Microsoft Excel 2007: Functions and Data Analyses
Part 2: PivotTables

INFORMATION TECHNOLOGY SERVICES
California State University, Los Angeles

Version 1.1 Spring 2009

Contents

Introduction

In the second part of **Microsoft Excel 2007: Functions and Data Analyses,** PivotTables and Lookup functions will be discussed. PivotTables enable the users to summarize and manipulate numerous amounts of data in a small amount of space. Lookup functions essentially return a value from a table in a range by looking up another value. This handout illustrates how to create and revise a PivotTable report and a PivotChart Report, publish a PivotTable in HTML format, and use the LOOKUP, VLOOKUP, and HLOOKUP functions.

Scenario

Many companies and organizations use Excel to deal with numeric data and analyze it from a different perspective. A bank report is one of the examples which show how a dataset is analyzed based on multiple conditions. For instance, it is used to show the account balance, the account average balance, the number of accounts, and the open date of the accounts in each branch. Also, it seeks to compare the data between branches. In addition, the use of different kinds of graphs provided in Excel enhances the analysis of the data as well as its appearance. Therefore, this handout will demonstrate how the user can customize a bank report appropriate to the purpose, by employing the PivotTable or PivotChart wizard. Furthermore, it will help the user to understand how to perform numerous calculations with ease in the PivotTable and PivotChart.

The dataset of Part two includes several data fields such as bank branch, account type, customer type, and open date, which demonstrate the relevant data for a bank report. The bank branches include Central, Northwest, and Westside. There are three types of bank accounts which include the CD (Certificate of Deposit), Checking, and Saving Accounts. The dataset categorizes the customers into four types, such as Personal, Personal VIP, Corporate, and Corporate VIP depending on their current balance, average balance, and other factors affecting their credit for the past five years. In this dataset, the average balance and other factors will not be displayed for the users to simplify creating a PivotTable report. Also, the dataset shows only the open dates of accounts from 2001 to 2005, but the date items can be grouped by months, quarters, and years in the PivotTable and PivotChart Reports.

Creating a PivotTable

A PivotTable, also called PivotTable Report, is a summary table which uses two-dimensional data to create a three-dimensional table based on multiple conditions that have intersecting points**.** PivotTable can summarize large amounts of information in a small amount of space. The advantage of the PivotTable is its flexibility to view the details that make up the total number and its ease in performing numerous calculations without typing a formula. A PivotTable Report is created using the **PivotChart Wizard,** which walks the user through the step-by-step process.

CREATING A PIVOTTABLE REPORT

To open the data file:

1. Select the **Start** menu ► **Microsoft Excel.**
2. Click the **Office Button** and then **Open**  . The *Open* dialog box appears.
3. In the *Open* dialog box, select the drive where the data file is stored in the ***Look in:*** list box. Double-click the file named "***PivotTable.xlsx***".

To create a PivotTable:

1. Place the cursor anywhere in the range of the database.
2. From the *Insert* tab, select **PivotTable** under the *Tables* group. The *Create PivotTable* dialog box opens (see Figure 1).

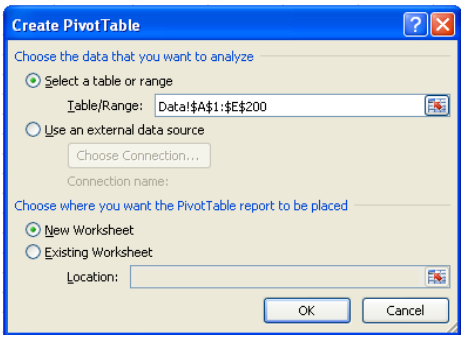


Figure 1 – PivotTable & Chart Wizard (Step One of Three)

3. The range of data is automatically given as; **$A$1:$E$200**. It resulted from the position of the cursor in the worksheet before starting the *Create PivotTable* dialog box. Otherwise, click on the edit box and select a range of data to use from **$A$1:$E$200**.
4. Select ***New worksheet*** under ***Choose where you want the PivotTable report to be placed.***
5. Click the **OK** button. ***"Sheet1"*** is automatically created (see Figure 2).

