Microsoft Excel – Advanced Topics

LOOKUP functions – a very powerful set of functions are the LOOKUP functions. This enables you to create a separate table of values to use as a source, and automatically fill in values on another sheet based on this table. Typical applications are price lists and zip codes. We'll design a lookup for our Mail Merge DB spreadsheet.



Now let's return to the **RawDB** tab. Delete all of the values in the **Zip Code** column, and select the first cell under the **Zip Code** heading (cell G2 in the diagram below). Now choose **Insert** Function from the menu (or click the function button: fx). In the Paste Function window, select the *Function category* : Lookup & Reference; then select the *Function name*: LOOKUP.

Click OK and you should have the Select Arguments window on the next page.

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	G2	•	×		-				1		
2	A	В	С	D	E	F	G	Н	1	J	
1	Title	First Name	Last Name	Address	City	State	Zip Code	ate of Bir	Age	Age Group	-
2	Mr.	Sean	Connery	123 Secret Service Rd	London	NY	=	8/25/30	69.4	SENIOR	
3	Mr.	Dick	Clark	1 Times Square	New York	NY		11/30/29	70.1	SENIOR	
4	Mr.	Joseph	Smith	1053 Broadway	Westbury	NY		6/4/57	42.6		
5	Mr.	Pohert	Dino	720 Northern Rlvd	Brookville	NY		7/30/60	39.4		
6	Mr.	Paste Fu	nction		? ×	NY		1/15/56	44.0		
7	Ms.	T				NY		2/29/80	19.8		
8	Mr.		syory:			NY		12/25/74	25.0		
9	Ms.	F All	ay Usea	ADDRESS	<u> </u>	NY		10/10/77	22.2		
10	Dr.	< Financial		CHOOSE		NY		5/20/79	20.6		
11	Mr.	Date & Time		COLUMN		NY		9/29/65	34.3		
12	Ms.	1 Math & Trig				NY		3/15/67	32.8		
13	Mr.	F Lookup & Re	ference	HYPERLINK	and the second s	NY		4/24/72	27.7		
14	Mrs.	† Database		INDEX		i NY		11/22/62	37.1		
15	Dr.	Text		INDIRECT		NY		8/31/66	33.3		
16	Dr.	/ Information		MATCH	-	NY		11/8/71	28.1		
17		(LOOKUP()				NY		4/1/81	18.7		
18	Ms.	[Beturns a upl	Iuo oithar from -		from an	NY		6/30/61	38.5		
19	Mr.	array.	ide eicher from e	sone-row or one-column range or	roman	NY			100.0	SENIOR	
20	Ms.	E				NY		9/4/59	40.3		
21		0			Cancel 1						
22		<u></u>									
23		38									-
M	• •	N Raw D	B /Sheet2	/ Sheet3 /							
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The Select Arguments windows offers you a choice of two kinds of LOOKUP functions.

A COLUMN TO A COLUMN	Select Arguments	The second one. "Lookup value, array," is a
and the second s	LOOKUP This function has multiple argument lists. Please select one of them.	simple version which is easy to use, but has, among its limitations, the requirement of a list
l	Arguments:	with no more than two columns.
or result along fairs and the result of the result of the result of	lookup_value,lookup_vector,result_vector	We'll focus on the more versatile: "Lookup_value, lookup_vector,result_vector."
	OK Cancel	

Click on the **OK** button above, to reveal the function editor window show below (*yours might be in the upper left corner of your sheet, to move it, click on a dead area and drag it to a more appropriate location*).

11	LOOK	(UP	× √ = =LC	OKUP(E2,Sheet	2!A2:A16	,Sheet2!C2:C1	16)					
	A	В	С	D		E	F	G	Н	L.	J	
1	Title	First Name	Last Name	Addres	SS	City	State	Zip Code	ate of Bir	Age	Age Group	
2	Mr.	Sean	Connery	123 Secret Servi	ice Rd	London	NY	C2:C16)	8/25/30	69.4	SENIOR	
3	Mr.	Dick	Clark	1 Times Square		New York	NY		11/30/29	70.1	SENIOR	
4	Mr.	Joseph	Smith	1053 Broadway		Westbury	NY		6/4/57	42.6		
5	Mr.	Robert	Dino	720 Northern Blv	/d	Brookville	NY	#	7/30/60	39,4		
6	Mr.	Louis	Hues							0		
7	Ms.	Marilyn	Struddle	Lookup_value	E2			🚹 = "Lor	idon"	8		
8	Mr.	Walter	Palmer	Lookup_vector	Sheet2!A2	2:A16		* = {"Br	ookville";"Farn	min 0		
9	Ms.	Ronda	Tolstoy	Desult vester	Charlotor					-2		
10	Dr.	John	Egon	Result_vector	Joneet21C2	C16			540;11735;11	⁵²¹ 6		
11	Mr.	Ken	Wilton					= 123	45	3		
12	Ms.	Maryanne	Northrup	Returns a value eith	ner from a c	ne-row or one-co	lumn range	or from an ar	ray.	.8		
13	Mr.	Pete	Gwangi							7		
14	Mrs.	Marion	Eberthal	Lookup_value	is a value t	hat LOOKUP searc	hes for in l	Lookup_vecto	r and can be a to a value	° 1		
15	Dr.	James	Newsworthy		namber, ce	xt, a logical value,	or a name			1 3		
16	Dr.	Andrew	Milner	E Formul	la result =1	2345		OK	Can	cel 1		
17	-	Geogian	Krespe	50 Roosevelt Driv	ve	Plainview	INY		4/1/81	18.7		
18	Ms.	Diane	Balle	PO Box 11576		Roslyn	NY		6/30/61	38.5		

There are three fields to fill out:

- Lookup_value: is the cell or value you want the function to use when it refers to the lookup list. In the figure above, you want to take "London" (the contents of cell E2) and go find it in the lookup list on Sheet2.
- Lookup_vector: is the range of cells in the lookup list that the function will try to find match with the Lookup_value you specified. In this example, click on Sheet2, and select the range of cells containing the city names as shown on the right.

