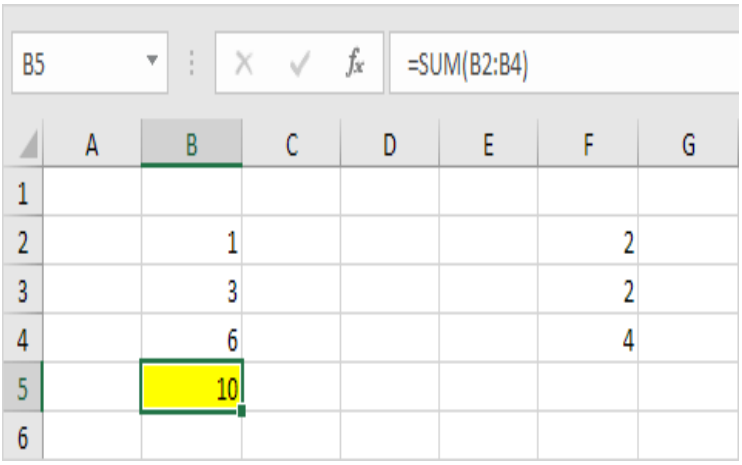
5- SQRT(number): Returns a positive square root.

6- MOD(number, divisor): Returns the remainder after number is divided by divisor. The result has the same sign as divisor.

Paste Options

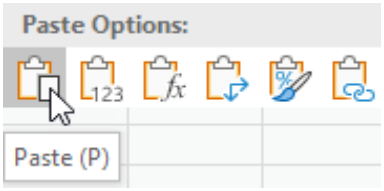
Copying and Pasting data is one of the most performed actions in Excel. There is a lot more to copy-pasting then simple Control + C and Control + V, this example illustrates the various paste options in Excel. Cell B5 below contains the SUM function which calculates the sum of the range B2:B4. Furthermore, we changed the background color of this cell to yellow and added borders.

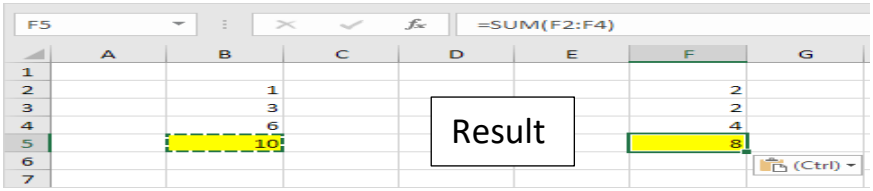


A- Paste: The Paste option pastes everything.

1.Select cell B5, right click, and then click Copy (or press CTRL + C).

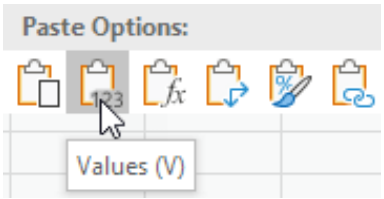
2.Next, select cell F5, right click, and then click Paste under 'Paste Options:' (or CTRL + V).

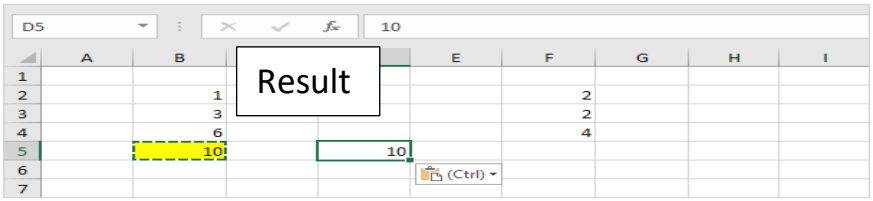




B- Values: The Values option pastes the result of the formula.

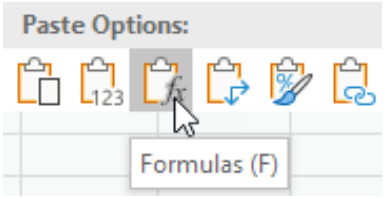
a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell D5, right click, and then click Values under 'Paste Options:'

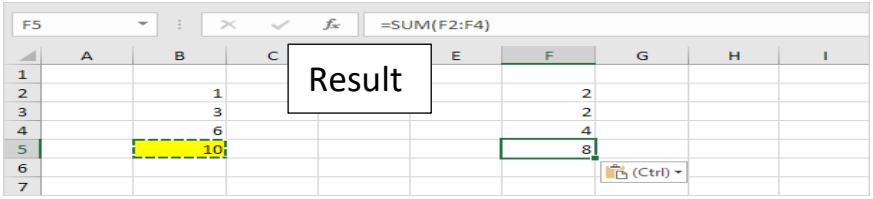




C- Formulas: the formula option only pastes the formula.

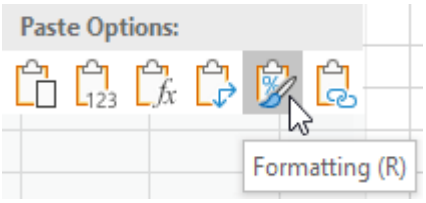
a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell F5, right click, and then click Formulas under 'Paste Options:'

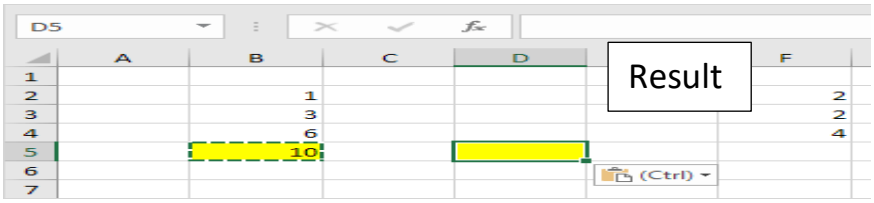




D- Formatting: The Formatting option only pastes the formatting.

a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell D5, right click, and then click Formatting under 'Paste Options:'

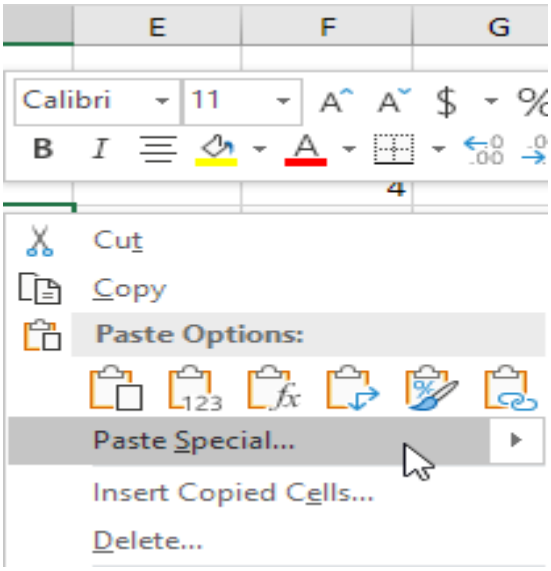


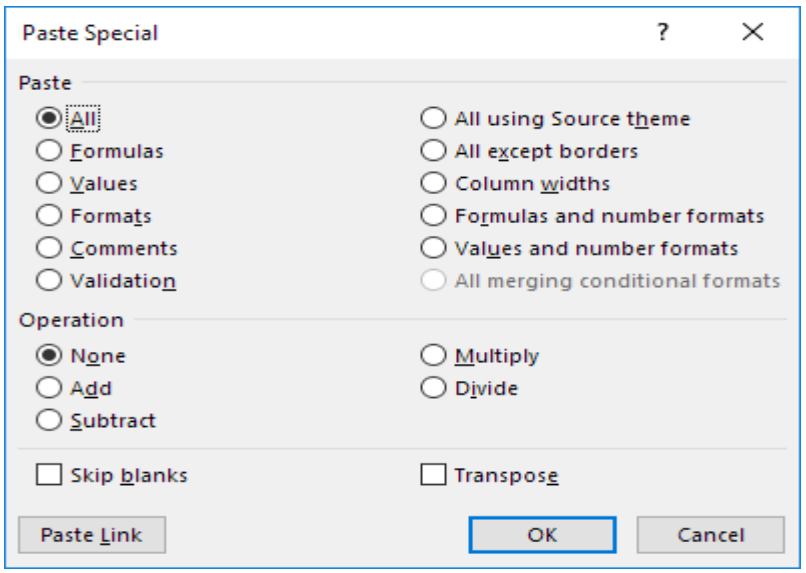


Note: The Format Painter copy/pastes formatting even quicker.

E- Paste Special: The Paste Special dialog box offers many more paste options. To launch the Paste Special dialog box, execute the following steps.

a. Select cell B5, right click, and then click Copy (or press CTRL + c).
b. Next, select cell D5, right click, and then click Paste Special.





Paste Special - Operations.

Operations options give you a quick way to perform the given operations without applying a formula or directly changing the cell contents.

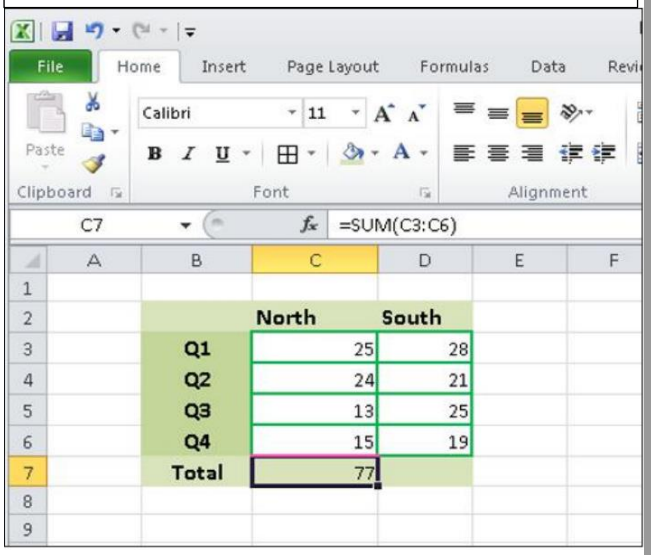
Skip Blanks: This would skip copying and pasting the blanks. A practical use if this could be when you have data split into 2 columns and you want to combine it in a single column.

Transpose: As the name suggests, if this is checked, it transposes the data when you paste it.

Cell Reference

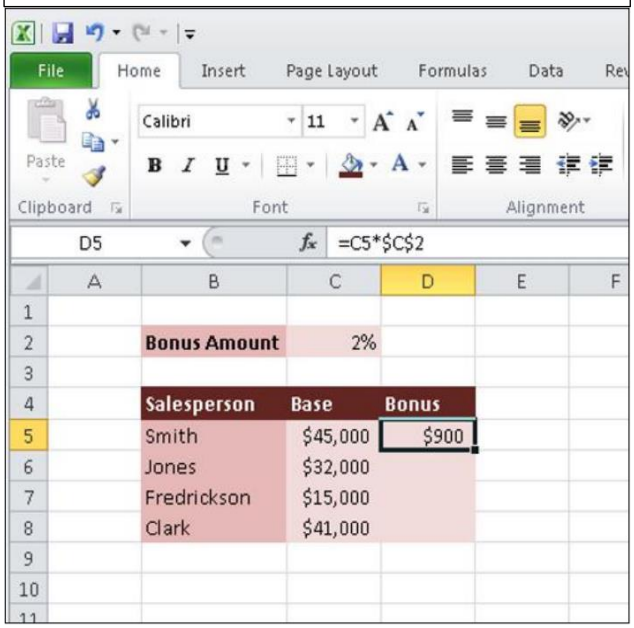
When you move or copy cells that contain references to other cells, such as a formula that references another cell, those references are relative. Excel will change the cell references to match the relative positioning in the new location. An example will make this clearer. Suppose as shown in Figure 1 below, you have a function in cell C7 that adds up the amounts in cells C3 through C6. The function looks like this: C7> =SUM(C3:C6).

Figure 1



Now suppose that you click the Copy button on the Ribbon, click cell D7, and click the Paste button on the Ribbon. The formula is copied to D7. However, the copied version appears like this: D7>=SUM(D3:D6). Excel has assumed that the references to the cells in column C in the original formula were context-sensitive. It assumed that what you really wanted was to sum the values in the four cells immediately above D7, rather than to sum the cells in column C. And, in this case, it is right. That's called a ***relative reference***.

Figure 2



The alternative to a relative reference is an ***absolute reference***, which never changes no matter where you copy it. For example, in Figure 2, cell D4 contains a formula that multiplies the base amount in C5 by the bonus percentage in C2. When that formula is copied into D6:D8, you want the copies to update the references to the base amounts, but you don't want the reference to the bonus amount to change. Therefore, ***you make the reference to C2 an absolute reference by placing dollar signs before the column letter and before the row number***, like this: C2. An absolute reference does not change, no matter where you copy it.

A ***mixed reference*** is a reference that is partially absolute and partially relative. For example, $C2 makes the column absolute but keeps the row number relative, and C$2 does the opposite.

TIP: You can press F4 to toggle among the reference types (absolute, mixed, and relative) for a selected reference.

IF Function in M.S. EXCEL

The IF function is one of the most popular functions in Excel, and it allows you to make logical comparisons between a value and what you expect.

So, an IF statement can have two results. The first result is if your comparison is True, the second if your comparison is False.

Syntax

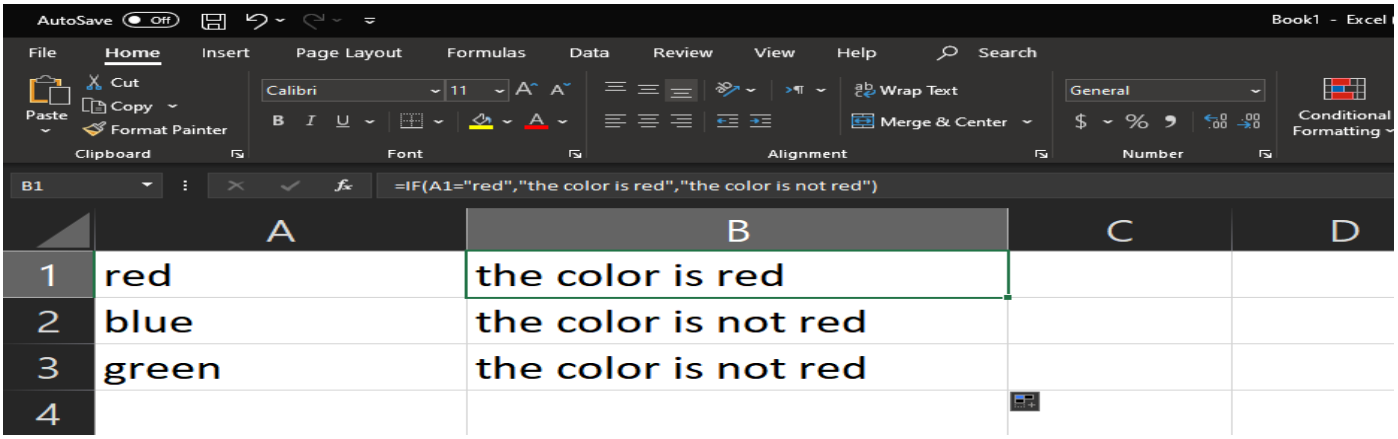
IF(logical_test, [value_if_true], [value_if_false])

For example: check the value of C2 and return 1 if is a “yes” and return 2 otherwise.

Sol: =IF(C2 = ”Yes” , 1 , 2) says IF(C2 = Yes, then return a 1, otherwise return a 2).

Another example: check if the cells A1:A3 contain the text “red” and return *the color is red if true* and *the color is not red otherwise*.

Sol: **=IF(A1=”red” , “the color is red” , “the color is not red”).**



Nested IF Function in M.S. EXCEL

It is possible to nest multiple IF functions within one Excel formula. You can nest up to 7 IF functions to create a complex IF THEN ELSE statement.

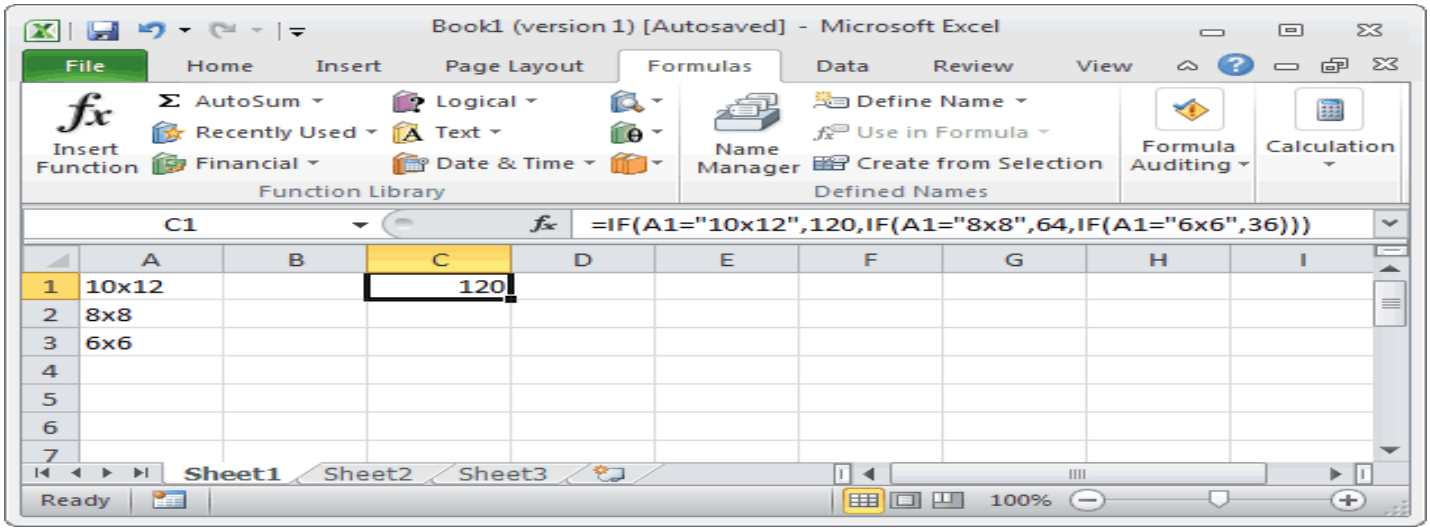
Syntax

The syntax for the nesting the IF function is:

IF(condition1, value_if_true1, IF(condition2, value_if_true2, value_if_false2))

Example

Let's look at an example to see how you would use a nested IF and explore how to use the nested IF function as a worksheet function in Microsoft Excel:



Based on the Excel spreadsheet above, the following Nested IF examples would return:

=IF(A1="10x12",120,IF(A1="8x8",64,IF(A1="6x6",36)))

Result: 120

=IF(A2="10x12",120,IF(A2="8x8",64,IF(A2="6x6",36)))

Result: 64

=IF(A3="10x12",120,IF(A3="8x8",64,IF(A3="6x6",36)))

Result: 36

If there is an even number of values in a distribution, then there will be two middle values. **In that case the average of those two values is the median**.

The ***Mode*** is the most frequently occurring value. The mode of the distribution [3 5 7 5 6 8 9] is 5, because 5 occurs most frequently (twice, all other values occur only once).

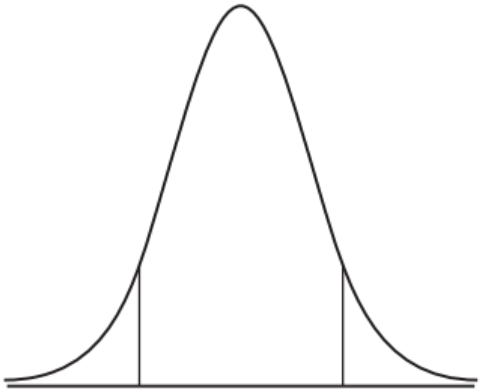
Measures of Variability Around the Mean

The ***Variance*** is the sum of squared deviations from the mean divided by N − 1. The variance for the distribution [3 5 7 5 6 8 9] (the same numbers used above to illustrate the mean) is: $[(3–6.14)^2 + (5–6.14)^2 + (7–6.14)^2 + (5–6.14)^2 + (6–6.14)^2 + (8–6.14)^2 + (9–6.14)^2]/6 = 4.1429$ Variance is used mainly for ***computational purposes***.

