Al-Mustaqbal University Collage Of Pharmacy



Computer Sciences III S1

Lecture 6 Introduction to MS Excel Part 3

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Summary of the Last week

- Hiding & unhiding rows & columns.
- Selecting worksheets
- Navigating between worksheets
- Renaming worksheets
- Inserting & deleting worksheets
- Moving & copying worksheets
- Switching between MS Excel views
- Freezing & unfreezing panes
- Using templates

Learning Objectives

Understand and apply the following skills:

- How to enter a formula.
- How to edit a formula.
- How to use parentheses to change the operators precendence.
- How to copy/paste a formula.
- How to choose between the paste options (Paste, Values, Formulas, Formatting, and Pase Special).
- How to insert a function.
- How to use the count functions (Count, Countif, and Countifs).
- How to use the sum functions (Sum, Sumif, and Sumifs).
- How to use the logical functions (If, And, and Or).
- How to use the statistical functions (Average, Averageif, Median, Mode, Standard Deviation, Min, Max, Large, and Small).

- Formulas and Functions
- Entering a Formula
- Editing a Formula
- Changing the Operators Precedence
- Copying/Pasting a Formula
- Paste Options
- Inserting a Function
- Count Functions (Count, Countif, Countifs)
- Sum Functions (Sum, Sumif, Sumifs)
- Logical Functions (If, And, Or)
- Statistical Functions (Average, Averageif, Median, Mode, Standard Deviation, Min, Max, Large, and Small).

Outlines

Formulas and Functions

- A formula is an expression which calculates the value of a cell.
- Functions are predefined formulas, and are already available in Excel.
- For example, cell A3 below contains a formula which adds the value of cell A2 to the value of cell A1.

A 3	(=	f_{x}	=A1+A2		
	А	В	С	D	E
L	2				
2	3	_			
3	5				
4					
5					

• For example, cell A3 below contains the SUM **function** which calculates the sum of the range A1:A2

A 3	(=	f_{x}	=SUM(A	1:A2)	
	А	В	С	D	E
1	2				
2	3				
3	5				
L I					
5					

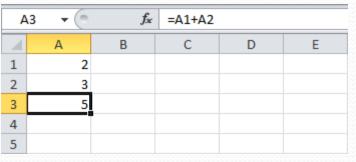
Entering a Formula

To enter a formula, execute the following steps.

1. Select a cell.

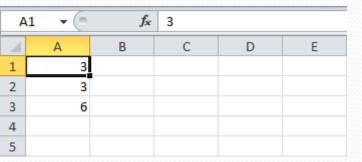
2. To let Excel know that you want to enter a formula, type an equal sign (=).

3. For example, type the formula A1+A2.



Tip: instead of typing A1 and A2, simply select cell A1 and cell A2.

4. Change the value of cell A1 to 3.



Excel automatically recalculates the value of cell A3. This is one of Excel's most powerful features!

Editing a Formula

When you select a cell, Excel shows the value or formula of the cell in the formula bar.

Α	3 🔻 💿	f_x	=A1+A2)	
	А	В	С	D	E
1	2				
2	3	_			
3	5				
4					
5					

To edit a formula:

1. click in the formula bar and change the formula.

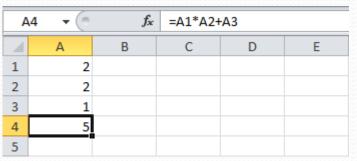
SU	MIF 🔻 💿	$X \checkmark f_x$	=A1-A2		
	А	В	С	D	E
1	2				
2	3				
3	=A1-A2				
4					
5					

2. Press Enter

Α4		f_{x}			
	А	В	С	D	E
1	2				
2	3				
3	-1				
4					
5					

Operator Precedence

Excel uses a default order in which calculations occur. If a part of the formula is in parentheses, that part will be calculated first. It then performs multiplication or division calculations. Once this is complete, Excel will add and subtract the remainder of your formula. See the example below.



First, Excel performs multiplication (A1 * A2). Next, Excel adds the value of cell A3 to this result.

Another example,

A4	(0	f_{x}	=A1*(A2	2+A3)	
	А	В	С	D	E
1	2				
2	2				
3	1	_			
4	6				
5					

First, Excel calculates the part in parentheses (A2+A3). Next, it multiplies this result by the value of cell A1.

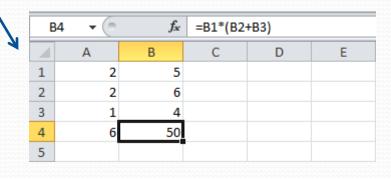
Copying/Pasting a Formula

When you copy a formula, Excel automatically adjusts the cell references for each new cell the formula is copied to. To understand this, execute the following steps.

- 1. Enter the formula shown below into cell A4.
- 2. Select cell A4, right click, and then click Copy (or press CTRL + c), and then select cell B4, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).Or You can also drag the formula to cell B4. Select cell A4, click on the lower right corner of cell A4 and drag it across to cell B4. This is much easier and gives the exact same result!

