

MICROSOFT

Excel

Expert

① REFERENCES; Cell references are of three types;

Relative = T 1 (Free column/row)

Fixed = \$T\$1 (Fixed c/r)

Mixed = \$T1 or T\$1

### Default Cell References (Excel)

⇒ Explicit = Ranges

⇒ Structured = Tables

## LOGICAL OPERATORS;

{ = ; > ; ≥ ; < ; ≤ ; <> }

## LOGICAL FUNCTIONS;

- IF; ch Logical Test, True, False
- IFS; multiple Logical Test & returns value corresponding to first TRUE condn.
- NOT; changes TRUE to FALSE & vice versa
- OR; Logical Test; returns true if one of condn is true
- AND; Logical Test; returns true if all condn's are true

✓ **SWITCH**: evaluates an expression against a list of values and returns the result corresponding to value.

e.g., SWITCH (C2), 1, "Tag", 2, "Tiku"

\* If value isn't available add "Not Available"

⇒ **USING IF FUNCTION**:

**NESTED IF**; If (logical test, If, True, False)

\* **IFS**; ① < ② < ③ >

**IF (NOT)**; IF (NOT (0>1), "Act", "InAct")

[ < > or NOT ]

**IF (OR)**; IF (OR x>2, y>3), "Yes", "No"

**IF (AND)**; IF (AND x=2, y=4), "Yes", "No"

"No"

## CONDITIONAL

## LOGICAL FUNCTIONS



- # SUMIFS = (Range, criteria, sum range)
- # AVERAGEIFS = (Range, criteria, sum range)
- # COUNTIFS = (Range, criteria) / (Range 1, C1, R2, C2)
- # SUMIFS = (sum Range, criteria Range, criteria 1)
- # AVERAGEIFS = (Average Range, Cx range, criteria 1)

## MAXIFS & MINIFS

2019

## EXCEL DATE VALUES

January, 1, 1940 (start of Date in excel)

Date value  
1

Ctrl + I => format cells.

Jan 2 1990 = ①

Jan 2 1990 = 12:00pm ②

⇒ Change Dates into numbers by simply change it to General (Always use 4 digit year)

f x / = Date

\* (use 4 digit year)

Imp Ques:

20170506

How will you extract this? (as date)

Pro Tip = Use left (Mid) Right.

= Date(Left(-), Mid(\_), Right(-))

[TODAY]; [Now];

↓ ↓  
[volatile & change]  
every Day

Today() with date  
Now() with time

Formulas - calculate now

Ctrl + ; = Date  
Ctrl + Shift + : = Time

Non volatile

Hard coded value.

## # SERIALIZATION FUNCTIONS

YEAR	MONTH	DAY
HOUR	MIN	SEC

Year() -- Lane:

WEEKDAY()

(Formats)

= 2 = #(1)(Mon → Sunday) (7)

(cell value) & (format) e.g. :

WORKDAY

(Start Date, 20 days, ) (after 100 days what was date)

Total Day ; A

Network Day

12/08/8 - 12/04

Start Date

/

Stop Date

> 90 days.

## ⇒ **MACROS**

(Merge & calculate recorded output)  
System

What is VBA?

③

VBA = Visual Basics for Applications

It is the programming language which Excel uses for MACROS

Enabling Developer options

Options - customize Ribbons - Developer

ctrl + shift + U = macros.

Needs to be saved as XLSM.

(Macro Enabled Workbook)

\* ctrl + Z won't Undo

Form Controls

light click for  
format control  
settings

## ⇒ **Lookup Functions**

VLOOKUP

HLOOKUP

INDEX

MATCH

XLOOKUP

IN NEW EDITIONS

FOR REPLACING (MATCH & INDEX) LOOKUPS

## VLOOKUP & HLOOKUP

(Left most column)  
(or top row)

\* The lookup value must be in the first row or column\* and in case of two duplicates available in sheet ; we can ~~hlookup~~ for get one in the highest row/ column order

VLOOKUP ( <sup>Lookup</sup> Value, Range, column no./ exact match),  
R.R.C row no.

