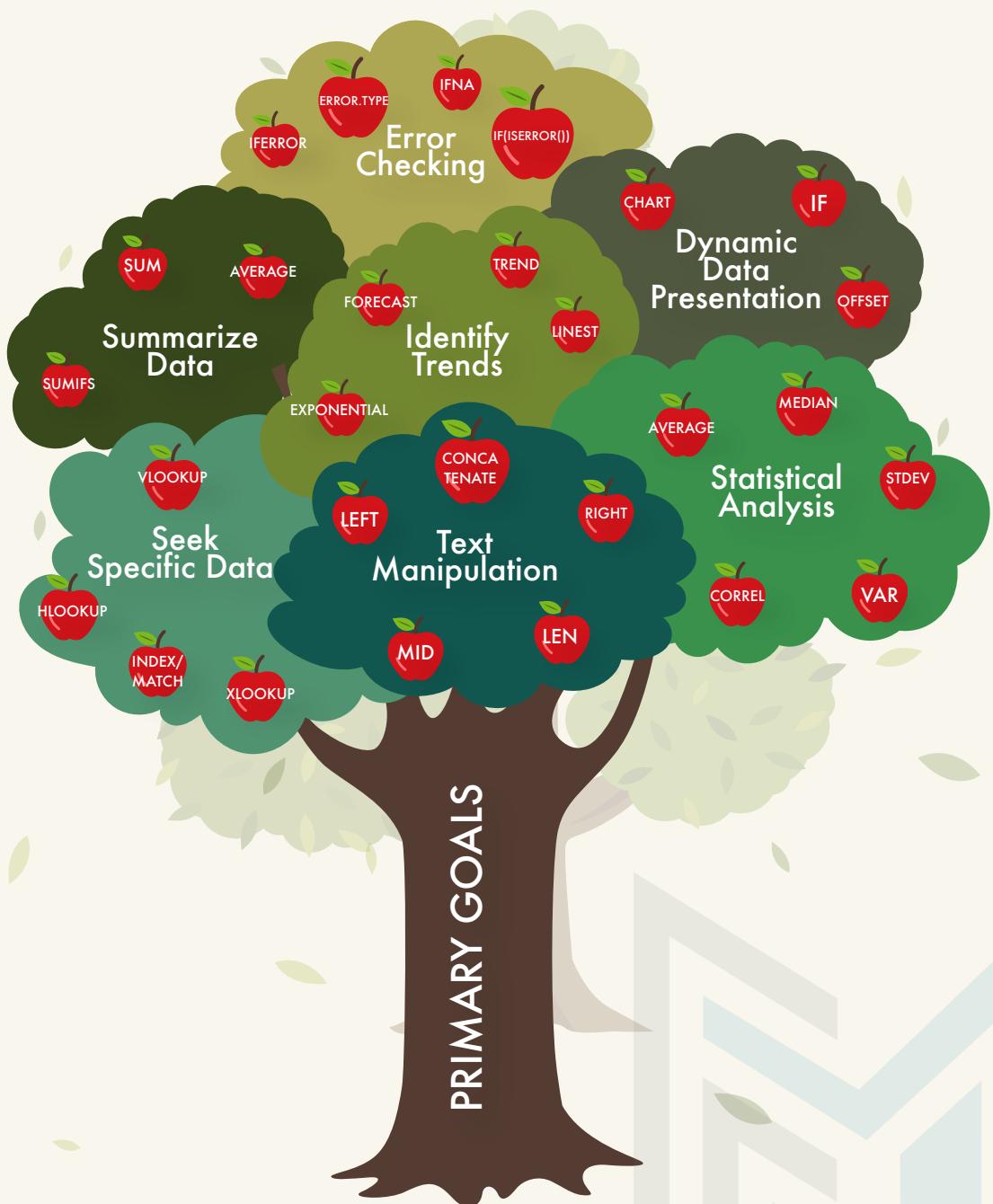
• Users at this level are comfortable working with data from different angles.



# EXCEL FUNCTIONS DECISION TREE



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# XLOOKUP GUIDE

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The **XLOOKUP** function in Excel is a powerful and versatile tool for searching a range, returning corresponding values, and handling various lookup scenarios.

- **XLOOKUP Function Syntax**

*fx* | =XLOOKUP(lookup\_value, lookup\_array, return\_array, [if\_not\_found], [match\_mode], [search\_mode])

- **Arguments**

- lookup\_value:** The value you want to find in the lookup\_array.
- lookup\_array:** The range of cells containing possible lookup values.
- return\_array:** The range of cells containing the values to be returned.
- [if\_not\_found]:** Optional. Specifies the value to return if the lookup\_value is not found. If omitted, #N/A is returned.
- [match\_mode]:** Optional. Specifies the type of match: 0 for an exact match, -1 for less than, and 1 for greater than.
- [search\_mode]:** Optional. Specifies the search mode: 1 for first to last, 2 for last to first, and 3 for a binary search.

- **Examples**

## 1. Basic XLOOKUP

*fx* | =XLOOKUP(lookup\_value, A2:A10, B2:B10)

Searches for **lookup\_value** in the range A2:A10 and returns the corresponding value from B2:B10.



# XLOOKUP GUIDE

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- Examples

## 2. Handling not found

*fx* | =XLOOKUP(lookup\_value, A2:A10, B2:B10, "Not Found")

Returns "Not Found" if the **lookup\_value** is not found in the specified range.

## 3. Approximate Match

*fx* | =XLOOKUP(lookup\_value, A2:A10, B2:B10, 0)

Performs an exact match lookup. Use 1 for greater than or -1 for less than.

## 4. Reverse Lookup

*fx* | =XLOOKUP(lookup\_value, B2:B10, A2:A10)



Searches for **lookup\_value** in the range B2:B10 and returns the corresponding value from A2:A10.

## 5. Handling Errors

*fx* | =IFERROR(XLOOKUP(lookup\_value, A2:A10, B2:B10), "Not Found")

Uses **IFERROR** to handle errors and return a custom message for not found values.

# XLOOKUP GUIDE

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- Examples

## 6. Binary Search

**fx** | =XLOOKUP(lookup\_value, A2:A10, B2:B10, , , 3)

Performs a binary search for faster results (requires sorted data).

- Tips

### 1. Wildcard Characters:

- Use wildcard characters like \* and ? in **lookup\_value** for partial matches.



### 2. Array Mode:

- XLOOKUP supports array mode, allowing you to handle multiple lookup values at once.



### 3. Dynamic Arrays:

- XLOOKUP automatically spills results into adjacent cells for dynamic array functionality.

### 4. Error Handling:

- Use **IFERROR** or other error-handling functions to manage situations where values are not found.



# SUMIFS CHEATSHEET



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**SUMIFS** is an **Excel** function designed for summing values based on multiple criteria. It allows users to specify different conditions in various ranges, summing only the values that meet all specified criteria. The syntax provides a sum range, multiple criteria ranges, and their corresponding conditions.

## SYNTAX

=**fx** | =SUMIFS(sum\_range, criteria\_range1, criteria1, [criteria\_range2, criteria2], ...)

sum_range:	The range of cells to sum.
criteria_range1:	The range to apply the first condition.
criteria1:	The condition to be met in criteria_range1.
[criteria_range2, criteria2]:	Additional ranges and their respective conditions.

## EXAMPLES

### 1. Basic SUMIFS

Product	Sales (\$)
A	500
B	700
A	300
C	400
B	600

Result: \$800 – Sum of Sales where Product is A

### 2. Multiple Conditions

Region	Quarter	Revenue (\$)
North	Q1	1000
South	Q2	800
North	Q1	1200
East	Q2	1500
South	Q3	1100

Result: \$800 - Sum of Revenue where Region is South and Quarter is 2

### 3. Dynamic Date Range

Category	Type	Date	Value
A	X	01/01/2024	50
B	Y	03/01/2024	80
A	X	13/01/2024	60
B	Y	17/02/2024	90
A	X	13/02/2024	70
B	Y	31/01/2024	100
A	X	11/01/2024	40
B	Y	30/01/2024	110
A	X	01/02/2024	30

Result: 300 - Sum of Values where Category is B, Type is Y, and Date is within the last 30 days

## Why SUMIFS instead of SUMIF?

### SUMIFS

Allows for multiple criteria ranges.

More versatile with multiple conditions.

Supports AND logic for criteria.

Criteria columns are independent.

More flexible for complex conditions.

### SUMIF

Only accommodates a single criteria range.

Suitable for simple, single-condition sums.

Operates on OR logic for multiple criteria.

Single criteria column is used for summing.

Limited flexibility due to single criteria.

# IF FUNCTION CHEATSHEET



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## SYNTAX

`fx | =IF(logical_test, value_if_true, value_if_false)`

logical_test:	The condition you want to check.
value_if_true:	The result if the condition is true.
value_if_false:	The result if the condition is false.

## COMMON USE CASES

### BASIC IF

`fx | =IF(A1>10, "Yes", "No")`

If the value in cell A1 is greater than 10, return "Yes"; otherwise, return "No"

### NESTED IF

`fx | =IF(A1>10, "High", IF(A1>5, "Medium", "Low"))`

If the value in cell A1 is greater than 10, return "High"; if it's greater than 5, return "Medium"; otherwise, return "Low".

## ADVANCED OPTIONS

### IF with OR

`fx | =IF(OR(A1>10, B1="Approved"), "Yes", "No")`

If A1 is greater than 10 or B1 is "Approved", return "Yes".

### IF with AND

`fx | =IF(AND(A1>10, B1="Approved"), "Yes", "No")`

If A1 is greater than 10 and B1 is "Approved", return "Yes".

### IF with ISBLANK

`fx | =IF(ISBLANK(A1), "Blank", "Not Blank")`

Check if A1 is blank.

## ERROR HANDLING

### BASIC IF

`fx | =IFERROR(formula, "Error Message")`

If the formula results in an error, display a custom error message.

### NESTED IF

`fx | =IFNA(formula, "Not Available")`

If the formula results in #N/A error, display a custom message.

## TIPS AND TRICKS

### Boolean Logic

`fx | =IF(A1>B1, "True", "False")`

Compare the value in cell A1 with the value in cell B1. If A1 is greater than B1, it returns the text "True"; otherwise, it returns "False." This is useful for creating logical conditions based on numerical comparisons.

### Text Values

`fx | =IF(A1="Apple", "Fruit", "Not a Fruit")`

Check if the value in cell A1 is equal to the text "Apple." If true, it returns "Fruit"; otherwise, it returns "Not a Fruit." This is handy for categorizing or labeling data based on specific text values.

### Date Comparison

`fx | =IF(A1>TODAY(), "Future Date", "Past Date")`

Compare the date in cell A1 with the current date (TODAY()). If the date in A1 is in the future, it returns "Future Date"; otherwise, it returns "Past Date." This is a common scenario for tracking and categorizing dates based on their relationship to the current date.