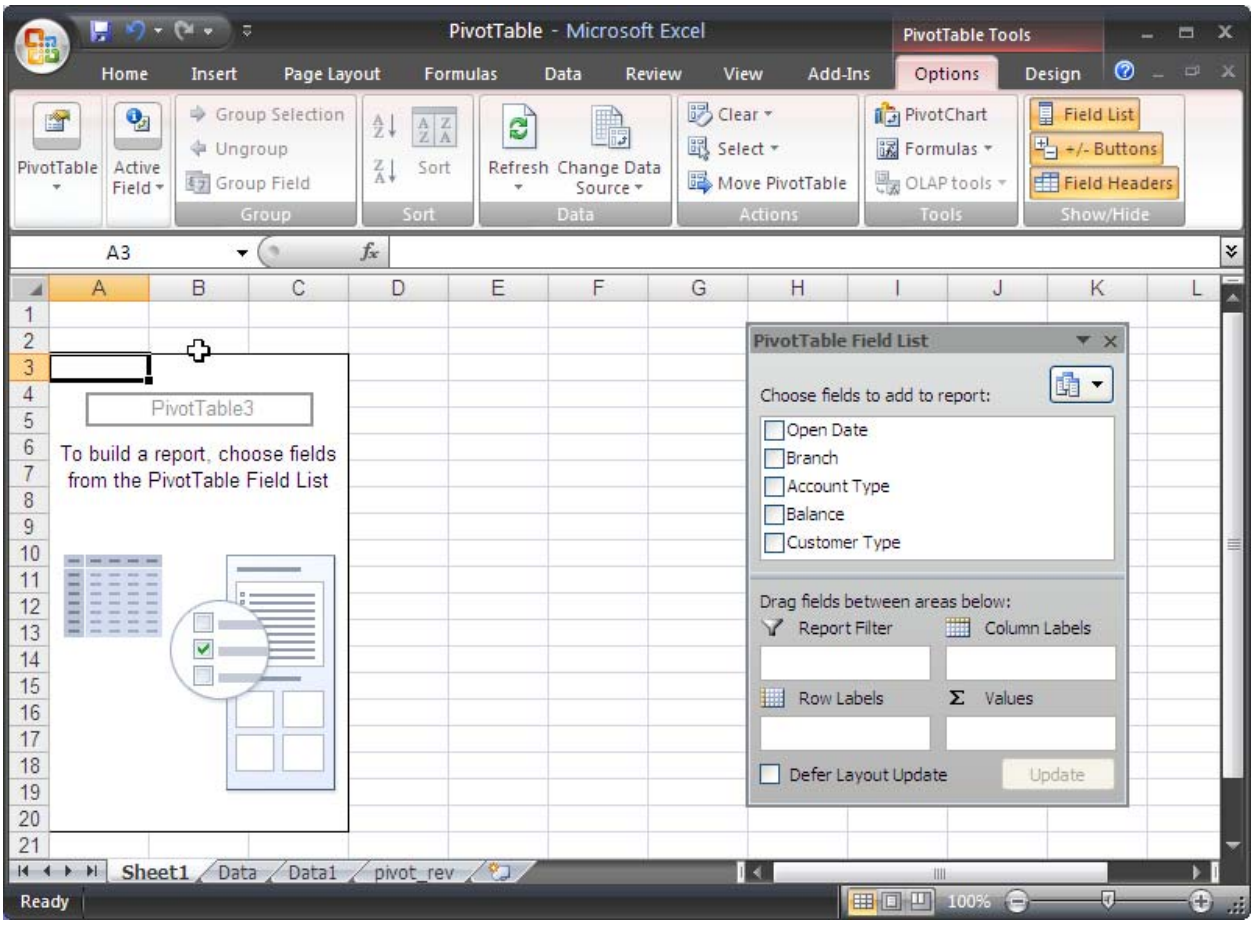


Figure 2 – Drag Data Items

Adding PivotTable Report Fields

When the fields from the selected data appear on the right side of the screen, each field needs to be added into the PivotTable layout.

The following describes the four areas that are available for adding a field (see Figure 3):

1. **Report Filter**: Creates a drop-down menu above the table to analyze a specific item from the field, such as a selected branch.
2. **Row Labels**: Applies a vertical format to the table, summarizing the data from top down. The row drop area lists each item in the field down the left side of the PivotTable.
3. **Column Labels**: Applies a horizontal format to the table, summarizing the data from left to right. The column drop area lists each item in the field across the top of the PivotTable.
4. **Values**: The data drop area is the summary of the numbers. This area adds, counts, or creates other analytical functions against the data dropped here.

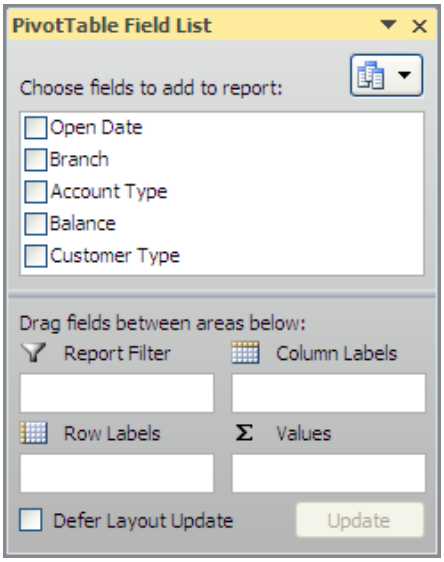


Figure 3 – Field Placement Areas

To add fields into the PivotTable layout under the *PivotTable Field List* dialog box:

1. Click the **Branch** field. Drag and drop it into the ***Report Filter*** drop area.
2. Click the **Account Type** field. Drag and drop it into the ***Row Labels*** drop area.
3. Click the **Customer Type** field. Drag and drop it into the ***Column*** drop area.
4. Click the **Balance** field. Drag and drop it into the ***Values*** drop area (see Figure 4).

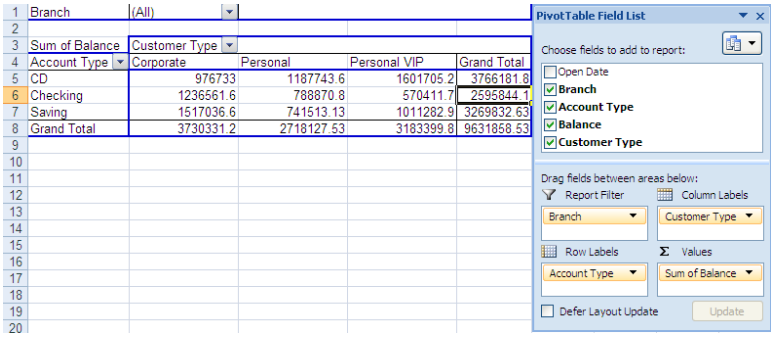


Figure 4 – PivotTable Layout

5. Double-click on the worksheet tab ***"Sheet1"*** and rename it to ***"PivotTable"***.

Selecting a Page Field Item

When each field is dropped in the drop area, a user can customize a summary report by selecting one of the items in the page field drop-down box.

To select a page field item:

1. When the field data is dropped in the ***Report Filter*** drop area, the PivotTable Report displays a summary of all the data because ***(All)*** is selected by default (see Figure 5).
2. To apply report filtering, click the drop-down box next to **Branch** and select **Northwest** (see Figure 6).
3. Notice the PivotTable Report displays the summary data of the Northwest branch only (see Figure 7).

	A	B	C
1	Branch	(All)	
2			
3	Sum of Balance	Customer Type	
4	Account Type	Corporate	Personal
5	CD	976733	1187743.6
6	Checking	1236561.6	788870.8
7	Saving	1517036.6	741513.13
8	Grand Total	3730331.2	2718127.53

Figure 5 – Selecting a Page Field Item

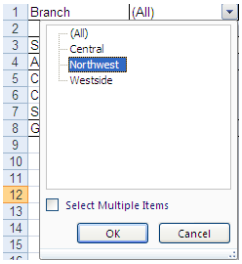


Figure 6 – Changing a Page Field Item

	A	B	C
1	Branch	Northwest	
2			
3	Sum of Balance	Customer Type	
4	Account Type	Corporate	Personal
5	CD	260726	391707.4
6	Checking	296595.2	139930.9
7	Saving	302815.1	290550.9
8	Grand Total	860136.3	822189.2

Figure 7 – Northwest Branch Displayed

Revising a PivotTable Report

Once a PivotTable or PivotChart is created, the user can restructure the PivotTable or PivotChart by dragging and dropping fields, by using the options on the menus, or by using the PivotTable toolbar. Formatting options can also be used to change the look or structure of the PivotTable.

REFRESHING A PIVOTTABLE REPORT

After a PivotTable is created, if some data in the original worksheet has changed, the PivotTable must be refreshed to automatically update the contents of the table.

To refresh a PivotTable Report:

1. Click on worksheet "***Data***."
2. Click cell D3, as a **Checking** product opened in the **Northwest** branch.
3. Change the value of cell D3 to **1,000,000**.
4. Click worksheet "***PivotTable.***"
5. Click on the *Options* tab under the *PivotTable Tools* contextual tabs.
6. Click on the  button in the Data group (see Figure 8). Notice that the PivotTable automatically refreshes the data.

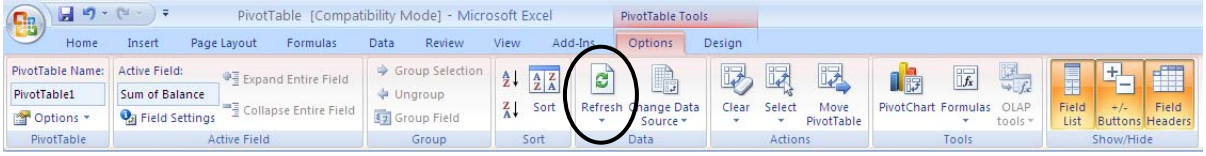


Figure 8 – Refresh Button

CHANGING THE SUMMARY FUNCTION

By default, a PivotTable uses the SUM function to summarize the data, but the user can change the summary method of a PivotTable or PivotChart data by using different summary functions.