## INDEX FUNCTION

Returns value of a cell

at the intersection of a particular row & column in a range/ ranges

1	2	3
4	5	6
7	8	9
10	11	12

reference, row no., col no.

$$(1:12, 3, 3) = 9.$$

1D

## MATCH FUNCTION

is somewhat similar to  
VLOOK / HLOOKUP

(Lookup value, array, <sup>lookup</sup> match type)  $\in \{0, 1, -1\}$

\* one dimensional

takes only one column / row.

" To find position of specified value  
within one dimensional lookup Array).

## XLOOKUP

\* Searching from bottom, wildcard matching.

## COMBOS OF INDEX / MATCH FUNCTION:

are commonly used together to act as a versatile lookup function

Index (Array,

APPROXIMATE MATCH; \* Ascending order\*

VLOOKUP = Lookup value, array, row no. App. max)

## FINANCIAL FUNCTIONS

NPER

&

PMT

1. NPER; returns, is the number of periods for a loan based on constant payment / interest rate

$NPER = \text{RATE, PMT, PV, } \downarrow \text{ FV, [TYPE]}$   
 $\uparrow \text{Interest rate} \quad \uparrow \text{Payment} \quad \downarrow \text{Present value} \quad \text{End of payment period}$

\* Time unit must be same e.g.,

monthly payments = monthly Interest Rate

2. PMT; returning periodic Payments for a loan based on fixed period and a constant interest rate

$PMT = (\text{rate, nper, pv}) \text{ [type]}$

Multiply by  $\times (-1)$ .  
(End of payment period)

\* Payment will be in Red / negative.

## SCENARIO

## MANAGER

⇒ DATA ANALYSIS TOOLS  
allows you to save and access specific combinations of cell values;

(Data > what if Analysis > scenario manager)

\* Give understandable names to sm.

different combinations of values for profit rate period Down payment

\* change cell Address to Names

(Add multiple scenarios)

## CONSOLIDATE

DATA; can summarizes (two) separate ranges into single output Range < Data → consolidate)

By position

By category

## GOAL SEEK

allows you to find a result in a formula by changing the value of a given input cell.

To find profit =  $x(1 - \text{other costs})$

"Seeking the desired Goal"

Target cell, value profit, (By changing) cell

## FORMULA AUDITING

# FORMULA AUDITING;

(5)

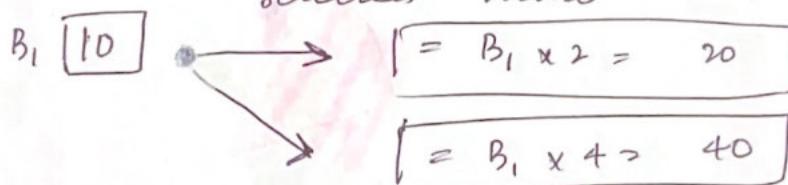
(tool allows you to troubleshoot formulas by tracing references, evaluating calculations and diagnosing errors.)

(Formula > Formula Auditing)

- Trace Precedents; shows cells that impact the selected value



- Trace Dependents; shows cells that are impacted by selected value



- Show formulas; Shows temporarily all the formulas

- Error checking; checks for error in whole sheet.
- Evaluate Formula; Evaluates each component of formula.

- Watch window; pinning the formula in any sheet.

MANAGING  
&  
FORMATTING  
DATA.

## Topics:

- Number Formatting
- Data Validation
- Groups & Subtotals
- Remove Duplicates
- AutoFill / Flash Fill
- Conditional Formatting

⑥

## Custom Number Formats:

can contain upto 4 conditions, separated by semi colons ( $A; B; C; D$ )

- $A = +ve$
  - $B = -ve$
  - $C = \text{zero's}$
  - $D = \text{Tent}$
- { No.s } (copy previous custom format & edit it)

# 0 ?  $\Rightarrow$  Holds place for digit

,  $\Rightarrow$  sets location of decimal/ separator

%  $\Rightarrow .96 = 96\%$  (multiplies by 100)