A	4 - 🤆	f_{x}	=A1*(A2	+A3)	
	А	В	С	D	E
1	2	5			
2	2	6			
3	1	4			
4	6				
5					

Result. The formula in cell B4 references the values in column B.

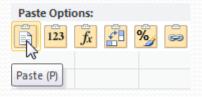


A	4 - (*	f_x	=A1*(A2	2+A3)	
	А	В	С	D	E
1	2	5			
2	2	6			
3	1	4			
4	6				
5					

Paste Options - the Paste Option

The **Paste** option pastes everything.

- 1. Select cell B5, right click, and then click **Copy** (or press **CTRL** + **c**).
- 2. Select cell F5, right click, and then click **Paste** under 'Paste Options:' (or press **CTRL** + **v**).



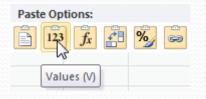
Result

F5	(0	f _×	=SUM(F2	2:F4)					
	Α	В	С	D	E	F	G	Н	I.
1									
2		1				2			
3		3				2			
4		6				4	_		
5		10				8			
6							🔁 (Ctrl) -		
7									

Paste Options - the Values Option

The Values option pastes the result of the formula.

- 1. Select cell B5, right click, and then click **Copy** (or press **CTRL** + **c**).
- 2. Select cell D5, right click, and then click Values under 'Paste Options:'



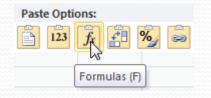
Result

D5	(0	f _*	10						
	Α	В	С	D	E	F	G	Н	I.
1									
2		1				2			
3		3				2			
4		6				4			
5	- (10		10					
6					Ctrl) -				
7									

Paste Options - the Formulas Option

The Formulas option only pastes the formula.

- 1. Select cell B5, right click, and then click **Copy** (or press **CTRL** + **c**).
- 2. Select cell F5, right click, and then click Formulas under 'Paste Options:'



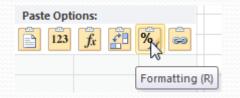
Result

F5	(f_{x}	=SUM(F	2:F4)					
	А	В	С	D	E	F	G	Н	I.
1									
2		1				2			
3		3				2			
4		6				4			
5		10				8			
6							🔁 (Ctrl) 🗸		
7									

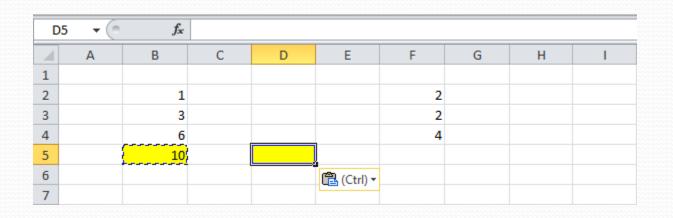
Paste Options – the Formatting Option

The Formatting option only pastes the formatting.

- 1. Select cell B5, right click, and then click **Copy** (or press **CTRL** + **c**).
- 2. Select cell D5, right click, and then click Formatting under 'Paste Options:'



Result



Note: the **Format Painter** copy/pastes formatting even quicker.

Inserting a Function

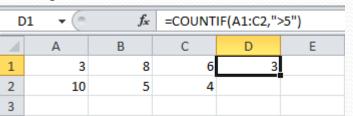
To insert a function, execute the following steps.

- 1. Select a cell.
- 2. Click the **Insert Function** button.
- 3.The Insert Function dialog box appears, search for a function or select a function from a category. For example, choose COUNTIF from the Statistical category.
- 4. Click **OK**, the **Function Arguments** dialog box appears.
- 5. Click in the **Range** box and select the range A1:C2.
- 6. Click in the **Criteria** box and type >5.
- 7. Click OK.

Function Argume	ents				? 🛃
COUNTIF					
	Range	A1:C2		=	{3,4,5;6,10,8}
	Criteria	>5	E	=	
				=	
Counts the number	r of cells w	ithin a range	that meet the given condit	ion.	
Counts the number	r of cells w	_	_	n of a	a number, expression, or text that define
Counts the number	r of cells w	_	is the condition in the form	n of a	a number, expression, or text that define
Counts the number	r of cells w	_	is the condition in the form	n of a	a number, expression, or text that define

D) 1 - (*	fx			
	А	В	^у с	D	E
1	3	8	6]
2	10	5	4		
3					
			4		
Ins	ert Function				? ×
Sea	arch for a functio	n:			
Sel	Or select a <u>c</u> atego ect a functio <u>n</u> : COUNTA COUNTBLANK	statistical		T	•
	COUNTIF COUNTIFS COVARIANCE.P COVARIANCE.S DEVSQ COUNTIF(range				-
C	Counts the numbe	r ot cells within a	range that mee	t the given cond	lition.

Result. Excel counts the number of cells that are higher than 5.



Count Functions- the COUNT Function

To count the number of cells that contain <u>numbers</u>, use the following **COUNT** function.