### Multiple Conditions

`fx | =IF(AND(A1>10, B1="Approved"), "High", IF(AND(A1>5, B1="Pending"), "Medium", "Low"))`

This nested IF formula classifies values in cells A1 and B1 into categories (High, Medium, Low) based on multiple conditions. If A1 > 10 and B1 is "Approved," it's "High." If not, it checks if A1 > 5 and B1 is "Pending" for "Medium." Otherwise, it's "Low." Useful for tiered classification.

### Checking Duplicates

`fx | =IF(COUNTIF($A$1:$A$100, A1)>1, "Duplicate", "Unique")`

Identify duplicate values in a range. If the value is a duplicate, return "Duplicate", if not, then "Unique".

## REMEMBER

Always Balance Parentheses:

Ensure that each opening parenthesis has a corresponding closing parenthesis.

Use Cell References:

Whenever possible, refer to cell values to make the formula dynamic.

Test in Steps:

Break down complex IF statements into simpler ones for easier troubleshooting.

9.



# EXCEL SHORTCUTS

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# Most Used EXCEL Shortcuts

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## GENERAL

Alt F1

Create embedded chart

F11

Create chart in new worksheet

Ctrl Shift F4

Find previous match

Shift F4

Find next match

Ctrl Alt V

Display the Paste Special dialog box

F4

Repeat last action

Ctrl W

Close current workbook

Alt F4

Close Excel

Ctrl N

Create new workbook

Ctrl O

Open workbook

# NAVIGATION

Alt PgDn

Move one screen right

Alt PgUp

Move one screen left

PgUp

Move one screen up

PgDn

Move one screen down

Ctrl →

Move to right edge of data region

Ctrl ←

Move to left edge of data region

Home

Move to beginning of row

Ctrl End

Move to last cell in worksheet

Ctrl Home

Move to first cell in worksheet

# FORMATTING

**Alt H A C**

Align center

**Alt H A L**

Align left

**Alt H A R**

Align right

**Alt H F G**

Increase font size one step

**Alt H F K**

Decrease font size one step

**Ctrl Shift \$**

Currency Format

**Ctrl Shift %**

Percentage Format

**Ctrl Shift ^**

Scientific Number Format

**Ctrl Shift #**

Date Format

**Ctrl Shift @**

Time Format

**Ctrl Shift !**

Number Format

**Ctrl Shift \_**

Remove borders

**Ctrl ;**

Enter Current Date

**Ctrl :**

Enter Current Time

# WORKBOOK

**Shift** **F11**

Insert new worksheet

**Ctrl** **PgDn**

Go to next worksheet

**Ctrl** **PgUp**

Go to previous worksheet

**F6**

Move to next pane

**Shift** **F6**

Move to previous pane

**Ctrl** **Tab**

Go to next workbook

**Ctrl** **Shift** **Tab**

Go to previous workbook

**Ctrl** **F9**

Minimize current workbook window

**Ctrl** **F10**

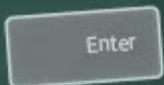
Maximize current workbook window

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# EXCEL Shortcuts Alphabet



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**Ctrl A** Select All

**Ctrl B** Bold

**Ctrl C** Copy

**Ctrl D** Fill Down

**Ctrl E** Flash Fill

**Ctrl F** Find

**Ctrl G** Go to

**Ctrl H** Find & Replace

**Ctrl I** Italic

**Ctrl J** Justify

**Ctrl****K****Hyperlink****Ctrl****L****Convert Data to Table Format****Ctrl****M****Indent the Selected Cells****Ctrl****N****New Workbook****Ctrl****O****Open Workbook****Ctrl****P****Print****Ctrl****Q****Quit Excel****Ctrl****R****Fill Right****Ctrl****S****Save Workbook****Ctrl****T****Create a Table**

**Ctrl** **U** **Underline**

**Ctrl** **V** **Paste**

**Ctrl** **W** **Close Workbook**

**Ctrl** **X** **Cut**

**Ctrl** **Y** **Redo**

**Ctrl** **Z** **Undo**

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# EXCEL Ctrl + 0-9 Shortcuts

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- |      |   |   |
|------|---|---|
| Ctrl | 0 | Hide the selected columns   |
| Ctrl | 1 | Open the Format Cells dialog  |
| Ctrl | 2 | Apply or remove Bold formatting to font<br>(CTRL+B)   |
| Ctrl | 3 | Apply or remove Italics formatting to font<br>(CTRL+I)  |
| Ctrl | 4 | Apply or remove Underline formatting to font<br>(CTRL+U)                                      |
| Ctrl | 5 | Apply or remove strikethrough formatting to font  |
| Ctrl | 6 | Switch between hiding objects, displaying objects,<br>and displaying placeholders for objects |
| Ctrl | 7 | None  |
| Ctrl | 8 | Display or hide the outline symbols   |
| Ctrl | 9 | Hide the selected rows  |

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# EXCEL Ctrl + Shift Shortcuts

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#  
3

**Ctrl Shift**

**Ctrl+Shift, then scroll your mouse wheel up to go left, down to go right**

**Ctrl Shift A**

**Insert argument names and parentheses when the insertion point is to the right of a function name in a formula**

**Ctrl Shift F or P**

**Format fonts in the Format Cells dialog**

**Ctrl Shift G**

**Open the Workbook Statistics dialog**

**Ctrl Shift L**

**Apply / Remove Auto-filter**

**Ctrl Shift O**

**Select all cells containing Notes  
(earlier called comments)**

**Ctrl Shift U**

**Apply / Remove Auto-filter**

**Ctrl Shift F2**

**Insert a threaded comment /  
Open and reply to a threaded comment**

**Ctrl Shift F3**

**Open create name from selection dialog box**

**Ctrl Shift F6**

**Switches between all Excel windows**

**Ctrl**   **Shift**   **F10**

**Open the context menu**

**Ctrl**   **Shift**   **F12**

**Opens print worksheet dialog box**

**Ctrl**   **Shift**   **+**

**Open the Insert dialog to insert blank cells**

**Ctrl**   **Shift**   **:**

**Enter the current time**

**Ctrl**   **Shift**   **-**

**Remove the outline border from the selected cells**

**Ctrl**   **Shift**   **~**

**Apply the General number format**

**Ctrl**   **Shift**   **=**

**Insert Rows / Columns when row column is selected or display insert menu when cell is selected**

**Ctrl**   **Shift**   **1**

**Apply the Number format with two decimal places, thousands separator, and minus sign (-) for negative values**

**Ctrl**   **Shift**   **2**

**Apply the Time format with the hour and minute, and AM or PM**

**Ctrl**   **Shift**   **3**

**Apply the Date format with the day, month, and year**

**Ctrl**   **Shift**   **4**

Apply the Currency format with two decimal places (negative numbers in parentheses)

**Ctrl**   **Shift**   **5**

Apply the Percentage format with no decimal places

**Ctrl**   **Shift**   **6**

Apply the Scientific number format with two decimal places

**Ctrl**   **Shift**   **7**

Apply an outline border to the selected cells

**Ctrl**   **Shift**   **8**

Select the current region around the active cell

**Ctrl**   **Shift**   **9**

Unhide Rows

**Ctrl**   **Shift**   **Space**

Select the entire worksheet (equivalent to CTRL+A) Select all objects on a worksheet when an object is selected

**Ctrl**   **Shift**   **PgDn**

Select the current and next sheet in a workbook

**Ctrl**   **Shift**   **PgUp**

Select the current and previous sheet in a workbook

**Ctrl**   **Shift**   **Home**

Extend the selection of cells to the beginning of the worksheet

**Ctrl**   **Shift**   **End**

Extend the selection of cells  
to the last used cell on the worksheet

**Ctrl**   **Shift**   

Extends the selection of cells to  
the last nonblank cell in the same  
column or row as the active cell, or  
if the next cell is blank, extends the  
selection to the next nonblank cell

**Ctrl**   **Shift**   **Tab**

Switches to the previous tab in a dialog,  
or (if no dialog is open) switches  
between all Excel windows

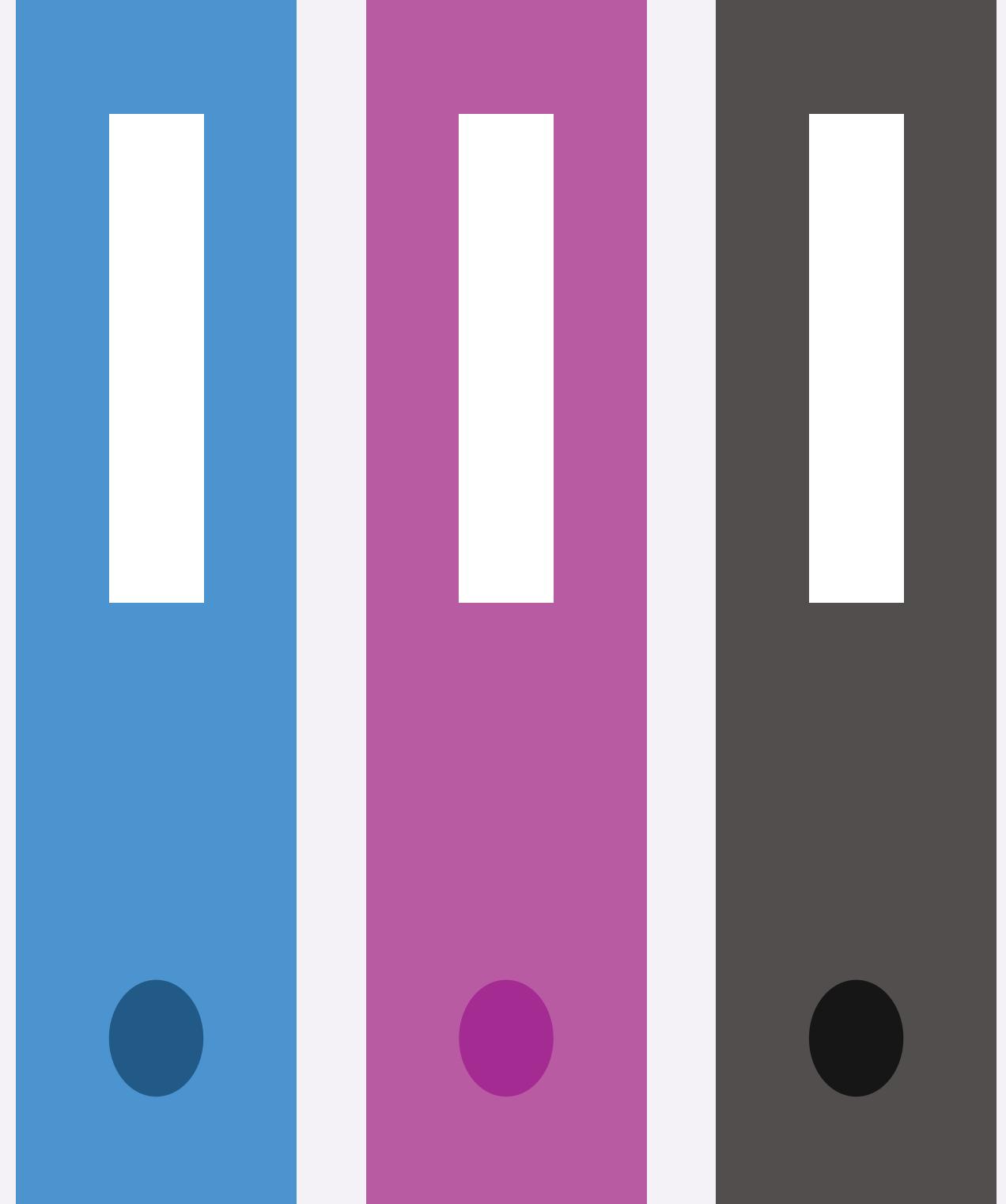
**Ctrl**   **Shift**   **Enter**

Confirm a formula as Array formula

**Ctrl**   **Shift**   **"**

Copy the value from the cell above the  
active cell into the cell or the formula bar