(  $\Rightarrow * / * * = .65 = \frac{13}{20}$  (Fraction Separator)

-  $\Rightarrow$  (Space)  $= \$ - 1000 = \$ 1000$

" "  $\Rightarrow$  Inserts Tent

@  $\Rightarrow$  Displays cell Tent

[ ]  $\Rightarrow$  Displays cell contents in colour. [Red]  $\Rightarrow$

Setting  $\rightarrow ^+$  Blue / Green / Red  $\rightarrow ^-$   $\rightarrow ^0$

$\Rightarrow$

## Restrictions



### Data Validation;

set limit to value to be entered

allows you to limit the values a particular cell will accept (whole nos., ranges, dates etc.)

\* The list option is used to create a drop down menu.

Data > Data Validation (list).

10%, 20%, 30%.

or select cell.

=> whole number => won't accept in .decimals

Settings

— [Input message] - [Error]

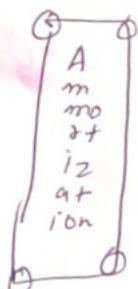
$\left\{ \begin{array}{l} \text{STOP} \text{ (won't allow)} \\ \text{WARNING (continue?)} \\ \text{Information (Allows)} \end{array} \right.$



### Group / Ungroup Data;

Group ; is used hide selected rows or columns from View (Data > Group) (+/-).

Ctrl + 8 → (To hide or show)  
Toggle buttons



(P)

=> Sub-Totals & Totals; \* can't use min/max.

Sub-Total = Summary of our Data

\* For sorted Tables/Ranges.

Data > Subtotal



=> Remove Duplicates; only unique values

Data > Removing Duplicates

[AMORTIZATION TAB]

(Categorize data on basis of sumif & MIN/MAXIF)

=> AUTO Fill / FLASH FILL; Automatic fill

Right click → Add Month

Series      Fill

1, 2, 3

Flash Fill; fill one or two cells and then flash fill

"Flash fill uses any pattern and then fills accordingly"

=> Advanced Fill Series; Right click  $\rightarrow$  series

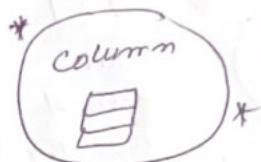
Linear = (+ -) Step value

Growth = (\*) Step value

Date = in series (Day, month, year).

(Home  $\Rightarrow$  Editing > Fill > series)

(Right click and Drag)



=> Conditional Formatting; To;

- \* extract meaningful insights.
- \* identify patterns.
- \* Trends at a glance.

meaningful insights  
patterns.  
Trends

- \* Highlight cells \* Top/Bottom
- \* Data Bars \* Color Scales
- \* Icon sets

=> Formula Based Conditional Formatting;

(Next Page)



## FORMULA BASED FORMATTING

X



- Formula-driven rules to format - cells
- Using reference types are crucial (relative / fixed)  
(Use a formula to determine which cells to format)
- is equal to  $\$B\$1 = \$C1$
- Use in case of conditions return the value of True.



## MANAGING CONDITIONAL FORMATS;

### Conditional

### Formats;

clear Rules > Deletes all Rules

In case of Bars (( Show Bars only \* )  
excludes no.s)

• Editing Rules;

color, font etc



• changing order of c. formating

1st format; overlays other formats

\* PRO TIP \* (iii) (To Invisible in custom formats).

## => MAKING OF A HEAT MAP

Select Values → conditional formatting  
(color scales)

ctrl + l → (iii)

(invisible)

