Excel Functions (fx)

Excel has prewritten formulas called **functions** to help simplify making complicated calculations.

A function takes a value or values, performs an operation, and returns a result to a cell. The values that you use with a function are called **arguments**. All functions begin with an equal sign and include the arguments in parentheses after the function name.

For example, in the function =SUM(D3:D10), the function name is SUM and the argument is the range D3:D10.

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Paste Function

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To start entering functions, click on a cell then click the Paste Function (fx) button on the Toolbar.— Following are some common Excel functions and examples how to use them in a spreadsheet.

SUM

Adds all the numbers in a range of cells.

Syntax:

=SUM(number1,number2, ...)

- Number1, number2, ... are 1 to 30 arguments for which you want the total value or sum.
- The arguments can be numbers, cells or ranges
- If an argument is a range, only numbers in that range are counted. Empty cells, logical values, text, or error values in the range are ignored.

Examples:

SUM(3, 2) equals 5 If A1 contains 3 and B1 contains 1, then: SUM(A1, B1, 2) equals 6 If cells A2:E2 contain 5, 15, 30, 40, and 50: SUM(A2:C2) equals 50 SUM(B2:E2, 15) equals 150

Exercise from Student Files:

Open file "LESSON 6 Class Demo.xls" from the Excel Folder

Select the " Bridge Scores " worksheet	Paste Function	23
get a complete total	Function category:	Function <u>n</u> ame:
Click cell N16 – type "Total of All Scores"	Most Recently Used	
Click cell M16	Financial	STDEVA
Click the Paste Function button.	Date & Time Math & Trig Statistical	STDEVP STDEVPA STEYX
In the Function Category select All	Database Text	
Scroll down the Function Name list	Information	SUMIF SUMPRODUCT
And select SUM	SUM(number1,number2,)	
Click OK	Adds all the numbers in a range of	cells.
	2	OK Cancel

This opens the Sum Function Formula Palette:

	SUM Number1 M7:M15 Number2	= {19950;18190;1741)
Click the Collapse/Expand button	Adds all the numbers in a range of cells.	= 121560
	Number1: number1, number2, are 1 to 3 are ignored in cells, included if ty	D numbers to sum. Logical values and text ped as arguments.
	Formula result = 121560	OK Cancel

Click/Drag the range of cells to be added by the Sum Function (In this case it is range F7:L14) Note the formula entered in the Formula Bar

			\						•					_
	SUM = = SUM(F7:L14)													
F7:L	:L14 🔽 L M N O													
1											1			
2										/				
3								~~	_	-				
4				∖в	KIL	JGE	= 50	CO	КĔ	S				
5									7					
6		LAST NAME	WIFE	HUSBAND	SEP	OCT	NOV	JAN	FEB	MAR	APR	TOTALS	LAST NAME	
7	1	HEDIN	ROXANNE	RON	2930		3570	3590	2980	6880		19,950	HEDIN	1
8	2	UEBERSCHAER	JANET	FRED	3500		6470	2940	2750	2530		18,190	UEBERSCHAER	2
9	3	CUSHING	SANDY	JERRY	1860	3270	2880	\$100	2620	3680		17,410	CUSHING	3
10	4	PREUSS	MARILYN	DICK	2590	2410	1750	2940	2220	2340		14,250	PREUSS	4
11	5	STATON	SHIRLEY	GENE	3430	2340	2610	1070	2270	2090		(13,810	STATON	5
12	6	BALMES	PAT	MARK	1330		1/630	2740	3740	3660		13,300	BALMES	6
13	7	GILMARTIN	DARLYNE	DAVID	2280	1020	1150	2770	2410	2790		12,420	GILMARTIN	7
14	8	PAT & JEAN			2510		2080	3000	1360	3280		12,230	LYONS	8
15						17								
16						/						(F7:L14)	Total of All Score	s
47				1	1	/						1		

After selecting the range click the **Collapse/Expand** button

This re-opens the Formula Palette – Click OK

AVERAGE

Returns the average (arithmetic mean) of the arguments.

Syntax: =AVERAGE(number1,number2, ...) where number1, number2, ... are 1 to 30 numeric arguments for which you want the average.

Remarks: The arguments must be either numbers, ranges, or cell references that contain numbers.

If a range or cell reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value zero are included.