Standard deviation is the more commonly used measure of variability. The Standard deviation is the positive square root of the variance. For the distribution [3 5 7 5 6 8 9], the standard deviation is the square root of 4.1429, or 2.0354.

Measures of Deviation from Normality

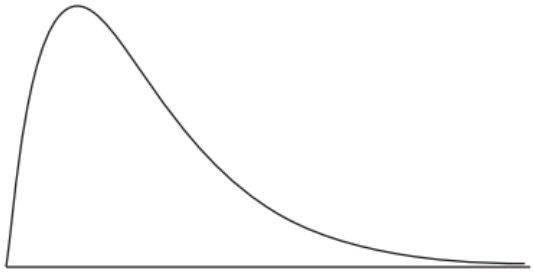
Kurtosis is a measure of the “peakedness” or the “flatness” of a distribution. A kurtosis value near zero (0) indicates a shape close to normal. A positive value for the kurtosis indicates a distribution more peaked than normal. A negative kurtosis indicates a shape flatter than normal. An extreme negative kurtosis (e.g., < −5.0) indicates a distribution where more of the values are in the tails of the distribution than around the mean. but a value between ±2.0 is in many cases also acceptable, depending on the particular application. Remember that these values are only guidelines. In other settings different criteria may arise, such as significant deviation from normality (outside ±2 × the standard error). Similar rules apply to skewness.



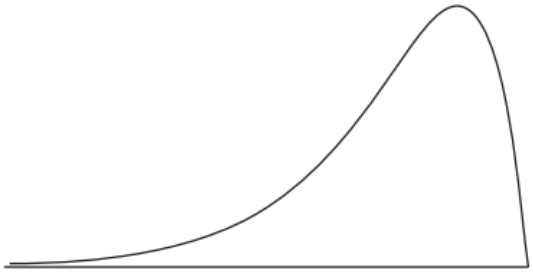
Example of positive kurtosis

Example of negative kurtosis

Skewness measures to what extent a distribution of values deviates from symmetry around the mean. A value of zero (0) represents a symmetric or evenly balanced distribution. A positive skewness indicates a greater number of smaller values (sounds backward, but this is correct). A negative skewness indicates a greater number of larger values. As with kurtosis, a skewness value between ±1.0 is considered excellent for most psychometric purposes, but a value between ±2.0 is in many cases also acceptable, depending on your application.



Example of positive skewness



Example of negative skewness

Measures of Size of the Distribution

For the distribution [3 5 7 5 6 8 9], the Maximum value is 9, the Minimum value is 3, and the Range is 9 − 3 = 6. The Sum of the scores is 3 + 5 + 7 + 5 + 6 + 8 + 9 = 43.

Measures of Stability: Standard Error

SPSS computes the Standard errors for the mean, the kurtosis, and the skewness. Standard error is designed to be a measure of stability or of sampling error. The logic behind standard error is this: If you take a random sample from a population, you can compute the mean, a single number. If you take another sample of the same size from the same population, you can again compute the mean—a number likely to be slightly different from the first number. If you collect many such samples, the standard error of the mean is the standard deviation of this sampling distribution of means. A similar logic is behind the computation of standard error for kurtosis or skewness. A small value (what is "small" depends on the nature of your distribution) indicates greater stability or smaller sampling error. $\boldsymbol{the\ standard\ error\ formula\ is\ SE = \frac{\sigma}{\sqrt{N}}}$

Crosstabulation and X^2 Analyses

THE PURPOSE of crosstabulation is to show in tabular format the relationship between two or more categorical variables. Categorical variables include those in which distinct categories exist such as gender (female, male), place of residence (urban, suburban, rural), responses (yes, no), grades (A, B, C, D, F), and many more. Crosstabulation can be used with continuous data only if such data are divided into separate categories, such as age (0–19 years, 20–39 years, 40–59 years, 60–79 years, 80–99 years), **total points** (0–99, 100–149, 150–199, 200–250), and so on. While it is acceptable to perform crosstabulation with continuous data that has been categorized, it is rare to perform chi-square analyses with continuous data because a great deal of useful information about the distribution is lost by the process of categorization. For instance, in the **total points** distribution (**above**), two persons who scored 99 and 100 points, respectively, would be in the first and second categories and would be considered identical to two persons who scored 0 and 149 points, respectively. Nonetheless, crosstabulation with continuous data is often used for purposes of data description and display. The SPSS command Crosstabs and the

subcommands Cells and Statistics are used to access all necessary information about comparisons of frequency data.

Crosstabulation

Crosstabulation is a basic technique for examining the relationship between two categorical variables. For example, using Age category as a row variable and Gender as a column variable, you can create a two-dimensional crosstabulation that shows the number of males and females in each age category.

While the Frequencies command can tell us, for example, there are 5 persons with 6/6 sight, 2 persons with 12/6 sight and that there are 10 females and 11 males) in our ***sight.sav*** file, it cannot give us the number of females with 6/6 sight or males with 12/6 sight. This is the function of the Crosstabs command. It would be appropriate to "cross" two variables (sight by gender). This would produce a table of 12 different cells with frequencies inserted in each cell by crossing two (2) levels of gender with five (5) levels of sight. Note that it is possible to cross three or more variables.

Chi-Square Test of Independence

The Chi-Square Test of Independence determines whether there is an association between categorical variables (i.e., whether the variables are independent or related). This test is also known as Chi-Square Test of Association.

The test statistic for the Chi-Square Test of Independence is denoted X2, and is computed as:

$$\chi^2 = \sum_{i=1}^{R} \sum_{j=1}^{C} \frac{(o_{ij} - e_{ij})^2}{e_{ij}}$$

Where:

o_{ij} is the observed cell count in the i_{th} row and j_{th} column of the table.

e_{ij} is the expected cell count in the i_{th} row and j_{th} column of the table, computed as:

$$e_{ij} = \frac{\text{row } i \text{ total} * \text{col } j \text{ total}}{\text{grand total}}$$

DECISION AND CONCLUSIONS

Since the p-value (Asymptotic Significance (2-sided)) is greater than our chosen significance level (α = 0.05), we conclude that there is not enough evidence to suggest an association between gender and smoking.

Based on the results of the practical part of chi-square in spss, we can state the following:

No association was found between gender and smoking behavior ($X^2(2)> = 1.667$, p = 0.179).

Al-Noor University College

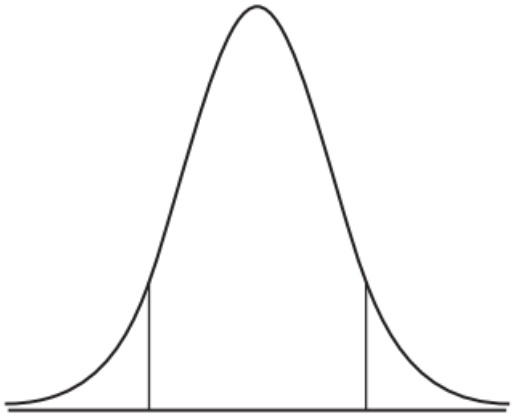
Computer for Medical Techniques Departments

2020 – 2021

BY: MUHAMMAD ABDELKARIM MUHAMMAD

Measures of Deviation from Normality

- Kurtosis is a measure of the "peakedness" or the "flatness" of a distribution.
- A kurtosis value near zero (0) indicates a shape close to normal.
- A positive value for the kurtosis indicates a distribution more peaked than normal.
- A negative kurtosis indicates a shape flatter than normal.



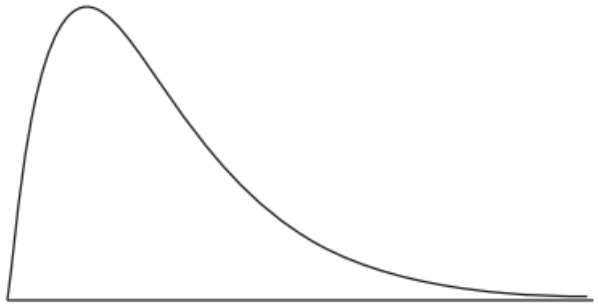
Example of positive kurtosis

Example of negative kurtosis

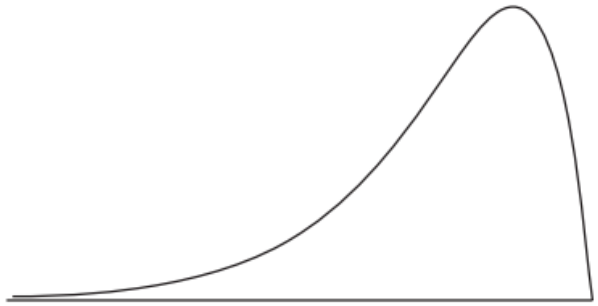
Measures of Deviation from Normality: Kurtosis

Measures of Deviation from Normality: Skewness

- Skewness measures to what extent a distribution of values deviates from symmetry around the mean.
- A value of zero (0) represents a symmetric or evenly balanced distribution.
- A positive skewness indicates a greater number of smaller values (sounds backward, but this is correct).
- A negative skewness indicates a greater number of larger values.



Example of positive skewness



Example of negative skewness

Measures of Deviation from Normality: Skewness

Measures of Size of the Distribution

Measures of Stability: Standard Error

SPSS computes the Standard errors for the mean, the kurtosis, and the skewness.

Standard error is designed to be a measure of stability or of sampling error.

The logic behind standard error is this: If you take a random sample from a population, you can compute the mean, a single number.

If you take another sample of the same size from the same population, you can again compute the mean—a number likely to be slightly different from the first number.

If you collect many such samples, the standard error of the mean is the standard deviation of this sampling distribution of means.

A small value (what is “small” depends on the nature of your distribution) indicates greater stability or smaller sampling error.

The standard error formula is

$$SE = \frac{\sigma}{\sqrt{N}}$$

Crosstabulation and X2 Analyses

- THE PURPOSE of crosstabulation is to show in tabular format the relationship between two or more categorical variables.
- Categorical variables include those in which distinct categories exist such as gender (female, male), responses (yes, no), grades (A, B, C, D, F).
- The SPSS command Crosstabs and the subcommands Cells and Statistics are used to access all necessary information about comparisons of frequency data.

Crosstabulation

Crosstabulation is a basic technique for examining the relationship between two categorical variables. For example, using Age category as a row variable and Gender as a column variable, you can create a two-dimensional crosstabulation that shows the number of males and females in each age category.

Chi-Square Test of Independence

The Chi-Square Test of Independence determines whether there is an association between categorical variables (i.e., whether the variables are independent or related). This test is also known as Chi-Square Test of Association.

The test statistic for the Chi-Square Test of Independence is denoted X2, and is computed as:

$$\chi^2 = \sum_{i=1}^{R} \sum_{j=1}^{C} \frac{(o_{ij} - e_{ij})^2}{e_{ij}}$$

Chi-Square Test of Independence cont…

Where:

- oij is the observed cell count in the ith row and jth column of the table.
- eij is the expected cell count in the ith row and jth column of the table.

computed as:

$$e_{ij} = \frac{\text{row } i \text{ total} * \text{col } j \text{ total}}{\text{grand total}}$$

Example

Observed Values

Age الفئة العمرية	Football	swimming	walking	Total
<15	25	10	10	45
15-30	8	55	22	85
30-60	6	24	40	70
Total	39	89	72	200

هل نوع الرياضة مستقل عن العمر ؟

Example solution

Expected Values

$$e_{ij} = \frac{\text{row } i \text{ total} * \text{col } j \text{ total}}{\text{grand total}}$$

Age الفئة العمرية	Football	swimming	walking	Total
<15	(45*39) / 200 =8.8	(45*89) / 200 =20	(45*72) / 200 =16.2	45
15-30	(85*39) / 200 =16.6	(85*89) / 200 =37.8	(85*72) / 200 =30.6	85
30-60	(70*39) / 200 =13.6	(70*89) / 200 =31.2	(70*72) / 200 =25.2	70
Total	39	89	72	200

لاحظ ان مجموع التكرارات المتوقع يساوي مجموع التكرارات المشاهدة لأي صف او عمود

Example solution cont.

chi Value

$$x^2 = \sum_{i=1}^{R} \sum_{j=1}^{C} \frac{(o_{ij} - e_{ij})^2}{e_{ij}}$$

$$x^2 = \sum_{i=1}^{R} \sum_{j=1}^{c} \frac{(O_{ij})^2}{e_{ij}} - total$$

X2 = 25^2 / 8.8 + 10^2 / 20 + … + 40^2 / 25.2 = 266.6 – 200

X2 = 66.6

Example solution cont.

X2 = 66.6

Degree of Freedom (df) = (rows – 1) * (columns – 1) = (3-1)*(3-1) = 4

Chosen significance level (a = 0.05) note that (0.01) can be used also

Using the df & a & the table below we find that P (critical value) = 9.488

Chi-Square (χ^2) Distribution
Area to the Right of Critical Value

Degrees of Freedom	0.995	0.99	0.975	0.95	0.90	0.10	0.05	0.025	0.01	0.005
1	—	—	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321

Example solution cont.

DECISION AND CONCLUSIONS

Since X2 = 66.6 is greater than the found Value in the table = 9.488

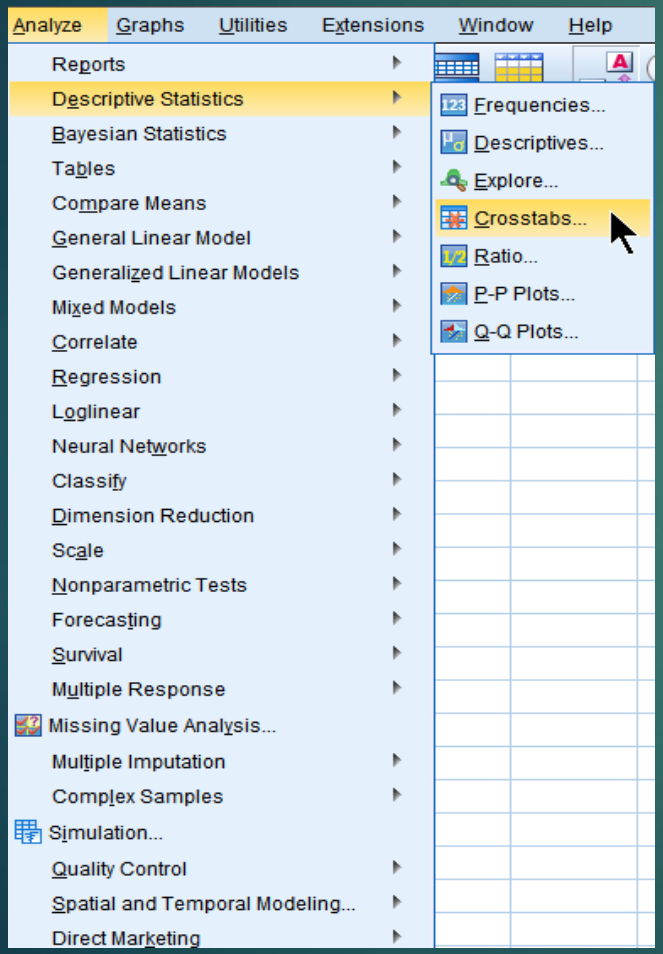
we conclude that there is enough evidence to suggest an association between Sport and Age.

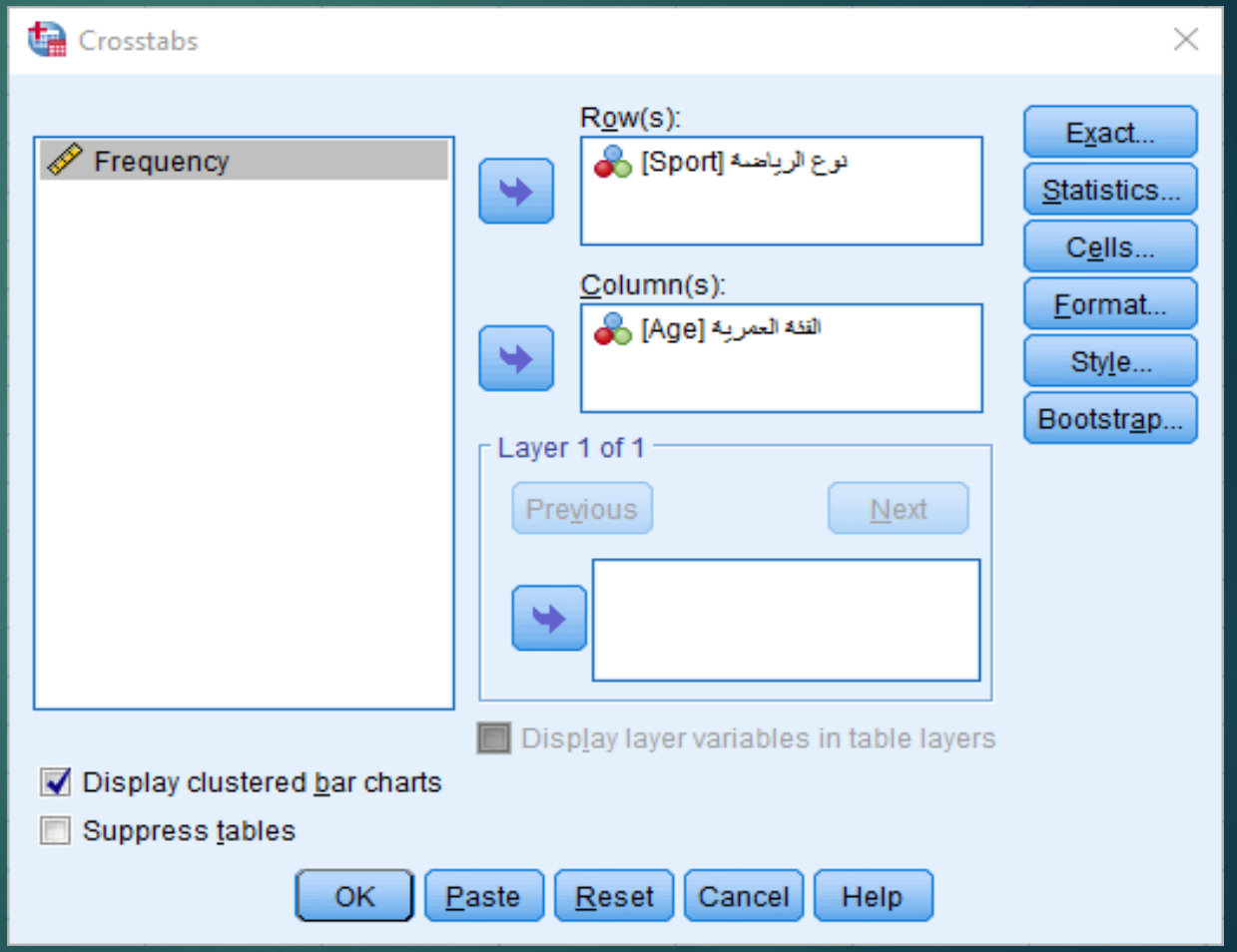
Chi-Square Tests

Value	df	Asymptotic Significance (2-sided)
66.664[a]	4	0.000

$\chi^2(4) = 66.664a$, **P = 0.000**

Crosstabulation and X2 Analyses in SPSS.