Double click format painter

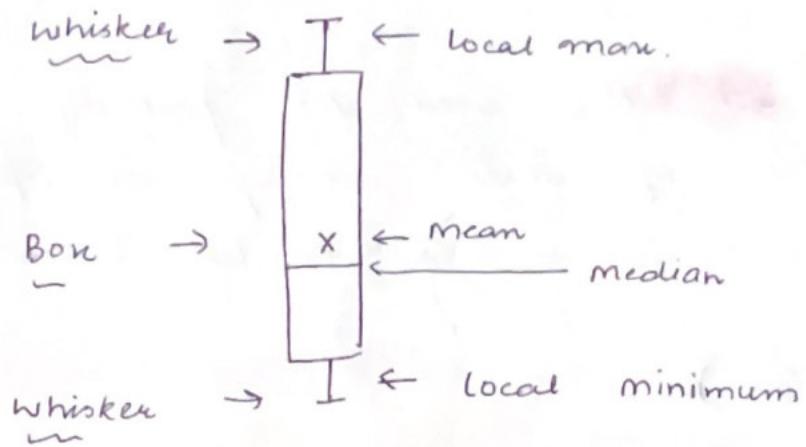
Paste formats on other  
Tables.

ADVANCED  
CHARTS  
&  
TABLES . . .

## ⇒ ADVANCED CHARTS;

(a)

1. Box and whisker charts; to visualize the statistical characteristics of a Data set



**Pro Tip:** Quantiles are calculated by excluding the median;

(Room Type / price)  
AIRBNB DATA.

Select Data

Room & prices ⇒ (Right click  
move to other tab)

\* Press Alt + F to Auto Fit in columns / Rows.

2. Histograms; are used for showing the distribution of a continuous, numerical data set

Histograms = Frequencies (Air BnB) use

Column

chart = Volume.

\* Format Axis >

(0.1) Binwidth = Axis options = underflow

2019.

### 3. FILLED MAPS; Location Based Data.

(Host country = Remove duplicates  
copy)

(Country = Hosts).

### 4. COMBO CHART; used for plotting 2 or more series of data using multiple chart types within a single visual.

(Host Tab).

(Year / superhost).  $\Rightarrow$  custom combo chart.

① run (Apostrophe in beginning).

### 5. TREE MAPS / SUNBURST CHARTS;

are used for visualizing hierarchical data with natural groups and subgroups.

.) Tree Maps = For visualizing 1 or 2 HL's

.) Sunburst Charts = For visualize depth of multiple hierarchical levels.

\* Data should be Grouped & sorted before creating any hierarchical charts

(Neighbourhoods = AirBNB) => sumbutton

District / neighbourhood / ① count column (For equal dist)  
Add =

Tree map ;

District / neighbourhood / count

Places (from places tab)  
Add =

6. **WATERFALL CHARTS**; are used for showing the net value after a series of positive and negative contributions.

e.g., (Corporate Balance Sheet).

(# use subtotals to create check points and split certain types of Gains / Losses)

(mortgage calculator) AIRBNB

\* Set as total option  
= = - >

7) **FUNNEL CHARTS**: are used for showing progress through the stages of funnel.

# Conversion funnel;

Add %age

conversion steps & %age.

### USAGE:

- 2) LINE CHART; Trends
- 2) Bar Graph; comparison
- 2) Pie chart; composition
- 2) Relation; Scatter plot

# PIVOT TABLES; (Raw data)



- most powerful tools for Data Analysis
- Allow us to filter, summarize and analyze information without modifying raw data
  - \* used for single data: Range
  - 1. where headers are clearly mentioned
  - 2. Dimensions = group/filter data. (Row / column)
  - 3. Measures = Numerical fields (Aggregation)

- OPTIONS:
  - Deferr to stop updates  
(Automatic Updates)

Pivoting Table Views (Columns / Rows).

\* Summarize Value by option

R+ click + Σ value by Avg, sum

OR

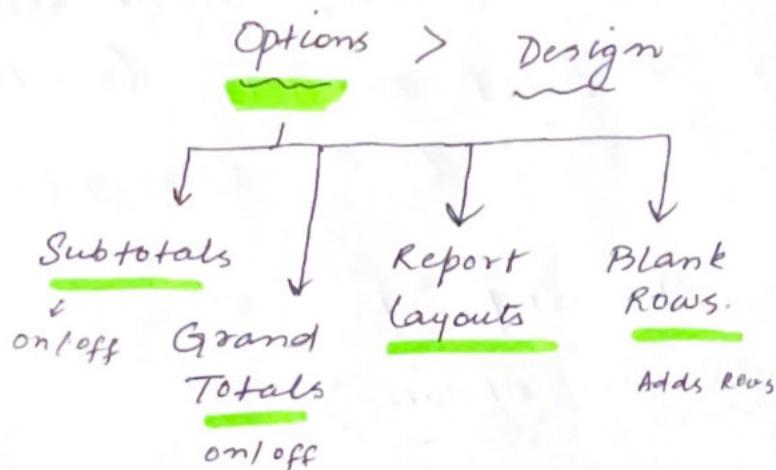
Value Field settings

\* Show values as options

Right click on pivot Tool.