To change the summary function:

1. In the PivotTable, right-click cell A3 in the data area and select **Value Field Settings…**. The *Value Field Settings* dialog box appears (see Figure 9).
2. In the *Summarize value field by* section, click the *COUNT* function to count the number of occurrences of each balance type.
3. Click the **OK** button.
4. Notice that the PivotTable displays the count of balance (see Figure 10).

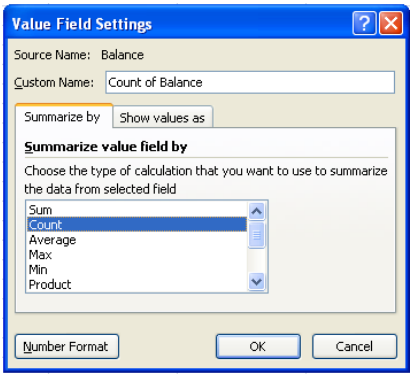


Figure 9 – Count Summary Function

NOTE: Another way of changing the summary function is by right-clicking cell A3 and then choosing *Value Field Settings…* from the drop-down menu.

	A	B	C	D	E
1	Branch	(All)			
2					
3	Count of Balance	Customer Type			
4	Account Type	Corporate	Personal	Personal VIP	Grand Total
5	CD	22	28	26	76
6	Checking	24	20	14	58
7	Saving	31	16	18	65
8	Grand Total	77	64	58	199

Figure 10 – Count Summary of Balance Function

Adding New Fields to a PivotTable Report

New Fields can be added to the PivotTable to view other aspects of the bank balances.

To add a new field:

1. Open the ***"pivot_rev"*** worksheet.
2. From the *PivotTable Field List* dialog box, click the *Open Date* field and drag it to the left of the **Account type** column in the PivotTable (see Figure 11 and Figure 12).

	A	B
1	Branch	(All)
2		
3	Count of Balance	Customer Type
4	Account Type	Corporate
5	CD	22
6	Checking	24
7	Saving	31
8	Grand Total	77

Figure 11 – Adding a New Field

	A	B	C
1	Branch	(All)	
2			
3	Count of Balance		Customer Type
4	Open Date	Account Type	Corporate
5	2005	CD	2
6		CD Sum	34266
7		Checking Sum	
8		Saving Sum	
9	Grand Total		2

Figure 12 – Open Date Field Added to PivotTable

NOTE: Different field items can only be places in certain areas. See Table 1 for the list and description of the icons that appear when dragging a field over the PivotTable.

Table 1 – PivotTable Field List Icons

Icon	Description of Icon
	Can only be used in the Row, Column, and Range field areas
	Can only be used in the Data Range of the PivotTable
	Can be used in any field area in the PivotTable

Changing the Order of Data Fields

To change the order of data fields:

1. Place the cursor in cell A4 and right-click.
2. Point to *Move* on the shortcut menu.
3. Select the *Move "Open Date" to Right* option (see Figure 13).
4. Notice that the *Open Date* field has moved to the right of the **Account Type** field.

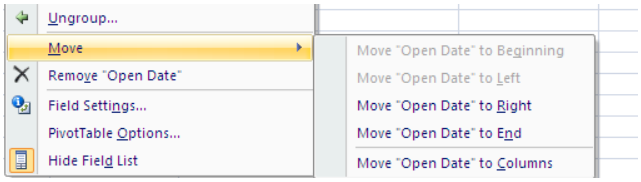


Figure 13 – Changing the Order of Data Fields

NOTE: As an alternative way, point the cursor on a data field cell. The pointer becomes a four-headed arrow. Drag the data field to the desired position.

WORKING WITH DATES

PivotTable enables numeric items, dates and times, and selected items to be grouped by a desired range. This section explains grouping by dates, but grouping other items can be applied in the same manner.

To group dates:

1. Place the mouse cursor in cell A4.
2. Right-click and select the *Group…*option (see Figure 14).
3. The *Grouping* dialog box appears. By default, the two dates, ***Starting at:*** and ***Ending at:***, are automatically selected based on the field data (see Figure 15).
4. In the ***By*** list box, select *Months*, *Quarters*, and *Years* to group the dates in the data field area by month, quarter, and year (see Figure 16). Notice the data fields are now grouped by years, quarters, and months in separate columns.

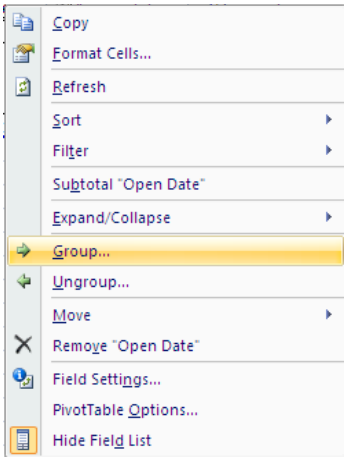


Figure 14 – Grouping by Dates

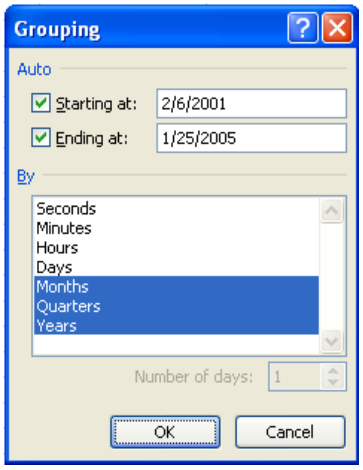


Figure 15 – Grouping Dialog Box

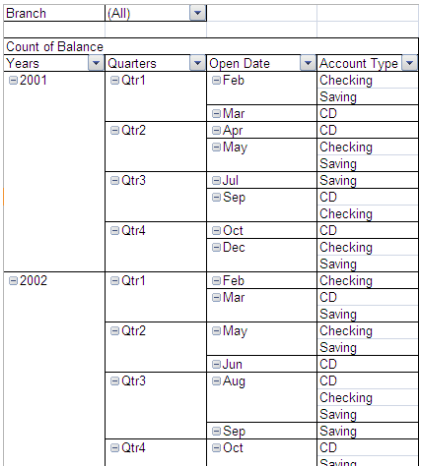


Figure 16 – Grouped by Year

Showing and Hiding Detail

In the PivotTable, users can show or hide details of the fields.

To hide details of the *Year* field:

1. Click the field's heading, cell A4.
2. Right-click and go to *Expand/Collapse*.
3. Select the *Collapse* option (see Figure 17).