Crosstabulation and X2 Analyses in SPSS cont…

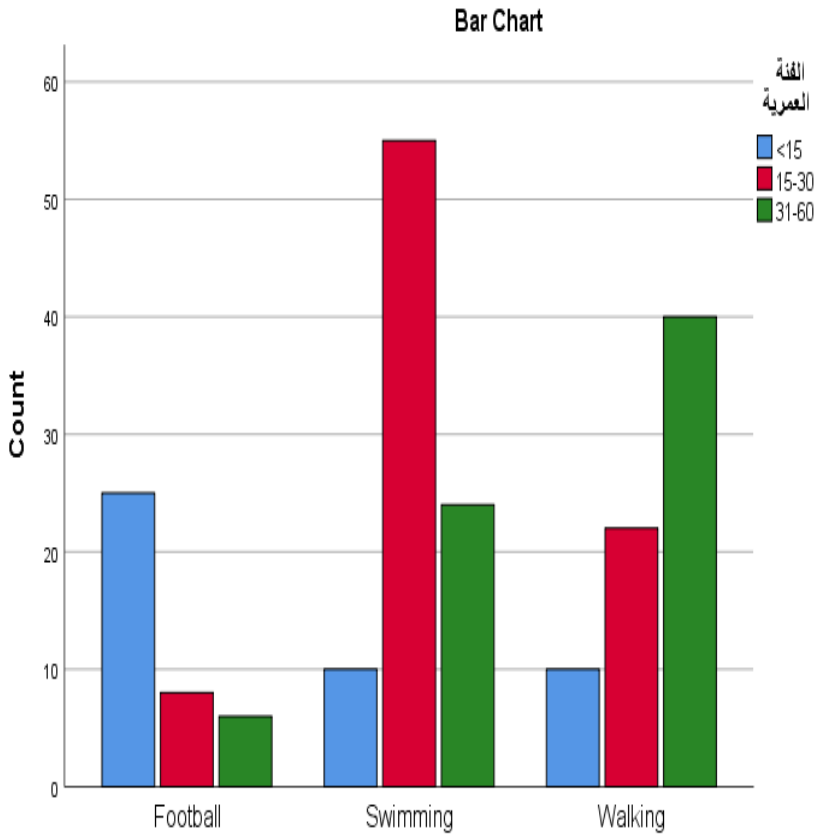
Crosstabulation نوع الرياضة * الفئة العمرية

			الفئه العمريه			
			<15	15-30	31-60	Total
نوع الرياضه	Football	Count	25	8	6	39
		Expected Count	8.8	16.6	13.7	39.0
	Swimming	Count	10	55	24	89
		Expected Count	20.0	37.8	31.2	89.0
	Walking	Count	10	22	40	72
		Expected Count	16.2	30.6	25.2	72.0
Total		Count	45	85	70	200
		Expected Count	45.0	85.0	70.0	200.0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	66.664[a]	4	.000
Likelihood Ratio	58.401	4	.000
Linear-by-Linear Association	33.935	1	.000
N of Valid Cases	200		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.78.



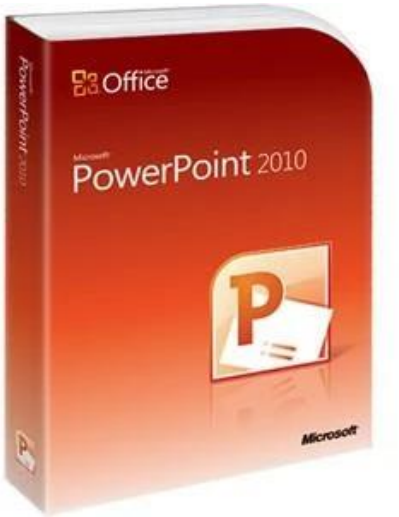
Thank You

Al-Noor University College

Computer for Medical Departments

By: Muhammad A. Muhammad

2021 - 2022



Microsoft Office PowerPoint 2010

PowerPoint: PowerPoint is a slideshow presentation program that's part of the Microsoft office suite, it makes it easy to create and present your ideas in dynamic, visually interesting ways.

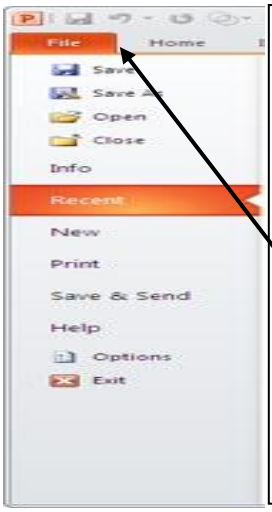
Getting Started with Microsoft PowerPoint 2010

You open Microsoft PowerPoint by clicking on the icon on your desktop (if you have one there) or by going to start → all programs → Microsoft office → PowerPoint.

When you click on the icon, a blank slide will open. This is a new slide for which the default name is Presentation1. For each additional new document that you open, the name increases by one digit: Presentation2, Presentation3, etc. If you start MS PowerPoint by clicking on an already existing presentation on your computer, it will open automatically, and your presentation will be displayed in the MS PowerPoint window.

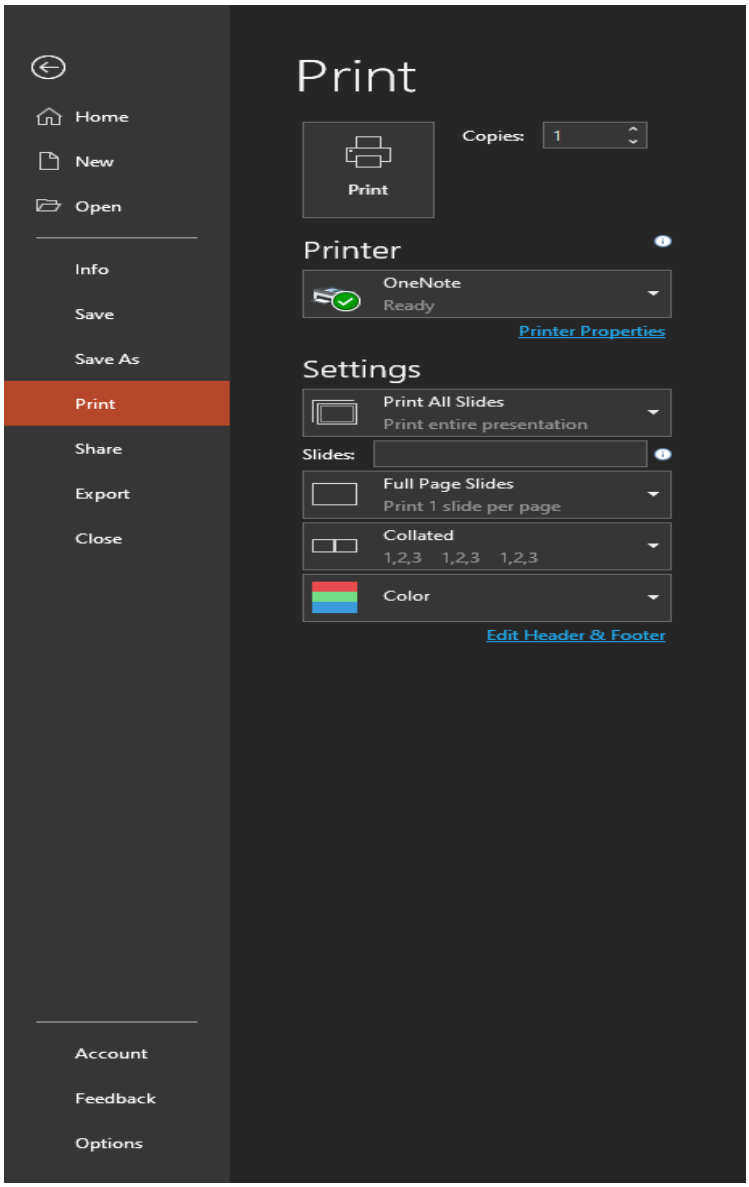
File TAB

In this lesson we explain many commands of Microsoft PowerPoint 2010 interface.



File menu contain

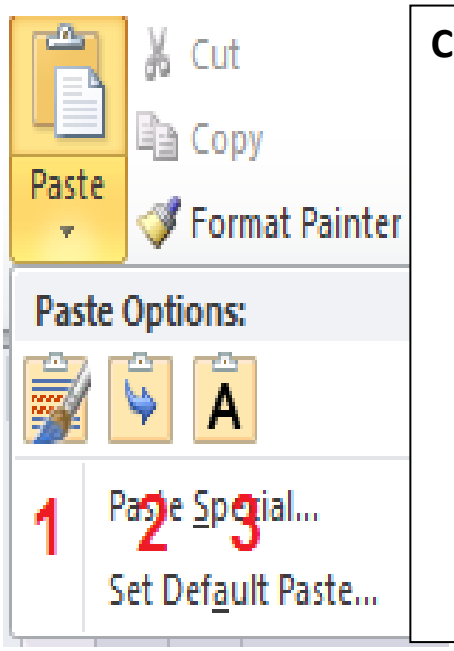
1- Save: to save the presentation after any change.
2- Save as: to save the presentation with another name, place, type.
3- Open: to open a presentation, that was saved in the computer.
4- Recent: reach to the recent presentations, that were opened recently.
5- New: create a new presentation from the available templates.
6- Print: configure to print.



Print

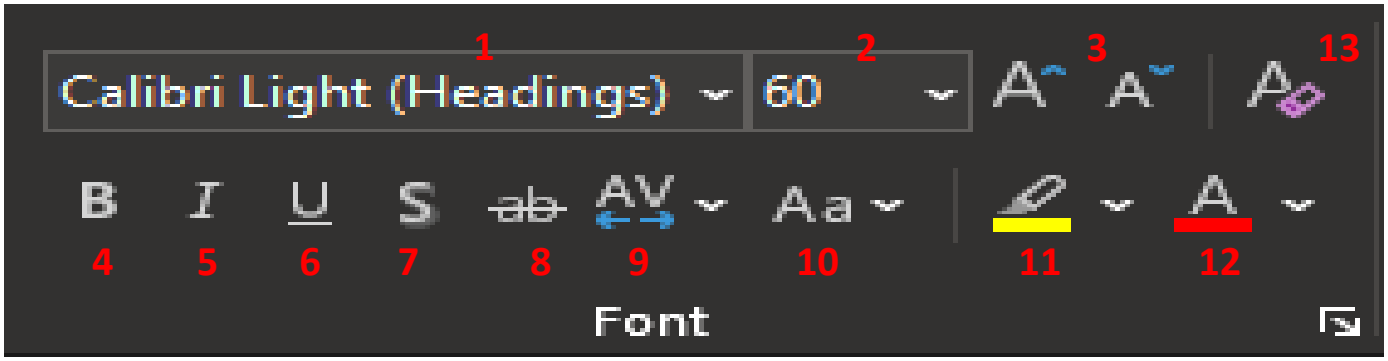
1- Copies: number of copies
2- Printer: choose the printer
3- Setting
   a. print all slides or print current slide or printing a custom range of slides.
   b. Full page slide, 1 slide per sheet, 2 slides per sheet, 4 pages per sheet, etc.
   c. Colored printing or black and white printing

Home TAB



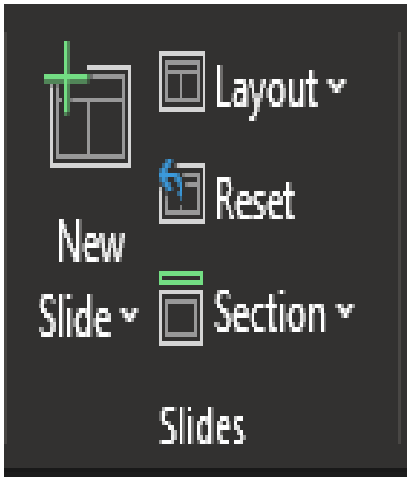
Clipboard group

- **Cut: - cut the selection and put it on the clipboard**
- **Copy: - copy the selection and put it on the clipboard**
- **Format painter: - copy information from one place and apply it to another**
- **Paste: - paste the contents of the clipboard.**
- **From left to right**
  1- **Keep source formatting**
  2- **Merge formatting**
  3- **Copy text only**



Font Group

1) Choose font type
2) Choose font size
3) Choose font size
   a. Grow font (increase the size)
   b. Shrink font (decrease the size)
4) B :- make the selected text bold (CTRL + B)
5) *I* :- Italic (CTRL + I)
6) U :- underline the selected text. (CTRL + U)
7) S : add shadow behind the selected text.
8) ~~abc~~:- draw a line through the middle of the selected text.
9) AV : increase or decrease the spacing between characters.
10) Aa: change the case of the text from many options
11) Make the text look like it was marked by highlight color.
12) choose the text color.
13) A : clear formatting from the selected text.



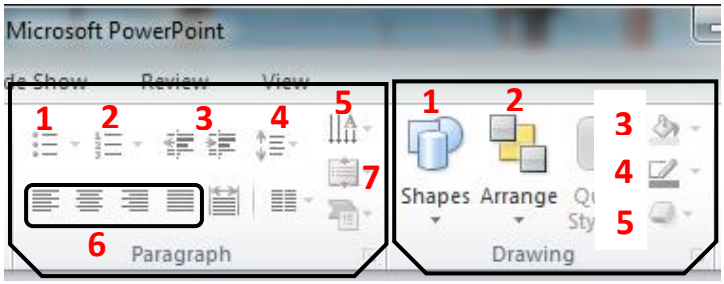
Slides Group

New slide: add a slide to the presentation or duplicate an existing slide (CTRL + M)

Layout: change the layout of the current slide

Section: add a new section to the presentation, rename it, remove it, collapse all sections or expand them all.

Paragraph Group



1- Start a bulleted list
2- Start a numbered list
3- Increase or decrease the indent
4- Line spacing: - choose the spacing between lines of text
5- Text direction: the direction of the text (horizontal, rotated by degree, stacked).
6- Align text (left, middle, right, justify)
7- Align text (Top, Middle, bottom).

Drawing Group

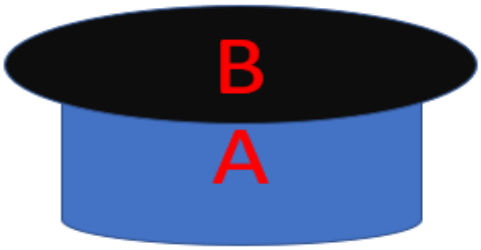
1- **Shapes:** adding many different shapes to the presentation like (lines, ellipse, square, circle, etc.)
2- **arrange:**
   a. **Group:** after selecting a shape, the group option will be inactive until you select another shape ***by pressing CTRL keyboard button then left clicking the second shape.***
   b. **Ungrouping:** to ungroup an already grouped shapes select the grouped shapes then arrange→ group objects→ ungroup.
   c. **Order objects:** to rearrange a shape select it then use arrange→order objects → (bring to front, send to back, bring forward, send backward).

Drawing Group (cont…)

3- **Shape fill:** fill the selected shape with solid color or gradient.
4- **Shape outline:** select the desired color and line width for the outline of the selected shape.
5- **Shape effects:** apply an effect to the selected text such as glow, shadow, etc.

Object order example

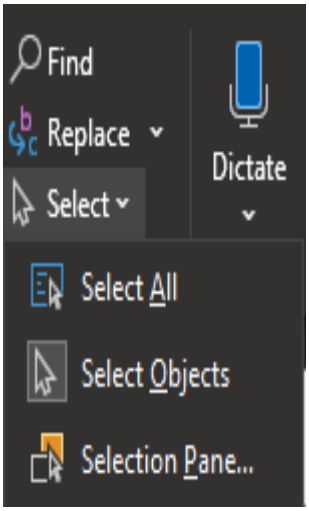
A in front of B



B in front of A

Example of a textbox with blue fill and black outline of width 2.25 pt. and blue glow and 3D rotation.

Hello my name is Muhammed I am the computer teacher at Alnoor University College…



Editing Group

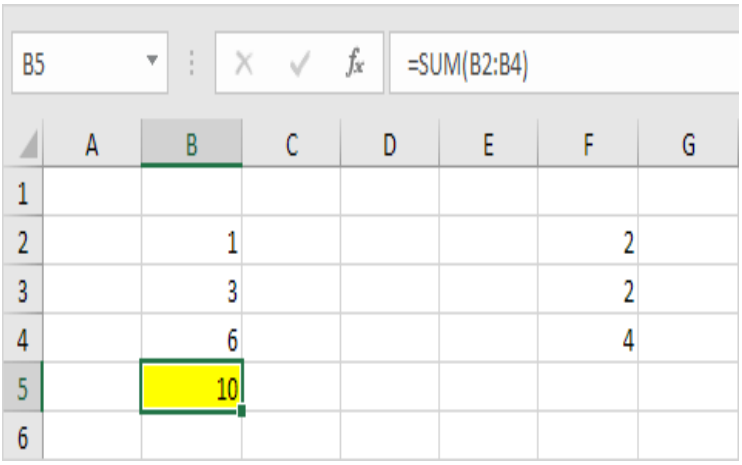
- **Find: -** Find text in the presentation.
- **Replace: -** replace text in the presentation.
- **Select: -** select text or objects in the presentation.
    - **Select all: -** select everything in the presentation.
    - **Select objects: -** a very useful tool to select objects behind text.
    - **Selection pane:** a pane that display all the objects in the presentation, useful for selection or reordering.

5- SQRT(number): Returns a positive square root.

6- MOD(number, divisor): Returns the remainder after number is divided by divisor. The result has the same sign as divisor.

Paste Options

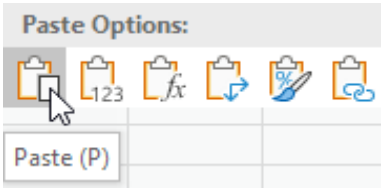
Copying and Pasting data is one of the most performed actions in Excel. There is a lot more to copy-pasting then simple Control + C and Control + V, this example illustrates the various paste options in Excel. Cell B5 below contains the SUM function which calculates the sum of the range B2:B4. Furthermore, we changed the background color of this cell to yellow and added borders.

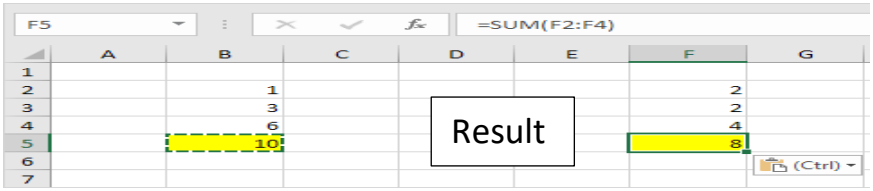


A- Paste: The Paste option pastes everything.

1.Select cell B5, right click, and then click Copy (or press CTRL + C).

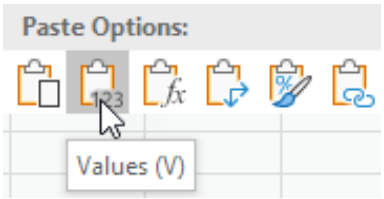
2.Next, select cell F5, right click, and then click Paste under 'Paste Options:' (or CTRL + V).

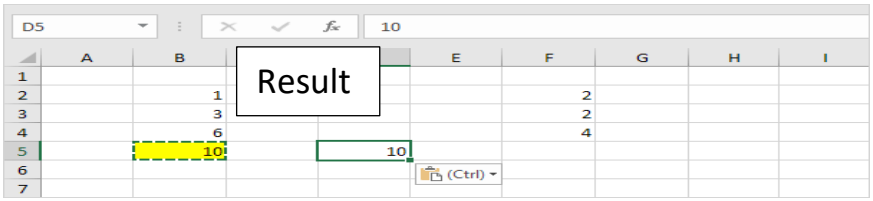




B- Values: The Values option pastes the result of the formula.