## \* ANALYZE & DESIGN PIVOT TABLES;

1. Analyze Tab = supplement data Analysis
  2. Design Tab = layout & styl.
- \* Report Layouts;



- \* Number Formatting > Pivot tables  
at click on any cell and select  
NF.

\* Values > Value field settings > Number Format.

\* Pivot Table Options;

- For error values ; show  NO
- For empty cells; show  0

## \* Sorting & Filtering;

(12)

Sort ;

A - Z

Z - A

} More Sort options

Filter ;

can be filtered manually  
or by using

et  
click  
Label  
Filters

et  
click  
Value  
Filters

(For Text  
Strings)

(Numbers)  
Numerical  
Values

\* For multiple filters ; } Allow in  
Pivot Table Options }

# Always have Report in Outline Form

## \* Slicers & Timelines;

Slicers = User friendly Pivot table filters

Timelines = are slicers set specifically  
designed to work with date  
fields.

Pivot Table  
Analytic  $\Rightarrow$  Add Slicer.

multi select	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
--------------	-------------------------------------	-------------------------------------	-------------------------------------

Pivot Table  
Timeline  $\Rightarrow$  Adds only Dates

year
Q's
Days

\* Grouping Text Fields;

Right click = Group } For Text  
or  
Pivot Table < Analyze } Value fields

\* Grouping Numerical Fields; (Should be Numerical)

1	4
3	2
6	3
12	14

Rt click  $\rightarrow$  Group

~~Starting at = 1  
Ending at = 12  
Group by = "3" points~~

\* Make sure to ungroup the values otherwise they will be treated as text values.

## # Grouping Data Fields;

\* Excel may group dates automatically

\* Group Data fields are used

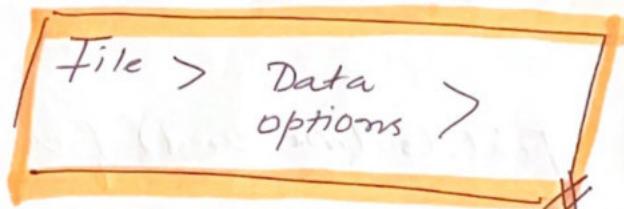
Dates  $\longleftrightarrow$  (months, Quarters & years)

Roll Data

into

Putting it (Date) into pivot fields.

\* For Disabling Auto Grouping



\* By Default excel groups Dates by  
Years / Months / Quarters.

Manually Grouping Data Fields



Group field

(Years / Q's / m's)  $\Rightarrow$  - (Collapse)  
Days etc.

measures  $\leq$  (only summation)  
④ Calculated Fields; allow you to  
create measures based on existing  
numerical fields;

\* we can add formulas in  
existing numerical fields (Automatically  
new column) gets created.

Pivot Table Analyze



Fields, items & sets



calculated Fields (not used) { creates duplicate }  
fields

N.Imp.

\* Calculated Items; allow you to  
create new dimensions based on  
existing categorical fields

Pivot Table Analyze



Fields, items & sets



Calculated Items

X  
Not used most of the times

**PIVOT CHART**; is a regular excel chart which is dynamically tied to a Pivot Table.

\* **NOTE**; All tables in a pivot Table will be visible in Pivot chart

**Field Buttons** allow you to apply or adjust filters directly within a Pivot chart.

### **PIVOT CHART FORMATTING**;

Same { Edit in Design Tab }

chart style no. (7) } Important.

Layout = quick layout no. = (2).

Format { Data Labels / }  
 { Data Series }.