# 10. **MASTERING LARGE DATA SETS**

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# MASTERING LARGE DATA SETS

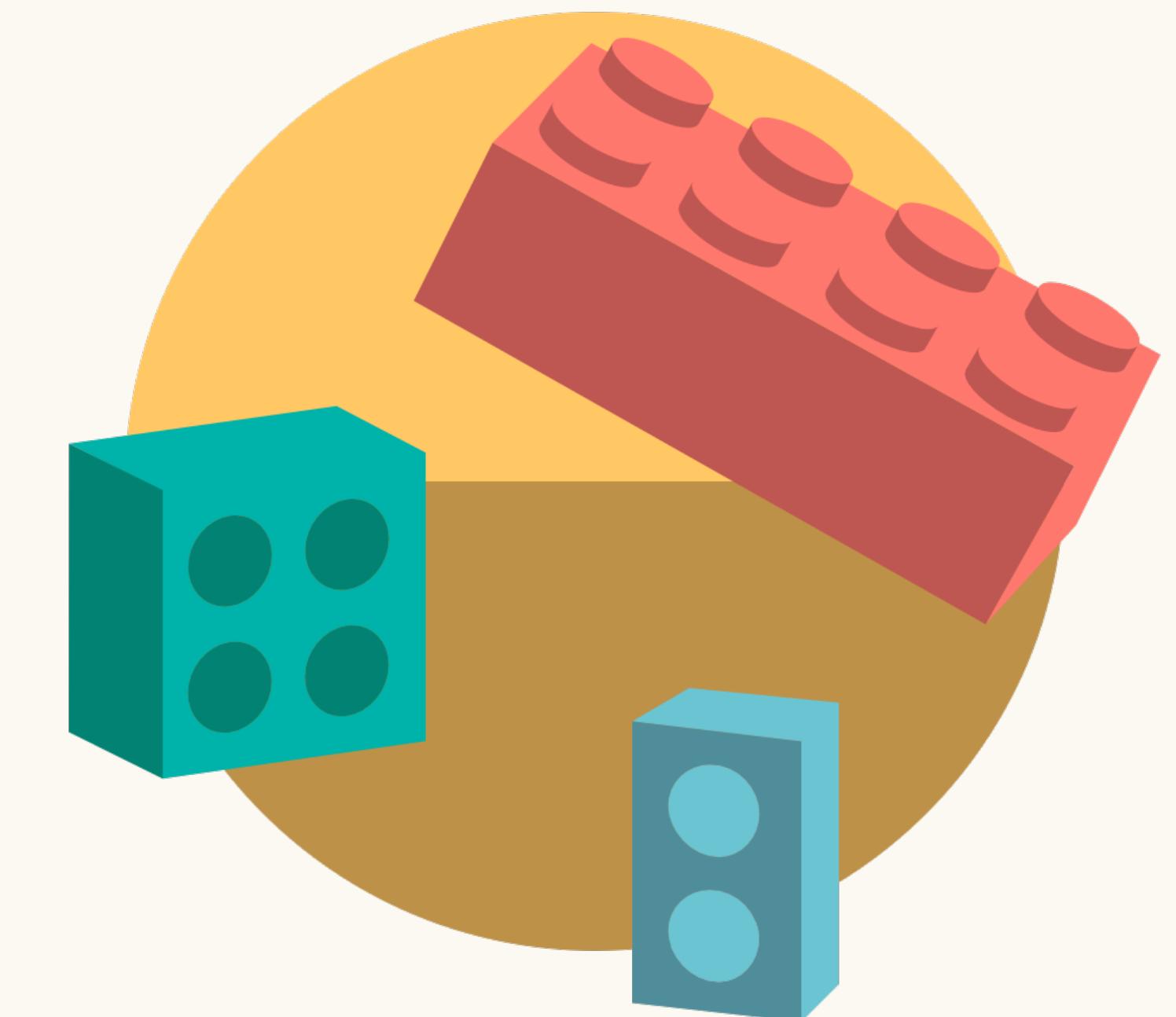
## A Guide on How to Analyze Over 1 Million Entries in Excel

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### 1. Build an Emergency Fund:

#### a. Importing Data

- i. Utilize Excel's import data features for large datasets.
- ii. Use the Power Query Editor to clean and transform data during the import process.



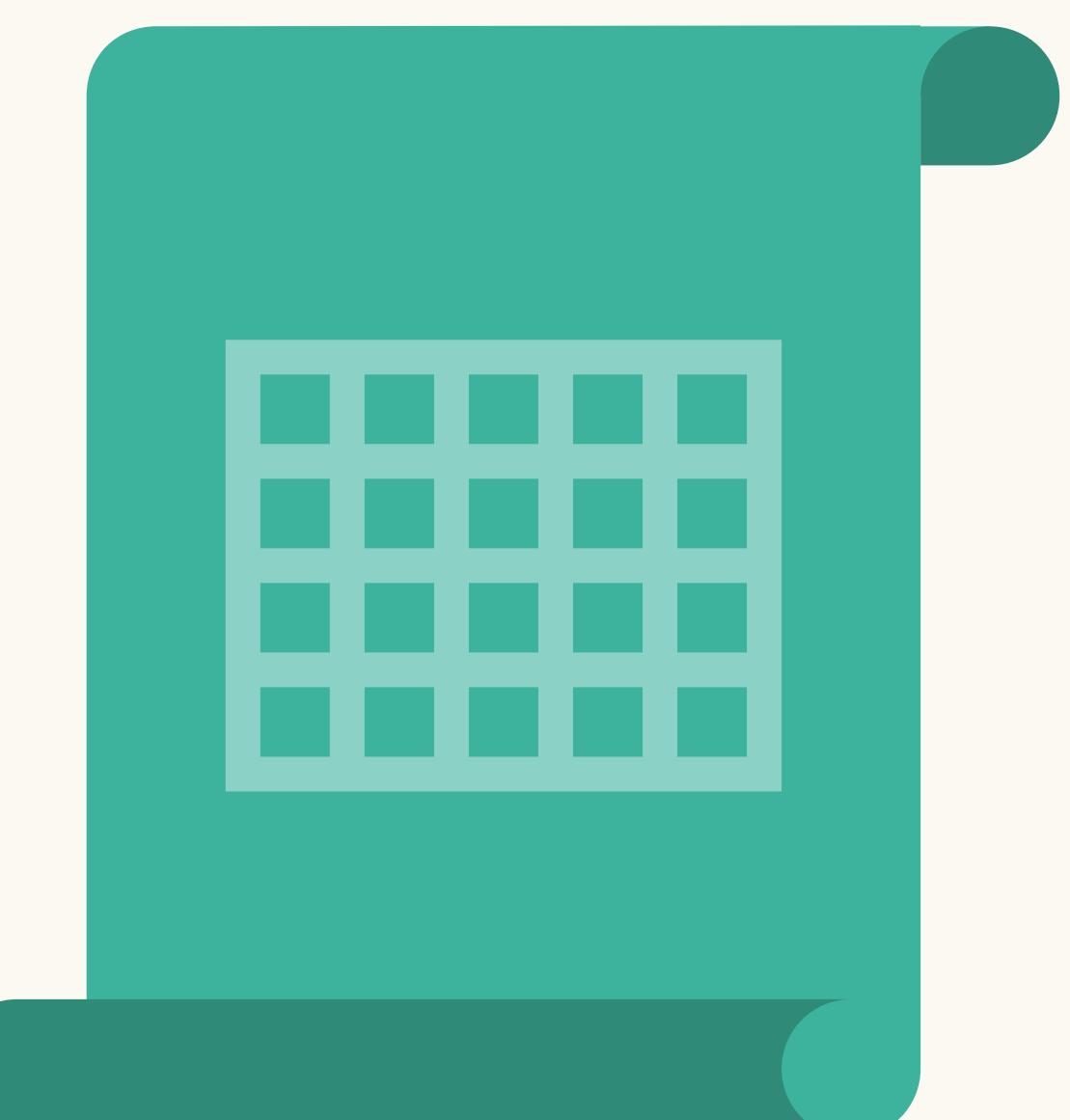
#### b. Data Cleaning and Formatting

- i. Identify and handle missing or erroneous data.
- ii. Format columns appropriately (text, date, numeric) for accurate analysis.

