



CPSC203 WEEK-1 LAB-2

COMPLEX CALCULATIONS, IF-THEN STATEMENTS, AND PIVOT TABLES

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DO A CUSTOM CALCULATION USING A FORMULA (POSSIBLY IN SEVERAL STEPS)

- In addition to the provided formulas in Excel, custom calculation can also be performed. A custom calculation use the data associated with cells in a single worksheet, or across multiple worksheets. A custom calculation is specified in the function toolbar.
- A cell, in the same worksheet, is referenced by column and row, e.g. F11.
- A cell in a different worksheet is referenced by sheet name, exclamation point, and cell reference, e.g. Sheet2!A1
- The following steps show how to perform a custom calculation:
 - Step 1
 - Select the cell in which you would like the evaluation of the custom calculation to be displayed
 - Step 2
 - In the Function toolbar, enter the custom calculation by starting with the equals symbol '='.
 - Step 3
 - After entering the custom calculation, press the 'enter' key to evaluate the function. The result will appear in the cell that was originally selected.
- A custom calculation can also include functions which are bundled with Excel.



DO A CUSTOM CALCULATION USING A FORMULA (POSSIBLY IN SEVERAL STEPS)

The screenshot shows a Microsoft Excel spreadsheet titled "Book3 - Microsoft Excel". The spreadsheet has a table with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Item	price																						
2	bag	23																						
3	ball	53																						
4	shirt	656																						
5	car	687897																						
6	shoe	345																						
7	book	223																						
8	bag	234																						
9	shirt	23																						
10	watch	544																						
11																								
12	Total Available Money	45657677																						
13																								
14	Remaining	=B12-(SUM																						
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
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The formula bar shows the formula for cell B14: `=B12-(SUM`. The spreadsheet is titled "Book3 - Microsoft Excel" and the active sheet is "Sheet3". The taskbar at the bottom shows the Windows Start button and several open applications, including "Control Panel", "probability theory", "My Documents", "TA rules [Compa...", "Microsoft Excel -...", "Microsoft Excel -...", "Microsoft Power...", "Courses/Comput...", "Excel Help", and "Search Desktop". The system clock shows 5:54 PM.

USE A NESTED IF.. THEN STATEMENT TO DEFINE CLASSES

- An If-Then statement answers the question "is this true or false?" and then performs a corresponding action.
- An If-Then statement consists of three parts: logical test, true statement, and false statement.
 - where the if-part refers to the logical test, and the then-part refers to either the true statement or false statement
- As with performing a custom calculation, an If-Then statement is entered in the Function toolbar.
- The syntax of an If-Then statement in Excel is: =IF(<logical statement>, <>true statement>, <>false statement>)
 - where the items in angle brackets are replaced by their proper statements/values
- A statement can correspond to a number, or a string of characters by using double quotation marks (e.g. "yes", "true", "evaluation if false", etc.)
- An example If-Then statement can be found in the following spreadsheet.
- A nested If-Then statement can be created, if the true statement and/or false statement consists of another If-Then statement.
 - See the following spreadsheet for an example.
 - In nested If-Then statements, evaluations of inner-most statements occur first, and their evaluations are propagated to the outer-most statements



USE A NESTED IF.. THEN STATEMENT TO DEFINE CLASSES

SpshtLec2_SimpleCalExamples_20080131 [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

SUM X ✓ ✖ =IF(G2="Cat","Kitten",IF(G2="Dog","Puppy","Small Mammal"))

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Lookup Table					Key	LookupFn	Simple IfThen		NestedIfThen									
2	1	Cat				1	Cat	Kitten		=IF(G2="Cat","Kitten",IF(G2="Dog","Puppy","Small Mammal"))									
3	2	Dog				1	Cat	Kitten		K IF(logical_test, [value_if_true], [value_if_false])									
4	3	Hat				2	Dog	Small Mammal		Puppy									
5	4	Mouse				1	Cat	Kitten		Kitten									
6	5	Toad				3	Hat	Small Mammal		Small Mammal									
7	0	Rat				3	Hat	Small Mammal		Small Mammal									
8						4	Mouse	Small Mammal		Small Mammal									
9						4	Mouse	Small Mammal		Small Mammal									
10						5	Toad	Small Mammal		Small Mammal									
11						6	Rat	Small Mammal		Small Mammal									
12						6	Rat	Small Mammal		Small Mammal									
13						1	Cat	Kitten		Kitten									

