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**ADVANCED  
EXCEL**

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**TEACHUCOMP, INC.**

*...it's all about you*

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# INTRODUCTION AND OVERVIEW

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Welcome to Teachucomp, Inc.'s Advanced Excel course. This class caps the student's knowledge of Microsoft Excel, one of the most popular spreadsheet programs available today. This class is designed to give the student a firm grasp of the advanced concepts in Excel. We will spend much time understanding the database-like qualities that Excel possesses and enhancing our skills in using formula functions.

Excel is an excellent program to learn, as the skills that we learn in Excel apply to many other programs as well, especially Access. It is the recommended starting point for learning database programs as it contains some basic database functionality and features.

Excel is a multi-featured spreadsheet program in which you can create powerful spreadsheets that can manipulate numbers and store data for you. It is a very powerful program, and has many advanced features that can automate and simplify your work. Whether you want it to create charts, spreadsheets, or data sources, Excel can assist you in accomplishing your tasks quickly and easily.

This class will focus on the advanced concepts of the Excel program. We will learn how to create and manage databases in Excel, write advanced formulas, sort and organize data, create forms, and set up macros.

# **CHAPTER 27-**

## **TABLE-RELATED FUNCTIONS**

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**27.1- THE HLOOKUP AND VLOOKUP FUNCTIONS**

**27.2- USING THE IF, AND, AND OR FUNCTIONS**

Sample- for evaluation only.

# TABLE-RELATED FUNCTIONS

## 27.1- The Hlookup and Vlookup Functions:

Now you will examine some formulas that are commonly used when dealing with tables. The first functions that we will discuss are in the “Lookup & Reference” function category. There are two primary functions within this function set that are used to lookup table data. You can use these functions to lookup a column value in a table and then return a corresponding column value from the same row. The first, “HLOOKUP,” will look up a data value in a table that is structured in rows (with a “header column” on the left). The second and more commonly used function, “VLOOKUP,” will lookup data values in a traditional columnar table. Based on the layout of the table in which you are looking up data, you will need to use either one or the other to lookup a data value in a table.

There are three required arguments and one optional fourth argument that you must know before you can create a lookup function. “Arguments” are the additional pieces of information that a function requires in order to be performed. First, you must know the “lookup value.” This is the value which you want to lookup within the table. This is most commonly a cell reference. Second, you need to know the cell range reference of the table in which you want to lookup the first value. This is called the “table array.” Third, you need to know the “column or row index number.” This is the number of columns to the right of the leftmost column, or the number of rows down from the top row of the table, within which Excel must look for the data that you want it to return. The optional fourth argument is “range lookup.” This is a logical value (“TRUE” or “FALSE”) which you can enter, if needed. If omitted, this argument is assumed to be “TRUE.” What it does is specify whether or not you wish to perform a “ranged” lookup on the data within the database. If you need to find an exact match on your data, often when you are looking up text values, you can insert “FALSE” for the “range lookup” argument to find an exact match in the table.

For example, let’s say that you have a columnar customer table in a worksheet. In that sheet, you want to create a cell that will automatically lookup the customer’s address when you type the customer’s company name in an adjacent cell. Assume that the first column of the table contains the customer’s company names and the third column of the table contains the customer’s addresses. You can then write a function that will take the value of the cell adjacent to it (the lookup value), compare it to the customer table (the table array), lookup the customer’s company name in the first column until it finds a match, and then count over three (3) columns (the column index number) to find the customer’s address! Since we want the function to find an exact match on the customer name, we will then add the “FALSE” value to the “range lookup” argument in this case.

After you created the formula, you could type a customer name into the cell that is being looked up and the cell into which you had placed the formula would display the customer’s address after looking it up in the table. In this case, we would use the “VLOOKUP” function because the example stated that we had a traditional columnar table in which we were looking up the data. The syntax of a lookup function is either:

**=VLOOKUP(lookup\_value,table\_array,column\_index\_number,range\_lookup)**

OR

**=HLOOKUP(lookup\_value,table\_array,row\_index\_number,range\_lookup)**

When you are entering the “table array” value for the lookup function, it may be useful to assign it a range name or make it an absolute reference. Named ranges are always assigned as absolute references and this will ensure that the “table array” argument will not change if you copy and paste this formula. If you don’t use named ranges, you can assign the “table array” as an absolute reference by typing the dollar symbol (\$) before **both** the column reference letter **and** the row reference number for both cell references in the range. Remember, if you don’t do this, the lookup function may not work if you copy it to a new location.

