

Data Analysis with Microsoft Excel 2003

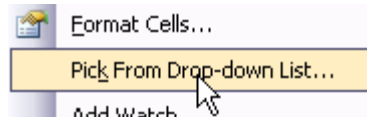
Working with Lists:

Microsoft Excel is an excellent tool to manage and manipulate lists. With the information you have in a list, you can sort and display data that meet certain criteria, insert formulas to calculate subtotals, and create summary tables. When designing a list, pay attention to details such as label rows, using similar types of information in columns, and not using any blank rows since to Excel a blank row signals the end of a list.

You can enter data into a list in a variety of ways:

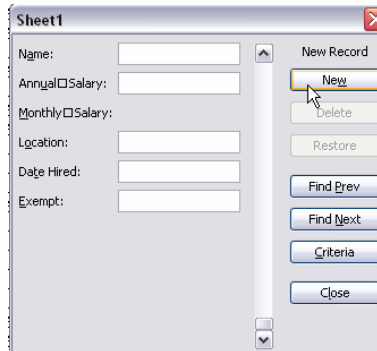
1. data can be copied and pasted from a different file;
2. data can be entered manually – the auto complete feature in Excel will automatically scan the list as you enter data and try to predict the entry. (To turn this feature off: On the **Tools** menu, click **Options**, and then click the **Edit** tab. Select or clear the **Enable AutoComplete for cell values** check box.)

3. data can be picked by using a dialog box. These pick lists are available by right clicking on a cell then selecting **Pick from List** from the resulting menu.



4. data can be entered by using data forms. To accomplish this, simply click anywhere in your list then from the menu bar choose: **Data>Form**

(The data form allows for a maximum of 32 columns.)



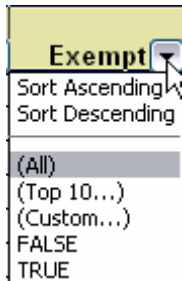
Filtering Data in Lists:

Filtering is the process of displaying data that meet certain criteria. For this exercise, please open the Excel Class Files folder on the desktop and select Employee Database file.

Exercise 1: Auto filtering: Click anywhere in your list then choose **Data>Filter>Autofilter**. Excel will provide you with dropdown menus for each column

Name	Annual Salary	Monthly Salary	Location	Date Hired	Exempt
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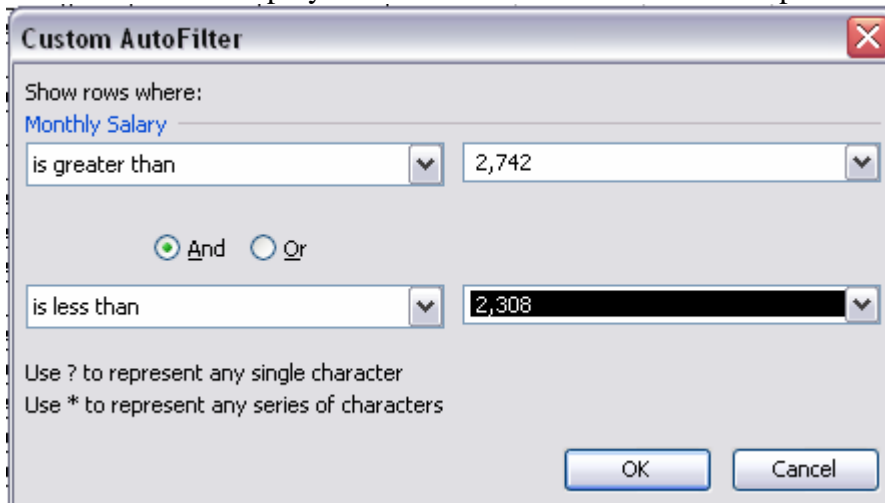
Click on one of the drop downs to reveal your choices for auto filtering.