A7	(0	f_x	=COUNT	(A1:A5)					
	А	В	С	D	E	F	G	Н	I.
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	5								
8									

Count Functions – the COUNTIF Function

To count cells based on <u>one criteria (for example, higher than 9)</u>, use the following **COUNTIF** function.

Note: in contrast to the COUNT function, cells can contain text as well.

A7	- (0	f_x	=COUNT	IF(A1:A5,">	·9")				
	А	В	С	D	E	F	G	Н	1
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	2								
8									

Count Functions – the COUNTIFS Function

To count cells based on <u>multiple criteria (for example, green and higher than 9)</u>, use the following **COUNTIFS** function.

E	37 🔻 💿	f _x	=COUNT	IFS(A1:A5,'	"green",B1	:B5,">9")			
	Α	В	С	D	E	F	G	Н	L.
1	red	10							
2	green	1							
3	red	7							
4	green	20							
5	red	3							
6									
7		1							
8									

Sum Functions - the SUM Function

To sum a range of cells, use the following **SUM** function.

A7	(-	f_{x}	=SUM(A1	.:A5)					
	А	В	С	D	E	F	G	Н	1
1	10								
2	1								
3	7								
4	20								
5	3								
6									
7	41								
8									

Sum Functions - the SUMIF Function

To sum cells based on one criteria (for example, higher than 9), use the following **SUMIF** function (two arguments).

B7	• (=	f _x	=SUMIF(B1:B5,">9")				
	А	В	С	D	E	F	G	Н	I.
1		10							
2		1							
3		7							
4		20							
5		3							
6									
7		30							
8									

Sum Functions - the SUMIFS Function

To sum cells based on multiple criteria (for example, blue and green), use the following **SUMIFS** function (first argument is the range to sum).

(:7 🔹 🕘	f_{x}	=SUMIFS	(C1:C5,A1:	A5,"blue",	B1:B5,"gre	en")		
	А	В	С	D	E	F	G	Н	I.
1	blue	red	10						
2	yellow	green	1						
3	blue	red	7						
4	blue	green	20						
5	yellow	red	3						
6									
7			20						
8									

Logical Functions - the IF Function

The **IF** Function checks whether a condition is met and returns one value if TRUE and another value if FALSE.

Select cell C2 and enter the following function.

С	1 •	f _*	=IF(A1>10,"C	IF(A1>10,"Correct", "Incorrect")										
	А	В	С	D	E	F	G	Н						
1	12		3 Correct											
2														
3														

The IF function returns Correct because the value in cell A1 is higher than 10.

Logical Functions - the AND Function

The **AND** Function returns TRUE if all conditions are true and returns FALSE if any of the conditions are false.

Select cell D2 and enter the following formula.

D	1 •	f_{x}	=IF(AND(A1	AND(A1>10,B1>5),"Correct", "Incorrect")										
	А	В	С	D	E	F	G	Н						
1	12	3	Correct	Incorrect										
2														
3														

The AND function returns FALSE because the value in cell B2 is not higher than 5. As a result, the IF function returns Incorrect.

Logical Functions - the OR Function

The **OR** Function returns TRUE if any of the conditions are TRUE and returns FALSE if all conditions are false.

Select cell E2 and enter the following formula.

E	L - (*	f_{x}	=IF(OR(A1>	•10,B1>5),"Co	orrect", "Inco	orrect")		
	А	В	С	D	E	F	G	Н
1	12	3	Correct	Incorrect	Correct]		
2								
3								

The OR function returns TRUE because the value in cell A1 is higher than 10. As a result the IF function returns Correct.

General note: the AND and OR function can check up to 255 conditions

Statistical Functions – the AVERAGE Function

To calculate the average of a range of cells, use the following **AVERAGE** function.

Α	3 🖣	- (<i>f</i> _x =	AVER	AGE(A	1:01)									
	А	В	С	D	Е	F	G	Н	1	J	K	L	М	Ν	0	Ρ
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	5.6															
4																

Statistical Functions – the AVERAGEIF Function

To average cells based on one criteria, use the following **AVERAGEIF** function. For example, to calculate the average excluding zeros.

А	3 🔻	. (<i>f</i> _x =	AVER	AGEIF	(A1:O1	L,"<>0	")							
	А	В	С	D	E	F	G	Н	I.	J	K	L	М	Ν	0	Ρ
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	6.46															
4																

Note: <> means not equal to

Statistical Functions – the MIN Function

To find the minimum value, use the following **MIN** function.

Α	3 🔻	0	<i>f</i> _x =MIN(A1:O1)													
	А	В	С	D	Е	F	G	Н	1	J	K	L	М	N	0	Ρ
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	0															
4																

Statistical Functions – the MAX Function

To find the maximum value, use the following MAX function.

A3 🔻 (. (f _x =	=MAX(A1:O1)											
	А	В	С	D	E	F	G	Н	I.	J	K	L	М	Ν	0	Ρ
1	0	7	8	6	5	9	8	7	4	8	0	3	5	6	8	
2																
3	9															
4																