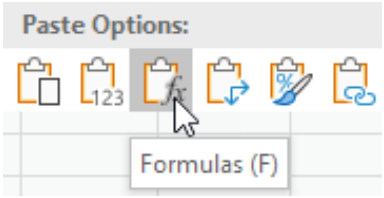
a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell D5, right click, and then click Values under 'Paste Options:'

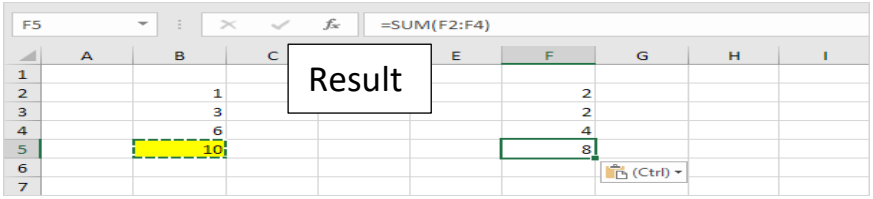




C- Formulas: the formula option only pastes the formula.

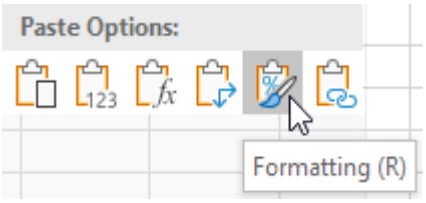
a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell F5, right click, and then click Formulas under 'Paste Options:'

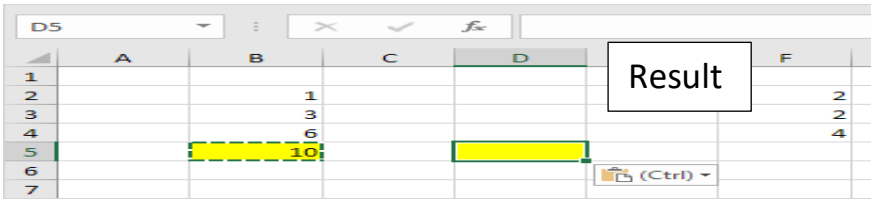




D- Formatting: The Formatting option only pastes the formatting.

a. Select cell B5, right click, and then click Copy (or press CTRL + C).
b. Next, select cell D5, right click, and then click Formatting under 'Paste Options:'

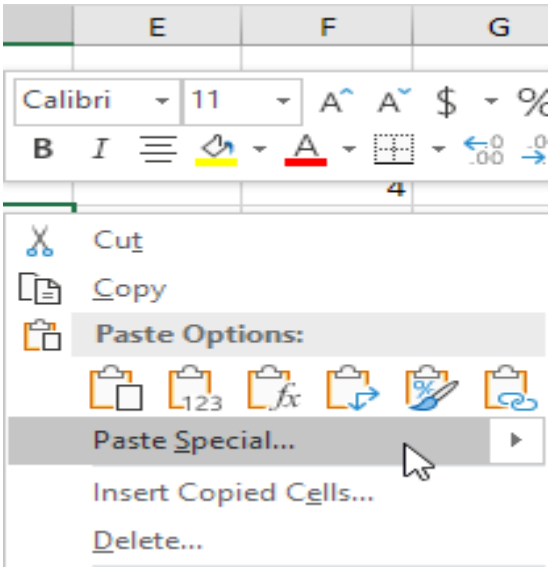


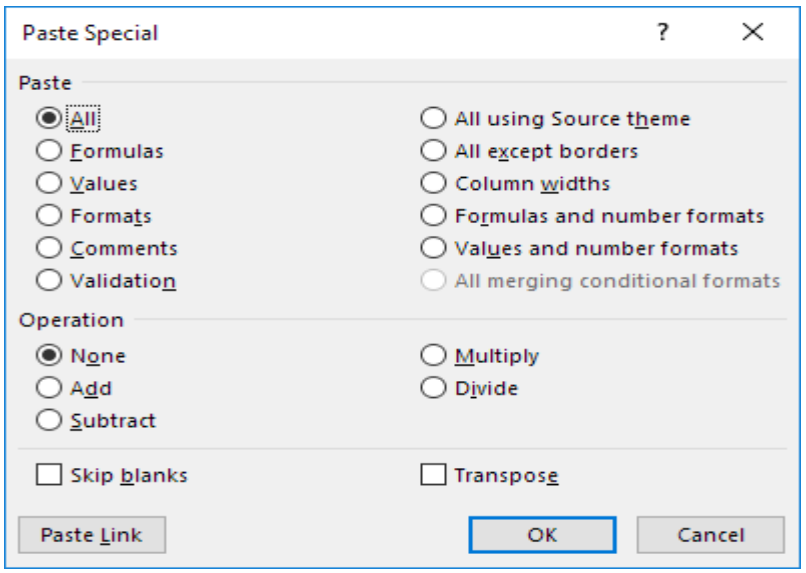


Note: The Format Painter copy/pastes formatting even quicker.

E- Paste Special: The Paste Special dialog box offers many more paste options. To launch the Paste Special dialog box, execute the following steps.

a. Select cell B5, right click, and then click Copy (or press CTRL + c).
b. Next, select cell D5, right click, and then click Paste Special.





Paste Special - Operations.

Operations options give you a quick way to perform the given operations without applying a formula or directly changing the cell contents.

Skip Blanks: This would skip copying and pasting the blanks. A practical use if this could be when you have data split into 2 columns and you want to combine it in a single column.

Transpose: As the name suggests, if this is checked, it transposes the data when you paste it.

Al-Noor University College

Computer for Medical Techniques Departments

2020 – 2021

By: Muhammad Abdelkarim Muhammad

IBM SPSS

Introduction

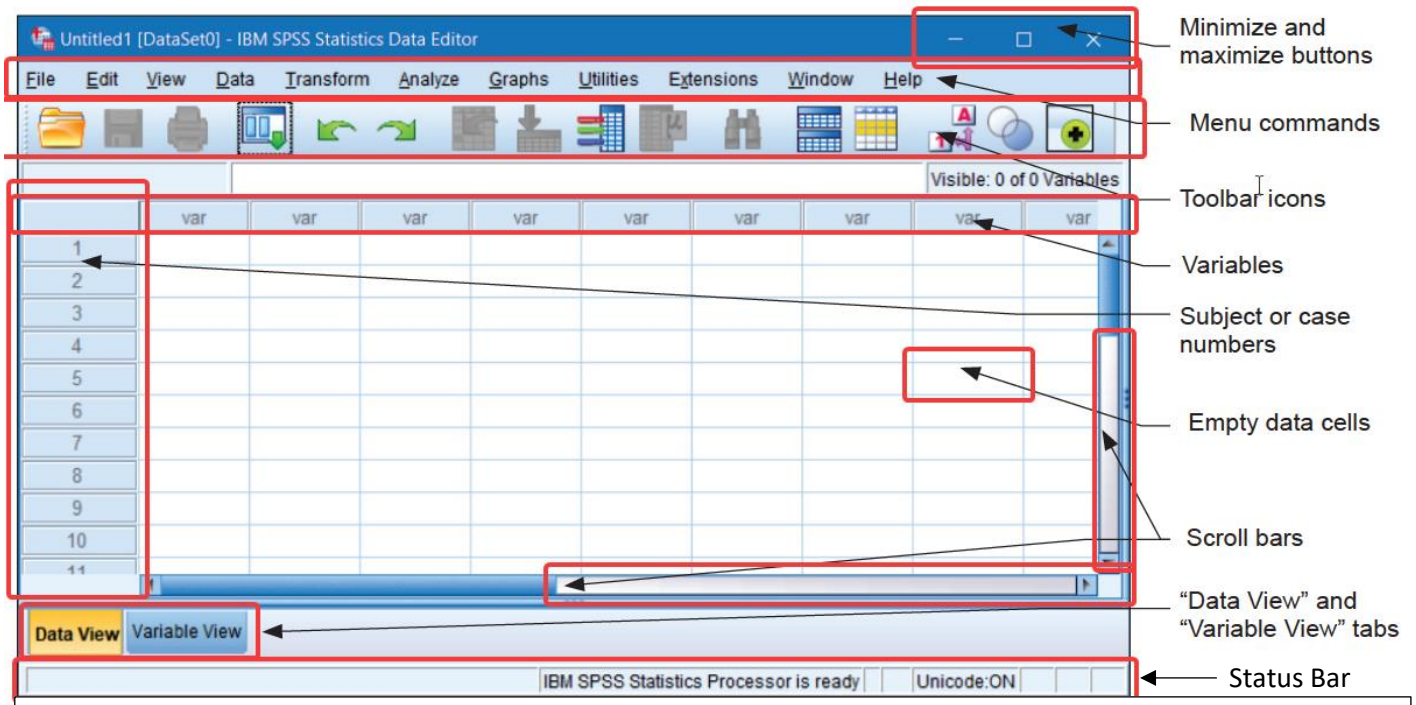
SPSS (Statistical Package for the Social Sciences) has now been in development for more than thirty years. Originally developed as a programming language for conducting statistical analysis, it has grown into a complex and powerful application with now uses both a graphical and a syntactical interface and provides dozens of functions for managing, analyzing, and presenting data.

The following lessons provide methods to learn your way around the program, exploring the various functions for managing your data, conducting statistical analyses, creating tables and charts, and preparing your output for incorporation into external files such as spreadsheets and word processors. Most importantly, you'll learn how to learn more about SPSS.

SPSS V.S. EXCEL: -

NO.	SPSS	EXCEL
1	statistical analysis software.	spreadsheet software
2	but SPSS is more powerful. SPSS has built-in data manipulation tools such as recoding, transforming variables, and in Excel, you have a lot of work if you want to do that job.	perform some Statistical analysis
3	SPSS allows you to perform complex analytics such as factor analysis, logistic regression, cluster analysis etc.	perform Simple analytics
4	every column is one variable	Excel does not treat columns and rows in that way.
5	number of variables and observations is not a problem.	starts becoming unwieldy to use when the number of variables and observations starts getting large.
6	serve you the purpose in their domains exceptionally	

SPSS v26 Main Interface: - The simple interface of the SPSS 26 is illustrated below.



SPSS v26 Main Interface

TOOLBAR: - The toolbar icons are located below the menu bar at the top of the screen. The icons were created specifically for ease of point-and-click mouse operations.

Icon	Function	Icon	Function	Icon	Function
	Click this to open a file		Find data		(upper left corner) the "+" sign indicates that this is the active file
	Save current file		Insert subject or case into the data file		Shifts between numbers and labels for variables with several levels
	Print file		Insert new variable into the data file		Go to a particular variable or case number
	Recall a recently-used command		Split file into subgroups		Use subsets of variables/use all variables
	Undo the last operation		Weight cases		Access information about the current variable
	Redo something you just undid		Select cases		Spell check

SPSS v26 Tool bar icons

It must be noted that even in SPSS applications the format of the icon bar may vary slightly. The toolbar shown above applies to the data editor window; a different tool-

bar is available that applies to the output window. Also note that some of the icons are bright and clear and others are “grayed.” Grayed icons are those that are not currently available. Note, for instance, that the Print File icon is grayed because there are no data to print. When data are entered into the data editor, then these icons become clear because they are now available. The best way to learn how the icons work is to click on them and see what happens.

THE MENU BAR The menu bar (just above the toolbar) displays the commands that perform most of the operations that SPSS provides. You will become well acquainted with these commands as you spend time with spss. Whenever you click on a p articular command, a series of options appears below, and you will select the one that fits your need. The commands are now listed and briefly described:

• **File**: Deals with different functions associated with files, including opening, reading, and saving, as well as exiting SPSS.

• **Edit**: Several editing functions, including copying, pasting, finding, and replacing.

• **View**: Several options that affect the way the screen appears; the option most frequently used is **Value Labels.**

• **Data**: Operations related to defining, configuring, and entering data; also deals with sorting cases, merging, or aggregating files, and selecting or weighting cases.

• **Transform**: Transformation of previously entered data, including recoding, computing new variables, reordering, and dealing with missing values.

• **Analyze**: All forms of data analysis begin with a click of the Analyze command.

• **Graphs**: Creation of graphs or charts can begin either with a click on the Graphs command or (often) as an option while other statistics are being performed.

• **Utilities**: Utilities deals largely with sophisticated ways of making complex data operations easier. Most of these commands are for advanced users.

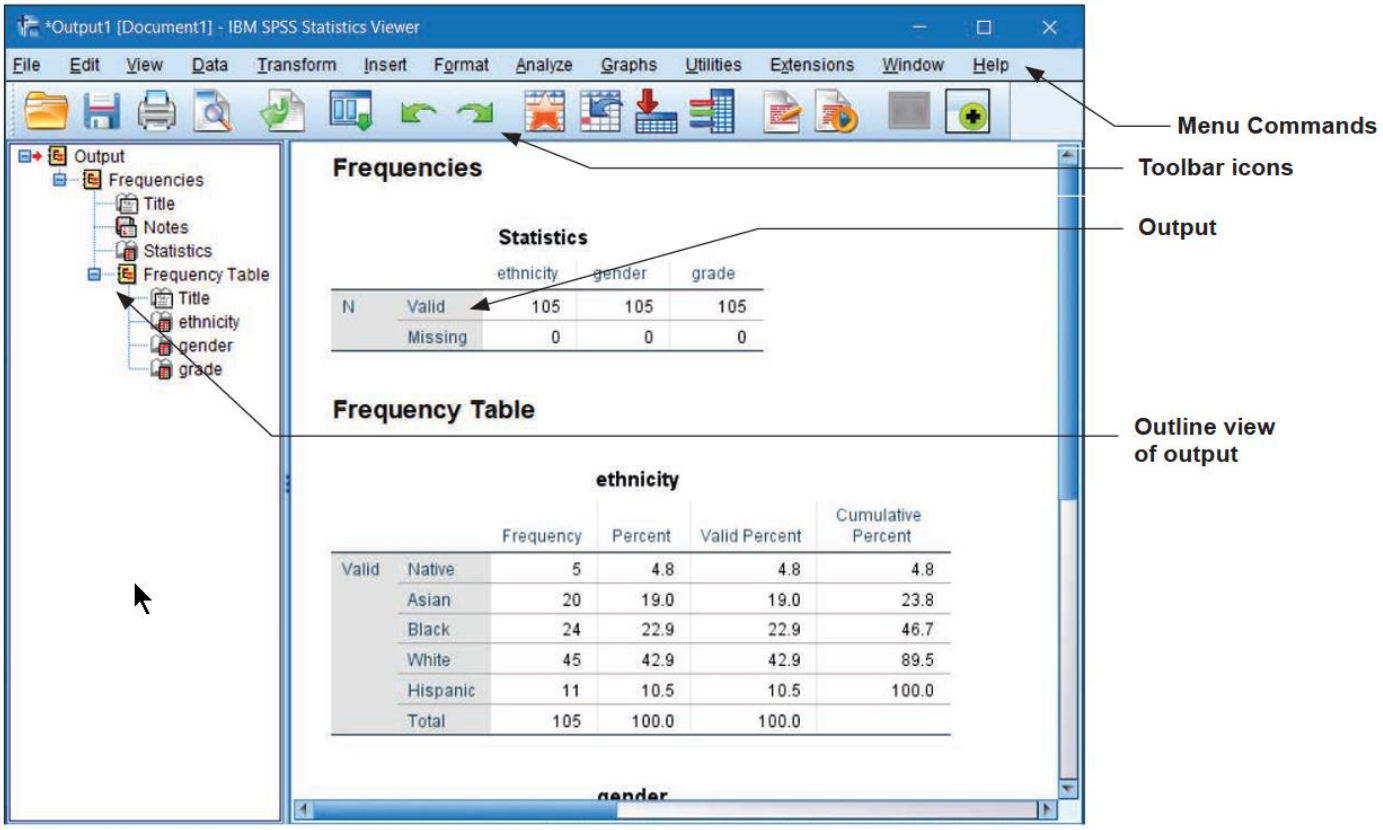
• **Add-ons**: If you want to do advanced statistics that aren't already in SPSS, these menu options will direct you to other programs and services that SPSS can sell you.

• **Window**: Deals with the position, status, and format of open windows. This menu may be used instead of the taskbar to change between SPSS windows.

• **Help**: A truly useful aid with search capabilities, tutorials, and a statistics coach that can help you decide what type of SPSS procedure to use to analyze your data.

The Output Window

"Output" is the term used to identify the results of the previous analyses. It is the objective of all data analysis. SPSS has a long history of efforts to create a format of output that is clear yet comprehensive. The current version uses a tables-with-borders format. When utilizing options described below, this is relatively clear, but output can still be awkward and occupy many pages.



The SPSS Output Navigator Window

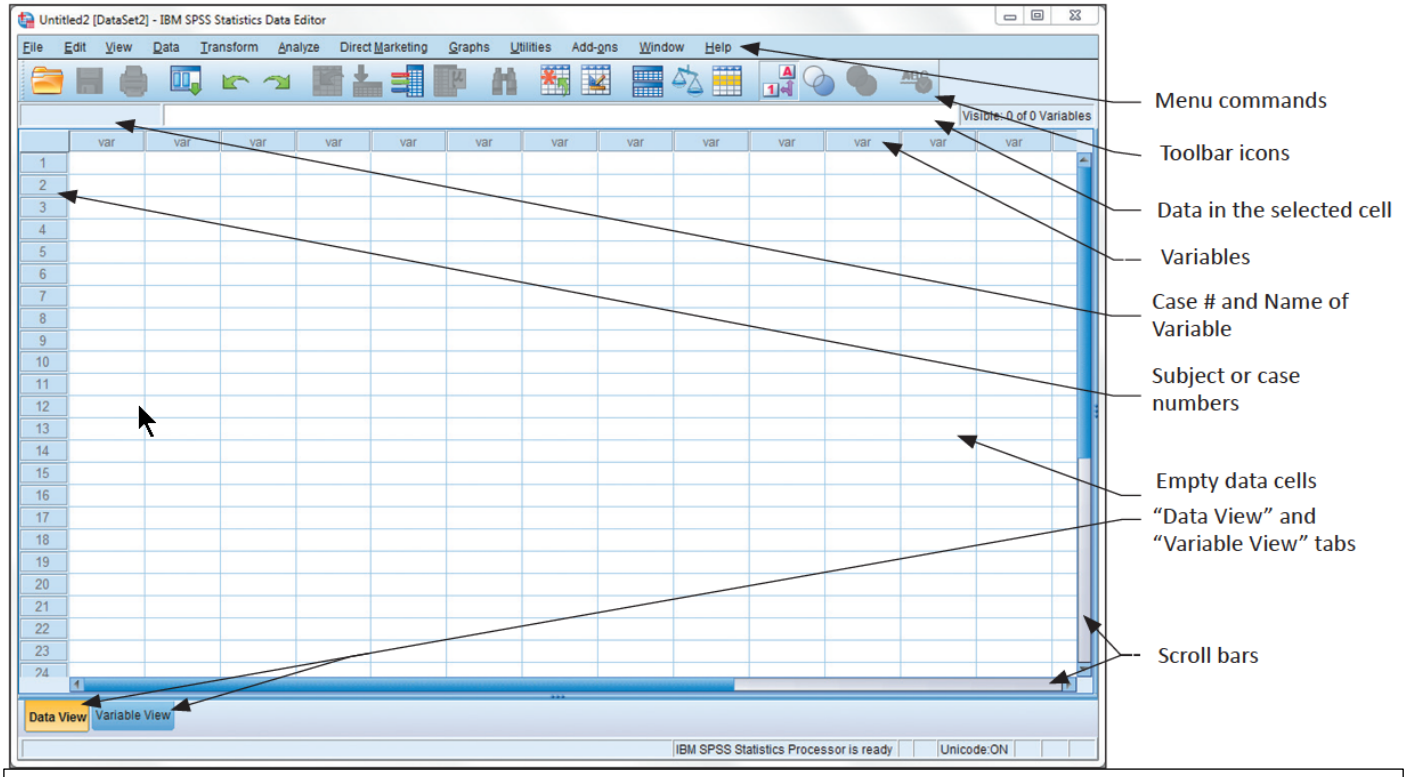
Icon	Function	Icon	Function
	Click to open a file		Go to a particular variable or case number
	Click to save a file		Get information about variables
	Print output		User-defined subset of the data
	Print preview (see what the printout will look like)		Show all variables
	Export output to text or web (HTML) file		Select most recent output
	Recall a recently used command		Automatically format output (Advanced)
	Undo or redo the last operation		Send future output to this window
	Go to SPSS Data Editor (frequently used!)		

