

COMP1022Q
Introduction to Computing with Excel VBA

Lookup Techniques

David Rossiter and Eddie Chan

This Presentation

- It is very common to use Excel to store lots of information, and then later search through that information to find something
- Excel gives us 3 functions to do that:

LOOKUP ()

VLOOKUP ()

HLOOKUP ()

The LOOKUP Function

- The general idea of Lookup is to find something, called a *key*, inside an area of data, which we call a *conversion table*, and then return the corresponding ‘answer’
- It looks like this:

LOOKUP (*key*, *KeyRange*, *ResultRange*)

- For example, we can find the equivalent Chinese word for the ‘B’ grade using LOOKUP with the data shown here, like this:

	A	B
15	Grade in English	Grade in Chinese
16	A	優
17	B	良
18	C	中
19	D	差
20	F	劣

LOOKUP ("B", \$A\$16:\$A\$20, \$B\$16:\$B\$20)

A Step By Step Example of Using LOOKUP 1/3

- The letter grades which we need to convert are shown on the right:

	A	B	C
4	Subject	Grade in English	Grade in Chinese
5	English	B	
6	Chinese	B	
7	Mathematics	A	
8	Physics	B	
9	Biology	F	
10	Chemistry	F	
11	Computer Science	A	

- We first enter the appropriate formula in the top cell:

f_x **=LOOKUP(B5, \$A\$16:\$A\$20, \$B\$16:\$B\$20)**

- You need to use absolute (fixed) referencing so that when the formula is pasted it doesn't get automatically changed*

	A	B
15	Grade in English	Grade in Chinese
16	A	優
17	B	良
18	C	中
19	D	差
20	F	劣

The conversion table

A Step By Step Example of Using LOOKUP 2/3

- After we enter the formula for one cell we want to apply it to all the cells underneath it
- We discussed ways to do that in another presentation
- The quickest way: point to the bottom right corner of the cell you want to copy until it shows '+', then double click:

	A	B	C
4	Subject	Grade in English	Grade in Chinese
5	English	B	良
6	Chinese	B	
7	Mathematics	A	
8	Physics	B	
9	Biology	F	
10	Chemistry	F	
11	Computer Science	A	



	A	B	C
4	Subject	Grade in English	Grade in Chinese
5	English	B	良
6	Chinese	B	良
7	Mathematics	A	優
8	Physics	B	良
9	Biology	F	劣
10	Chemistry	F	劣
11	Computer Science	A	優

A Step By Step Example of Using LOOKUP 3/3

- Excel will immediately show all the examination grades as Chinese words:

	A	B	C
4	Subject	Grade in English	Grade in Chinese
5	English	B	良
6	Chinese	B	良
7	Mathematics	A	優
8	Physics	B	良
9	Biology	F	劣
10	Chemistry	F	劣
11	Computer Science	A	優

Using VLOOKUP and HLOOKUP

- LOOKUP works fine
- However, perhaps you feel that specifying a complete range *twice* is a bit unnecessary and troublesome
- The two other functions we will look at, VLOOKUP and HLOOKUP, are ‘nicer’ than LOOKUP
- These are ‘nicer’ because you can use a simple number such as ‘2’ to indicate which column contains the answer you are looking for, instead of writing a range

The VLOOKUP Function

- VLOOKUP () means ‘vertical look up’
- Similar to LOOKUP, it finds a value inside a range and returns the corresponding value
- It looks like this:

VLOOKUP (*key* , *TargetRange* , *ResultColumnNumber*)

The value you want to find in the conversion table
(*the same as LOOKUP*)

The **whole area** of the conversion table
(*not the same as LOOKUP*)

The **number of the column** you want to take the answer from

The diagram illustrates the VLOOKUP function syntax: VLOOKUP (*key* , *TargetRange* , *ResultColumnNumber*). The *key* argument is enclosed in a pink box, with a pink bracket pointing to the text 'The value you want to find in the conversion table' and '(the same as LOOKUP)'. The *TargetRange* argument is enclosed in an orange box, with an orange bracket pointing to the text 'The whole area of the conversion table' and '(not the same as LOOKUP)'. The *ResultColumnNumber* argument is enclosed in a green box, with a green bracket pointing to the text 'The number of the column you want to take the answer from'. A long orange bracket spans the *TargetRange* and *ResultColumnNumber* arguments, with the text '(not the same as LOOKUP)' centered below it.

Replacing LOOKUP With VLOOKUP

- For example, because the conversion table in the last example is organised vertically we can replace LOOKUP with VLOOKUP, like this:

VLOOKUP ("B" , \$A\$16:\$B\$20 , 2)

	A	B
15	Grade in English	Grade in Chinese
16	A	優
17	B	良
18	C	中
19	D	差
20	F	劣

This refers to the second column of the target range.

- Although we only have 2 columns in our example, for other types of conversion data there might be lots of columns

The HLOOKUP Function

- HLOOKUP is very similar to VLOOKUP
- The only difference is that HLOOKUP has a conversion table which is organised horizontally
- It looks like this:

HLOOKUP (*key* , *TargetRange* , *ResultRowNumber*)

	A	B	C	D	E	F
15	Grade in English	A	B	C	D	F
16	Grade in Chinese	優	良	中	差	劣

- For example, we can find the Chinese word translation for the B grade using the HLOOKUP function together with the data shown above like this:

HLOOKUP ("B" , \$B\$15:\$F\$16 , 2)