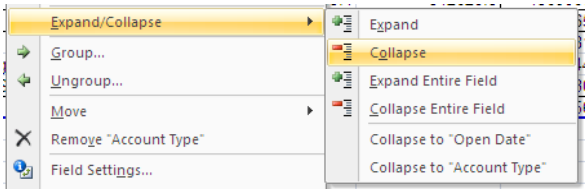


Figure 17 – Hiding Details

To show hidden details of the field:

1. Click the field's heading, cell A4.
2. Right-click and go to *Expand/Collapse*.
3. Select the *Expand* option (see Figure 18).

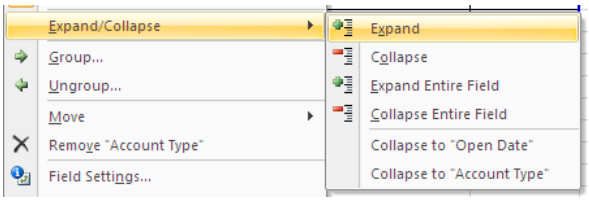


Figure 18 – Show Hidden Details

Hiding/Displaying PivotTable Fields

PivotTables enable a particular data field to be hidden and redisplayed.

To hide the *Open Date* field in the PivotTable report:

1. Find the *PivotTable Field List* dialog box. If not found, click the **Field List** button in the Show/Hide group on the **Options** tab of the *PivotTable Tools* contextual tabs on the **Ribbon**.
2. In the *PivotTable Field List,* uncheck the box for the ***Open Date*** field (see Figure 19). Notice that the **Open Date** field is hidden in the PivotTable report.

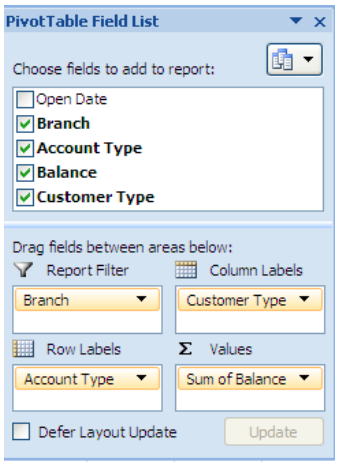


Figure 19 – Hiding PivotTable Fields

To redisplay the hidden field in the PivotTable report, simply recheck the checkbox of that hidden field in the *PivotTable Field List* dialog box (see Figure 20).

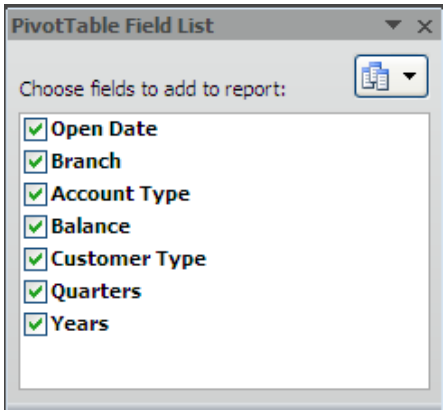


Figure 20 – Redisplaying the Hidden Field

NOTE: As an alternative way, select cell A4 and click on the **Expand Entire Field** button in the Active Field group in the *Options* tab of *PivotTable Tools* contextual tabs on the **Ribbon**. The *Show Detail* dialog box appears (see Figure 21). Then, double click the *Open Date* field.

NOTE: Keep in mind that a cell must be selected in the PivotTable in order for *PivotTable Tools* to appear on the **Ribbon**.

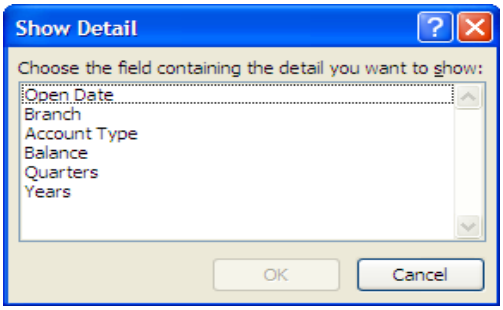


Figure 21 – Show Detail Dialog Box

APPLYING AUTOFORMATS

In Excel, it is possible to manipulate and format a PivotTable by changing the font, point size, colors, etc. This section shows how Excel can automatically apply a preset style to a new PivotTable.

To apply a format to a PivotTable:

1. Place the cursor anywhere in the PivotTable report.
2. Click the *Design* tab under *PivotTable Tools* contextual tabs on the **Ribbon**.
3. Select one of the available styles from the PivotTable Styles group (see Figure 22).

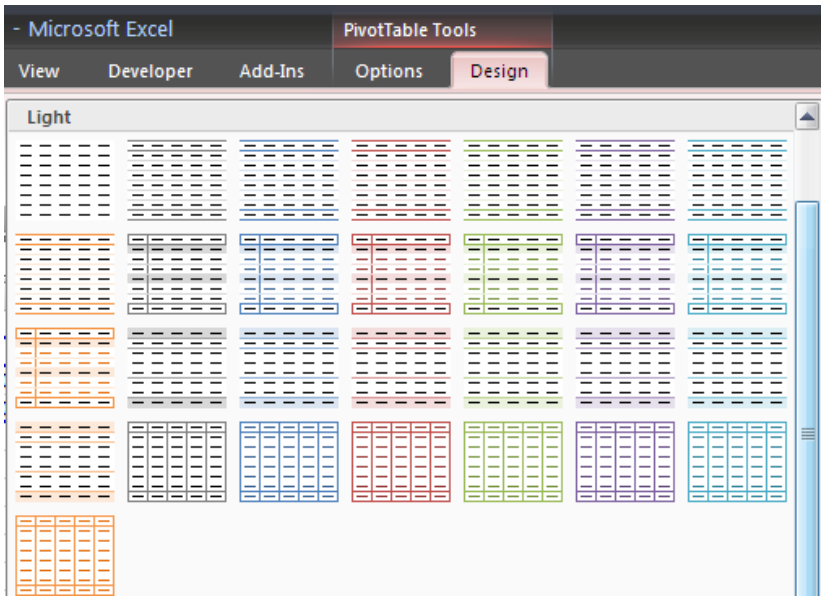


Figure 22 – PivotTable Styles

Creating a PivotChart Report

A PivotChart Report provides interactive analysis of data, like a PivotTable Report. The display view of the data can easily be changed to see different level of details, and the organization of the chart layout can be changed by dragging fields and by showing or hiding items in fields. There are several different types of data sources that can be used, such as the list or table taken from an Excel list or range, an external database, or another PivotTable Report.

CREATING A PIVOTCHART REPORT

To create a PivotChart Report using an existing PivotTable:

1. Open the file "***PivotChart.xlsx***" from the student data directory.
2. Select the worksheet "***PTable***".
3. Select any cell in the PivotTable area.
4. *PivotTable Tools* contextual tabs appear. Select the *Options* tab and then click on the **PivotChart** button under the *Tools* group.
5. Select the chart type preferred. Click on the *Column* tab at the left and then double-click **Stacked Column** (first row, second from left). A PivotChart is created on the same worksheet (see Figure 23).