### 2. Optimizing Excel Performance

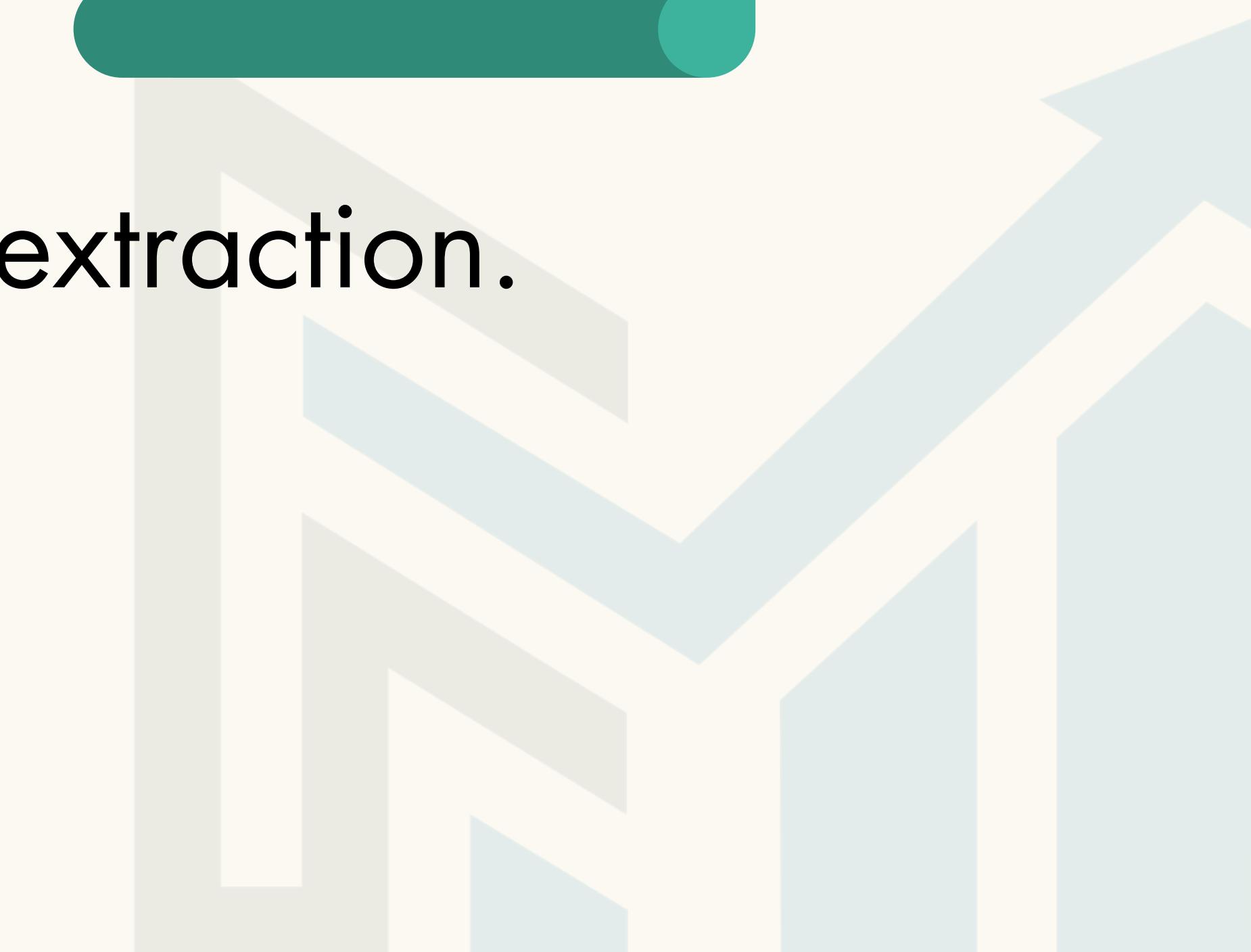
#### a. Data Model and PivotTables

- i. Create a data model to optimize memory usage.
- ii. Utilize PivotTables for dynamic and faster analysis.



#### b. Filtering and Sorting

- i. Use Excel's advanced filtering options for specific data extraction.
- ii. Sort data to make patterns and trends more apparent.



# MASTERING LARGE DATA SETS

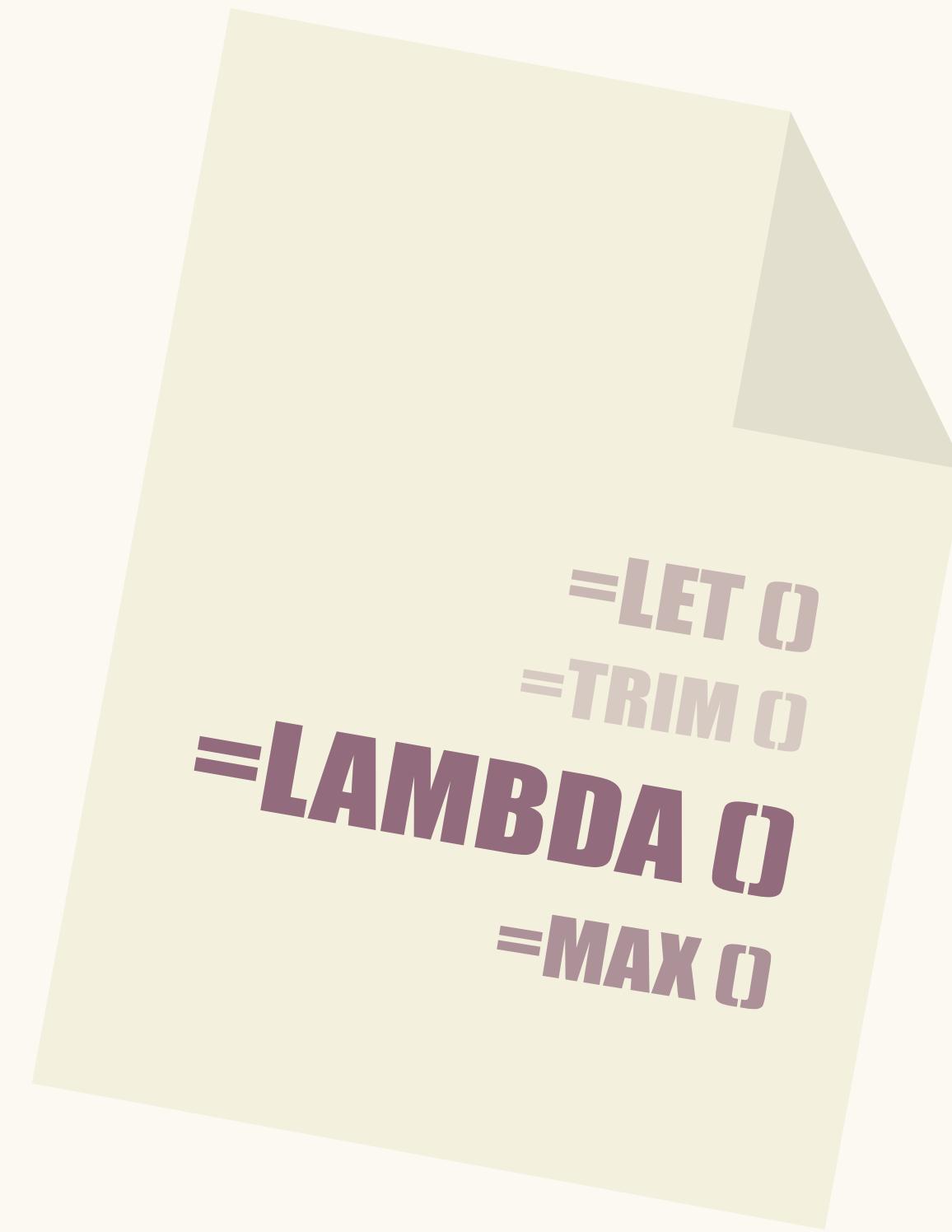
## A Guide on How to Analyze Over 1 Million Entries in Excel

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### 3. Formulas and Functions

#### a. Array Formulas

- i. Master array formulas to perform calculations efficiently.
- ii. Apply array functions such as SUMIFS, AVERAGEIFS, and COUNTIFS.



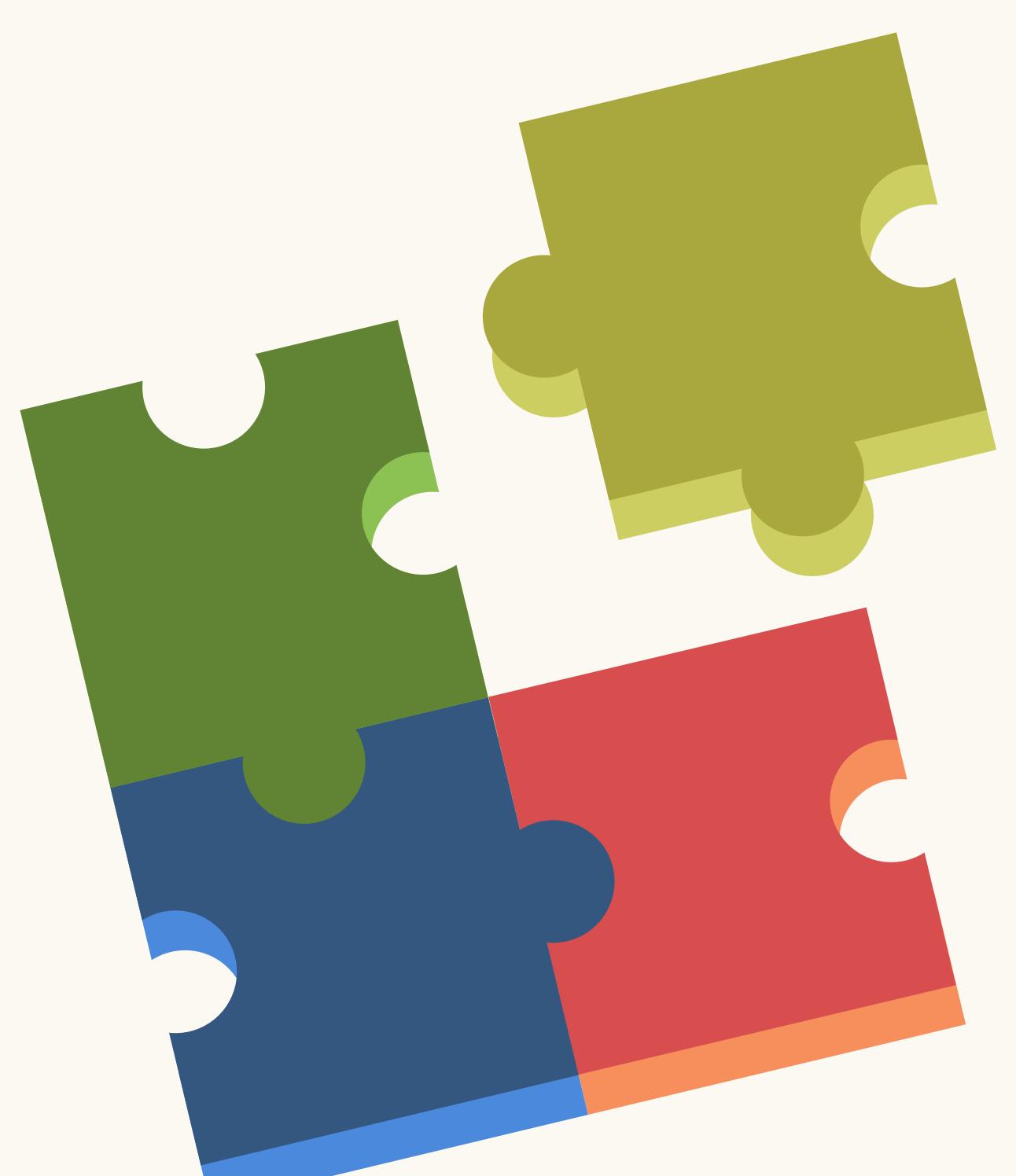
#### b. Use of INDEX and MATCH

- i. Replace VLOOKUP with INDEX and MATCH for faster and more flexible lookups.
- ii. Leverage OFFSET and INDIRECT functions for dynamic referencing.