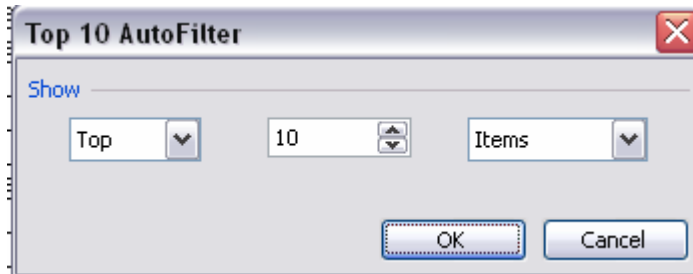
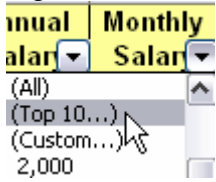
Select the criteria from the dropdown list and let Excel display the records that meet your criteria.

Exempt	Name	Annual Salary	Monthly Salary	Location	Date Hired	Exempt
Sort Ascending	Clark Bickerson	120,000	10,000	Los Angeles	1/29/02	TRUE
Sort Descending	Douglas Williams	89,687	7,474	Portland	10/15/99	TRUE
(All)	Ivan Silberstein	95,000	7,917	Los Angeles	9/11/00	TRUE
(Top 10...)	Michael Hayden	78,230	6,519	Seattle	3/12/01	TRUE
(Custom...)	Rick Fogerty	89,873	7,489	Portland	4/8/00	TRUE
FALSE	Robert H. Miller	149,000	12,417	Portland	2/9/01	TRUE
TRUE	Tom Brown	65,000	5,417	Seattle	3/8/03	TRUE

Exercise 2: To autofilter with multiple columns, use autofilter in one column then repeat the operation with the second column. You can also create custom auto filtering. This feature would be used to filter for certain ranges or values above and/or below certain limits. To select employees with salaries above and below specified limits:

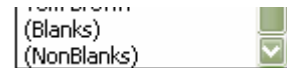


Exercise 3: Top ten (not necessarily limited to ten) auto filtering allows you to select highest or lowest values.



NOTE: Once a list is filtered, if you copy in order to paste the data elsewhere, only the filtered data will be copied.

NOTE: When you have blanks in your data, the filter list includes (Blanks) and (NonBlanks) as filtering options.



To turn off Auto filter: Data>Filter>Show All

Another way to filter by multiple criteria is with the use of the Advance Filter function. Before creating an advanced filter, insert at least three rows above your data range and type the column headings you wish to include in your filtered list and the criteria from one or more rows.

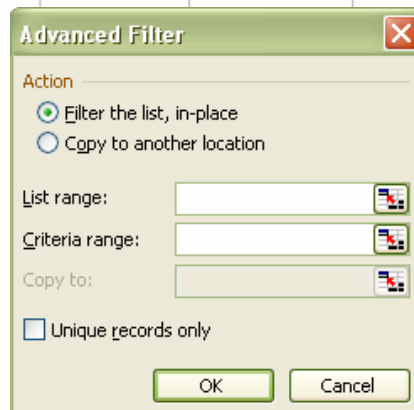
	A	B	C
1	Sales Rep	Region	Sales
2		South	>250,000
3			
4			
5			
6		Month	Sales Rep
10		Jan	Randy
16		Feb	Randy
21		Mar	Paul

You can filter by using any comparison operators such as "=", "<", ">", "<>", "<=", ">=". Two wildcards are also available for searches.