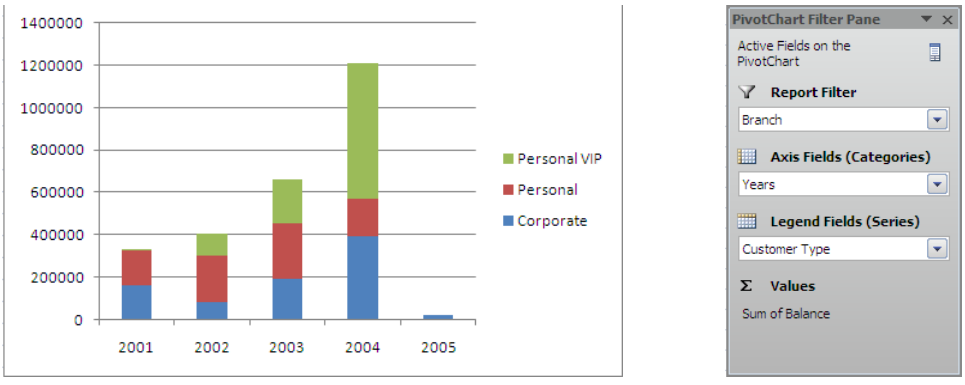


Figure 23 – PivotChart Report with PivotChart Filter Pane

6. To change the chart location, click on the PivotChart to select it and click on the *Design* tab on the **Ribbon**. Select the **Move Chart** button under Location group. Click on the ***New Sheet*** option button. The PivotChart will be moved to ***"Chart1"*** sheet.

Changing a Chart Type

To change the chart type:

1. Click anywhere on the PivotChart to select it. The *PivotChart Tools* contextual tabs appear.
2. Click on the *Design* tab. Click the **Change Chart Type** button under the Type group. The *Change Chart Type* dialog box opens.
3. Select **Clustered Bar** (fourth row, first column) (see Figure 24).
4. Click the **OK** button.

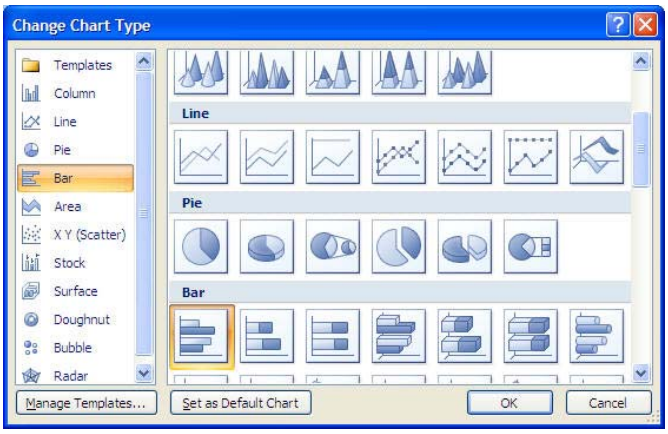


Figure 24 – Changing Chart Type

Dragging Fields from the PivotTable Field List

A PivotChart offers the power of PivotTables and normal charts combined in one interactive medium. As the fields are dragged to new locations on the chart, Excel will pivot the chart to correspond to the new field location.

To drag fields from the PivotTable field list:

1. Click on the PivotChart to display the *PivotChart Tools* contextual tabs.
2. Click on the *Analyze* tab. Click on the **Field list** button under *Show/Hide* group.
3. Drag the *Account Type* field to the ***Axis Fields (Categories)*** list box under the ***Years*** field (see Figure 25).

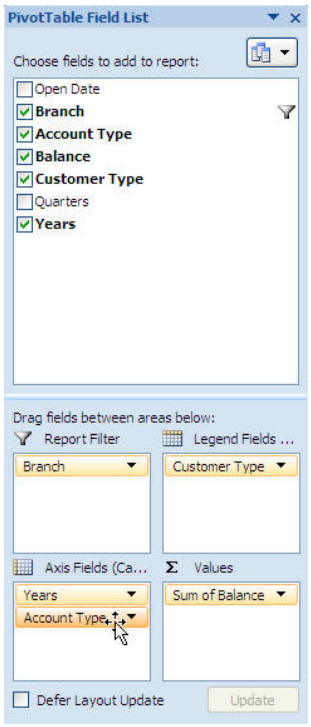
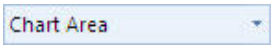


Figure 25 – Dragging Fields to PivotChart Report

FORMATTING A PIVOTCHART

Formatting changes the appearance of the chart. The formatting options available depend on the selected object. For example, if the chart area is selected, Excel allows the patterns, fonts, and chart area properties to be changed. The user can also use the buttons on the **Formatting** toolbar to format text, add values, data points, and data series, as well as fill colors and patterns.

To format a chart title using the formatting button on the **Chart** toolbar:

1. Open the file "***PivotChart2.xlsx***" from the student data drive.
2. Click on the worksheet ***"Chart1"*** to begin formatting.
3. Click on the chart title once to select it. The *PivotChart Tools* contextual tabs appear. Click on the *Format* tab.
4. Click on the ***Chart Area***  drop-down arrow to select an object to format. Click on the **Format Selection** button (see Figure 26). The *Format Chart Title* dialog box appears.

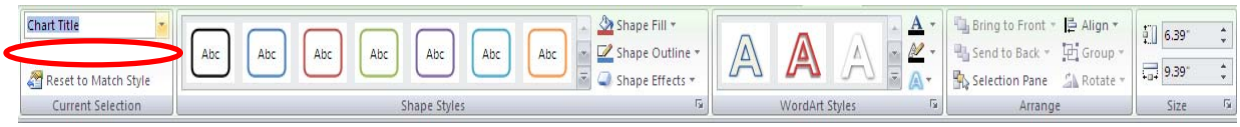


Figure 26 – Format Tab

5. Select the *Fill* tab. Change fill color and type of fill as desired (see Figure 27).

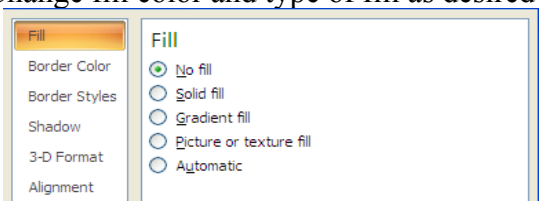


Figure 27 – Format Title (Fill)

6. There are also the *Border Color, Border Styles, Shadow, and 3-D Format* tabs to change the format as desired. Change border style, line color, line weight, and filled area color (see Figure 28).