### 4. Utilizing Excel Add-Ins

#### a. Power Pivot

- i. Integrate Power Pivot for enhanced data modeling and analysis.
- ii. Create relationships between tables to streamline complex analyses.



#### b. Filtering and Sorting

- i. Leverage Power Query for data cleaning, transformation, and merging queries.
- ii. Automate repetitive tasks to save time and reduce errors.

# MASTERING LARGE DATA SETS

A Guide on How to Analyze Over 1 Million Entries in Excel

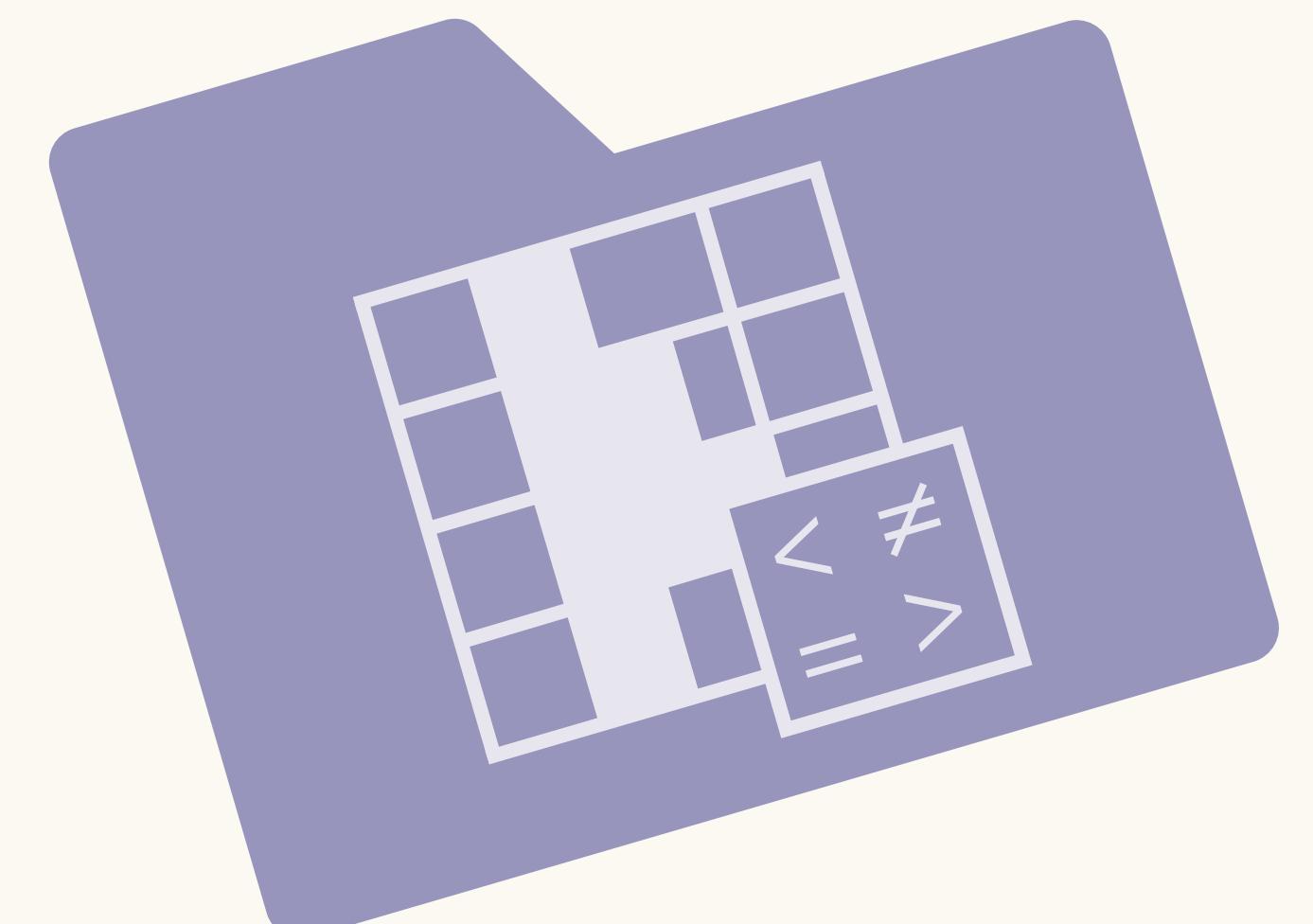
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## 5. Conditional Formatting and Visualization

### a. Heat Maps and Color Scales

- i. Apply conditional formatting to highlight trends and anomalies.
- ii. Use color scales for a quick visual assessment of data distribution.



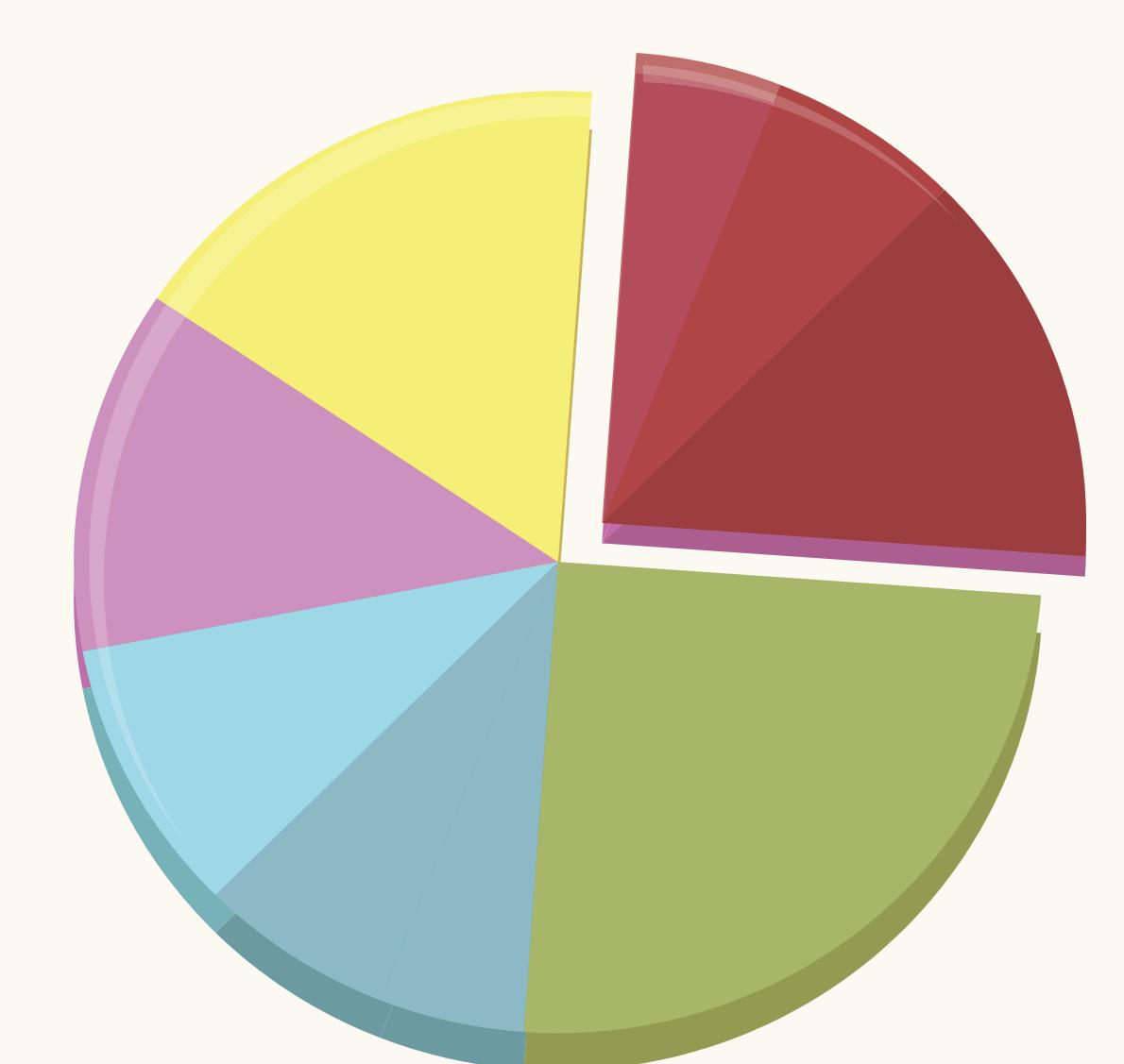
### b. Charts and Graphs

- i. Create dynamic charts that update automatically with changes in data.
- ii. Opt for charts that represent the data comprehensively.

## 6. Data Sampling and Subsetting

### a. Random Sampling

- i. Randomly sample a subset of data for initial analysis.
- ii. Ensure the subset is representative of the entire dataset.



### b. Filtering Relevant Data

- i. Identify and analyze specific segments of the data using filters.
- ii. Focus on relevant subsets for targeted insights.





11.

# GETTING STARTED WITH PYTHON IN EXCEL

Python availability in Excel introduces a fresh realm of possibilities for data analysis that was once primarily accessible to data scientists and developers. Now, within the comfort of your well-known spreadsheet environment, you have the ability to tap into the capabilities of Python.