- * matches any number of characters
- ? matches any single character

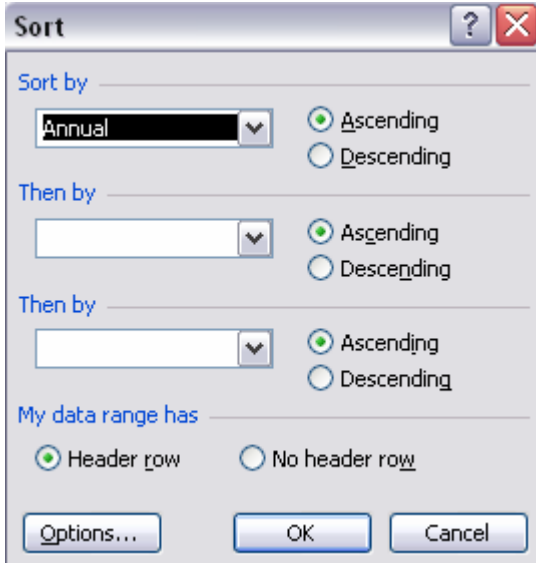
Then select **Data>Filter>Advanced Filter**. Select the data range (your list) and the criteria range as you created above your data range and click OK.

You can use the Advance Filter option to eliminate duplicates in your data range by clicking on the Unique records only checkbox.



Sorting Lists:

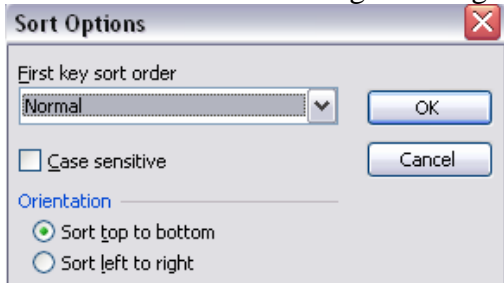
To quickly sort a list, click on the header of the sort column and select **Data>Sort** from the menu bar:



To add additional sort criteria, simply select column headers from the subsequent drop down lists then click OK.

Sorting rules:

Text – numbers, special characters, alphabetic characters (initially, sorting is not case sensitive. This can be changed through the sort options dialog box.)



Logical values- False, True

Blank cells – always appear last

Creating Subtotals:

Excel can quickly create subtotals at each change of a given column content. Consider the Employee List spreadsheet in your data folder:

To create Annual Salary subtotals per location select **Data>Subtotals**

Subtotal

At each change in:
Location


Use function:
Sum

Add subtotal to:
 Name
 Annual Salary
 Monthly Salary

Replace current subtotals
 Page break between groups
 Summary below data

Remove All OK Cancel

	A	B	C	D	E	F
1	Name	Annual Salary	Monthly Salary	Location	Date Hired	Exempt
2	Anthony Taylor	55,500	4,625	Los Angeles	2/11/00	FALSE
3	Charles S. Billings	39,000	3,250	Los Angeles	8/13/02	FALSE
4	Clark Bickerson	120,000	10,000	Los Angeles	1/29/02	TRUE
5	Ivan Silberstein	95,000	7,917	Los Angeles	9/11/00	TRUE
6	James Millen	27,690	2,308	Los Angeles	12/26/98	FALSE
7	Kurt Kamichoff	48,000	4,000	Los Angeles	8/17/02	FALSE
8	Stephen C. Carter	44,123	3,677	Los Angeles	7/10/00	FALSE
9	Steven H. Katz	32,900	2,742	Los Angeles	12/26/01	FALSE
10	Thomas E. Abbott	60,000	5,000	Los Angeles	1/22/99	FALSE
11		522,213		Los Angeles Total		
12	Douglas Williams	89,687	7,474	Portland	10/15/99	TRUE
13	Phillip A. Todd	29,500	2,458	Portland	10/15/99	FALSE
14	Rick Fogerty	89,873	7,489	Portland	4/8/00	TRUE
15	Robert H. Miller	149,000	12,417	Portland	2/9/01	TRUE
16		358,060		Portland Total		
17	Chris Poundsworth	29,850	2,488	Seattle	3/24/99	FALSE
18	Jeffrey P. Jones	42,000	3,500	Seattle	1/19/02	FALSE
19	Joe Morrison	24,000	2,000	Seattle	12/22/00	FALSE
20	John T. Foster	39,500	3,292	Seattle	7/21/01	FALSE
21	Michael Hayden	78,230	6,519	Seattle	3/12/01	TRUE
22	Richard E. Card	43,000	3,583	Seattle	4/13/99	FALSE
23	Tom Brown	65,000	5,417	Seattle	3/8/03	TRUE
24		321,580		Seattle Total		
25		1,201,853		Grand Total		