DataTableExample LookUp_IfThen PivotExample Adding_Text Now_Today Fns Charts

Edit 100%

SUMMARIZE DATA IN A PIVOT TABLE

- Large amounts of data can quickly accumulate in a spreadsheet. Pivot tables provide a mechanism to summarize data, and as a result, makes it easier to analyze and present data. Perform the following steps to create a Pivot table
- Step 1: select a range of cells, or table. Important Note: make sure the range of cells have column headings.
- Step 2: select the 'PivotTable' icon under the 'Tables' contextual menu as part of 'Insert' in the main toolbar.
- Step 3: in the new panel that appears make sure that the selected range of cells or table is correct, and specify the destination of the Pivot table
- Step 4: a new Pivot table is created. Added to the main toolbar is 'PivotTable Tools' (along with its associated contextual menus), when the Pivot table is selected. As well, a 'PivotTable Field List' panel also appears when the Pivot table is selected. Use the options in the contextual menus and panel to format the Pivot table and present the data in an appropriate manner.



SUMMARIZE DATA IN A PIVOT TABLE

The screenshot displays the Microsoft Excel interface with a PivotTable summarizing data from a source table. The source data is as follows:

Item	price
bag	23
ball	53
shirt	656
car	687897
shoe	345
book	223
bag	234
shirt	23
bag	3434
ball	34
shirt	55
car	566
shoe	454
book	34
bag	5767
shirt	4
bag	65
ball	76
shirt	565
car	7867
shoe	6
book	56
bag	5675
shirt	565

The PivotTable is structured as follows:

Row Labels	Sum of price
bag	15198
ball	163
book	313
car	696330
shirt	1868
shoe	805
Grand Total	714677

The PivotTable Field List on the right shows the following configuration:

- Choose fields to add to report: Item, price
- Report Filter: (empty)
- Column Labels: (empty)
- Row Labels: Item
- Values: Sum of price



SUMMARIZE DATA IN A PIVOT TABLE

Change the PivotTable report form: compact, outline, or tabular

You can change the form, whether compact, outline or tabular, for a PivotTable report and any of its various fields.

PivotTable report

- Click the PivotTable report.
- On the **Design** tab, in the **Layout** group, click **Report Layout**, and then do one of the following:
 - **Show in Compact Form** Use to keep related data from spreading horizontally off of the screen and to help minimize scrolling. Beginning fields on the side are contained in one column and are indented to show the nested column relationship.
 - **Show in Outline Form** Use to outline the data in the classic PivotTable style.
 - **Show in Tabular Form** Use to see all data in a traditional table format and to easily copy cells to another worksheet.



SUMMARIZE DATA IN A PIVOT TABLE

Add fields

- To add fields to the report, do one or more of the following:
 - Select the check box next to each field name in the field section. The field is placed in a default area of the layout section, but you can rearrange the fields if you want. By default, non-numeric fields are added to the Row Labels area, numeric fields are added to the Values area, and OLAP date and time hierarchies are added to the Column Labels area.
 - Right-click the field name and then select the appropriate command — **Add to Report Filter, Add to Column etc**



LOOKUP FUNCTIONS

Lookup functions can be used to find values (data) in a data table, essentially answers to questions. Several lookup functions are provided in Excel.

- LOOKUP
- VLOOKUP
- HLOOKUP



LOOKUP FUNCTIONS

- The syntax for the Lookup function is either
 - =Lookup(lookup_value, lookup_vector, [result_vector])
 - lookup_value is the value to search for in the lookup_range
 - lookup_vector is a single row or single column of data that is sorted in **ascending order** (the Lookup function searches for value in this range)
 - [result_vector] is a single row or single column of data that is the same size as the lookup_range; the Lookup function searches for the value in the lookup_range and returns the value from the same position in the result_range
 - =Lookup(lookup_value, array)
 - lookup_value is the value to search for in the array (values must be in ascending order)
 - The array form of **LOOKUP** looks in the first row or column of an array for the specified value and returns a value from the same position in the last row or column of the array. Use this form of **LOOKUP** when the values that you want to match are in the first row or column of the array. Use the other form of **LOOKUP** when you want to specify the location of the column or row.



LOOKUP FUNCTIONS-VECTOR FORM

The screenshot displays the Microsoft Excel interface with a table of data. The table has four columns: Frequency, Color, Result, and Lookup Function. The data is as follows:

Frequency	Color	Result	Lookup Function
4.14	red	orange	=LOOKUP(4.19,A3:C7,B3:D7)
4.19	orange	orange	=LOOKUP(5,A3:A7,B3:B7)
5.17	yellow	blue	=LOOKUP(7.66,A3:A7,B3:B7)
5.77	green	#N/A	=LOOKUP(0,A3:A7,B3:B7)
6.39	blue		

The interface includes the ribbon with tabs for Home, Insert, Page Layout, Formulas, Data, Review, and View. The Home tab is active, showing options for Clipboard, Font, Alignment, Number, Styles, Cells, and Editing. The status bar at the bottom indicates 'Ready' and '100%' zoom.