The SPSS Output Navigator Window icons details.

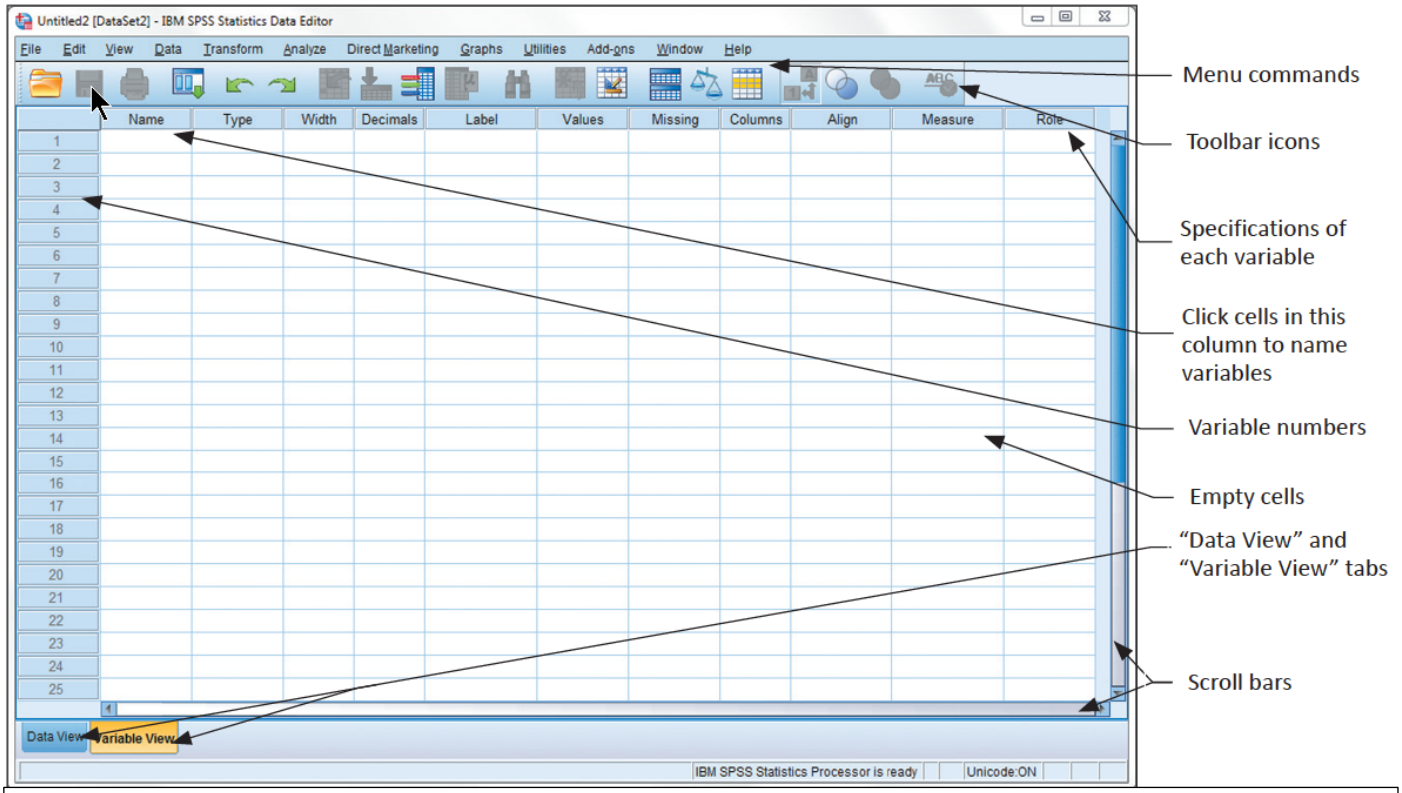
One of the most important things to learn about the SPSS output window is the use of the outline view on the left of the screen. On the right side of the window is the output from the SPSS procedures that were run, and on the left is the outline (like a table of contents without page numbers) of that output. The SPSS output is composed of a series of *output objects*; these objects may be titles (e.g., “Frequencies”), tables of numbers, or charts, among other things. Each of these objects is listed in the outline view.

You will notice that there is no “Notes” section in the output window to correspond with the “Notes” title in the outline view. That’s because the notes are (by default) hidden. If you want to see the notes, double click on the word “Notes” and they will appear. The closed-book icon will then become an open-book icon and the notes will materialize in the window to the right. Double click on the word “Notes” in the outline view again and the notes will disappear, and the book will close.

SPSS Views: The two screens serve distinct and complementary purposes: **Data View** is designed to enter data after the data file has been created. **Variable View** is designed to name, label, and determine specifications for each variable.



Data View Screen

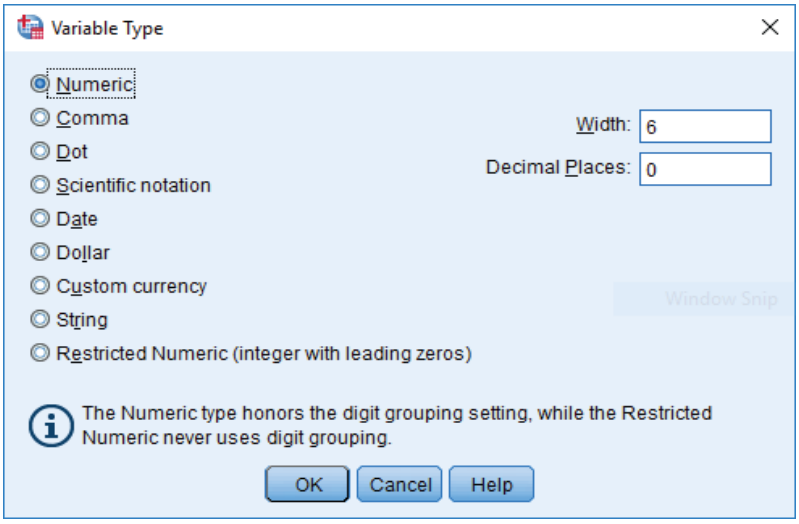


Variable View Screen

Variables in SPSS: - for each variable in SPSS there are ***"Specifications***", those specifications are detailed as follows.

Name: Beginning with the variable view screen, simply type the names of your variables one at a time in the first column. After a name is typed, you may use the cursor keys or the tab to move to the next cell to type the next variable name.

Type: When you click on a cell in any row under Type you notice a small, grayed box to the right of the word Numeric. A click on the box opens Variable Type Window



Notice that **Numeric** is selected. Most of your variables *will* be numeric and you will retain the default setting.

A variable that contains letters (rather than only numbers) is called a ***String*** variable.

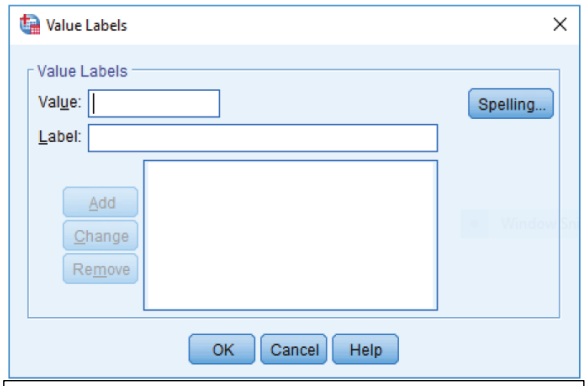
Decimals: The function of the **Decimal** column is to identify the number of decimal places for each variable.

Width: In the Width column you determine the largest number or longest string that will occur for each variable.

Label: The **Label** column allows you to label any variable whose meaning is not clear from the variable name. Many times, the meaning is clear from the variable name itself (e.g., **id, gender, quiz1, quiz2**) and no label is required. Other times the meaning is NOT clear, and a label is very useful. After an analysis, in the Output section, an **Options** selection will allow the label to be listed instead of the variable name to assist in clarity and interpretation. the maximum length is 256 characters.

Values: Value labels allow you to identify *levels* of a variable (e.g., **gender**: 1 = female, 2 = male; **marital**: 1 = married, 2 = single, 3 = divorced, 4 = widowed). Entering value labels for variables that have several distinct groups is critical for clarity in interpretation of output.

Just like the **Type** option, a click on any cell in the **Values** column will produce the small, grayed box. A click on this box will produce the "Value Labels" Window dialog box that will allow you to create value labels.



Value Labels Window dialog box

Missing: The **Missing** column is rarely used. Its purpose is to designate different types of missing values in your data. For instance, subjects who refused to answer the marital question.

Columns: the width of each column in the data view tab.

Align: The **Align** column provides a drop-down menu that allows you to align the data in each cell right, left, or center. By default, numeric variables align to the right, string variables align to the left. You may select otherwise if you wish.

Measure:

The **Measure** column also provides a drop-down menu that allows you to select three options based on the nature of your data: **Scale**, **Ordinal**, and **Nominal**.

• **Scale** measures have fundamental numeric meaning that allow typical mathematical manipulations. For instance, age is a scale variable: 16 is twice as much as 8, 4 is half as much as 8, the sum of a 4 and 8 is 12, and so forth. **Scale** is the default for all numeric variables.

• **Ordinal** measures have fundamental order, but mathematical manipulations are typically meaningless like the age groups (10 – 20, 20-30, …) or the satisfaction level (strongly agree, agree, disagree, strongly disagree).

• **Nominal** measures are used for identification but have no fundamental order (lesser to greater) such as gender, ethnicity, marital status, yes/no questions, and most string variables. Nominal data may be used for categorization and for several other statistical procedures.

Sometimes it can be difficult to choose between scale and ordinal. If so, don't worry too much. In all analysis, SPSS handles both ordinal and scale variables identically.

Role: The **Role** column is designed for large data sets in which the researcher wishes to keep track of which variables are independent variables (**Input**, the default), which are dependent (**Target**), and other functions unique to certain designs. For most studies this column may be ignored.

Sometimes it can be difficult to choose between scale and ordinal. If so, don't worry too much. In all analysis, SPSS handles both ordinal and scale variables identically.

Role: The **Role** column is designed for large data sets in which the researcher wishes to keep track of which variables are independent variables (**Input**, the default), which are dependent (**Target**), and other functions unique to certain designs. For most studies this column may be ignored.

Entering Data: After naming and formatting the variables, entering data is a simple process.

ENTER DATA BY VARIABLE: Click on the first empty cell under the first variable, type the number (or word), press the Down-arrow key, or Enter key, then type the next number/word, press the Down-arrow, or Enter key, and so forth. When you finish one variable, scroll to the top of the file, and enter data for the next variable in the same way.

ENTER DATA BY CASE OR PARTICIPANT: Click on the first empty cell for the first subject under the first variable, and then type the first number/word, press the Right arrow key or Tab key, type the next number, press the Right-arrow or Tab key,

and so forth. When you finish one participant, scroll back to the first column, and enter data for the next participant.

Editing Data: Just as data entry is a simple procedure, so also is editing previously entered data. The following options are available:

CHANGING A CELL VALUE Simply click on the cell of interest, type the new value, and then hit Enter, Tab, or any of the Arrow keys.

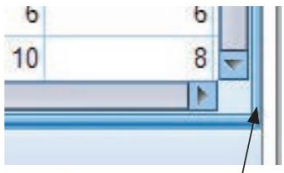
INSERTING A NEW CASE If you wish to insert data for a new subject or case, click on the case number above which you would like the new case to be. Then click on

the insert case toolbar icon () and a new line will open and push all other cases down by exactly one line. You may then enter data for the new subject or case.

INSERTING A NEW VARIABLE: To insert a new variable, click on the variable to the right of where you would like the new variable to be located, click on the insert-variable icon (), and a new column will open (to the left) and push all other variables exactly one column to the right. You may then name and format the new variable and enter data in that column.

TO SEARCH FOR DATA: One of the handiest editing procedures is the Find function. A click on the Edit command followed by a click on the Find option (or a click on the  toolbar icon) opens up a screen that allows you to search for a particular word or data value, note that CTRL + F can be used also.

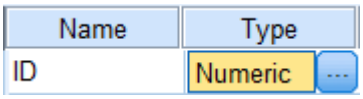
MAKING PARTICIPANT IDENTIFIERS ALWAYS VISIBLE When a file has many variables, it is often useful to make some of the columns (those on the left) always visible, even when you are scrolling over to view or enter variables along the right. This is easy to do once you find where to put the cursor. Near the bottom right of the screen, look for a small area to the right of the vertical scroll bar. Drag that line to the left, until it is immediately to the right of any variables you want to always be visible.



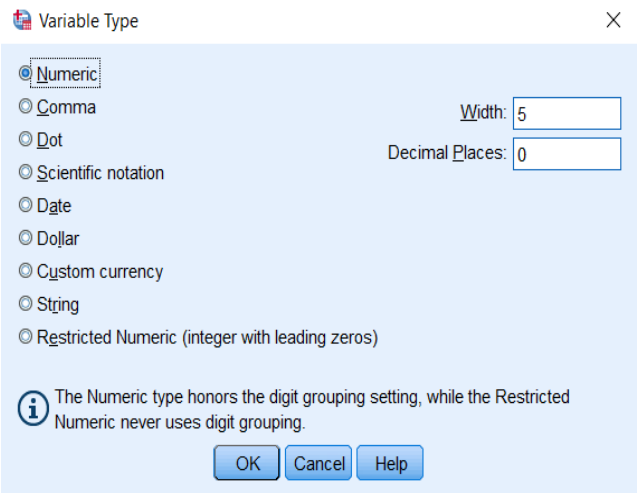
This is what you're looking for

Variable Types: For your data analysis to be accurate, it is imperative that you correctly identify the ***type*** and ***formatting*** of each variable. SPSS has special restrictions in place so that statistical analyses can't be performed on inappropriate types of data.

Information for the type of each variable is displayed in the **Variable View** tab. Under the "Type" column, simply click the cell associated with the variable of interest. A blue "…" button will appear.



Click this and the Variable Type window will appear. You can use this dialog box to define the type for the selected variable, and any associated information (e.g., width, decimal places).



The two common types of variables that you are likely to see are *numeric* and *string*.

NUMERIC

Numeric variables, as you might expect, have data values that are recognized as numbers. This means that they can be sorted numerically or entered into arithmetic calculations. When viewed in the Data View window, system-missing values for numeric variables will appear as a dot (i.e., "."). (Note that one should not type in a period character in a cell to specify a missing value. Simply leave the cell blank, and SPSS will recognize it as system-missing.)

STRING

String variables -- which are also called alphanumeric variables or character variables have values that are treated as text. This means that the values of string variables may include numbers, letters, or symbols. In the Data View window, missing string values will appear as blank cells. However, note that these blank cells are not recognized by SPSS as system-missing values (i.e., SPSS considers even blank strings to be non-missing)! This has important implications if you plan to use a string variable in an analysis, since it will affect your sample size.

COMMA

Numeric variables that include commas that delimit every three places (to the left of the decimals) and use a period to delimit decimals. SPSS will recognize these values as numeric even if they contain commas or use scientific notation.

- Example: Thirty-thousand and one half: 30,000.50
- Example: One million, two hundred thirty-four thousand, five hundred sixty-seven and eighty-nine hundredths: 1,234,567.89

DOT

Numeric variables that include periods that delimit every three places and use a comma to delimit decimals. SPSS will recognize these values as numeric even if they contain periods or use scientific notation.

- Example: Thirty-thousand and one half: 30.000,50
- *Example:* One million, two hundred thirty-four thousand, five hundred sixty-seven and eighty-nine hundredths:1.234.567,89

DATE

Numeric variables that are displayed in any standard calendar date or clock-time formats. Standard formats may include commas, blank spaces, hyphens, periods, or slashes as space delimiters.

- Example: Dates: 01/31/2013, 31.01.2013
- Example: Time: 01:02:33.7

DOLLAR

Numeric variables that contain a dollar sign (i.e., $) before numbers. Commas may be used to delimit every three places, and a period can be used to delimit decimals.

- Example: Thirty-three thousand dollars and thirty-three cents: $33,000.33
- *Example:* One million dollars and twelve point three cents: $1,000,000.123

Descriptive Statistics

Descriptive statistics is a **summary statistic** that quantitatively **describes or summarizes features** from a collection of information, they are designed to give you information about the distributions of your variables. Within this broad category are measures of central tendency (***Mean, Median, Mode***), measures of variability around the mean (***Std deviation and Variance***), measures of deviation from normality (***Skewness and Kurtosis***), information concerning the spread of the distribution (***Maximum, Minimum, and Range***), and information about the stability or sampling error of certain measures, including standard error (***S.E.***) of the mean (***S.E. mean***), S.E. of the kurtosis, and S.E. of the skewness (included by default when skewness and kurtosis are requested).

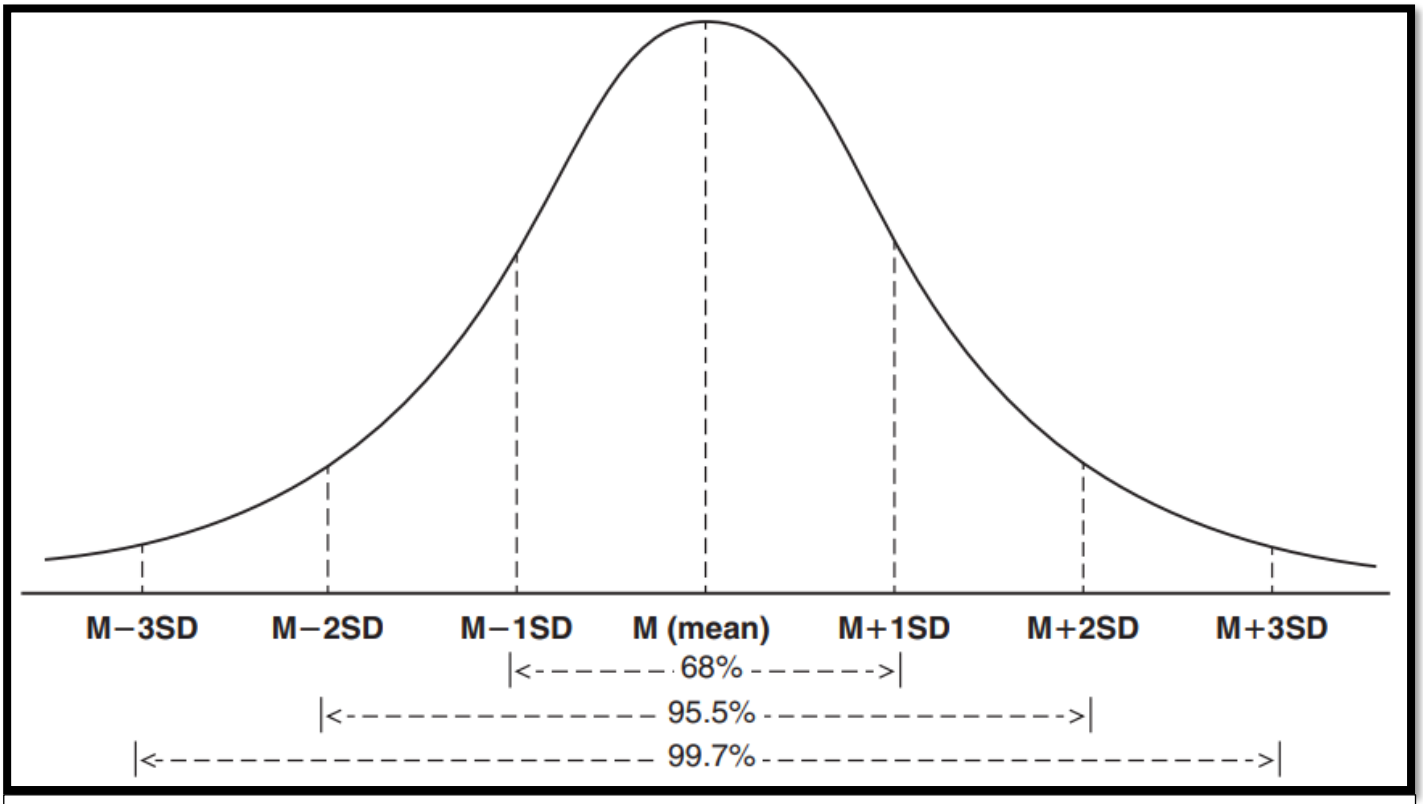
The Normal Distribution

Many naturally occurring phenomena produce distributions of data that approximate a normal distribution. Some examples include the height of adult humans in the world and the IQs of residents of Iraq. In all these distributions, there are many midrange values (e.g., 153–178 centimeters, 90–110 IQ points) and few extreme values (e.g., 76 centimeters, 12 IQ points).