The left most section of the Excel screen shows levels of subtotals. Click on  to collapse the category and reveal only the subtotal

	A	B	C	D	E	F
1	Name	Annual Salary	Monthly Salary	Location	Date Hired	Exempt
+	11	522,213		Los Angeles Total		
+	16	358,060		Portland Total		
+	24	321,580		Seattle Total		
-	25	1,201,853		Grand Total		

Using Database Functions with Lists:

Excel provides a variety of database functions. These functions are used in conjunction with criteria ranges.

Example:

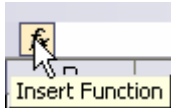
DAVERAGE- returns the average of selected database entries

Exercise 4: For this exercise, please open the Trees file in the Excel Class Files folder on the desktop.

	A	B	C	D	E
1	Tree	Height	Age	Yield	Profit
2	Apple	>10			
3					
4	Tree	Height	Age	Yield	Profit
5	Apple	18	20	14	105
6	Pear	12	12	10	96
7	Cherry	13	14	9	105
8	Apple	14	15	10	75
9	Pear	9	8	8	76.8
10	Apple	8	9	6	45

To find the average yield of apple trees over 10 ft tall:

1. Place cursor where the formula result should be displayed



2. Click on insert function from formula bar

Or select a category: Database

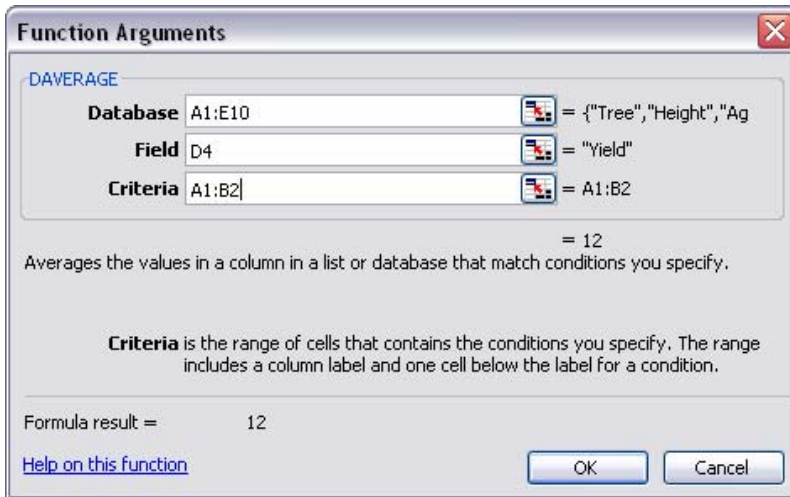
3. Select Database functions:

4. **DAVERAGE** Select DAVERAGE function

5. Highlight your list/database

6. Select the field which will be subject to the formula (average in this case)

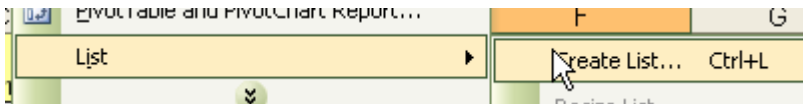
7. Highlight your criteria range and click OK



Several other Database Worksheet Functions exist within Excel, most of which are very similar to basic functions. However, each database function requires a criteria range. One may find it more useful to just use the basic function and define the criteria as he/she is building the function.

Designated Lists:

Any part of a worksheet can be set as a “Designated List” in order to use the functionality Excel provides for lists. To designate a portion of a worksheet as a list Select Data>List>Create List from the menu bar:



Once designated, Excel will put an outline around the list and add a blank row at the end for adding more data.

