COMP1022Q Introduction to Computing with Excel VBA

Lookup Techniques

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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

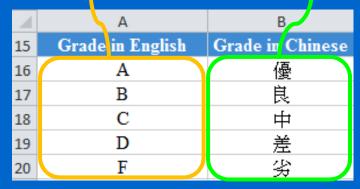
• The letter grades which we need to convert are shown on the right:

\mathcal{A}	А	В	С
4	Subject	Grade in English	Grade in Chinese
5	English	В	
6	Chinese	В	
7	Mathematics	A	
8	Physics	В	
9	Biology	F	
10	Chemistry	F	
11	Computer Science	A	

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

 f_{∞} =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



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:

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

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A Step By Step Example of Using LOOKUP 3/3

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

4	А	В	С
4	Subject	Grade in English	Grade in Chinese
5	English	В	良
6	Chinese	В	艮
7	Mathematics	A	優
8	Physics	В	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:

(the same as LOOKUP)

The value you and to find in the conversion table table take the answer from

(not the same as LOOKUP)

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Replacing LOOKUP With VLOOKUP

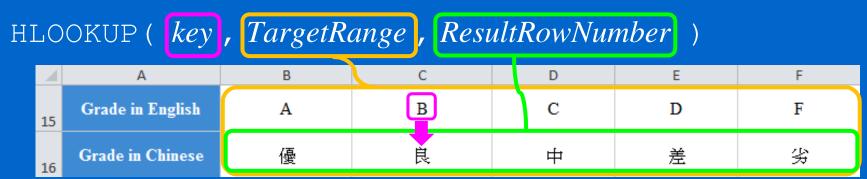
• For example, because the conversion table in the last example is organised vertically we can replace LOOKUP with VLOOKUP, like this:



• 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:



• 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)
```