VLOOKUP()

If we need to the get the value of a column from some other file or sheet based on a common field, you may use Vlookup. V-lookup is a function that searches for a value (lookup value) in the leftmost column of a given database (table array)and returns a value in the same row from a column you specify.

Syntax:

VLOOKUP(lookup_value,table_array,col_index_num,range_lookup)

You can write this function using Built-in Function Arguments dialog-box. Click on Formulas Tab and search in the Lookup & Reference category for Vlookup. Click on Vlookup and you will get a Function Arguments dialog box as shown in **Figure 3.8**.

Lookup_value is the value to be found in the first column of the table. It is the value that you are looking for. Lookup_value can be a value, a reference or a text string.

Table_array is the table of information in which data is looked up. It is the source database. Use a reference to a range or a range name.

Col_index_num is the column number in table_array from which the matching value must be returned.

Range_lookup is a logical value that specifies whether you want VLOOKUP to find an exact match or an approximate match. If Range Lookup is set as FALSE or 0, VLOOKUP will find an exact match. If exact match is not found, the error value #N/A is returned. If it is set to TRUE or non-zero, it finds the nearest value that is less than lookup value.

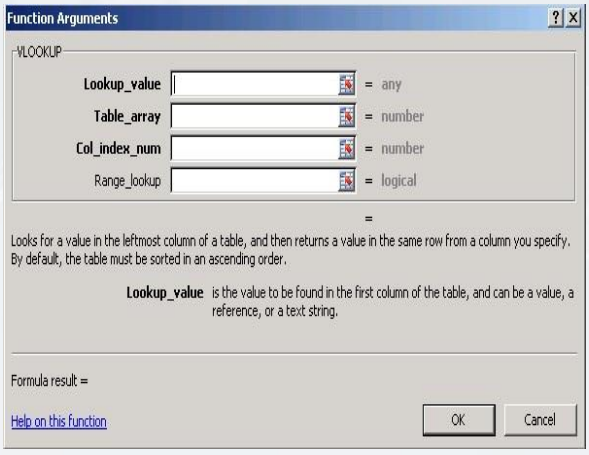

Figure 3.8

H-lookup

H-lookup function searches for a value in the top most row of a table, and then returns a value in the same column from a row you specify.

Syntax:

HLOOKUP(lookup_value,table_array,row_index_num,range_lookup)

H-lookup works the same way as V-lookup. However, in this case we need to specify the row index number instead of the column index number

Tips: You may also get the function argument box by the following method Type =VLOOKUP(or =HLOOKUP(as the case may be and press Ctrl+A.

Example of Vlookup with Range 0 (False):

Suppose you want to add incentive in the Salary Sheet according to the incentive table who's Range is A1:B12 in the Incentive worksheet, do the following.

1) Select the cell, where you want the result.
2) Click on Insert Function –Select the Vlookup () function from Lookup and Reference category. 3) Lookup Value – Select A2 [The Employee code]
4) Table Array: Select the Incentive Sheet and Select the Range from $A$1:$B$12 [i.e. Employee code and incentive Column]
5) Column Index: Type 2 [Column 2 is the Incentive column in Incentive table]
6) Range Lookup: Type False [we are searching the exact match from the table for the lookup value]

Tips: To remove **#NA (Not Available Error)**, you can use the function Iferror. The Syntax of iferror is as follows:

=iferror(vlookup….,"")

Example of Vlookup with Range Non-Zero (True)

Suppose you want to add incentive based on salary Slab-wise. In this case, instead of If condition you can use can use Vlookup with True range. In this scenario, we would create a table as given below.In table array, select this table and in the field for range lookup, type "True" instead of "False".

0	2%
5000	5%
10000	10%
15000	15%

Note: The table in this case would be sorted in ascending order of first column.

Example

In the "Advanced Excel Assignment" file, "emp_inf" sheet, we need to retrieve information of the employee based on his employee id. To do this, we may use vlookup as follows. To find the other details, you may use the same formula and change the column index number accordingly.

Making V-Lookup Dynamic

When we have a dynamic database, where a new column gets added to the database frequently, position of the current columns may also change. However, column index number of Vlookup does not update automatically with the growing database. This is where we would need to make VLookup Dynamically pick up the column index number. To do this, we may use one of the following functions to retrieve the column index number dynamically.

1) Column
2) Match

Using Column Function in Vlookup

To make Vlookup dynamic, we may use the column header as an indicator that would dynamically pickup the index number of the particular column in which the required value exist. The syntax of using column function in vlookup

```
=vlookup(lookup_value,table_array,COLUMN(reference),Range_lookup)
```

Here, Reference parameter of column function would contain the cell reference of the column header from the original database.

Example:

In the above example of vlookup, if we need to find the column index number dynamically we may use column function as follows.

Using Match Function in Vlookup

As we saw in the above case, we would require access to the original database or at least an idea as to the current position of the column. However, this information would not always be available. Here we would need to use a function that can retrieve the position of the column header just by the name.

A Match function does just the same. Match function returns the position of a string in a range.

Syntax of match function is as follows:

```
MATCH(lookup_value, lookup_array,[match_type])
```

Lookup_Value: It is the string that we are looking up for. It may be a string eg: "Salary" or a cell reference where the string is stored.

Lookup_Array: It is the range from which we need to know the position of Lookup_value.

Match_Type: It is an optional parameter that is used to specify the the type of match we require 0: Exact match, 1: Less than, -1: Greater Than.

For example, if we need to find out the position of the string "salary" in the first row of the salary sheet, we would write,
=match("salary",salary!$1:$1,0)

We may use the match function instead of column Index number to get the column index number dynamically.

The syntax of using match function in vlookup:

=vlookup(lookup_value,table_array,match(label,firstrow of source-database,0),Range_lookup)

Example:

In the emp_inf example, if we need to make the vlookup more dynamic using the column headers, we may use match with vlookup as shown in **figure 3.11**. Here the match looks for the labels on each field in the header of salary database and returns the position of the column dynamically.

Sometimes, we would need to lookup for a data in the database based on its row number and column number. Index function helps us do this.

Index()

Syntax of index function is as follows:

INDEX(array, row_number,[column_number])

As you can see there are two ways in which you can use the Index function. The first syntax is used to look for data in a single database and the second syntax is used when more than one database is involved.

Example

Suppose we need to find the data at the intersection of row number 3 and column number 4 of a database, we may use the following function.

=index(database,3,4)

Index-Match

As discussed earlier, vlookup can look for the data based on the values in the first column of the database. However, if we have a database where our lookup value is in the middle and we need to search towards the left, we would have to move the column to the left most corner before we use vlookup. **Index function** when used along with **match** helps ussearch for thedata even if the lookup value is not present on the left-most column.

The syntax for index-match is as follows:

INDEX(array,[MATCH(lookup_value,lookup_array,[match_type])],[Match(lookup_value, lookup_array,[match_type])])

Here, you may use match function for row number or column number or both.

Example:

Suppose, from the data given in the below figure, we need to find the total sales, given year and quarter, we may use the function.

=INDEX(database,MATCH(qtr 3,column header,0),MATCH(year,years column,0))