	A	В	0	D	E	F	8	н	C	J	- K:	
1	City	State	Zip Code									1-
2	Brookville	INY	11548									
3	Farmingdale	INY	11736									
4	Freeport	INY	11520									
5	Garden City	NY	11530							-		
6	Great Neck	NY	LOOKUP									
7	Levitown	NY	Leoku	p_value	22			h = Lond	lan"			
8	London	INY	Lookup	vector	sheet2142:A16			N = 18m	okville"/Famin			
9	Long Beach	2NY	Rea	A				- 11 m				
10	Massapequa	(NY	.000	e perio p	\$100C23C21C10			- 10 million	edit as not easily			
11	New York	INY	- Acres						50			
ŧ2	Plannew	INY	Reburns a	value eithe	r from a one-ro	N or one-co	kunin rahge o	r from an arri	895			
13	Rockville Center	INY	0500						in an	20		
14	Roshyn	NY	Lookup	vectors	a range that co	ricaris only cardin and	one row or o	ne column or	cexic, numbers, i	or i		
15	Seatord	5NV	(a)	399247				1	1			
16	Westbury	NY	10	Formula	result =12345				Carcel			
17			-									
18												
19												
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19 20 21												
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• **Result_vector**: is the range of cells containing the value that should be returned when a match is found

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between the Lookup_value and the Lookup_vector. In the figure below, you can see that the entire range of data in the Zip Code column is what must be selected.

	A	В	0.	D	E	E.	6	H	V (4)	J	- K	8
1	City	State	Zip Code									-
2	Brookville	NY	1 1548									
3	Farmingdale	NY	11736									
4	Freeport	NY	11520									
5	Garden City	NY	11530									
6	Great Neck	NY	11020	100	(UP						11	
7	Levitown	NY	11756	10	okup_valu	1 22			1 = 2:	andon"		
8	London	NY	12345	Lon	dun verte	Cast Star	616		3-17	maintin' Tran	-	
9	Long Beach	NY	11561	1 28		- Parcove see	n1.0		-			
10	Massapegua	NY.	11758		Result_vecto	Sheet21C2:	C16		1 = 0.	1546(11736(11	50	
IT	New York	NY	10001	_					- 10	0.45		
12	Plainiew	NY	11803	Rebu	ne a value of	ther from a pr	H-TON OF DEH-	column rang	e or from an a	RT NY :		
13	Rockville Center	r NY	11571	133							3	
4	Roslyn	NY	1 1578	Ra	sult_vecto	r is a nange th	at contains on	ly one rove o	t column, the	HATH SIDE AN		
15	Seaford	NY	11783	1000	1	LCONUD_Vec	Qf.		1000	_	in the second	
16	Westbury	NY.	11590	100	Pare	da result =12	345		06	Car	cel .	
17	1						0.00				_	
8												
19												
20												
21												
22												1
23												
1	ALL NA Pro	DB Sh	ant? / Quant	27			141				1.1	ŝ
4 + +	Raw	VDB \Sh	eet2 / Sheet	3/			1				1 2	

Click the **OK** resulting formula will be placed in our cell: G2.

=LOOKUP(E2,Sheet2!A2:A16,Sheet2!C2:C16)

Before we copy this formula into all the appropriate cells below it, let's stop and think about what will happen. Remember that the cell references will update as we copy it to a new location. Thus, if we copy this formula from G2 to G3, the **Lookup_value** of E2 will become E3 – just like we want. However, the **Lookup_vector** range will also increment by one from Sheet2!A2:A16 to Sheet2!A3:A17 – ruining our formula! To prevent this from occurring, we must employ absolute cell references to the portion of the formula that we want to hold steady. Hence:

=LOOKUP(E2,Sheet2!\$A\$2:\$A\$16,Sheet2!\$C\$2:\$C\$16)

Now it's safe to copy this formula into all the necessary cells below it. When you do, you should see that the zip codes from the list in **Sheet2** are returned for all rows.

Try changing a city name in the **RawDB** sheet. You should see the zip code change as soon as you complete entry on the city cell (by hitting the Tab, Enter or arrow keys). BUT BEWARE, if you type a city that is NOT in the list, the **Result_vector** value of the next nearest match is used. Try typing "Mexico" into a city cell; you'll see the zip code for "Massapequa" displayed! To fix this, you could try modifying the formula so it first tests the comparison to see if an exact match is found. To do this, you could employ the **IF** function, MATCH function and the **ISNA** function to create a formula as shown below:

=IF(ISNA(MATCH(E2,Sheet2!\$A\$2:\$A\$16,0)),"not listed",LOOKUP(E2,Sheet2!\$A\$2:\$A\$16,Sheet2!\$C\$2:\$C\$16))

The **MATCH** function, as shown, tests the comparison to see if an exact match exists (the last zero is the key to this). If an exact match does not exist, this function returns a value of "#NA" - which we test for using the **ISNA** function. Putting it all together with the **IF** function tells instructs our formula to:

- 1. See if the result of the **MATCH** is the value "#NA"
- 2. If it is, enter the text "not listed" into the zip code cell
- 3. If it isn't, then an exact match was found and display the matching zip code