Tip: When averaging cells, keep in mind the difference between empty cells and those containing the value zero. Empty cells are not counted, but zero values are.

Examples:

If range A1:A5 is named Scores and contains the numbers 10, 7, 9, 27, and 2, then:

AVERAGE(A1:A5) equals 11

AVERAGE(Scores) equals 11

AVERAGE(A1:A5, 5) equals 10 or (10+7+9+27+2+5)/6=10

If C1:C3 is named OtherScores and contains the numbers 4, 18, and 7, then:

AVERAGE(A1:A5, C1:C3) equals 10.5

AVERAGE(Scores, OtherScores) equals 10.5

Exercise from Student Files:

Use the same Bridge Scores Worksheet from the LESSON 6 Class Demo Workbook.

In cell N18 type "Average of All Scores"

Click cell M18 and click the Paste Function button in the Toolbar:

	Paste Function	2 🛛
I. (1 Trans 4)	Function <u>category</u> : Function <u>name</u> :	
In the Function category list select A		
Scroll down the Function name list and click AVERAGE		
	AVERAGE X V = = AVERAGE(M7:M17)	ļ
	AVERAGE	7
	Number1 M7:M17	■ = {19950;18190;1741)
In the Formula Palette	Number2	🖬 = number
click the Collapse/Expand button -		= 27013.33333



Click **OK** in the **Formula Palette**

Note that the **AVERAGE** function does not include any blank cells in its calculation

MAX

Returns the largest value in a set of values.

Syntax: =MAX(argument1,argument2,...)

Argument1, argument2,... are 1 to 30 numbers, ranges or cell references for which you want to find the maximum value.

- If an argument is a range or cell reference, only numbers in that range or reference are used. Empty cells, logical values, or text in the array or reference are ignored.
- If the arguments contain no numbers, MAX returns 0 (zero).

Examples:

If A1:A5 contains the numbers 10, 7, 9, 27, and 2, then: MAX(A1:A5) equals 27 MAX(A1:A5,30) equals 30

MIN

Same as MAX but returns the smallest value in a set of values. **Syntax:** =MIN(argument1,argument2,...) **Examples:** If A1:A5 contains the numbers 10, 7, 9, 27, and 2, then: MIN(A1:A5) equals 2 MAX(A1:A5,1) equals 1

Exercise from Student Files:

Use the same **Bridge Scores** Worksheet from the **LESSON 6 Class Demo** Workbook. In cell **N20** type "**Highest Score**"; in cell **N22** type "**Lowest Score**"

Click cell M20 – click the Paste Function button i	n the Toolbar: f *
Pe	aste Function
Select MAX from the Function Name list	unction <u>c</u> ategory: Function <u>n</u> ame:
M	
F	inancial MAXA
In the Formula Palette click the Collapse/Expand	button
	MAX - X - = MAX(M18:M19)
MAX	Number 1 118:M19
	Number2
Click/Drag the range of cells (F7:L14) that contain the bridge scores \sim	=MAX(M18:M19)
contain the ortuge secres.	
Click the Collapse/Expand button	
In the Formula Palette click OK	BRIDGE SCOR
Now click in cell M22 and see if you can add the MIN function to find the lowest bridge s	E WIFE HUSBAND SEP OCT NOV JAN FI ROXANNE RON 2930 3570 3590 29 score !! 1

IF

Returns one value if a condition you specify evaluates to TRUE and another value if it evaluates to FALSE. Use IF to conduct conditional tests on values and formulas. **Syntax**

=IF(Logical test, Value if true, Value if false)

Logical_test is any value or expression that can be evaluated to be TRUE or FALSE.

• Examples of Logical tests on cell A1: A1=10, A1>=90 (A1 greater than or equal to 90), A1="Smith"

Value_if_true is the value that is returned if logical_test is TRUE. Value_if_true can be another formula or text within quotation marks.

Value_if_false is the value that is returned if logical_test is FALSE. Value_if_false can be another formula or text contained within quotation marks.

Remarks

• Up to seven IF functions can be nested as Value_if_true and Value_if_false arguments to construct more elaborate tests. See the following last example.