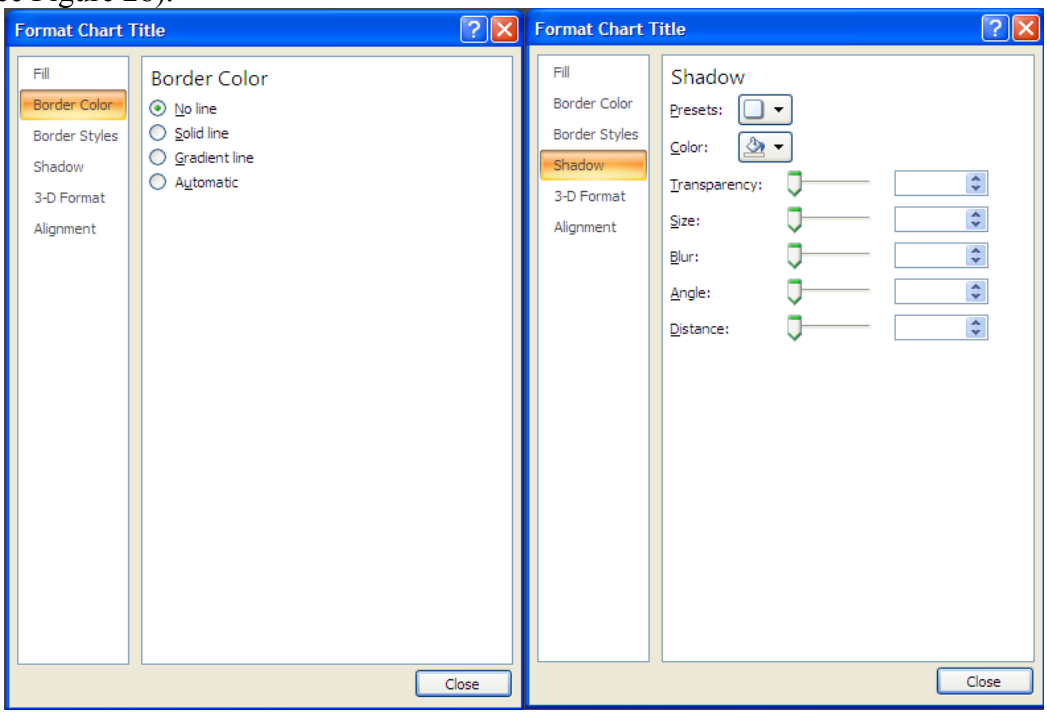


Figure 28 – Format Title (Border Color and Shadow)

7. Select the *Alignment* tab to change text alignment and orientation degree (see Figure 29).

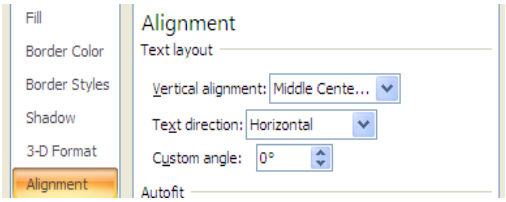


Figure 29 – Format Title (Alignment)

8. Click on the *Home* tab to change the font style and font size (see Figure 30).

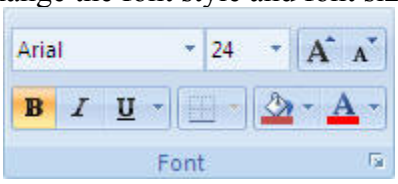


Figure 30 - Font Group

Displaying Data Labels

Without labels for data, it can be difficult to determine what each item refers to. Excel allows data labels to be displayed in the PivotChart (see Figure 32).

To display data labels:

1. Select the *Layout* tab and select the **Data Labels** button under the *Labels* group.
2. Select *More Data Label Options*. The *Format Data Labels* dialog box opens. Under the *Label Options* tab, select the ***Percentage*** check box, and uncheck the ***Value*** and ***Show Leader Lines*** check boxes. Under the *Label Position* section, select the ***Outside End*** option (see Figure 31).

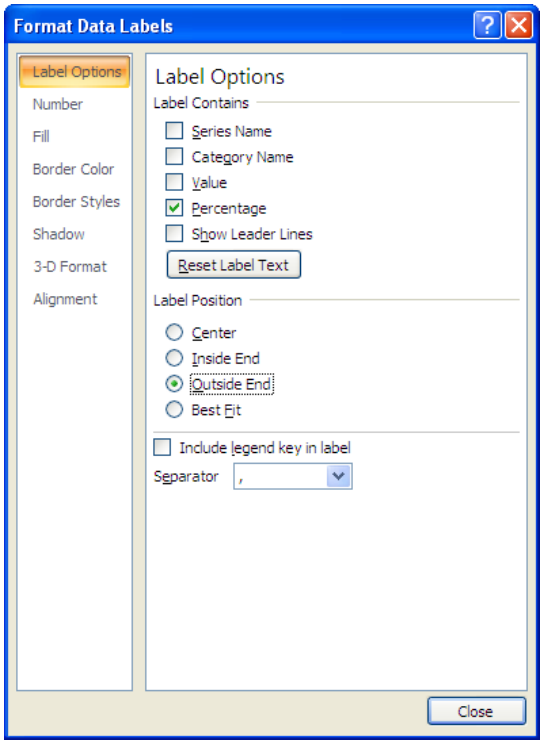


Figure 31 – Applying Data Labels

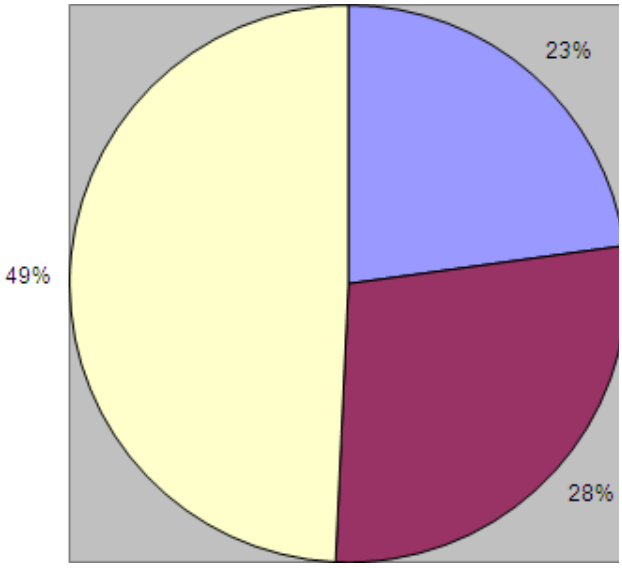


Figure 32 – Displaying Data Labels

Saving and Publishing a PivotTable in HTML Format

Excel can save a PivotTable as a regular table in an HTML document, allowing other people to view the table using their Web browser without having to open up an Excel file. Excel also offers the option of republishing the Web page each and every time the Excel file containing the PivotTable is saved. The table in the Web page is read-only and displays the last contents displayed in the PivotTable when it was last saved in Excel.

SAVING AND PUBLISHING A PIVOTTABLE

To save a PivotTable as a Web page:

1. Open the data file "***pivottable_html.xlsx***" from the student data drive.
2. Click on the worksheet "***PivotTable***."
3. Select the **Office** button, ► **Save as Web Page**.
4. Specify the location of the file to save (e.g., Desktop).
5. Select the Selection: Sheet radio button (see Figure 33).