## ① Expanding & collapsing;

Right click on the chart / Table

Expand / collapse

for

extra News.

# WORKBOOK OPTIONS & SETTINGS

( WORKBOOK      OPTIONS      & )  
 SETTINGs

- \* Managing Macros (Enabling / copying).
- \* Linking workbooks ✓
- \* Protection & Recovery
- \* Comments
- \* Calculation Modes
- \* Language options

Common      Use      Cases

1. Limiting user interaction to specific inputs on cells.
2. Avoiding constant recalculations in large files
3. Recovering earlier versions of workbooks
4. Communicating with colleagues within the content of the workbook directly.

① (+) Managing Macros;  
⇒ Enabling Macros;

Warning



Go to Info ⇒ Enable content

or

Developer ⇒ Macro Security



Copying Macros to Other Files;

\* Macros Problem;

"This workbook" ⇒ means they will not work properly in other workbooks unless macro itself is copied.

\* To make macros available for all workbooks, you can choose to store them in personal Macro Workbook.  
(PERSONAL.XLSB)

( Macros can be viewed inside a Modules in Visual Basics Editor. )

(16)

VBA

||

Open ( Multiple worksheets )

||

Copy macros in other

Sheet { Modules }

||

Drag macros from workbook 1  
to workbook 2.

Saving Permanently in Personal Workbook

( PERSONAL.XLSB ).

||

Record - Save as personal.

II

## Linking Data Across Workbooks

Linking data between 2 sheets  
However if we update the source sheet;

e.g., Parent sheet (update)  
" child sheet (update)

To update manually

Go To  $\Rightarrow$  Data  $\Rightarrow$  Edit links

Imp;

Break links

Data  $\Rightarrow$  Break links

As the name suggests, our sheet will be no longer linked to references from other sheets. only hard coded values.

III

## Protect Worksheets

Select All  $\Rightarrow$  Ctrl+1  $\Rightarrow$  Protection (locked)

Go to  $\Rightarrow$  {Protect} in {Review} Tab \* protection wont be active unless sheet is protected in Review Tab.

(Locked) = Don't allow editing

(Hidden) = Keep formulas hidden as well.

## \* Selective Cell Protection

(17)

Select Cells  $\Rightarrow$  Ctrl + 1

||

Protect Sheet.

$\Leftarrow$  Protect / hide

## \* Password Protection

Allow Edit Access  $\Rightarrow$  Select cell

||

Confirm pw.  $\Leftarrow$  choose pw

\*

Protecting &

Encrypting

Workbooks;

(Moving / Rename)

For saving manipulating and deletion  
of different work sheets

Review  $\Rightarrow$  Protect workbook  $\Rightarrow$  Protects basic structure  
of the workbook.

Encrypting;

File  $\Rightarrow$  Info  $\Rightarrow$  {password}  
{protect}

\* Mark as final;

Shows the message that  
edit has been finalized

File  $\Rightarrow$  Info  $\Rightarrow$  Mark as final

## # Recovering Workbooks;

Auto Recover Option; Frequency

File => Options => Save =  minutes

Problem ; After enabling macros / Ctrl + Z  
won't work;

So, we will use { Auto Recover option }

File => Info => choose any (Auto Recover option)

Restore

IV

## # Managing Comments;

We can add a comment and a reply  
to that comment can also be mentioned.

Review => Comments section

{ New comment  
Delete thread  
Reply }      

⑩

Formula

Calculation

Modes

⑪

MODES (Formulas => calculate)  
options



Automatic

" "

Automatically  
calculates

Imp

Manual

" "

manually  
press {calculate now}

F9 " "

\* Enabling Iterative Calculation

File => options => Formulas

" "

Enable Iterative Calc. ← Calculation Option

⑫

Language

Options;

Translate => {Review Tab}

{Proofing Opt  
Accented uppercase  
custom dict}

Change language

File => options => Language

Office display language = preferred

Imp;

Office Authoring language = (Add a language)  
and proofing

## (\*) SAVE FILE EXTENSIONS;

- XLS = pre 2007
- XLSX = post 2007
- XLSM = MACROS ENABLED.