Pivot Tables:

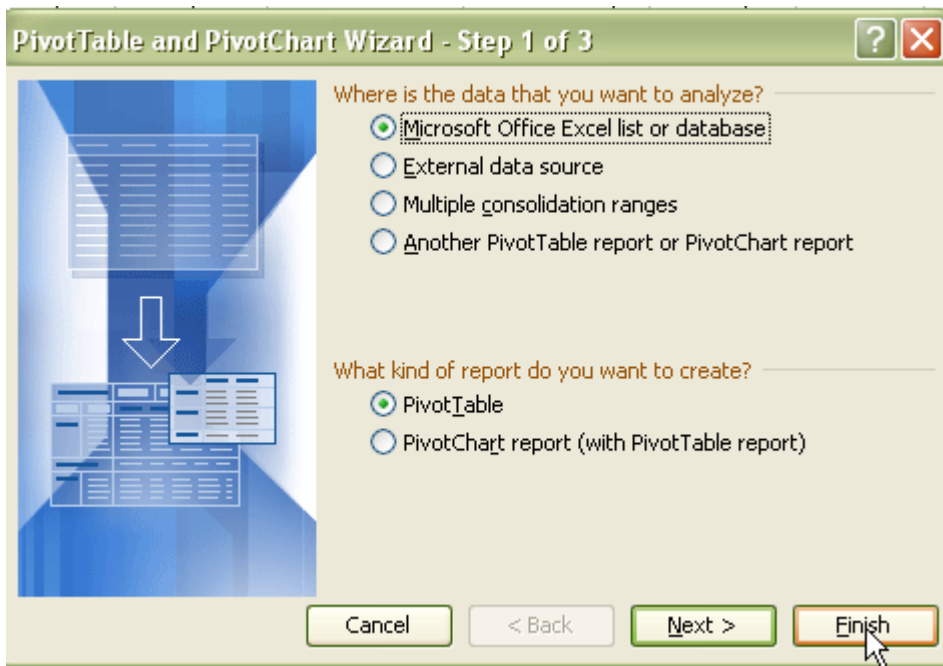
PivotTable report is an interactive table that quickly combines and compares large amounts of data. You can rotate its rows and columns to see different summaries of the source data, and you can display the details for areas of interest.

Use a PivotTable report when you want to analyze related totals, especially when you have a long list of figures to sum and you want to compare several facts about each figure. Keep in mind a few details before you begin:

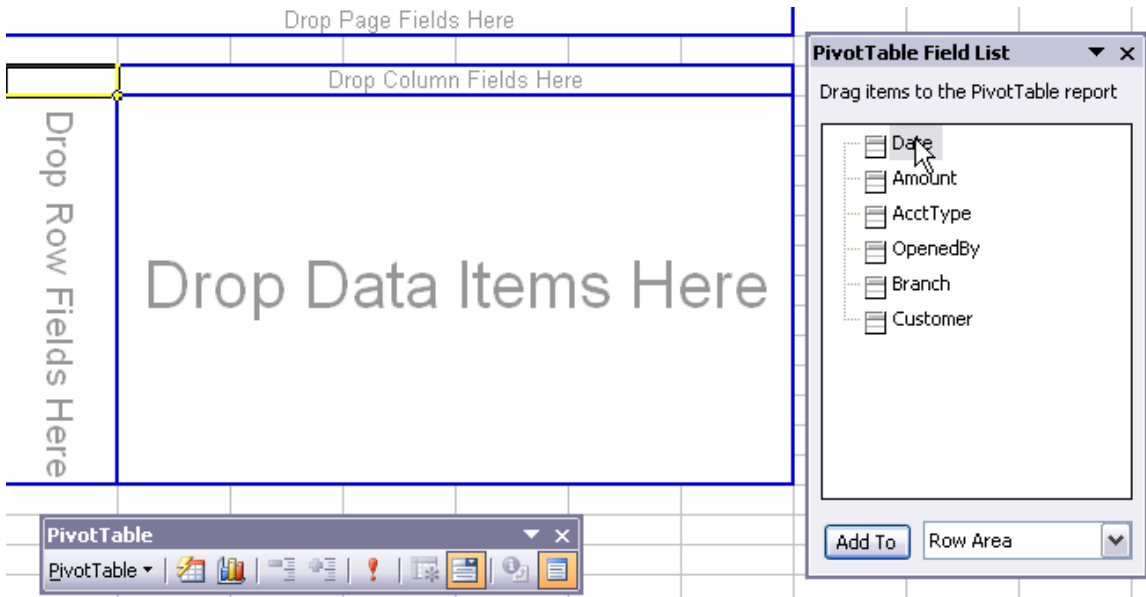
- The first row must have a heading for each column. The wizard will use these column headings as names for the **fields** (its word for data groupings) that you can drag and drop onto the PivotTable layout area.
- There should be no empty rows or columns within the range of data used for the report. For example, blank rows used to separate one block of data from another should be removed.
- Each column should contain only one kind of data—for example, include text in one column and numeric values in a separate column.
- Excel automatically creates subtotals and grand totals in a PivotTable report. If the source data contains automatic subtotals and grand totals created with the **Subtotals** command on the **Data** menu, use that command to remove them before you create the report.