Examples

In the following example, if the value in cell A10 is 100, then logical_test is TRUE, and the total value for the range B5:B15 is calculated and placed in the cell with the IF function. Otherwise, logical_test is FALSE, and zero is returned to the cell that contains the IF function. IF(A10=100,SUM(B5:B15),0)

Value if true can be text. Suppose an expense worksheet contains in B2:B4 the following data for "Actual Expenses" for January, February, and March: 1500, 500, 500. C2:C4 contains the following data for "Budgeted Expenses" for the same periods: 900, 900, 925. You can write a formula to check whether you are over budget for a particular month, generating text for a message with the following formulas: IF(B2>C2,"Over Budget","OK") equals "Over Budget" IF(B3>C3,"Over Budget","OK") equals "OK"

Suppose you want to assign letter grades to numbers referenced by the name AverageScore. See the following table:

If AverageScore is	Then return	
Greater than 89	А	
From 80 to 89	В	
From 70 to 79	С	
From 60 to 69	D	
Less than 60	F	
You can use the following	ing nested IF fu	nction:
IF(AverageScore>89,"A	A",IF(AverageS	core>79,"B",IF(AverageScore>69,"C",
IF(AverageScore>59,"I)","F"))))	

In the preceding example, the second IF statement is also the value_if_false argument to the first IF statement. Similarly, the third IF statement is the value_if_false argument to the second IF statement. For example, if the first logical_test (Average>89) is TRUE, "A" is returned. If the first logical_test is FALSE, the second IF statement is evaluated, and so on.

Exercise from Student Files:

Open **LESSON 6 Class Demo** – select the **Checking Account** Worksheet Using the **IF** function, we will add a warning statement if the Checking Account is overdrawn. Click cell **I9** – click the **Paste Function** button in the Toolbar:

f*

Select the IF function in the Function name list

Function <u>n</u> ame:
HYPGEOMDIST
IF
INDEX

In the Logical test window type E9>0 (If cell E9, the account balance, is greater than zero)

	▶ ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ►)
In the Value if true window	IF Logical_test E9>0	
type "// (2 quotation marks) —	Value_if_true	l
In the Value if false window		JC
Type "WARNING: Account Overdrawn"	Returns one value if a condition you specify evaluates to TRUE and another value if it evaluates to FALSE.)E
(Include the quotation marks.)	value_ir_raise is the value that is returned in Logical_test is FALSE. If omitted, FALSE is returned.)0
Click OK —		0

Note: The quotation marks are used to indicate text to be entered in the cell. Two quotation marks with nothing between indicates no text, resulting in a blank cell.

Copy the formula using the Fill Handle from cell I9 to cell I32

To make the warning message more noticeable, select **column I** and change the font to **Bold** with a **Red** color.

If done properly, you should see a warning message in cell I24.

Excel Lessons not covered in the Student Manual

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the "LESSON 1" Workbook to the "LESSON 2" Workbook	Tim	es Ne	• Repeat Close	Ctrl+Y	_ /	<u>u</u> ≣
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and LESSON 2. Insert Rows and Columns	1		Dasta Special	Ctrl+V		
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4. Click down arrow in To book: window		
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	Move selected sheets	ОК
5. Select the Workbook (<i>LESSON 2</i>) you want to copy the sheet to	LESSON 2 Insert Rows & Columns (new book) LESSON 1 Spreadsheet.xls LESSON 2 Insert Rows & Columns	Cancel
6. Check box for Create a Copy (avoids deleting file from original Workbook)	✓ ✓ ✓ Create a copy	

7. Select a location in the LESSON 2 Workbook	Move or Copy	? 🛛
in Before sheet: window	Move selected sheets	ок
	<u>T</u> o book:	
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	Sheet3	
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8. Click OK		

Password protecting an Excel File (This protects your Excel files from being opened and viewed by anyone using your computer)

- Open File "LESSON 8 Protecting Spreadsheet"
- Click **File** click **Save As** -- This opens the **Save As** dialog box:
- Click Tools -



		Save Options 🛛 🛛 💽
•	I ype a password in the Password to open: window	Always create <u>b</u> ackup
		File sharing
•	Click OK	Password to open:
		Password to modify:
		Read-only recommended
		OK Cancel

• Re-type password in the **Reenter password to proceed:** window

	Confirm Password
(Don't forget to remember your password!!)	Reenter password to proceed.
Click OK	Caution: If you lose or forget the password, it cannot be recovered. It is advisable to keep a list of passwords and their corresponding workbook and sheet names in a safe place. (Remember that passwords are case sensitive.)
• Finish saving the file	OK Cancel