## (\*) EXCEL SHORTCUTS;

TABS Home Tab = Alt + H

INSERT Tab = Alt + N

PAGE LAYOUT Tab = Alt + P

DATA Tab = Alt + A

VIEW Tab = Alt + W

FORMULA Tab = Alt + M

REVIEW Tab = Alt + R

DEVELOPER Tab = Alt + L

HELP Tab = Alt + Y.

## Ctrl TASKS

Open Spreadsheet = Ctrl + O

Close Spreadsheet = Ctrl + W

Save " = Ctrl + S

COPY / Paste / Cut = C / V / X

Undo / Redo = Z / Y

Bold / Italic / Underline = Ctrl + B, I, U

$\text{Ctrl} + \text{G}$  = Group / ungroup

$\text{Ctrl} + \text{H}$  = hide selected Rows

$\text{Ctrl} + \text{O}$  = hide selected columns.

$\text{Ctrl} + \text{L}$  = (Table).

$\text{Ctrl} + \text{+}$  = insert column.

AUTO SUM

$\text{Ctrl} + \text{H}$

\* COUNT  $Fx =$  only counts cells that contain Numbers.

\* AUTO SUM = can be infallible.

(\*) CELL STYLES; choose your style for cells you want.

(\*) SMARTART; Adding sub category by pressing Tab key. { Demote / Promote }

(\*) PIE CHARTS; can handle single column or row of a data.

(\*) Print Lines; Anytime we go to print; we can see dotted lines on the extreme ends of our pages.

-----  $\Rightarrow$  page break

(\*) Page layout (View)  $\Rightarrow$  Adjust Data for print.  
(Scaling the data)

(\*) Creating a Template; To create a Template; we click on worksheet and move to other workbook (new) and save it there. as an excel Template.

(II)

(\*) Conditional Format To FIND Duplicates;

=> CF => Find Duplicates / Uniques

(#) DATA BASE FUNCTIONS;

DSUM;

!!

Criteria

Column
Category
Category

① => Should be mentioned separately (V.V. Imp)

② Database, Field, Criteria

!!

position of column

Column
a <sub>1</sub>
b <sub>1</sub>

=> [ OR CRITERIA ]

Column x	Column y
c <sub>1</sub>	c <sub>2</sub>

[ AND CRITERIA ]

Also;

DAVERAGE; DMIN / DMAX; DCOUNT

(\*)

## DCOUNT

= Two types

1. DCOUNT = for numerical fields

2. DCOUNTA = For non numerical fields

(#)

## SUBTOTAL ( )

[works on ranges only]

V.V. Imp

(operation & )

Reference

(\*)

## IMPORTING DATA INTO EXCEL;

DATA

=) Get Data =)

Text / CSV

or Transform Data

Get Data from sources like

{ 1. File 2. Database 3. Azure 4. Online Services }  
5. Other sources or servers { SQL }  
{ Access }

(#)

## LEGACY WIZARDS

=) To Turn on

{ old }

{ Import wizard. }

From Access legacy

From Text legacy

(\*)

## EXPORTING DATA on WORKSHEET AS

A TEXT FILE ; (open with notepad).

Text file delimiters

Comma

THOUSANDS

Tab,

PERCENT

Semi colon

MINUS

COLA

PERIOD

{ Relations b/w  
two or more  
relative data  
models }

POWER

PIVOT

(To create Data  
models)

III

Available : MS 365, 2019, 2016, 2013

(Powerful Data Analysis Tool)

How to Enable => Options

(Go) !!

V.V.MP Com Addins (= Add ins)

# Creating Data model; can contain  
multiple worksheets Data

click on sheet => {Add to data  
model}

①  
②

If we got two worksheets somewhat  
related to each other, we will use  
Power pivot Tool (Data modeling).

DIAGRAM VIEW

choose a Parent Table 1

" " child Table "

Drag a line of relation;

DATA VIEW

creates some relation by  
selecting same columns.

Right click on header and  
Select "Create a Relationship"

## PIVOT TABLE

on power pivot tab.  
with relations selected

N-imp.