LOOKUP FUNCTIONS-VECTOR FORM

The screenshot displays the Microsoft Excel interface with a spreadsheet containing the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	barcelona	45	34	656																					
2	calgary	34	45	646																					
3	dallas	77	656	6		LOOKUP																			
4	delhi	56	77	46		6																			
5	dhaka	43	688	46																					
6	london	67	8978	46																					
7	newyork	54	676	64																					
8	oslo	7567	97	64																					
9	paris	343	98	88																					
10	riyad	65	98	46																					
11	tokyo	353	989	5757																					
12	torronto	65	567	757																					

The formula bar shows the formula: `=LOOKUP("dallas",A1:D12)`. The spreadsheet shows the result of the LOOKUP function in cell F4, which is 6. The text 'LOOKUP' is also visible in cell F3.

LOOKUP FUNCTIONS

- It is important to understand how Excel interprets the cut points. The following example illustrates the three points below, and is based on an example provided in Excel 2007 Help (Excel > Function Reference > Lookup).
- In the case of equality (=), a match is found, and its corresponding value is returned; the first example where 4.19 is found in column A and the corresponding value in column B is returned, orange
- In the case of greater than (>), the next smallest value is found, and its corresponding value is returned; the second example where 5.00 is not found and instead 4.19 is found in column A and the corresponding value in column B is returned, orange
- in the case of less than (<), if the value is less than any value, N/A is returned; the fourth example where 0 is less than every number in column A, and as a result, N/A is returned



HLOOKUP FUNCTION

- **HLOOKUP(lookup_value,table_array,row_index_num,range_lookup)**
- **Lookup_value** is the value to be found in the first row of the table. Lookup_value can be a value, a reference, or a text string.
- **Table_array** is a table of information in which data is looked up. Use a reference to a range or a range name.
- The values in the first row of table_array can be text, numbers, or logical values.
- If range_lookup is TRUE, the values in the first row of table_array must be placed in ascending order: ...-2, -1, 0, 1, 2,..., A-Z, FALSE, TRUE; otherwise, HLOOKUP may not give the correct value. If range_lookup is FALSE, table_array does not need to be sorted.
- Uppercase and lowercase text are equivalent.
- **Row_index_num** is the row number in table_array from which the matching value will be returned. A row_index_num of 1 returns the first row value in table_array, a row_index_num of 2 returns the second row value in table_array, and so on. If row_index_num is less than 1, HLOOKUP returns the #VALUE! error value; if row_index_num is greater than the number of rows on table_array, HLOOKUP returns the #REF! error value.
- **Range_lookup** is a logical value that specifies whether you want HLOOKUP to find an exact match or an approximate match. If TRUE or omitted, an approximate match is returned. In other words, if an exact match is not found, the next largest value that is less than lookup_value is returned. If FALSE, HLOOKUP will find an exact match. If one is not found, the error value #N/A is returned.



VLOOKUP FUNCTION

- VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup]) The VLOOKUP function syntax has the following arguments :
- **lookup_value** Required. The value to search in the first column of the table or range. The *lookup_value* argument can be a value or a reference. If the value you supply for the *lookup_value* argument is smaller than the smallest value in the first column of the *table_array* argument, **VLOOKUP** returns the #N/A error value.
- **table_array** Required. The range of cells that contains the data. You can use a reference to a range (for example, **A2:D8**), or a range name. The values in the first column of *table_array* are the values searched by *lookup_value*. These values can be text, numbers, or logical values. Uppercase and lowercase text are equivalent.
- **col_index_num** Required. The column number in the *table_array* argument from which the matching value must be returned. A *col_index_num* argument of 1 returns the value in the first column in *table_array*; a *col_index_num* of 2 returns the value in the second column in *table_array*, and so on.
- **range_lookup** Optional. A logical value that specifies whether you want **VLOOKUP** to find an exact match or an approximate match:
 - If *range_lookup* is either TRUE or is omitted, an exact or approximate match is returned. If an exact match is not found, the next largest value that is less than *lookup_value* is returned.
Important If *range_lookup* is either TRUE or is omitted, the values in the first column of *table_array* must be placed in ascending sort order; otherwise, **VLOOKUP** might not return the correct value.
 - If *range_lookup* is FALSE, the values in the first column of *table_array* do not need to be sorted.