There are other distributions that approximate normality but deviate in predictable ways. For instance, times of runners in a 10-kilometer race will have few values less than 30 minutes, but many values greater than 40 minutes. The majority of values will lie above the mean (average) value. This is called a ***negatively skewed distribution***. Then there is the distribution of ages of persons living in Iraq. While there are individuals who are 1 year old and others who are 100 years old, and in general the population has more values below the mean than above the mean. This is called a ***positively skewed distribution***.

A normal distribution is symmetric about the mean or average value. In a normal distribution, 68% of values will lie between plus-or-minus (±) 1 standard deviation (described below) of

the mean, 95.5% of values will lie between ± 2 standard deviations of the mean, and 99.7% of values will lie between ± 3 standard deviations of the mean. A normal distribution is illustrated in the figure below.



Normal Distribution

As a final example the average (or mean) height of an American adult male is centimeters with a standard deviation of 4 inches. Thus, 68% of American men are between 162.5cm and 185.5cm (69 ± 4); 95.5% of American men are between 155cm and 195.5cm (69 ± 8), and 99.7% of American men are between 145 and 206 (69 ± 12) in height.

Measures of Central Tendency

The ***Mean*** is the average value of the distribution, or the sum of all values divided by the number of values. The mean of the distribution [3 5 7 5 6 8 9] is: (3 + 5 + 7 + 5 + 6 + 8 + 9)/7 = 6.14

The ***Median*** is the middle value of the distribution. The median of the distribution [3 5 7 5 6 8 9], is 6, the middle value (when reordered from small to large, 3 5 5 6 7 8 9).

If there is an even number of values in a distribution, then there will be two middle values. **In that case the average of those two values is the median**.

The ***Mode*** is the most frequently occurring value. The mode of the distribution [3 5 7 5 6 8 9] is 5, because 5 occurs most frequently (twice, all other values occur only once).

Measures of Variability Around the Mean

The ***Variance*** is the sum of squared deviations from the mean divided by N − 1. The variance for the distribution [3 5 7 5 6 8 9] (the same numbers used above to illustrate the mean) is: $[(3–6.14)^2 + (5–6.14)^2 + (7–6.14)^2 + (5–6.14)^2 + (6–6.14)^2 + (8–6.14)^2 + (9–6.14)^2]/6 = 4.1429$ Variance is used mainly for ***computational purposes***.

Standard deviation is the more commonly used measure of variability. The Standard deviation is the positive square root of the variance. For the distribution [3 5 7 5 6 8 9], the standard deviation is the square root of 4.1429, or 2.0354.

Al-Noor University College

Computer for Medical Techniques Departments

2020 – 2021

POWERP

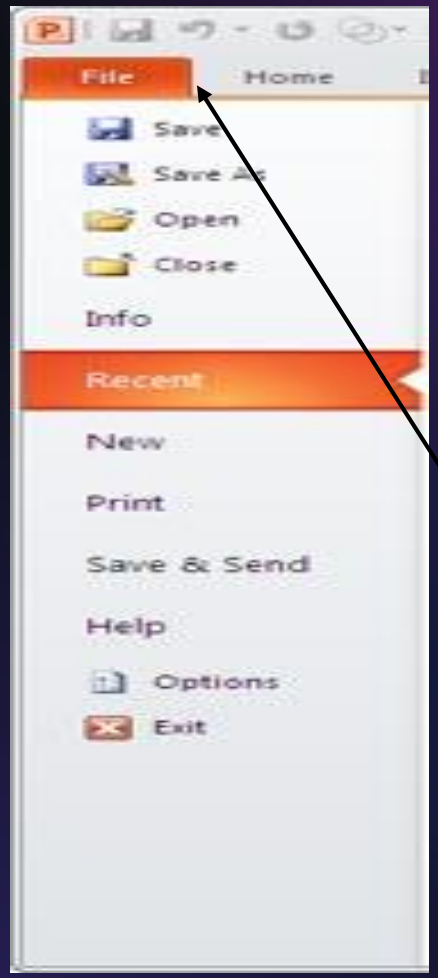
OINT

BY: MUHAMMAD A. MUHAMMAD

PowerPoint.

- PowerPoint is a slideshow presentation program that's part of the Microsoft office suite, it makes it easy to create and present your ideas in dynamic, visually interesting ways.
- You open Microsoft PowerPoint by clicking on the icon on your desktop (if you have one there) or by going to start > all programs > Microsoft office > PowerPoint.

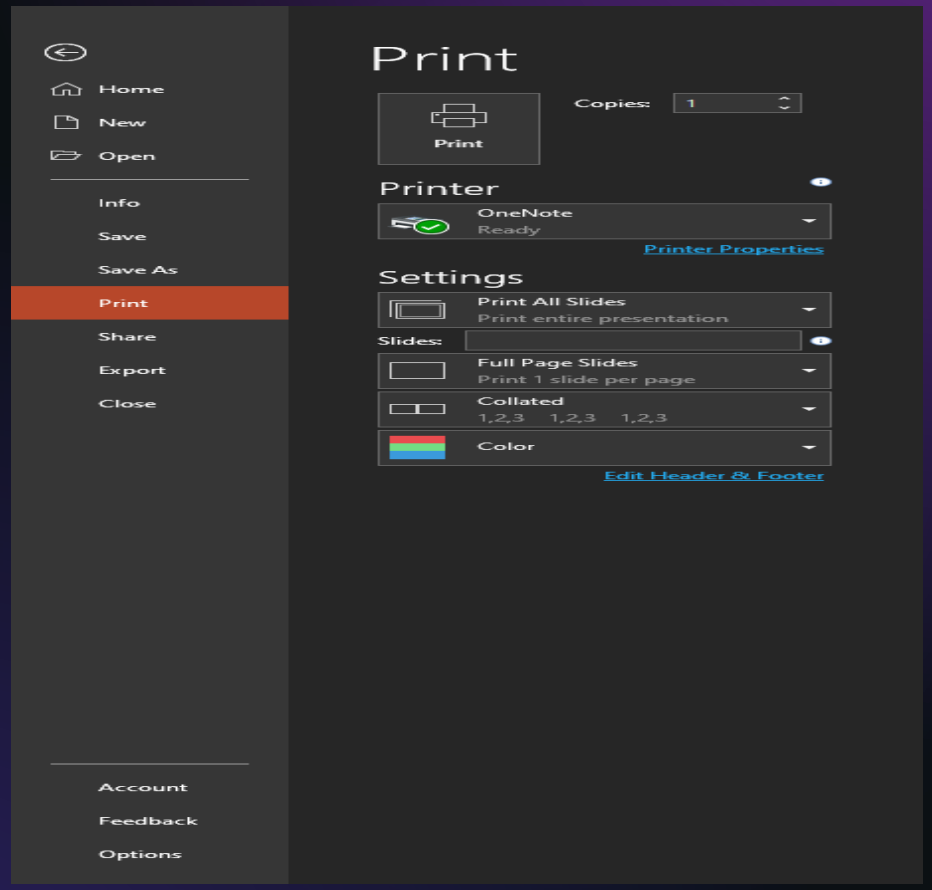
File TAB.



File menu contain

1. Save: to save the presentation after any change.
2. Save as: to save the presentation with another name, place, type.
3. Open: to open a presentation, that was saved in the computer.
4. Recent: reach to the recent presentations, that were opened recently.
5. New: create a new presentation from the available templates.
6. Print: configure to print.

File TAB cont…



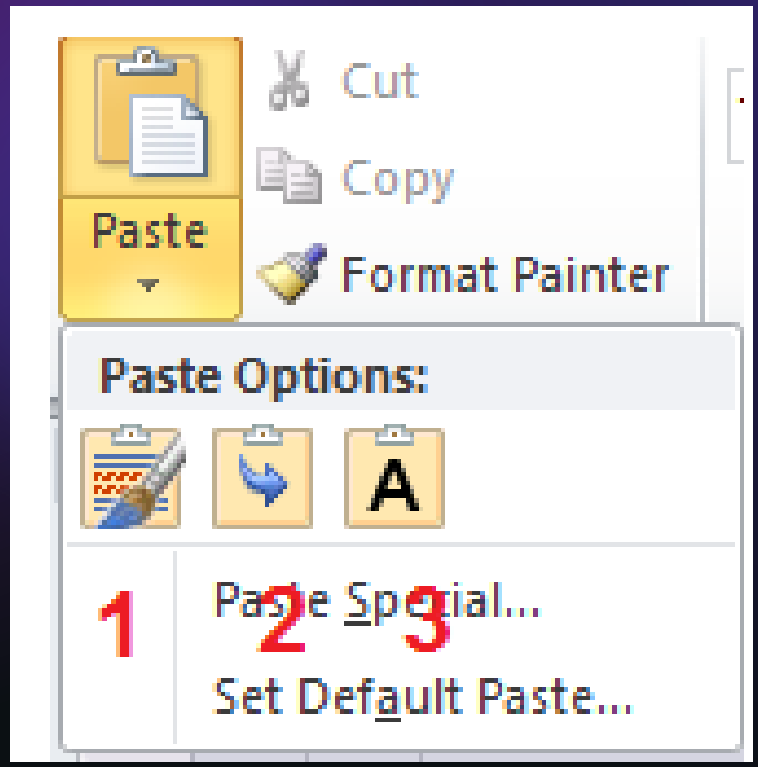
Print

1. Copies: number of copies
2. Printer: choose the printer
3. Setting
   a. print all slides or print current slide or printing a custom range of slides.
   b. Full page slide, 1 slide per sheet, 2 slides per sheet, 4 pages per sheet, etc.
   c. Colored printing or black and white printing

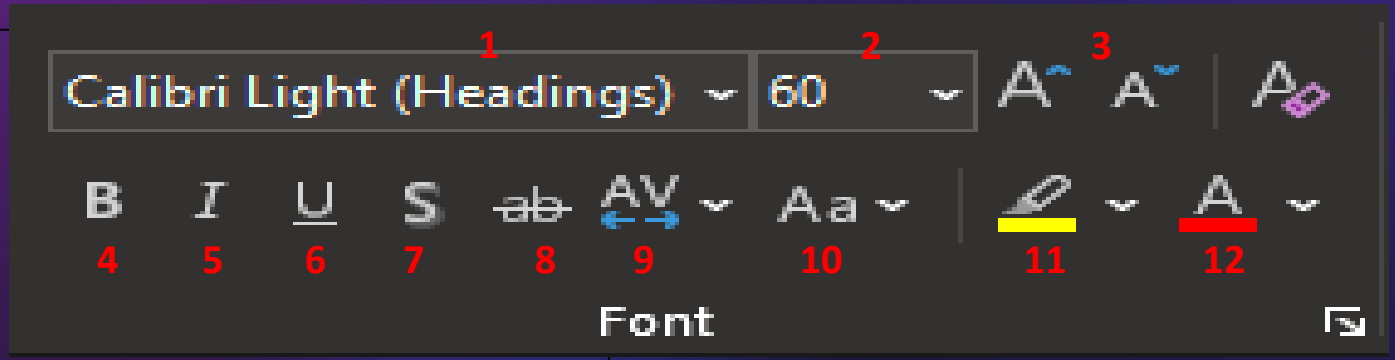
Home TAB.

Clipboard group

- **Cut: - cut the selection and put it on the clipboard**
- **Copy: - copy the selection and put it on the clipboard**
- **Format painter: - copy information from one place and apply it to another**
- **Paste: - paste the contents of the clipboard.**
  1. **Keep source formatting .**
  2. **Merge formatting.**
  3. **Copy text only.**



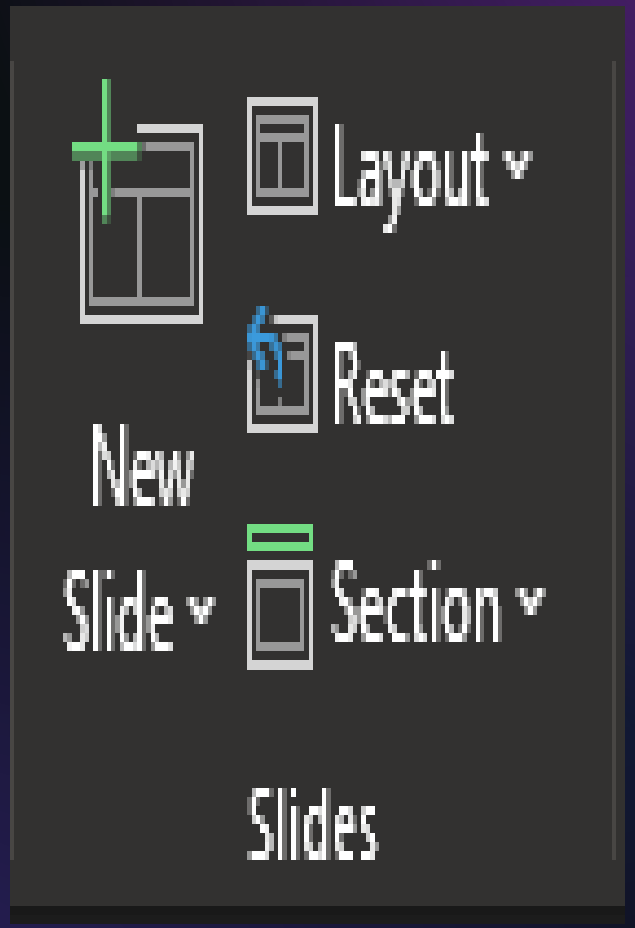
Home TAB cont…



Font Group

1) Choose font type
2) Choose font size
3) Choose font size
   a. Grow font (increase the size)
   b. Shrink font (decrease the size)
4) B :- make the selected text bold (CTRL + B)
5) *I* :- Italic (CTRL + I)
6) U :- underline the selected text. (CTRL + U)
7) **S** : add shadow behind the selected text.
8) abc:- draw a line through the middle of the selected text.
9) AV : increase or decrease the spacing between characters.
10) Aa: change the case of the text from many options
11) Make the text look like it was marked by highlight color.
12) choose the text color.
13) A : clear formatting from the selected text.

Slides Group.



Slides Groups

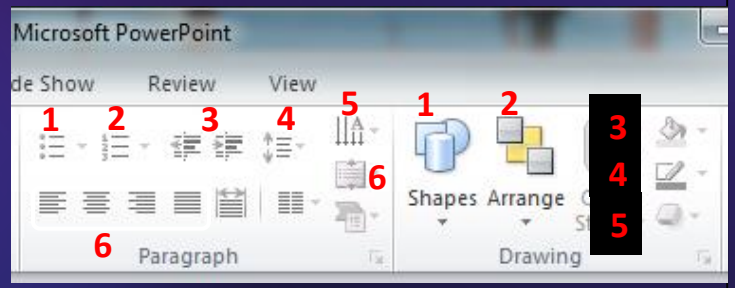
New slide: add a slide to the presentation or duplicate an existing slide (CTRL + M)

Layout: change the layout of the current slide

Section: add a new section to the presentation, rename it, remove it, collapse all sections or expand them all.

Slides Group cont...

Paragraph Group



1. Start a bulleted list
2. Start a numbered list
3. Increase or decrease the indent
4. Line spacing: - choose the spacing between lines of text
5. Text direction: the direction of the text (horizontal, rotated by degree, stacked).
6. Align text (left, middle, right, justify)
7. Align text (Top, Middle, bottom).

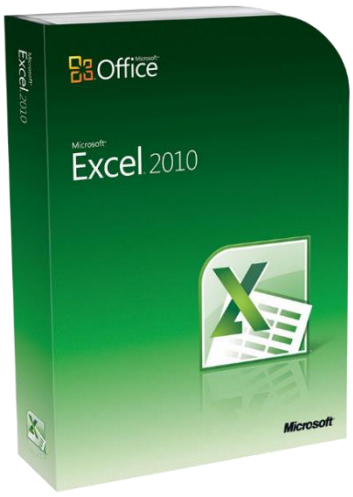
Thank You

Al-Noor University College

Computer for Medical Departments

2022 – 2023

By: Muhammad Abdelkarim Muhammad



Microsoft Office Excel 2010

Excel 2010 is a spreadsheet program included in the Microsoft Office suite, it present tables of values arranged in rows and columns that can be manipulated using both basic and complex arithmetic operations (formulas) and functions.

Running The application

To Run Excel program use: start → all program → Microsoft office → Microsoft Excel

Or you can search for it by typing “excel 2010” in the search box of the start menu.

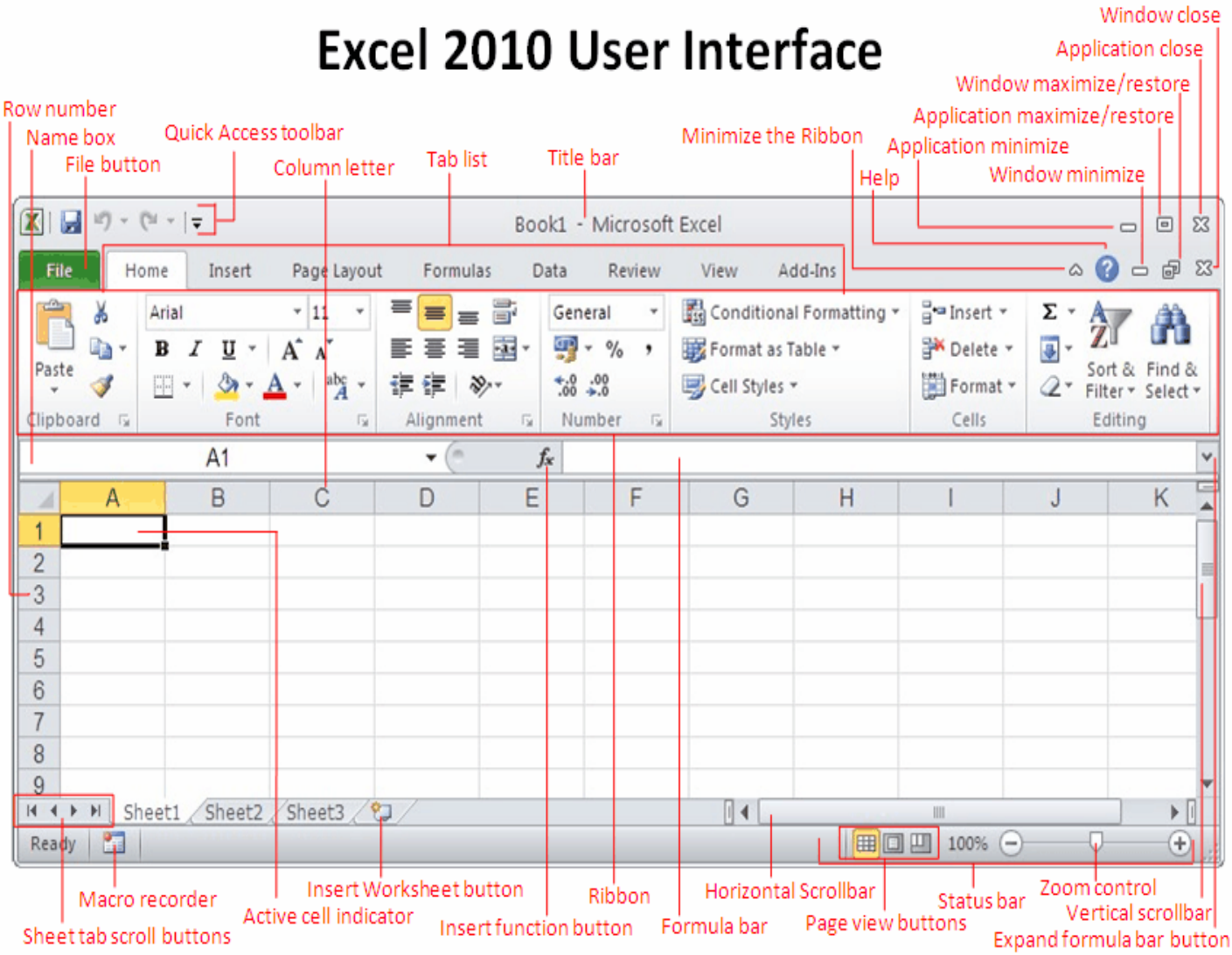
Eight Benefits of Microsoft Excel

1. Very good way to store data.
2. Easily perform calculations.
3. Variety of tools for data analysis.
4. Easy data visualizations with charts.
5. Easily print reports.
6. So many free templates to use.
7. Coding (using VBA) to automate.
8. Use excel online & excel mobile app.