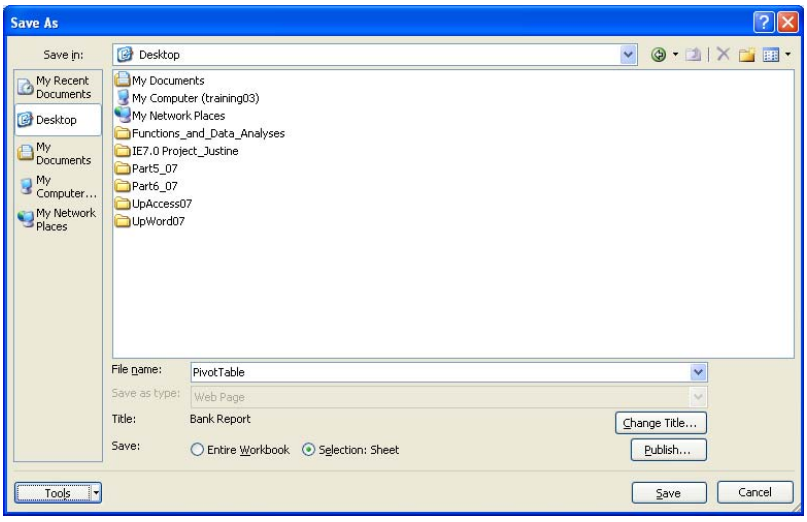


Figure 33 – Saving a PivotTable

NOTE: If a range is selected (PivotTable) before using the **Save as Web Page** command in the **File** menu, the *Selection* option will reflect the selected range instead of the entire sheet.

6. In the ***File name:*** field, type **[PivotTable]**.
7. Click on the **Change Title…** button.
8. Type **[Bank Report]** in the *Change Title* text box.
9. Click the **OK** button.
10. Click on the **Publish** button. This opens up the *Publish as Web Page* dialog box.
11. In the *Publish as Web Page* dialog box, select the sheet from the ***Choose*** list. Then select the entire sheet or just the PivotTable range. For example, under *Item to publish*, select *Items on PivotTable* and then *PivotTable (PivotTable2($A$1:$E$8))* (see Figure 34).
12. Check the ***AutoRepublish every time this workbook is saved*** check box to republish the Web page whenever the workbook in Excel is saved.
13. Click on the **Publish** button.

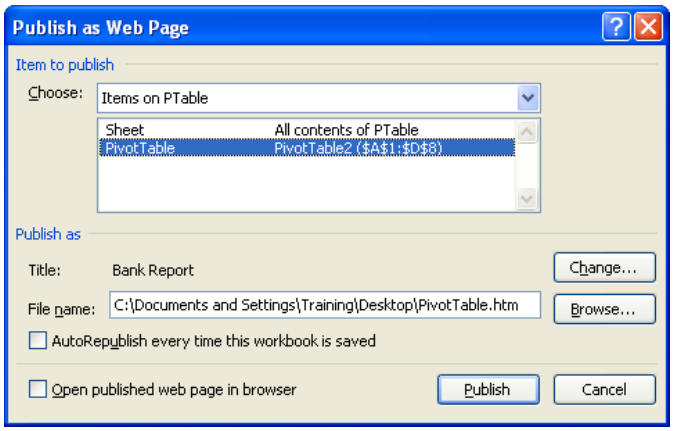


Figure 34 – Publish as a Web Page

OPENING A PIVOTTABLE IN THE WEB BROWSER

Once a PivotTable is saved as a Web page, users can view the PivotTable in a Web browser, such as **Internet Explorer** or **Netscape Navigator**.

To open a PivotTable in a Web browser:

1. Launch **Internet Explorer** by clicking on the icon.
2. In the **File** menu, select the **Open…** option to find the location of the PivotTable file. The *Open* dialog box appears.
3. Click on the **Browse…** button (see Figure 35).

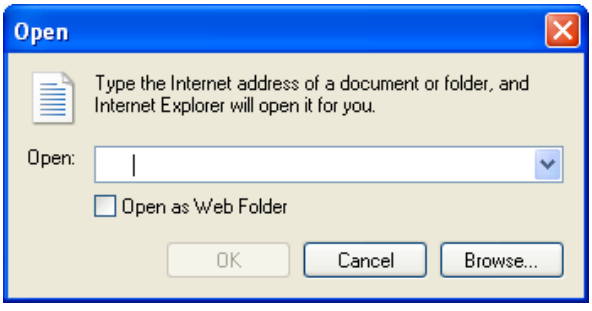


Figure 35 – Open the PivotTable in Web Browser

4. Click **Desktop** in the **Look in:** drop-down list and select the file, "***PivotTable***".

5. Click the **Open** button.
6. In the *Open* dialog box, click the **OK** button. The PivotTable appears in the Web browser (see Figure 36).

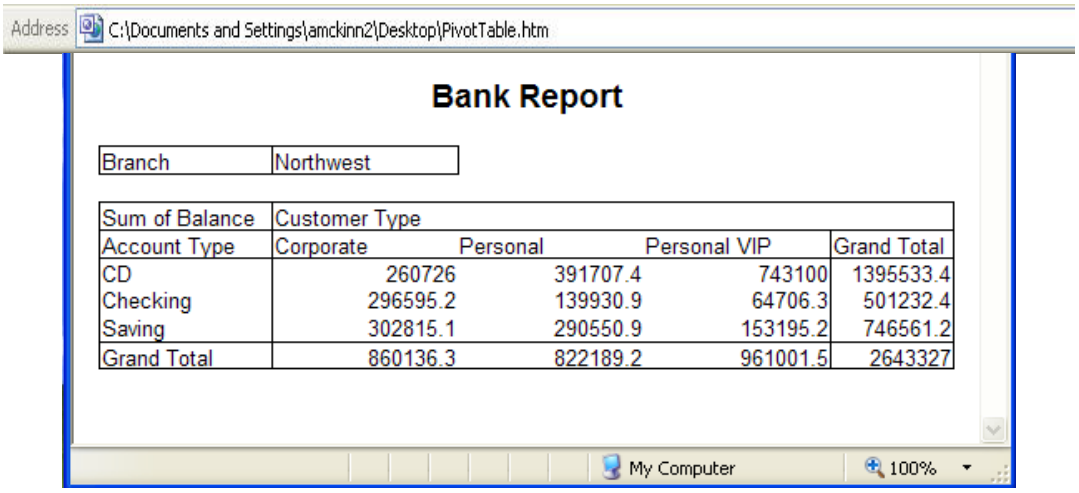


Figure 36 – Viewing the PivotTable in Web Browser

Lookup Functions

A lookup function essentially returns a value from a table in a range by looking up another value. A common telephone directory provides a good analogy. To find a person's telephone number, the name must first be located, and then the corresponding number can be retrieved. This is essentially how a lookup function works.