**KPI** = key performance Indicator;

Data Table  $\Rightarrow$  sum  $\Rightarrow$  kpi

Measure  
~~~~~

Very similar to conditional formatting

④ PRINT OPTIONS FOR LARGE SETS OF DATA

• Print Titles  $\Rightarrow$  Repeat Rows at Top.

• Set page order.

Print Titles

④ LINKING WORKSHEETS (3D FORMULAS)

OPERATIONS ACROSS MULTIPLE WORKSHEETS  
WITH SAME CATEGORY but different Data

(= sheet 1 a1, + sheet 2!a1).

④ CONSOLIDATE;

use labels in Top row /

left column.

④ **FORMAT AS TABLE**, At the extreme below we get drop down of operations like sum, average, product.

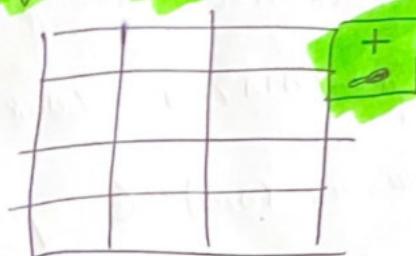
Total Row

!!

filters at bottom

⑤

Editing charts



← use this to remove or add things

⑥

Name Ranges  $\Rightarrow [A_1:A_{10}] = \text{Name1}$  or week1  
(Disadvantages with References) (no spaces)

⑦

NAME MANAGER  $\Rightarrow$  (Names Given to cells)  
formulas  $\Rightarrow$  (Modify / Delete)

⑧

IF ERROR  $\Rightarrow$  IF ERROR (VLOOKUP), "value"

⑨

VLOOKUP  $\Rightarrow$  lookup value should be in 1st column.

Disadvantage: { should lookup value  
Limitation } be on very 1st value }

!!

MATCH / INDEX

function does same lookup function as VLOOKUP but without limitations.

INDEX = Value at INTERSECTION of Row / column  
MATCH = Position of value (1D)

# COMBINED INDEX / MATCH; Due to the

\* Limitation of column index / 1st value in column in (VLOOKUP)

⇒ INDEX / MATCH is a versatile lookup fn.

IN CASE OF INDEX / MATCH LOOK UP

CONSIDER INDEX (column, row) ∈ PRO TIP

V.V.Tip = ; { First choose elements of column }  
{ Second choose elements of row }

Cut column; Ctrl + X ⇒ Rt click and paste cut cells.

# LEN() = Length of characters in a cell.

# V.V.Tip SEARCH( ) " A1

use of (LEFT & SEARCH) for first name

use of (RIGHT (len() - Search)) for last name.

# CONCATENATE,

Add 1ST & LAST Names Together

• But Add " " in 2nd Name.

## ④ Protecting Worksheet without some cells

Select  $\Rightarrow$  Cells  $\Rightarrow$  unlock and  
(Data formating)  
Protection protect the worksheet.

PRO TIP: by default; all cells are locked.

## ⑤ PASSWORD PROTECTING WORKBOOK;

(file  $\Rightarrow$  Info  $\Rightarrow$  Encrypt with the password)

⑥ PMT() = Add - before PMT e.g. -PMT(...)

## Limitation:

only one cell can be changed in order to change value in other cells.

V.Imp  
SOLVER

⑦

## SOLVER TOOL;

Multiple Goal seeks.

Activate = Options = Excel Add ins

{High level alternative for Goal seek with multiple options}

STEP ①: Set an objective for min<sup>↗</sup> (cell) by changing set of cells;

example:

(Salary to min) by changing salaries of salespersons based on multiple criterias

④ **DATA TABLES**; are ways for us to  
integrate values into the calculation  
\* without changing formulas \*

example

(PMT Function) 8%.

other %ages;

7%.  
9% } column in ?  
10% } Data Tables } select by  
Rate 8%

we can Single or multi-level Data Table.

### SINGLE DATA TABLE

"

Column Input cell or Row "

### MULTI DATA TABLE

"

Both row and column input cells.