Six Excel Features

1. Conditional Formatting.
2. PivotTables.
3. Paste Special.
4. Add Multiple Rows/columns.
5. Extend formula across/down.
6. Sorting & Filtering.

Excel 2010 Main Interface Contents: Excel 2010 comes with a new user interface called the Ribbon, which consists of a series of horizontal tabs, each containing a variety of commands grouped according to function. Most features in Excel 2010 are available through the commands on the Ribbon tabs. In addition, the Ribbon can be customized in Excel 2010. Below figure shows a typical Excel 2010 user interface, with the important parts labeled.



The Ribbon: The Ribbon is designed to help you quickly find the commands that you need to complete a task. Commands are organized in logical groups, which are collected together under tabs. Each tab relates to a type of activity, such as formatting or laying out a page. To reduce clutter, some tabs are shown only when needed. For example, the Picture Tools tab is shown only when a picture is selected.

Excel 2010 User interface Description:

Name	Description
Active cell indicator	This dark outline indicates the currently active cell (user selected cell).
Application Close button	Clicking this button closes Excel.
Application Minimize button	Clicking this button minimizes the Excel window.
Column letters	Letters range from A to XFD — one for each of the 16,384 columns in the worksheet. You can click a column heading to select an entire column of cells or drag a column border to change its width.
Expand formula bar button	Clicking this button expand formula bar to display more.
File button	Click this button to open Back Stage view, which contains many options for working with your document (including printing) and setting Excel options.
Formula bar	When you enter information or formulas into a cell, it appears in this line.
Help button	Clicking this button displays the Excel Help system window.
Horizontal scrollbar	Use this tool to scroll the sheet horizontally.
Insert function button	Clicking this button insert function.
Insert Sheet button	By default, each new workbook that you create contains three sheets. Add a new sheet by clicking the Insert Worksheet button (which is displayed after the last sheet tab).
Macro recorder indicator	Click to start recording a VBA macro. The icon changes while your actions are being recorded. Click again to stop recording.
Minimize Ribbon button	Clicking this button hides the Ribbon, giving you a bit more space onscreen. When you click a tab, the Ribbon reappears.
Name box	This field displays the active cell address or the name of the selected cell, range, or object.
Page View buttons	Change the way the worksheet is displayed by clicking one of these buttons.
Quick Access toolbar	This customizable toolbar holds commonly used commands. The Quick Access toolbar is always visible, regardless of which tab is selected.
Ribbon	This is the main location for Excel commands. Clicking an item in the tab list changes the Ribbon that displays.
Row numbers	Numbers start from 1 — one for each row in the worksheet. You can click a row number to select an entire row of cells.
Sheet tab scroll buttons	Use these buttons to scroll the sheet tabs to display tabs that aren't visible.
Sheet tabs	Each of these notebook-like tabs represents a different sheet in the workbook. A workbook can have any number of sheets, and each sheet has its name displayed in a sheet tab.

Status bar	**This bar displays various messages as well as the status of the Num Lock, Caps Lock, and Scroll Lock keys on your keyboard. It also shows summary information about the range of cells that is selected. Right-click the status bar to change the information that's displayed.**
Tab list	**Use these commands to display a different Ribbon, similar to a menu.**
Title bar	**This displays the name of the program and the name of the current workbook and holds some control buttons that you can use to modify the window.**
Vertical scrollbar	**Use this to scroll the sheet vertically.**
Window Close button	**Clicking this button closes the active workbook window.**
Window Maximize/Restore button	**Clicking this button increases the workbook window's size to fill Excel's complete workspace. If the window is already maximized, clicking this button "unmaximizes" Excel's window so that it no longer fills the entire screen.**
Window Minimize button	**Clicking this button minimizes the workbook window, and it displays as an icon.**
Zoom control	**Use this scroller to zoom your worksheet in and out.**

FILE TAB

File menu contain →save, save as, recent, new (to choose template for specific work), etc.

New (Create a new workbook by choosing specified template)

Save (save a workbook)

Save as (save a workbook with a new name or place)

Open (open any saved workbook)

print (print a desired sheet or sheets)

- **make sure to set the number of copies.**
- **Make sure to select the correct printer.**
- **Choose what to print (active sheet, entire workbook, selection)**
- **Select the proper page size.**
- **Set the proper margins.**
- **Choose the scaling that work best for you.**

HOME TAB

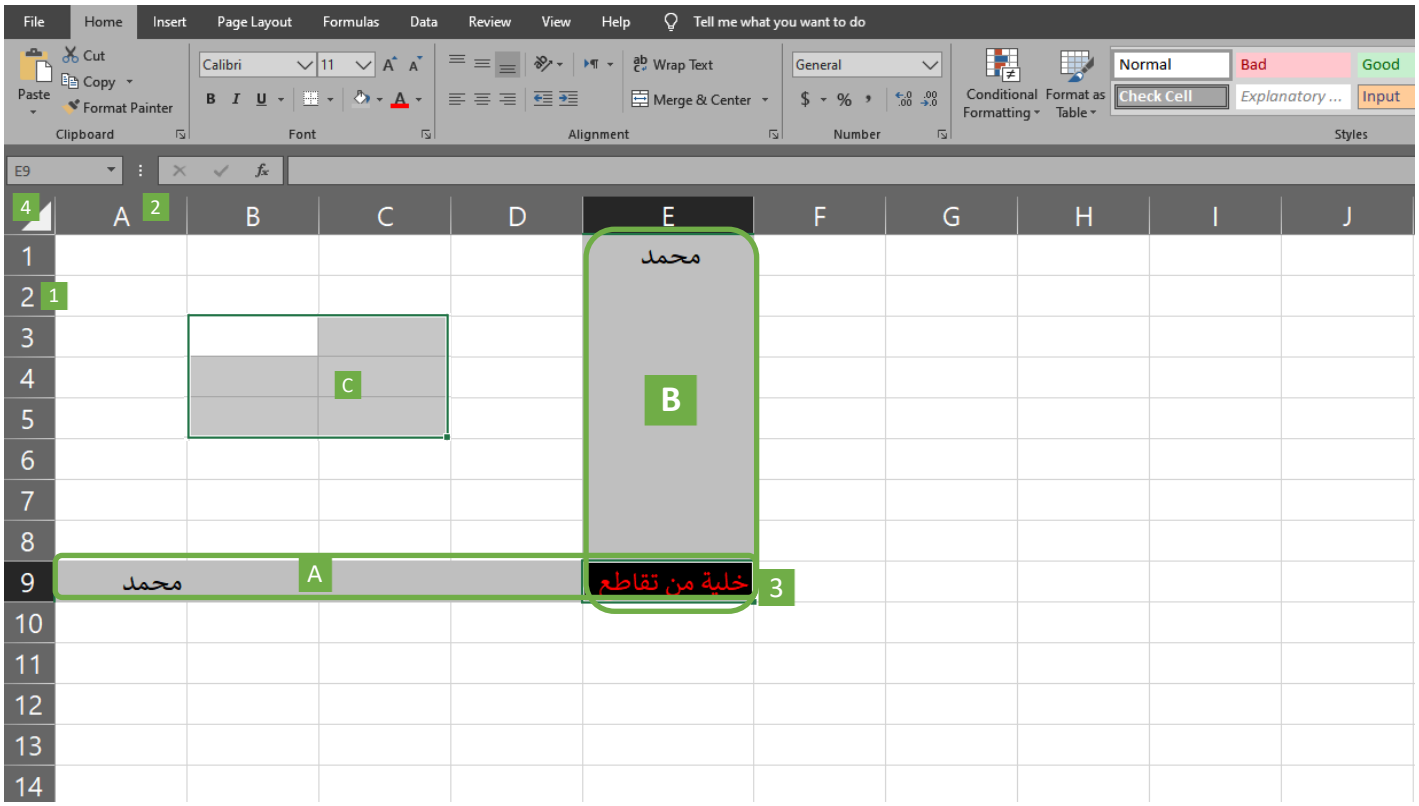
The home tab contains all the tools that you previously studied in addition to many other tools as follows.

Book: is a excel file, contain "sheets", and any sheet contain:

1. **ROW:** a group of cells are arranged horizontally and is indicated by number.
2. **COLUMN:** a group of cells are arranged vertically and is indicated by letter.
3. **CELL:** intersection between row and column, it is referred to by " cell reference " which is a letter of a column and the number of a row for example: the reference (E9) refers to column (E) and row (9).
4. **select all button:** To select all work sheet

Cells Range:

A. **Horizontal Range:** Which includes consecutive cells horizontally in a row.
B. **Vertical Range:** which include consecutive cells vertically in a column.
C. **Vertical and Horizontal Range:** Which includes consecutive cells horizontally and vertically at the same time.



SELECTING A WHOLE ROW: place the mouse pointer on the name of the specified row then left click it, to select other rows, select the first row and press **(CTRL)** key and select any other row or rows.

SELECTING A WHOLE COLUMN: put the mouse pointer on the name of the specified column then left click it and to select other columns, select the first column and press (CTRL) key and select any other column or columns.

INSERTING A ROW:

To insert a row in any place in a worksheet **right click** the row you want to insert a row before then select **insert**.

INSERTING A COLUMN:

To insert a column in any place in a worksheet **right click** the column you want to insert a column before then select **insert**.

FREEZEING/UNFREEZEING FIRST COLUMN/ROW

When the data is wider/longer than the width/height of the window, it is best to freeze

first column/row while scrolling through rest of the worksheet by ("view" →window group →freeze panes→ freeze first column / freeze first row), the same steps can be done to unfreeze the first column/row

Auto Fill:

The auto fill is used to copy data, numeric numbers, date, to many sequential cells by using the **fill handle** of any cell to copy its contents to its neighboring cells by pointing to the bottom right side of the cell then when the shape of pointer switch to "+" continue clicking and dragging.

When we want to fill the cells by series data (ex:- days, months) then we enter the first data in the first cell for example (Sunday) then select and drag it to its neighboring cells to do a series fill.

INSERTING / DELETING / RENAMING A SHEET

To insert, delete or rename a sheet right click the sheet bar or the desired sheet and select the desired action.

Merging Excel Cells 

To **merge and center** two or more excel cells select the cells then use the merge and center button, note that when you unmerge cells then the merged data are lost.

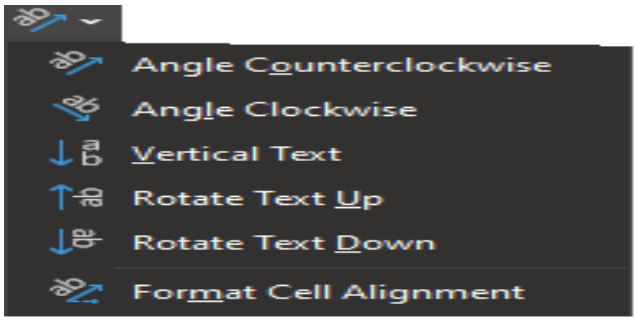
To **merge cells across** (merge the selected cells in the same row to one cell) click the drop-down arrow and select merge across.

To **unmerge cells,** click the drop-down arrow and select unmerge.

Changing Cell Orientation

To change the cell orientation in excel use the orientation button.

i.e. (rotate the text diagonally or vertically).



Text Wrapping

Break the long text (text that is beyond the cell boarders) into multiple lines to provide readability inside the cell, to add a new line inside the cell use ALT + ENTER.

Data Types

Microsoft Excel recognizes four kinds of information: Logical values (TRUE or FALSE, also called Boolean values), Numerical values, Text values, and Error types. The four kinds of information are known, in technical parlance, as Data Types.

Note that Excel will do the very best it can to figure out which of these types it THINKS you intend once you complete typing into a cell and hit the enter key. For example, if you type a series of numerals, it assumes you intend a number type. If that series of numerals happens to begin with one or more zeros, Excel STILL thinks you intend to type a number, and eliminates those leading zeros. Likewise, if you type something that looks like a date, and contains valid numbers which can represent a valid date, Excel assumes you mean a number type again, formatted as a date.

1-The Logical Data Type

Logical values are either TRUE or FALSE.

In most cases, logical values will be present as the result of the evaluation of an expression or function, for example the statement “1 is less than 2” is recognizable as a true statement. Another way to put that is:

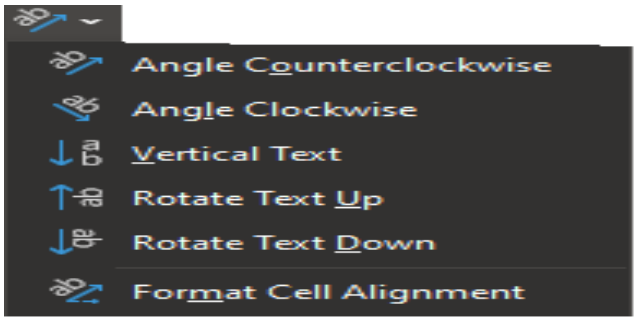
= 1 < 2 which will result TRUE

When evaluating logical expressions, Excel recognizes the text TRUE as a logical value. Excel also treats the value 0 as false, and any other numerical value as true.

Changing Cell Orientation

To change the cell orientation in excel use the orientation button.

i.e. (rotate the text diagonally or vertically).



Text Wrapping

Break the long text (text that is beyond the cell boarders) into multiple lines to provide readability inside the cell, to add a new line inside the cell use ALT + ENTER.

Data Types

Microsoft Excel recognizes four kinds of information: Logical values (TRUE or FALSE, also called Boolean values), Numerical values, Text values, and Error types. The four kinds of information are known, in technical parlance, as Data Types.

Note that Excel will do the very best it can to figure out which of these types it THINKS you intend once you complete typing into a cell and hit the enter key. For example, if you type a series of numerals, it assumes you intend a number type. If that series of numerals happens to begin with one or more zeros, Excel STILL thinks you intend to type a number, and eliminates those leading zeros. Likewise, if you type something that looks like a date, and contains valid numbers which can represent a valid date, Excel assumes you mean a number type again, formatted as a date.

1-The Logical Data Type

Logical values are either TRUE or FALSE.

In most cases, logical values will be present as the result of the evaluation of an expression or function, for example the statement “1 is less than 2” is recognizable as a true statement. Another way to put that is:

= 1 < 2 which will result TRUE

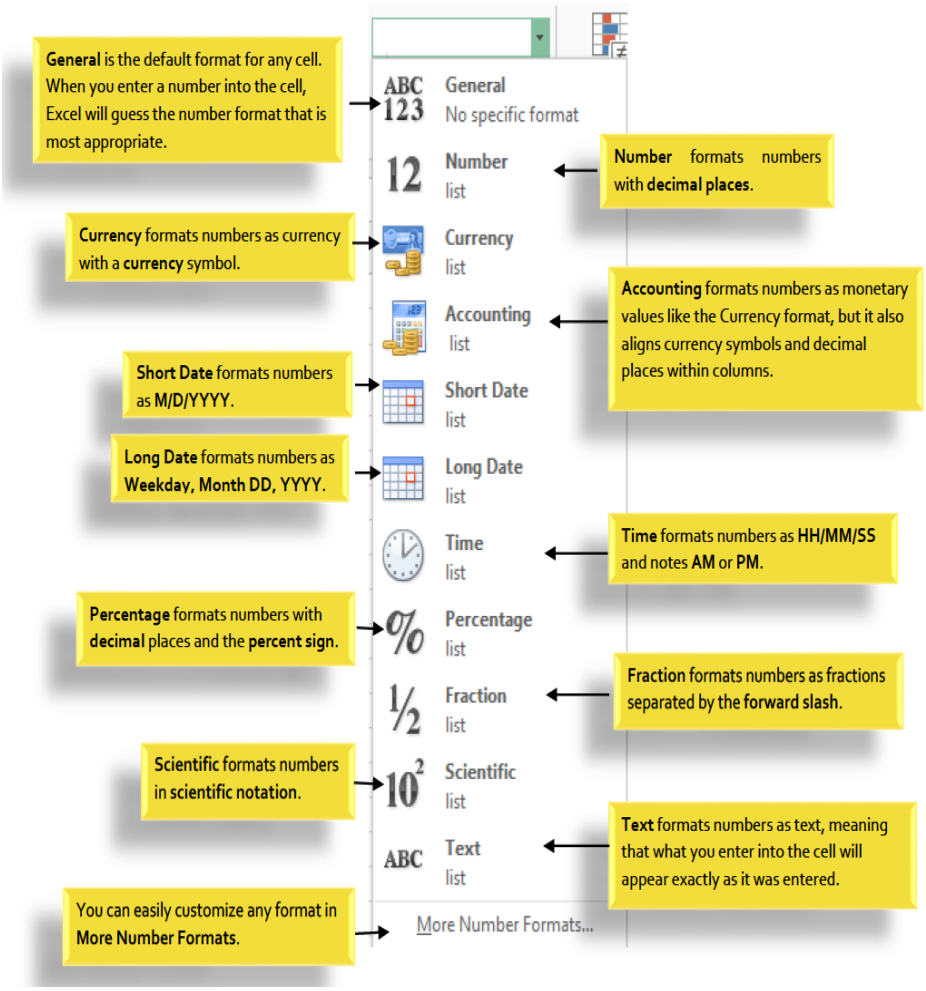
When evaluating logical expressions, Excel recognizes the text TRUE as a logical value. Excel also treats the value 0 as false, and any other numerical value as true.

2-The Number Data Type

Numerical values are, of course, numbers with some type of formatting.

There is many different Numerical value formatting as in the figure below.

1- General: the default format.
2- Number: best for data with numbers.
3- Currency/Accounting: best for monetary values.
4- Short/long date and time: best for date/time values.
5- Percentages: if the formula "=50/100" is entered excel will display it as 0.5 but when the cell is set to percentage format it will be shown as 50.00%.
6- Fraction: if the formula "=3/2" is entered excel will display it as 1.5 but when the cell is set to fraction format it will be shown as 1 ½ .
7- Scientific: if the formula "=5 * 3 ^ 2" is entered excel will display it as 45 but when the cell is set to scientific format it will be shown as 4.50E+01, also you can enter the scientific notation directly by typing the number then e then the exponent in a general formatted cell like 5e-2.