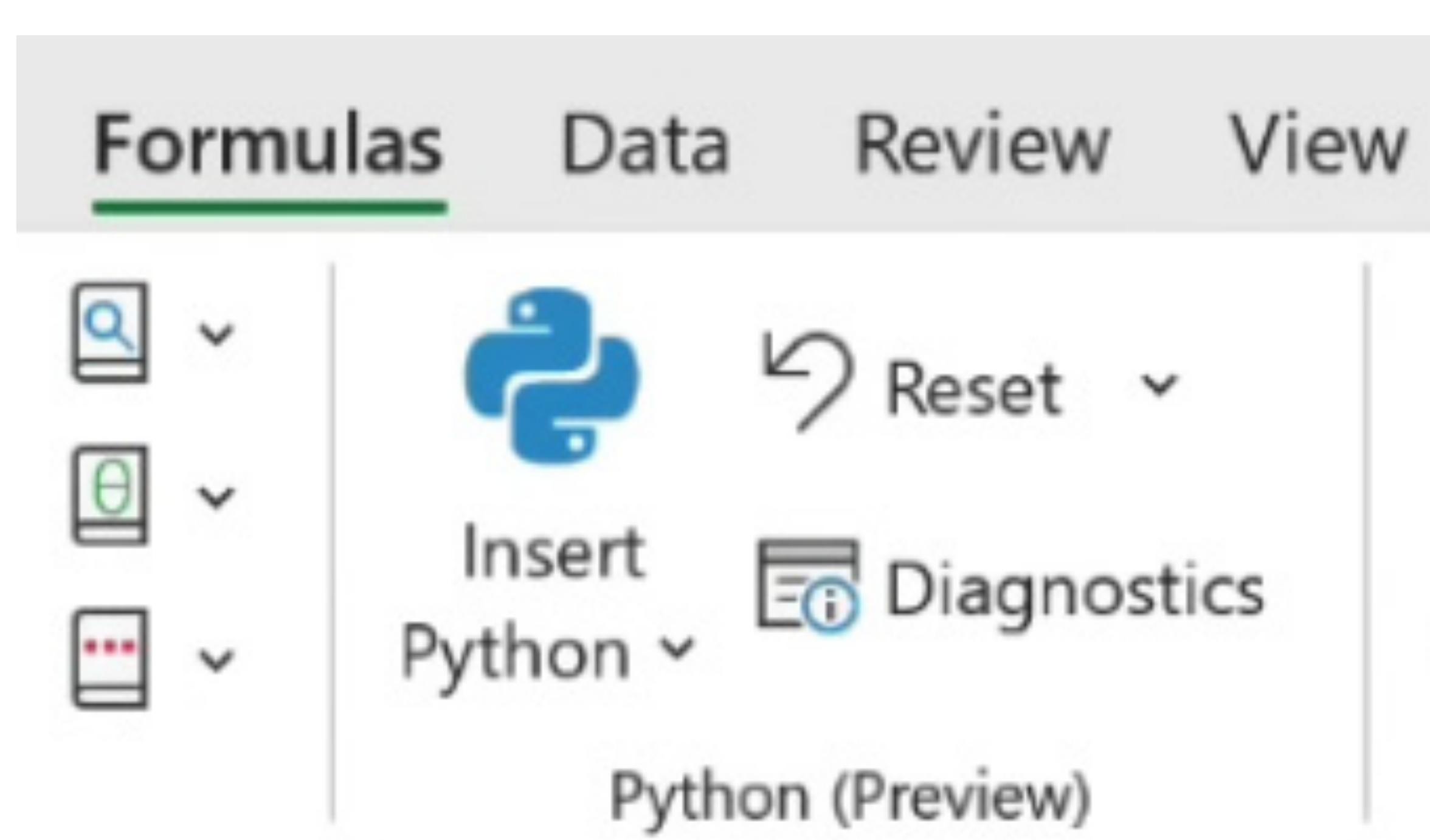
But how to start using Python in Excel and what functionalities does it offer?

## Just type =PY()

Could it be simpler? Write =PY() and get started! After the formula the Excel cell will change and you can enter your Python code and see the visualizations or calculations right there in your Excel spreadsheet!



You can also find Python under the formulas section in Excel!



Ok, but what can I actually create with Python in Excel?

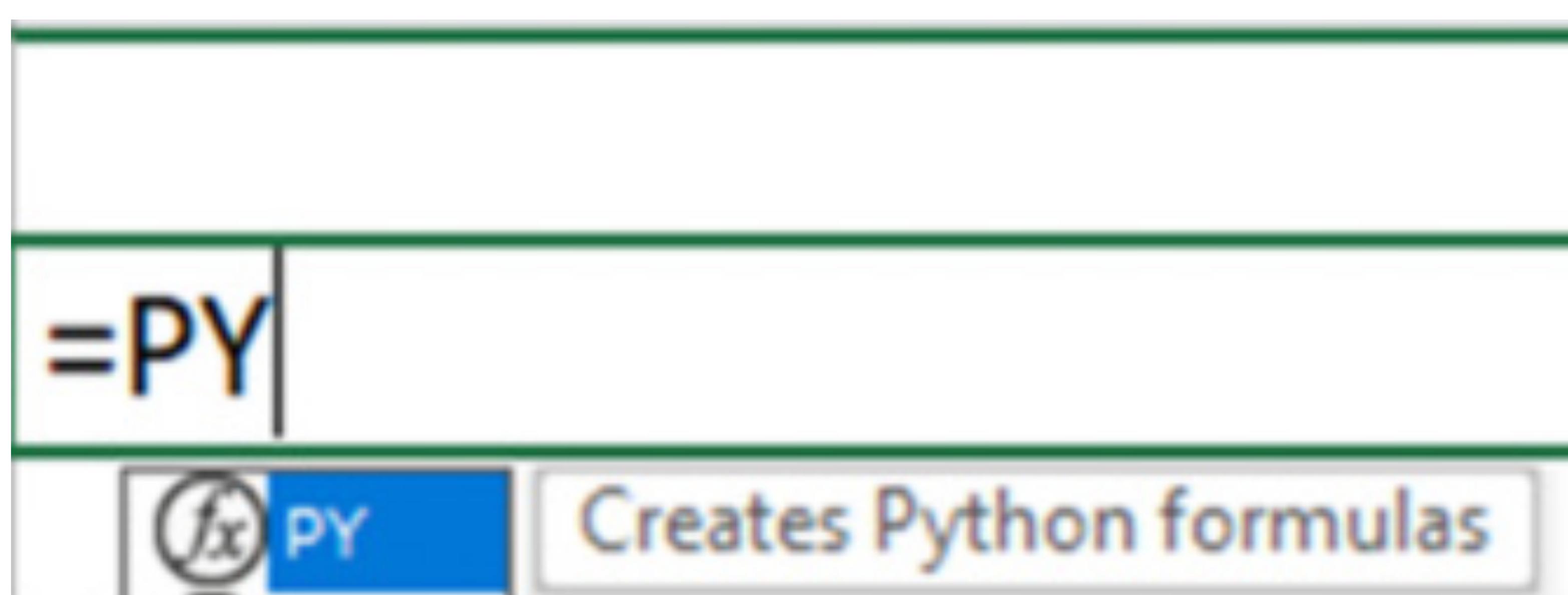
## 1. Creating a Data Frame

Python code runs in a controlled cloud container with limitations on its capabilities.

Python code lacks internet access and the ability to reach files on your local computer. The Excel workbook defines the boundaries of Python's reach.

With these constraints in mind, it's not surprising that creating a pandas DataFrame, for instance, often serves as the initial step when incorporating Python within Excel.

Constructing a pandas DataFrame from an Excel table is a clear process. The newly introduced PY() function facilitates the construction of Python formulas containing the necessary Python code.



## 2. Writing the Code

PY

```
xl("A2:D98", headers=True)
```

So, here's how the code works:

1

The `xl()` function is employed to extract data from Excel, generating a pandas DataFrame.

2

The initial parameter indicates the data's location, which in this instance refers to the Excel table within the range A2:D98.

3

The subsequent parameter informs the `xl()` function about the presence of headers (column names) within the data.

4

You can assign a variable name to your DataFrame like you were using named ranges or `LET()` function in regular Excel. You can subsequently access the DataFrame in subsequent Python formulas using the same variable name.



Press Ctrl+Enter to execute the Python formula. It might take a moment for the code to work. If your code is error-free, here's what will appear:

 DataFrame

Hover the mouse on the card icon to see a preview of the data within the DataFrame:

SalesOrderNumber	SalesOrderLineNumber	OrderDate
SO43697	1	12/29/2010
SO43698	1	12/29/2010
SO43699	1	12/29/2010
SO43700	1	12/29/2010
SO43701	1	12/29/2010
...	...	...
SO75122	1	1/28/2014
SO75122	2	1/28/2014
SO75123	1	1/28/2014
SO75123	2	1/28/2014
SO75123	3	1/28/2014

Source: Anaconda.com

The preview shows the first 5 and last 5 rows of the data.



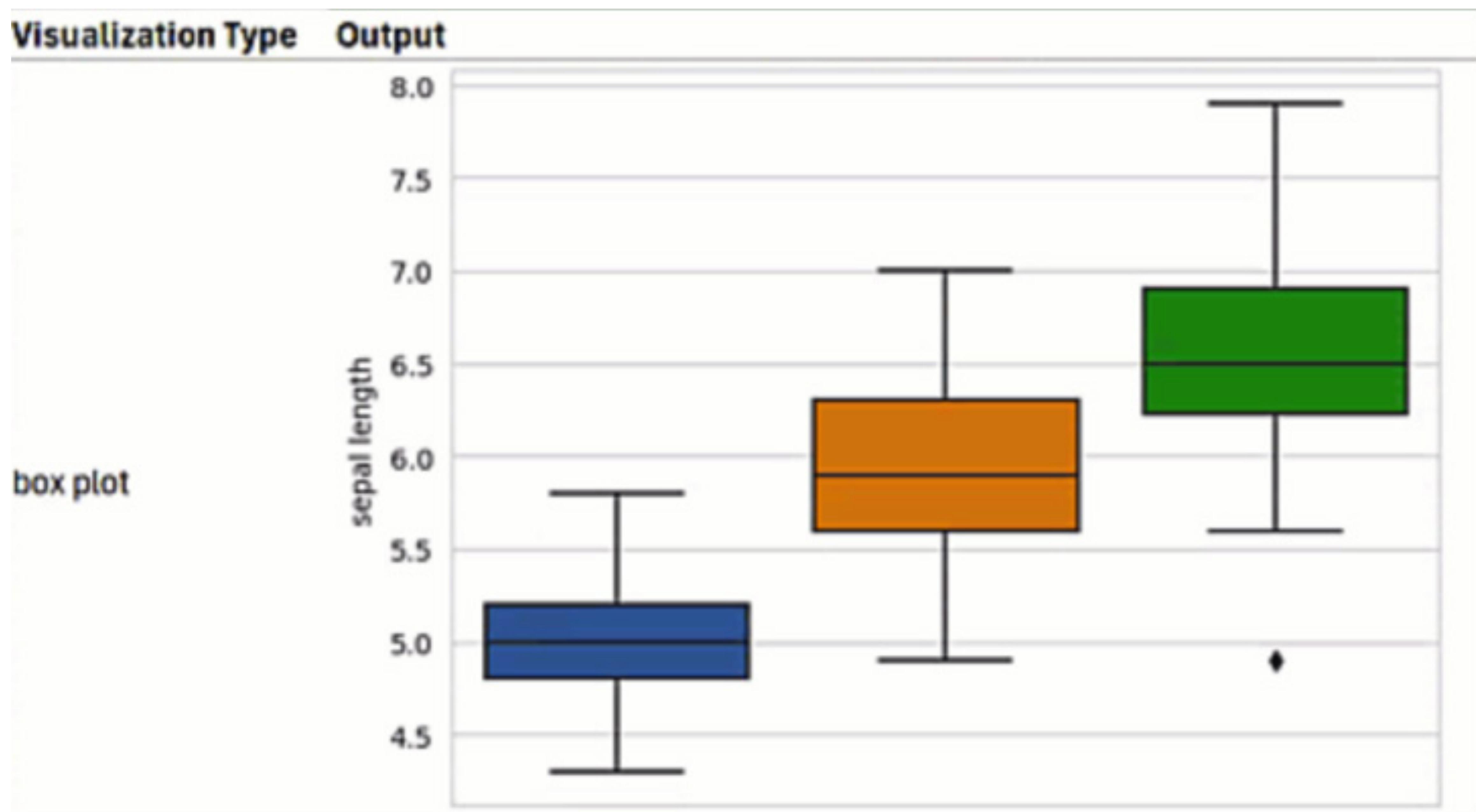
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### 3. Advanced Data Visualizations

You can also use the powerful visualization libraries of Python, including Matplotlib and Seaborn, directly within your Excel workbook to achieve thorough and insightful data portrayal.

