

Elevating your lookup game!

ADVANCED EXCEL FUNCTIONS



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From Excel - to leading a data team!

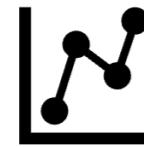
Hi there! 



Excel lover!



DataCamp believer!



Data passionate!



Agata Bak-Geerinck

The power of LOOKUP functions

Previously on DataCamp:

- VL00KUP() - vertical lookup
- HL00KUP() - horizontal lookup

Category	FEB	APR	MAY
Chairs	\$ 2,114	\$ 4,085	\$ 5,678
Labels	\$ 1,456	\$ 4,273	\$ 241
Storage	\$ 896	\$ 3,678	\$ 3,113

Limitations:

- VL00KUP() - searched value must be to the right of the lookup value
- HL00KUP() - searched value must be below of the lookup value

Category	FEB	APR	MAY
Chairs	\$ 2,114	\$ 4,085	\$ 5,678
Labels	\$ 1,456	\$ 4,273	\$ 241
Storage	\$ 896	\$ 3,678	\$ 3,113

What is an array?

Array - a set of row or column of values, or a combination of rows and columns of values¹

The diagram shows a table with three rows of data and four columns of headers. The first row contains the column headers: Category, FEB, APR, MAY, and JUN. The second row contains the data for 'Chairs': \$ 2,114, \$ 4,085, \$ 5,678, and \$ 5,678. The third row contains the data for 'Labels': \$ 1,456, \$ 4,273, \$ 241, and \$ 241. The fourth row contains the data for 'Storage': \$ 896, \$ 3,678, \$ 3,113, and \$ 3,113. A purple box labeled 'headers' points to the first row. An orange box labeled 'an array' points to the second row.

Category	FEB	APR	MAY	JUN
Chairs	\$ 2,114	\$ 4,085	\$ 5,678	\$ 5,678
Labels	\$ 1,456	\$ 4,273	\$ 241	\$ 241
Storage	\$ 896	\$ 3,678	\$ 3,113	\$ 3,113

An Excel table consists of:

- Header: row and column names
- Array: set of underlying values

¹ <https://support.microsoft.com/>

Drum roll... XLOOKUP!

XLOOKUP() - A lookup function that can search in **any direction**, thanks to arrays.

NEW as of Excel 2021!

Syntax:

```
XLOOKUP(lookup_value, lookup_array, return_array, [if_not_found], [match_mode],  
[search_mode])
```

	A	B	C	D	E	F	G	H
1	Category	Region	Sub-category	Profit	Sales	Category	Sub-category	Sales
2	Furniture	East	Book cases	\$ 5,678	\$ 5,678	=XLOOKUP(G2, C2:C5, A2:A5)		
3	Office Supplies	West	Appliances	\$ 241	\$ 241			
4	Technology	Central	Accessories	\$ 3,713	\$ 3,113			
5	Art	North	Paintings	\$ 822	\$ 27,119			

Pro tip! Use name ranges in your formulas: **XLOOKUP(G2, Sub_categories, Categories)**

2D lookups? INDEX()

	A	B	C	D
1	Category	FEB	APR	MAY
2	Chairs	\$ 2,114	\$ 4,085	\$ 5,678
3	Labels	\$ 1,456	\$ 4,273	\$ 241
4	Storage	\$ 896	\$ 3,678	\$ 3,113

column 2 row 2

array B2 : D4

Labels Sales for April? = INDEX (B2:D4, 2, 2)

- *Syntax:* INDEX(array, row_num, [column_num])
- Returns the value of a cell within a specified array

2D lookups? MATCH()

- *Syntax:* `MATCH(lookup_value, lookup_array, [match_type])`
- Finds which row and column to reference

	A	B
1		APR
2	Labels	???

rows array
= Categories

Category	FEB	APR	MAY
Chairs	\$ 2,114	\$ 4,085	\$ 5,678
Labels	\$ 1,456	\$ 4,273	\$ 241
Storage	\$ 896	\$ 3,678	\$ 3,113

column array = Months

Where to find Labels Sales for April?

= Match ("Labels", Categories, 0) = row 2

= Match ("APR", Months, 0) = column 2

2D lookups? (INDEX and) MATCH made in heaven

The diagram illustrates a 2D lookup using INDEX and MATCH functions. On the left, a small 2x2 grid is shown with columns labeled A and B and rows labeled 1 and 2. The top-left cell is empty, the top-right is 'APR', the bottom-left is 'Labels', and the bottom-right is '???'. To the right, a larger 3x3 sales table is shown with columns labeled FEB, APR, and MAY, and rows labeled Category, Chairs, Labels, and Storage. The 'Category' row is highlighted in dark green, the 'Chairs' row in light green, the 'Labels' row in yellow, and the 'Storage' row in light blue. The 'FEB' column is highlighted in teal, the 'APR' column in yellow, and the 'MAY' column in light blue. The cell 'Labels' in the 'Category' row and 'APR' in the 'FEB' column are highlighted in orange, representing the 'rows array' and 'columns array' respectively. The cell '???' in the bottom-right of the small grid is also highlighted in orange, representing the result of the lookup.

	A	B
1		APR
2	Labels	???

Category	FEB	APR	MAY
Chairs	\$ 2,114	\$ 4,085	\$ 5,678
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```
= INDEX ( B2:D4, 2, 2)
```

```
= INDEX(array, MATCH(rows), MATCH(columns))
```

```
= INDEX ( Sales, MATCH( "Labels", Categories, 0), MATCH( "APR", Months, 0) )
```

Meet our dataset!

Commercial dataset:

Column name	Data Group	Value example
Row ID	Order info	20
Order ID		CA-2014-143336
Returned?		Yes
Order Date		27/08/2014
Ship Date	Shipment info	01/09/2014
Ship Mode		Second Class
Customer ID	Customer info	ZD-21925
Customer Name		Zuschuss Donatelli
Segment		Consumer
Country		United States
City		San Francisco
State		California
Postal Code		94109
Region		West
Product ID	Product info	TEC-PH-10001949
Category		Technology
Sub-Category		Phones
Product Name		Cisco SPA 501G IP Phone
Sales	Value	213.48
Quantity		3
Discount		0.2
Profit		16.011

Data at a glance:

- Order information
- Customer socio-demo
- Detailed product data
- Sales, Volumes, Discounts, and Profits

Check out the [Metadata sheet](#) for more info.

Time for practice!

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XLOOKUP and INDEX MATCH in action

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Let's practice!

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