# TABLE-RELATED FUNCTIONS

## 27.2- Using the IF, AND, and OR Functions:

We will now discuss “Logical” functions, which you can use to perform logical tests on the values in cells and then return a result based on whether or not the value in the cell passed or failed the test. Logical formulas take the form of an “If...then...else” statement. You must know at least three different arguments before you can write a logical function: the “logical test” that you want to apply to the cell, the cell value or formula to return if the test returns a “TRUE” value (or “passes” the logical test), and the cell value or formula to return if the test returns a “FALSE” value (or “fails” the logical test). When you write logical functions, they must have a certain syntax. That is:

**=IF(logical\_test,true\_response,false\_response)**

Note that if you want the formula to display a text response for the true response or the false response, then you must place the response inside of double quotation marks (“ ”). If you want the cell to display dates, these must be enclosed within pound signs (# #). The only time you wouldn’t mark the type of value to return is if you want the cell to display a numerical result or calculate a formula.

A “nested” logical function is one that places the cell through a second logical test if it “fails” the first. These functions are useful for determining the value of a cell by placing it through several different tests, displaying different results based on which test it passes. You can nest up to 64 additional IF statements behind your original. The syntax for these are:

**=IF(logical\_test\_1,true\_response,IF(logical\_test\_2,true\_response,false\_response))**

You must remember to close all of the open parenthesis for every IF statement that you nest within the logical function at the end of the formula. In this case since there are two IF statements, there are two closing parentheses at the end of the formula.

Often it is the case that you will want to know if a cell meets multiple criteria. You can use the AND and OR functions to find this out. The AND function will return a “TRUE” value if the cell being evaluated passes **all** of the tests listed after the AND function. The OR function will return a true value if the cell being evaluated passes **any** of the logical tests that follow the OR function. Note that you can evaluate up to 255 different logical test after the AND and OR statements.

When you look at how you can combine these tests with the IF function, or many nested IF functions, you can begin to see how you can start to become a very powerful formula creator. Now you can run cells through a battery of tests, and then decide what function to perform or value to display based on the results shown from the tests. The general syntax when combining the IF function with the AND and OR functions is as follows:

**=IF(AND(logical\_test\_1,logical\_test\_2,logical\_test\_3,etc.),true\_response,false\_response)**

**=IF(OR(logical\_test\_1,logical\_test\_2,logical\_test\_3,etc.),true\_response,false\_response)**

# ACTIONS- TABLE-RELATED FUNCTIONS

## GENERAL SYNTAX FOR THE HLOOKUP AND VLOOKUP FUNCTIONS:

1. =VLOOKUP(lookup\_value,table\_array,column\_index\_number,range\_lookup)
2. =HLOOKUP(lookup\_value,table\_array,row\_index\_number,range\_lookup)

## GENERAL SYNTAX FOR THE IF FUNCTION:

1. =IF(logical\_test,true\_response,false\_response)

## GENERAL SYNTAX FOR NESTING IF FUNCTIONS:

1. =IF(logical\_test\_1,true\_response,IF(logical\_test\_2,true\_response,false\_response))

## GENERAL SYNTAX FOR USING THE IF FUNCTION WITH THE AND/OR FUNCTIONS:

1. =IF(AND(logical\_test\_1,logical\_test\_2,logical\_test\_3,etc.),true\_response,false\_response)
2. =IF(OR(logical\_test\_1,logical\_test\_2,logical\_test\_3,etc.),true\_response,false\_response)

# EXERCISES- TABLE-RELATED FUNCTIONS

## Purpose:

1. To be able to table-related functions.

## Exercises:

1. Open up the "Adv- Sample" workbook and open it to "Sheet1."
2. Select cell J1, and type "City."
3. Select cell K1, and type "Percent Commission."
4. Select cell J2, and type "Lansing."
5. Select cell K2, and type "5%."
6. Select cell J3, and type "Detroit."
7. Select cell K3, and type "6%."
8. Select cell J4, and type "Chicago."
9. Select cell K4, and type "7%."
10. Select cell H1 and type "Commission." Allow the table to expand to include this new column.
11. Select cell H2.
12. Type  
`=IF(C2="Lansing",PRODUCT(G2,VLOOKUP(C2,$J$1:$K$4,2,FALSE)),IF(C2="Detroit",PRODUCT(G2,VLOOKUP(C2,$J$1:$K$4,2,FALSE)),IF(C2="Chicago",PRODUCT(G2,VLOOKUP(C2,$J$1:$K$4,2,FALSE)),"No reference available")))`
13. If Excel does not fill in the column for you, then copy this formula to cells H3:H10.
14. Format cells H2:H10 as "Accounting Number Format."
15. Click the "Save" button in the Quick Access Toolbar to save your changes.
16. Click the "X" button in the upper right corner of the application window to exit.