The new Image in Cell feature, specifically, the Create Reference option allows to create an image/shape over the cells that can be resized.

This has the capacity to lead to powerful interactive dashboards, offering a realm of opportunities alongside Python's data refinement capabilities.



Source: Anaconda.com



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## 4.In-Depth Statistical Analysis

Enhance your analysis by harnessing the capabilities of Python's libraries like pandas and statsmodels. Conduct extensive statistical operations seamlessly within your Excel cells. You don't need advanced data science expertise— advanced analytics have become achievable for all. To get descriptive statistics table like the one below, use a formula name. `describe()`.

### Output

	sepal_length	sepal_width	petal_length	petal_width
count	150	150	150	150
mean	5.843333333	3.054	3.758666667	1.198666667
std	0.828066128	0.433594311	1.76442042	0.763160742
min	4.3	2	1	0.1
25%	5.1	2.8	1.6	0.3
50%	5.8	3	4.35	1.3
75%	6.4	3.3	5.1	1.8
max	7.9	4.4	6.9	2.5

Source: Anaconda.com



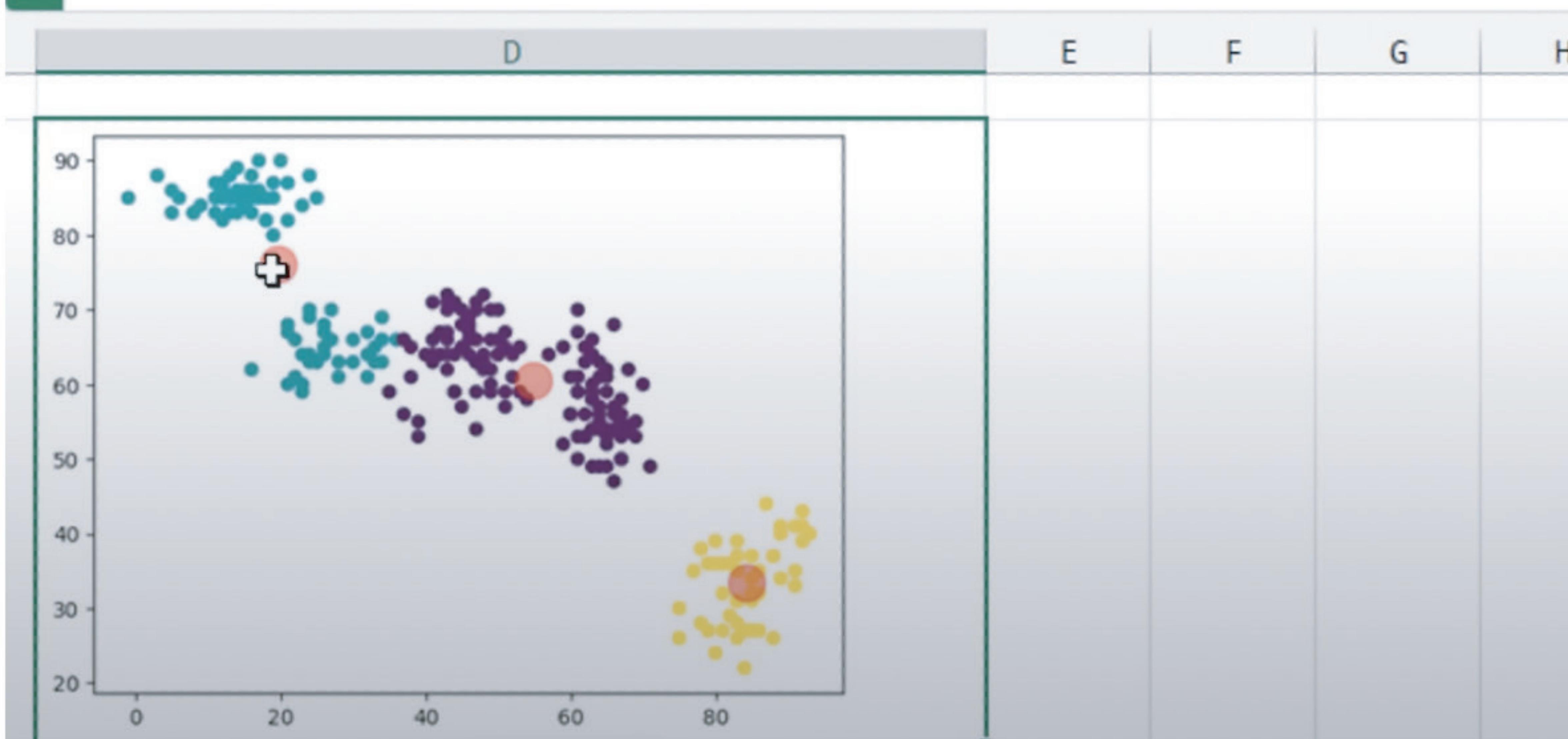
## 5. K-Means Clustering

You can also easily make clusters with Python in Excel which makes the work for data analysts a lot easier. This previously wasn't possible by default.

```
PY from sklearn.cluster import KMeans

df=xl("A5:B256", headers=True)
df_cluster = df[['x', 'y']]
kmeans = KMeans(n_clusters=3)
kmeans.fit(df_cluster)

plt.scatter(df_cluster['x'], df_cluster['y'], c=kmeans.labels_, cmap='viridis')
centers = kmeans.cluster_centers_
plt.scatter(centers[:, 0], centers[:, 1], c='red', s=300, alpha=0.5)
plt.show()
```



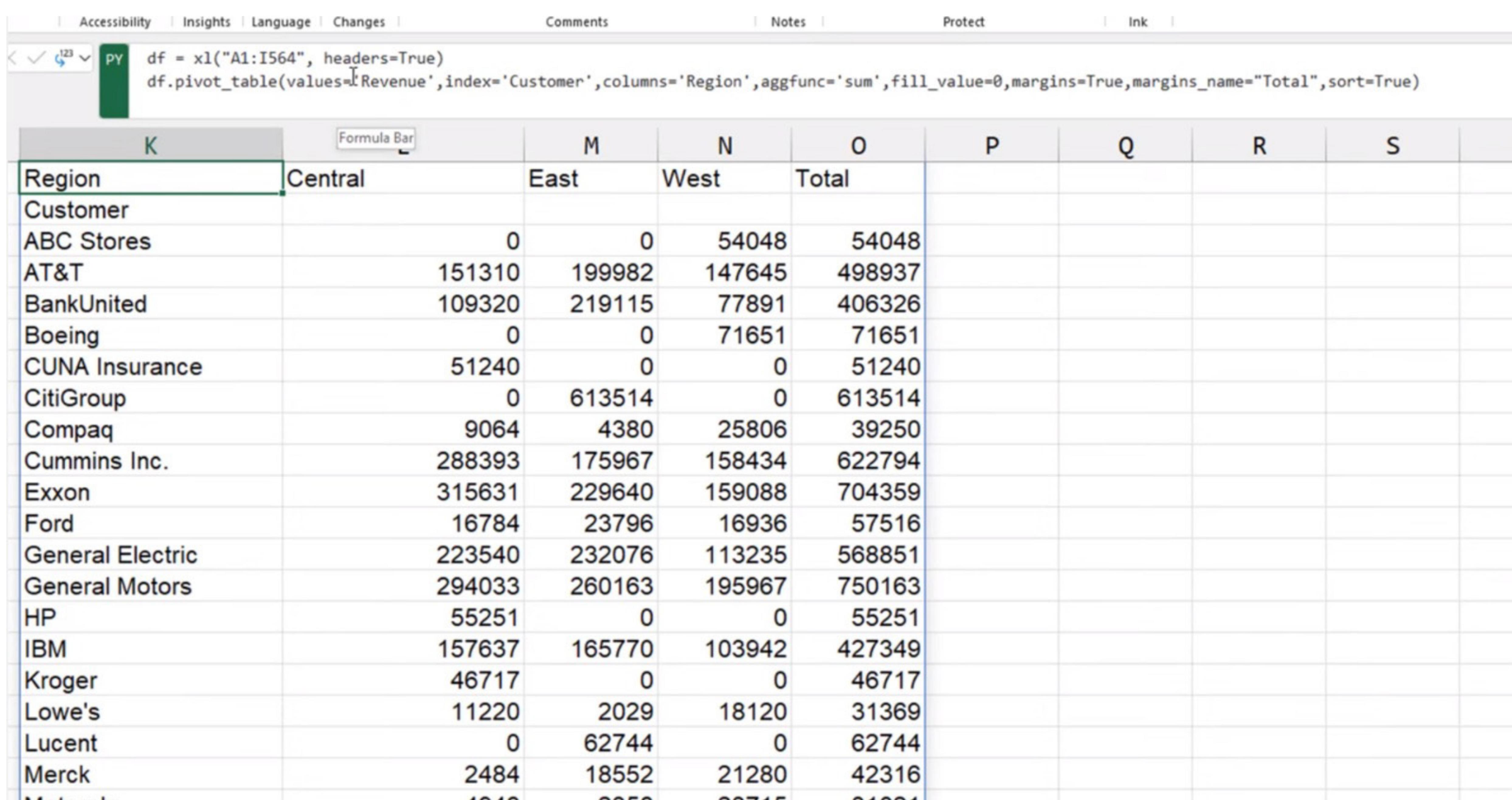
Source: Mr. Excel



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## 6. Create Pivot Tables

With Python integration, you can also create an Excel-like Pivot Table in a DataFrame. Compared to the basic Excel Pivot Tables, these ones are easier to use since they do automatic recalculation without refreshing. As well as you can use Date Grouping for some more possibilities within your Pivot Table.