This section discusses various techniques that can be used to look up a value in a table. Excel has three functions (**LOOKUP**, **VLOOKUP**, and **HLOOKUP**) designed for this task.

LOOKUP

LOOKUP has two different syntaxes. One is used to return a value from a single column or row and the other is used to return a value from a specified table array. Either syntax can be used.

LOOKUP(lookup_value, **lookup_vector**, **result_vector**)

lookup_value: The value searched for in the **lookup_vector**. It can be a number, text, logical value, name, or reference.

lookup_vector: The **single** column or row of values to look up and return (if **result_vector** is not specified), which can be text, numbers, or logical values.

> NOTE: The values in a lookup_vector must be sorted in ascending order; otherwise, LOOKUP may not return the correct value.

[result_vector]: (optional) The **single** column or row of values to return if specified. The range size must be the same as the size of the **lookup_vector**.

LOOKUP will compare the **lookup_value** with each value in the **lookup_vector** and stop at the **position** of the largest value that is **smaller** than the **lookup_value**. It will then return the value stored in **the same position it stopped on** from the **result_vector**. This is the reason why the size of the **result_vector** must be identical to the size of the **lookup_vector**.

For example, to assign a letter grade according to a numeric value:

1. Open ***"Lookup Functions.xlsx"*** if necessary, and select the ***"Lookup***" worksheet. The range G4:G8 contains some grades and the range H4:H8 contains the corresponding letter grade (see Figure 38).
2. Type the formula **[=LOOKUP(A4, $G$4:$G$8, $H$4:$H$8)]** into cell B4.

   NOTE: Absolute references, $G$4:$G$8, $H$4:$H$8, are needed since the formula needs to be copied. Another way to do this is by assigning a name for the range and using that name in the argument.

3. Copy the formula into range B5:B13 (see Figure 37).

	A	B
1		
2	Lookup a reference table	
3	Points	Grade
4	81	B
5	96	A
6	55	F
7	76	C
8	44	F
9	78	C
10	51	F
11	83	B
12	48	F
13	68	D

Figure 37 – Result of LOOKUP Function

Reference table	
Points	Grade
0	F
60	D
70	C
80	B
90	A

Figure 38 – Reference Table

LOOKUP(lookup_value, array)

Similar to the above syntax, the only difference is that the **lookup_vector** and **result_vector** are now combined together into a table array entry. This is the easiest syntax to use.

Consider the previous example once more, this time by entering a table array instead.

1. Type the formula **[=LOOKUP(D4, $G$4:$H$8)]** into cell E4.
2. Copy the formula into range E5:E13. The result is exactly the same as the previous example, but only two arguments are required in this syntax instead of three arguments (see Figure 39).

D	E	F	G	H
Lookup an array of values			Reference table	
Points	Grade		Points	Grade
81	B		0	F
96	A		60	D
55	F		70	C
76	C		80	B
44	F		90	A
78	C			
51	F			
83	B			
48	F			
68	D			

Figure 39 - Result of LOOKUP Function Using an Array

VLOOKUP

VLOOKUP searches for a value in the leftmost column of a table, and then returns a value in the same row from a specified column in the table. Table values must be sorted by the left column.

VLOOKUP(**lookup_value**, **table_array**, **col_index_num**)

lookup_value: The value to be searched for in the first column of the specified table. The **lookup_value** can be a value or a reference. If the **lookup_value** is smaller than the smallest value in the first column of **table_array**, VLOOKUP returns the #N/A error message.

table_array: Two or more columns of data. 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 considered equivalent.

col_index: The column number in **table_array** from which the matching value must be returned. A **col_index** of 1 returns the value in the first column in **table_array**; a **col_index** of 2 returns the value in the second column in **table_array**, and so on.

For example, to find the phone number and e-mail of a student within a range of data:

1. Select the ***"VLookup***" worksheet. A table is listed in the range A3:C11 with the columns "NAME", "PHONE", and "EMAIL".
2. Type **[Mary]** into cell E6. This will be the value to be searched in the table.
3. Type the formula **[=VLOOKUP(E6, A3:C11, 2)]** into cell F6. The result is the phone number corresponding to "Mary" (see Figure 40).
4. Type the formula **[=VLOOKUP(E6, A3:C11, 3)]** into cell G6. The result is the e-mail address corresponding to "Mary".
5. Type a different value into cell E6 and observe the VLOOKUP values change accordingly.

	A	B	C	D	E	F	G
1							
2	NAME	PHONE	EMAIL				
3	James	323-555-0000	John@somewhere.com				
4	Jane	323-555-1111	Jane@somewhere.com				
5	Jessie	323-555-2222	Jessie@somewhere.com		NAME	PHONE	EMAIL
6	John	323-555-3333	John@somewhere.com		Mary	323-555-4444	Mary@somewhere.com
7	Mary	323-555-4444	Mary@somewhere.com				
8	Michael	323-555-5555	Michael@somewhere.com				
9	Peter	323-555-6666	Peter@somewhere.com				
10	Tiffany	323-555-7777	Tiffany@somewhere.com				
11	Tony	323-555-9999	Tony@somewhere.com				

Figure 40 – Result of VLOOKUP Function

HLOOKUP

HLOOKUP works similar to VLOOKUP. It searches for a value in the topmost row of a table and returns values in the same column and from a specified row in the table. The table values must be sorted by the top row.

HLOOKUP(**lookup_value**, **table_array**, **row_index_num**)

lookup_value: The value to be found in the first row of the table. The **lookup_value** can be a value, a reference, or a text string.

table_array: A table of information in which data is looked up.

row_index: 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.

For example, to find the phone number and e-mail of a student within a range of data:

1. Select the "***HLookup***" worksheet. A table is listed in the range B1:J3 with the rows "NAME", "PHONE", and "EMAIL".
2. Type **[Mary]** into cell C7. This will be the value to be searched in the table.
3. Type the formula **[=HLOOKUP(C7, B1:J3, 2)]** into cell D7. The result is the phone number corresponding to "Mary" (see Figure 41).
4. Type the formula **[=HLOOKUP(C7, B1:J3, 3)]** into cell F7. The result is the e-mail address corresponding to "Mary".
5. Type a different value into cell C7 and observe the HLOOKUP values change accordingly.

	A	B	C	D	E	F	G
1							
2	NAME	PHONE	EMAIL				
3	James	323-555-0000	John@somewhere.com				
4	Jane	323-555-1111	Jane@somewhere.com				
5	Jessie	323-555-2222	Jessie@somewhere.com		NAME	PHONE	EMAIL
6	John	323-555-3333	John@somewhere.com		Mary	323-555-4444	Mary@somewhere.com
7	Mary	323-555-4444	Mary@somewhere.com				
8	Michael	323-555-5555	Michael@somewhere.com				
9	Peter	323-555-6666	Peter@somewhere.com				
10	Tiffany	323-555-7777	Tiffany@somewhere.com				
11	Tony	323-555-9999	Tony@somewhere.com				

Figure 41 – Result of HLOOKUP Function