HW: what is the usefulness of scientific formatting? do you think it will benefit you in the future?

3-The Text Data Type (the text option in the figure above)

In text cell format any data entered will appear as entered, useful when leading zeros are needed.

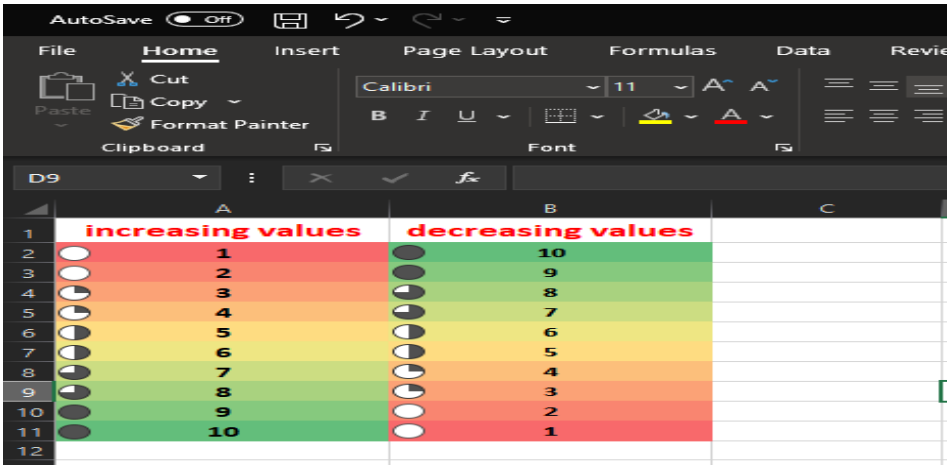
We can tell Excel to treat the data in a cell as text by pre-pending a single-quote character before the text we wish to enter, or by applying the text format to the cell through the cell formatting menu.

4-The Error Data Type

There are instances in which errors will occur when Excel evaluates the contents of a cell. For example, division by zero is mathematically undefined, it turns out the Excel has an Error type specifically for this instance, the #DIV/0! Result, another error is #VALUE! Which is resulted when an Invalid argument or operator in a function or formula are found.

Conditional Formatting: easily spot trends and patterns in the data using bars, colors, and icons.

The image on the right is an example **of ICON SET AND COLOR SCALES** applied to some values.



Format as Table: Once you've entered information into a worksheet, you may want to format your data as a table. Just like regular formatting, tables can improve the look and feel of your workbook, but they'll also help to organize your content and make your data easier to use. Excel includes several tools and predefined table styles, allowing you to create tables quickly and easily.

To format data as a table:

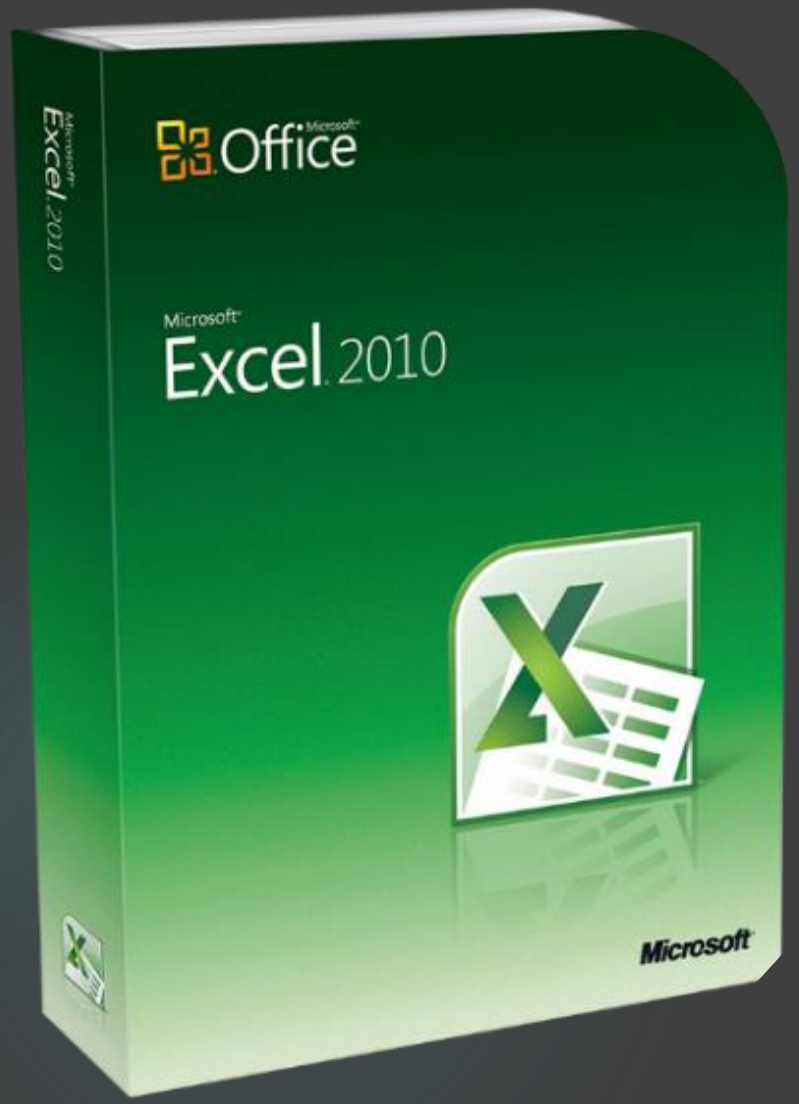
1. **Select the cells you want to format as a table. for example, select the cell range A4:D10.**
2. **From the Home tab, click the Format as Table command in the Styles group.**
3. **Select a table style from the drop-down menu.**
4. **A dialog box will appear, confirming the selected cell range for the table.**
5. **If your table has headers, check the box next to My table has headers, then click OK.**
6. **The cell range will be formatted in the selected table style.**

You can reformat the table and add new rows/columns to it by typing new content after the last row or column in the table. The row or column will be included in the table automatically.

To remove a table:

1. **Select any cell in your table. The Table Design tab will appear.**
2. **Click the Convert to Range command in the Tools group.**
3. **A dialog box will appear. Click Yes.**
4. **The range will no longer be a table, but the cells will retain their data and formatting.**

Styles: to apply several formats in one step, and to make sure that cells have consistent formatting, you can use a cell style. A cell style is a defined set of formatting characteristics, such as fonts and font sizes, number formats, cell borders, and cell shading.



Al-Noor University College

Computer for Medical Techniques Departments

2022 – 2023

M.S.O. EXCEL

BY: MUHAMMAD ABDELKARIM MUHAMMAD

CELLS GROUP / FORMAT:

- Format is used to do some changes to the cells size/visibility in addition to organizing and protecting the sheets and it can be reached by following (Home Tab -> Cells group-> Format).

CELLS GROUP / FORMAT CONT…

Row Height: set the row height in the sheet.

AutoFit Row Height: adjust the rows to fit the text in the cell (so that the text is completely within the cell).

Column Width: set the Column Width in the sheet.

AutoFit column width: adjust the columns to fit the text in the cell (so that the text is completely within the cell).

Default Width: Set the default width for all columns in the sheet.

CELLS GROUP / FORMAT CONT…

Hide & Unhide: this option is useful when a certain row(s) or column(s) or sheets are required to be hidden / unhidden.

Move or copy a sheet: This option is useful when you want to duplicate a sheet or move/copy an active sheet from the current workbook to a new workbook.

Lock Cell: Mark the selected cell as locked or unlocked (useful when using sheet protection feature).

Protect Sheet: Prevent other people from changing the sheet contents by limiting their ability to edit the sheet by using a password.

INSERT TAB:

- **Inserting a picture:** adding a picture to the current sheet.
- **Inserting a shape:** adding a shape to the current sheet such as circle, square or line etc.
- **Inserting a textbox:** adding a text box anywhere in the current sheet.
- **Inserting word art:** write in artistic way in your file.
- **Insert equation:** adding mathematical equations to the current sheet.
- **Inserting symbol:** adding symbols that are not on the keyboard to the sheet.

PAGELAYOUT TAB:

- **Page orientation:** change the page orientation to landscape or portrait.
- **Page size:** change the page size to A4, A5 or letter etc.
- **Sheet direction:** switch the sheet direction left or right.
- **Background:** set a background for the sheet this adds some personality to the worksheet.

Data Sorting & Filtering:

There are many built-in Excel tools to help with data management and the sorting and filtering features are among the best.

The filter tool gives you the ability to filter a column of data within a table to isolate the key components you need.

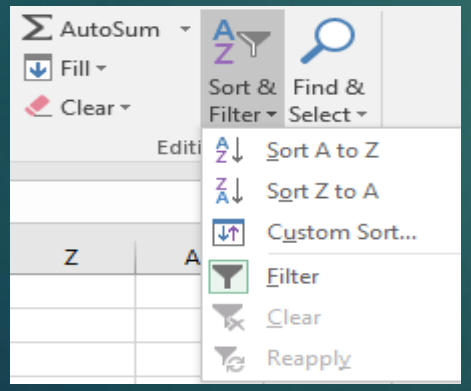
The sorting tool allows you to sort by date, number, alphabetic order and more.

Data Sorting & Filtering cont…

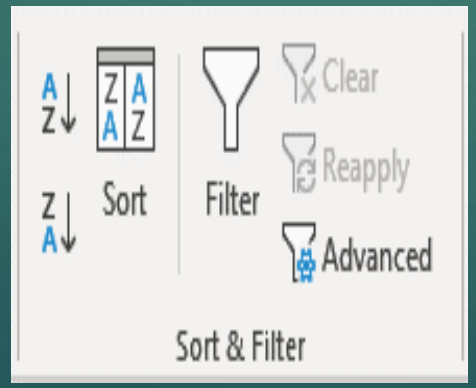
Sorting data in excel can be achieved in multiple ways, one is to use the **"Home Tab >>> Editing Group >>> Sort & Filter"**, another is to go to **"Data Tab >>> Sort & Filter Group"** then choose the type of sorting or filtering to be applied.

Finally, a **multi-level sorting** in Excel is possible using ***custom sort*** which satisfies the need to sort two columns or more at the same time.

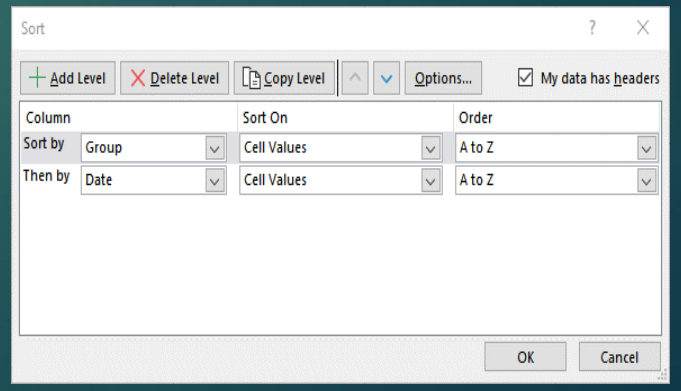
sort & filter in home tab.



sort & filter in data tab.



Custom Sorting.



Thank You

Data Sorting & Filtering

There are many built-in Excel tools to help with data management and the sorting and filtering features are among the best. The filter tool gives you the ability to filter a column of data within a table to isolate the key components you need. The sorting tool allows you to sort by date, number, alphabetic order and more. In the following example, we will explore the usage of sorting and filtering and show some advanced sorting techniques.

Figure 1: Unsorted Data.

A	B	C	D
ID	Item	Group	Date
1	item 1	Group A	1/1/2020
2	item 2	Group B	1/1/2021
3	item 3	Group C	1/1/2019
4	item 4	Group A	1/2/2020
5	item 5	Group B	1/2/2021
6	item 6	Group C	1/2/2019
7	item 7	Group A	1/3/2020

Figure 2: Sorted Data Based on group.

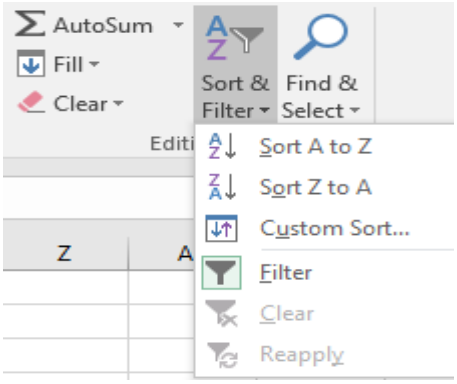
A	B	C	D
ID	Item	Group	Date
1	item 1	Group A	1/1/2020
4	item 4	Group A	1/2/2020
7	item 7	Group A	1/3/2020
2	item 2	Group B	1/1/2021
5	item 5	Group B	1/2/2021
3	item 3	Group C	1/1/2019
6	item 6	Group C	1/2/2019

SORTING:

By examining the example illustrated in the figures 1 & 2 Its easily noticeable that the items in figure 2 are sorted from the first one to the last based on the data in the "Group" column.

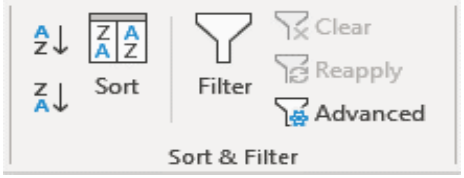
Its also possible to sort the sheet data based on any column that contain data relevant or irrelevant data to the specified column data that we want to sort.

Figure 3: sort & filter in home tab.



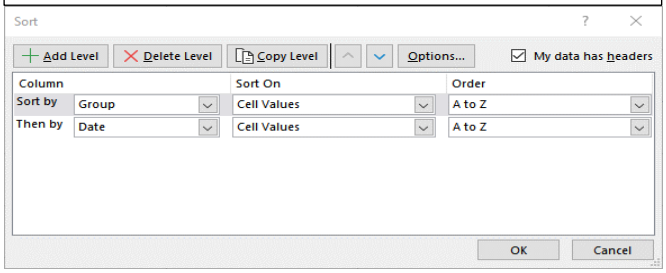
Sorting data in excel can be achieved in multiple ways, one is to use the **"Home Tab >>> Editing Group >>> Sort & Filter"**, another is to go to **"Data Tab >>> Sort & Filter Group"** then choose the type of sorting or filtering to be applied.

Figure 4: sort & filter in data tab.



Finally, a multi-level sorting in Excel is possible using ***custom sort*** which satisfies the need to sort two columns or more at the same time.

Figure 5: Custom Sorting.



FILTERING: In addition to sorting, you may find that adding a filter allows you to better analyze your data. When data is filtered, only rows that meet the filter criteria will display and other rows will be hidden. With filtered data, you can then copy, format, print, etc., your data, without having to sort or move it first. To use a filter,

1- Go to the Home Tab, click the arrow below the Sort & Filtering icon in the Editing group and choose Filter **(figure 3 above).**

OR

2- Go to the Data Tab, and then click Filter in the Sort & Filter group **(figure 4 above).**

You will notice that all your column headings now have an arrow next to the heading name. Click on the arrow next to the heading with which you want to filter, and you will see a list of all the unique values in that column. Check the box next to the criteria you wish to match and click OK. Click on the arrow next to another heading to further filter the data.

Homework: using what you learned today, use sorting and filtering to sort the data in figure 1 above based on item name then filter it so that only the even rows of the data are visible.

FUNCTIONS AND FORMULAS

In Excel, a formula is an expression that operates on values in a range of cells or a cell. For example, =A1+A2+A3, which finds the sum of the range of values from cell A1 to cell A3.

Functions are predefined formulas in Excel. They eliminate laborious manual entry of formulas while giving them human-friendly names. For example: =SUM(A1:A3). The function sums all the values from A1 to A3.

OPERATIONS PRECEDENCE

It's important to understand that when you create a formula with several operators, Excel evaluates and performs the calculation in a specific order. For instance, Excel always performs multiplication before addition. This order is called the order of operator precedence. You can force Excel to override the built-in operator precedence by using parentheses to specify which operation to evaluate first.

Consider this basic example. The correct answer to (2+3)*4 is 20. However, if you leave off the parentheses, as in 2+3*4, Excel performs the calculation like this: 3*4 = 12 + 2 = 14. Excel's default order of operator precedence mandates that Excel perform multiplication before addition. Entering 2+3*4 gives you the wrong answer.

Because Excel evaluates and performs all calculations in parentheses first, placing 2+3 inside parentheses ensures the correct answer.

The order of operations for Excel is as follows:

1. Evaluate items in parentheses.
2. Evaluate ranges (:).
3. Evaluate unions (,).
4. Perform negation (-).
5. Perform exponentiation (^).
6. Perform multiplication (*) and division (/), which are of equal precedence.
7. Perform addition (+) and subtraction (-), which are of equal precedence.
8. Evaluate text operators (&).
9. Perform comparisons (=, <>, <=, >=).

Note: Operations that are equal in precedence are performed left to right.

Here is another widely demonstrated example. If you enter 10^2, which represents the exponent 10 to the 2nd power as a formula, Excel returns 100 as the answer. If you enter -10^2, you expect –100 to be the result. Instead, Excel returns 100 yet again.

The reason is that Excel performs negation before exponentiation, meaning that Excel is converting 10 to –10 before the exponentiation, effectively calculating –10*–10, which indeed equals 100. Using parentheses in the formula -(10^2) ensures that Excel calculates the exponent before negating the answer, giving you –100.

Note: Remembering the order of operations and using parentheses where appropriate will ensure that you avoid miscalculating your data.

Example: what is the result of the following formula, = 6+3+SUM(A1:A5,B1:B5)**-**5*½ ?

EXCEL FUNCTIONS

A **function** is a **predefined formula** that performs calculations using specific values in a particular order. Excel includes many common functions that can be used to quickly find the **sum**, **average**, **count**, **maximum value**, and **minimum value** for a range of cells. To use functions correctly, you'll need to understand the different **parts of a function** and how to create **arguments** to calculate values and cell references.

To work correctly, a function must be written a specific way, which is called the **syntax**. The basic syntax for a function is the **equals sign (=)**, the **function name** (SUM, for example), and one or more **arguments**. Arguments contain the information you want to calculate. The function in the example below would add the values of the cell range A1:A20.

The parts of a function

The followings are some excel functions that we will be dealing with through the course.

1- SUM(range of cells)

This function is used to find the summation for several cells in range that contain numbers.

There is two ways to use it, first you select the cells to be added together then select the cell that will contain the result then from the HOME tab → Editing group → AutoSum command.

The second way is to write it manually using the keyboard as follows:

select the cell that will contain the result then type " = SUM(**Range Of Cells**) " and press enter.

2- COUNT(range of cells)

This function is used to find the **number of cells** in range that contain **numbers.**

3- Average(range of cells)

This function is used to find the **average** of cells in range that contain numbers.

4- MAX / MIN(range of cells)

These two functions are used to find the maximum/minimum value in the cells in range that contain numbers.

EX: this is an example about the above functions.

E3 | 80

	A	B	C	D	E	F	G	H	I	J	K
1	جدول درجات الطلبة						مجموع درجات الطالب	معدل الطالب	عدد درجات الطالب	اعلى درجة للطالب	اقل درجة للطالب
2	id	name	mark 1	mark 2	mark3		sum =SUM(C3:E3)	average =AVERAGE(C3:E3)	count =COUNT(C3:E3)	max =MAX(C3:E3)	min =MIN(C3:E3)
3	1	muhammad	90	50	80		220	73.33333333	3	90	50
4	2	ahmed	90	95	88		273	91	3	95	88
5	3	khalid	100	70	77		247	82.33333333	3	100	70
6											