The screenshot shows a Microsoft Excel spreadsheet. In the formula bar, there is Python code: `df = xl("A1:I564", headers=True)  
df.pivot_table(values='Revenue', index='Customer', columns='Region', aggfunc='sum', fill_value=0, margins=True, margins_name="Total", sort=True)`. The main area displays a Pivot Table with the following data:

Region	Central	East	West	Total
Customer				
ABC Stores	0	0	54048	54048
AT&T	151310	199982	147645	498937
BankUnited	109320	219115	77891	406326
Boeing	0	0	71651	71651
CUNA Insurance	51240	0	0	51240
CitiGroup	0	613514	0	613514
Compaq	9064	4380	25806	39250
Cummins Inc.	288393	175967	158434	622794
Exxon	315631	229640	159088	704359
Ford	16784	23796	16936	57516
General Electric	223540	232076	113235	568851
General Motors	294033	260163	195967	750163
HP	55251	0	0	55251
IBM	157637	165770	103942	427349
Kroger	46717	0	0	46717
Lowe's	11220	2029	18120	31369
Lucent	0	62744	0	62744
Merck	2484	18552	21280	42316
Total	46410	32550	22745	81001

Source: Mr. Excel

## 7. Bring In External Data

External data can be pulled into Python in Excel workflows using Excel's connectors and Power Query.

Consider that the Python integration is available in preview form only on Windows for Microsoft 365 Insider beta channel members, and only the "Office 365" cloud version receives Python integration.



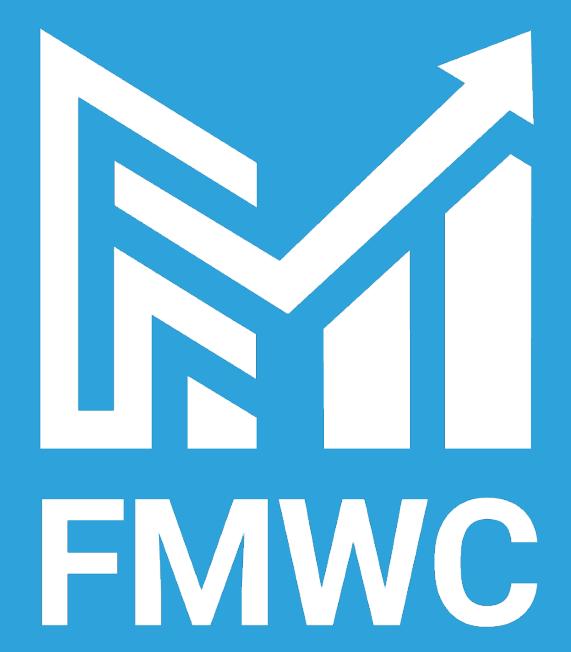
12.



# HOW CHATGPT CAN SIMPLIFY EXCEL WORKFLOW?

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# HOW CHATGPT CAN SIMPLIFY OUR EXCEL WORKFLOW



## Let's analyze how ChatGPT can create an Excel macro

Here is an example of an Excel macro that can send emails with the specified subject and message, pulling the information from columns A and B:

```
Sub SendEmails()
    Dim OutApp As Object
    Dim OutMail As Object
    Dim cell As Range
    Dim subjectLine As String
    Dim messageBody As String

    subjectLine = "Kevin Cookie Company Invoice"
    Set OutApp = CreateObject("Outlook.Application")

    For Each cell In Columns("A").Cells.SpecialCells(xlCellTypeConstants)
        If cell.Value Like "?*@?*.?*" Then
            Set OutMail = OutApp.CreateItem(0)
            messageBody = "You Regenerate response company " & cell.Offset(0, 1).Value
            OutMail.Subject = subjectLine
            OutMail.Body = messageBody
            OutMail.Send
        End If
    Next cell
End Sub
```

This macro will loop through each cell in column A, checking if the value in the cell is in the form of an email address (i.e. if it contains the "@" symbol). If it is an email address, it will use the value in the corresponding cell in column B as the "X" in the message, and send the email to the address in column A.

You will need to make sure that the Outlook object library is referenced in the VBE, you can do that from Tools -> references, select Microsoft Outlook library.

Note that this is a simple example that might need some adaptions to fit your actual use case.

In a recent video, Excel MVP Kevin Stratvert uses ChatGPT to create an Excel macro that functions as an invoicing app, using customer email addresses and the amount they owe (with all the data found on an Excel sheet). Not only does ChatGPT create an Excel macro, it also gives a detailed explanation for how this macro works.

# HOW CHATGPT CAN SIMPLIFY OUR EXCEL WORKFLOW



## Simplify nested IF formulas with ChatGPT

MA

=IF(G7>0,G7,0) make a simpler formula in Microsoft Excel



The formula you provided is already quite simple, but you can simplify it further by using the MAX function:

=MAX(G7, 0)

You can also simplify work with nested IF formulas by using ChatGPT with Excel. Simply by typing in the description of the problem, ChatGPT will break it down into steps and provide the Excel formula necessary.

# HOW CHATGPT CAN SIMPLIFY OUR EXCEL WORKFLOW



## Can ChatGPT write Excel Power Query codes?



Here is the Power Query M code that appends Sheet1 from Workbook1 and Sheet2 from Workbook2 and removes duplicates from Column B:

Copy code

```
less

let
    Source1 = Excel.Workbook(File.Contents("C:\Workbook1.xlsx"), null, true),
    Sheet1_Table = Source1{[Item="Sheet1",Kind="Sheet"]}[Data],
    Source2 = Excel.Workbook(File.Contents("C:\Workbook2.xlsx"), null, true),
    Sheet2_Table = Source2{[Item="Sheet2",Kind="Sheet"]}[Data],
    AppendedData = Table.Combine({Sheet1_Table, Sheet2_Table}),
    RemovedDuplicates = Table.Distinct(AppendedData, {"Column B"})
in
    RemovedDuplicates
```

Note: Please replace the file path `"`C:\Workbook1.xlsx`"` and `"`C:\Workbook2.xlsx`"` with the actual file paths of your workbooks. Also, make sure to replace `"`Column B`"` with the actual column name that you want to remove duplicates from.

**Yes, it can. All you need to do is type in a command, for example: “Write an Excel Power Query M code to append sheet1 from workbook1 and sheet2 from workbook2 and remove duplicates from column B and ChatGPT will come back with an example of a Power Query M code that can be used. Also, ChatGPT gives a detailed explanation about the Power Query M code. Then, just copy and paste the code and you’re good to go.**

# HOW CHATGPT CAN SIMPLIFY OUR EXCEL WORKFLOW



## Analyzing .csv with ChatGPT

E can you understand this .csv data?

```
Identifier;Access code;Recovery code;First name;Last name;Department;Location  
9012;12se74;rb9012;Rachel;Booker;Sales;Manchester  
2070;04ap67;lg2070;Laura;Grey;Depot;London  
4081;30no86;cj4081;Craig;Johnson;Depot;London  
9346;14ju73;mj9346;Mary;Jenkins;Engineering;Manchester  
5079;09ja61;js5079;Jamie;Smith;Engineering;Manchester
```

E ok, please show me all people who work in sales department

G To show all people who work in the Sales department, you could filter the data based on the value in the Department column. Here is the filtered data for people who work in the Sales department:

```
Identifier;Access code;Recovery code;First name;Last name;Department;Location  
9012;12se74;rb9012;Rachel;Booker;Sales;Manchester
```

G Yes, I can understand this .csv data. It appears to be a table with 7 columns: Identifier, Access code, Recovery code, First name, Last name, Department, and Location. Each row represents information about an individual, with columns for their identifier number, access code, recovery code, first name, last name, department, and location.

In this case, only one person, "Rachel Booker," works in the Sales department, as indicated by the value "Sales" in the Department column.

**Let's say you need to find some very specific information that's located in an Excel sheet. This is another case when using ChatGPT could save you some time. Export your Excel sheet as a CSV file. Copy and paste some of the data into ChatGPT (unfortunately it's not possible to copy and paste the whole thing as there's still some content limitations to what ChatGPT can digest).**

**ChatGPT will explain the data and now you can start asking questions to help locate specific information that you need. ChatGPT can successfully locate and show you the information you are looking for, possibly saving you time and a headache doing the same with Excel.**

**Even though ChatGPT is super powerful and useful – the data or solutions it provides can sometimes be inaccurate. We advise you to always double-check and see if the answers provided are correct (and don't rely on ChatGPT for everything just yet!)**

# 13. **HISTORY OF MICROSOFT EXCEL**



# HISTORY OF MICROSOFT EXCEL

**1982**

Microsoft launched Multiplan, a spreadsheet program, a competitor to Lotus 1-2-3.

**1985**

Birthday of Microsoft Excel on Mac

**1987**

Excel 2.0: Birthday of Microsoft Excel on Windows

**1990**

Excel 3.0 Included toolbars, drawing capabilities, outlining, add-in support, 3D charts, and many more new features

**1992**

Excel 4.0 Introduced auto-fill. Also, an easter egg in Excel 4.0 reveals a hidden animation of a dancing set of numbers 1 through 3, representing Lotus 1-2-3, which is then crushed by an Excel logo.

**1993**

Excel 5.0: Introduction of Visual Basic for Applications (VBA), taking Excel to unprecedented levels of functionality

**1997**

Excel 97: Introduced the Office Assistant (Clippy) and included improvements to VBA.

# HISTORY OF MICROSOFT EXCEL

## 1999

Excel 2000: Introduced the Clipboard feature, allowing users to interact with and use multiple objects simultaneously.

## 2002

Excel XP (Part of office XP): Featured a new task pane, improved data validation, and added the AutoRecover function for better data protection.

## 2003

Excel 2003: Introduction of the List feature (precursor to Tables), which enabled easier data management, and improvements to data analysis tools.

## 2007

Excel 2007: Introduced the Ribbon interface, named variables, and Open Office XML file formats.

## 2010

Excel 2010: Introduced Power Query (add-in), enabling users to work with larger datasets, as well as Excel Web App and mobile version for Windows 7.

## 2013

Excel 2013: New start screen, 50 new functions, Flash Fill tool, recommended charts, and three new chart tools; design, layout, and format.

# HISTORY OF MICROSOFT EXCEL

## ● 2016

Excel 2016: Added the Ink Replay button, Shared with Me feature, and integration with Power BI for advanced analytics.

## ● 2017

Office 365 including Excel 365 version introduced which had all updates automatically incorporated once they are released.

## ● 2018

The release of Excel 2019 introduced new functions like CONCAT and TEXTJOIN, improved the Power Query Editor with M Intellisense, and added new data visualization options such as funnel charts and map charts. Introduction of the Dynamic Arrays for Office 365 users.

## ● 2021

Excel 2021, new functions introduced: LAMBDA & LET to define your own formulas.

## ● 2022

Release of additional dynamic array function kit (MAP, LAMBDA, SCAN, etc.)

## ● 2023

IMAGE function released, waiting: Microsoft Copilot for Excel (aka Clippy AI?)