Exercise 5: For this exercise, please select the Bank Accounts file from the Excel Class Files folder on the desktop.

To create a pivot table you will use the **Data>Pivot Table and Pivot Chart Report**. To use the defaults, just click Finish in step 1 of the wizard. You will be able to make changes as you go along.



The next step is to lay out the pivot table. Excel provides you with a list of fields from your selected database to assist you with this process. The field list comes from the column headings in your worksheet. Numeric items are usually dropped in the “Data Item” area of the pivot table because Excel automatically totals these values.



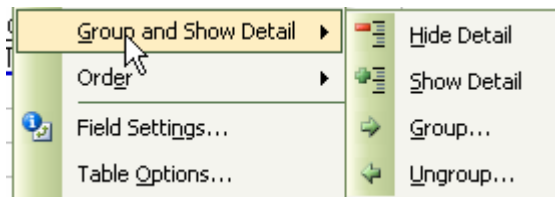
Selecting date as a column field and Acct Type as a row field and the amount as the data item from a bank database, one can create the following pivot table:

Sum of Amount	Date						
AcctType	Sep-01	Sep-04	Sep-05	Sep-06	Sep-07	Sep-08	Sep-11
CD	77671	177067	100500	136852	324474	12505	26519
Checking	9390	19555	16875	11906	37359	23169	14315
IRA	5000	11095	7000	22455	9277	9000	9095
Savings	70623	80185	1000	19462	33237	10500	73878
Grand Total	162684	287902	125375	190675	404347	55174	123807

This table answers the question “what amount was deposited at various dates in what types of accounts?”

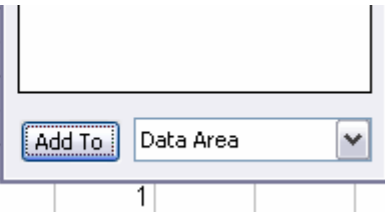
You can drag more than one field into a specific area of the pivot table. This may be useful when you wish to group items. Excel displays drop down buttons for the fields, which you can then use in grouping.

To group or ungroup your data, right click on the data field in the report and select from the pop up menu



By adding to the data area the “Customer” field, we can get a count of how many customers made these deposits on the specified dates:

12,505	Sum of Amount			
	Count of Customer			
13,000	Sum of Amount	26000	13000	
	Count of Customer	2	1	
13,428	Sum of Amount			
	Count of Customer			



You can also pivot your data to get a different view by dragging the fields within the report. Consider the following examples:

a.

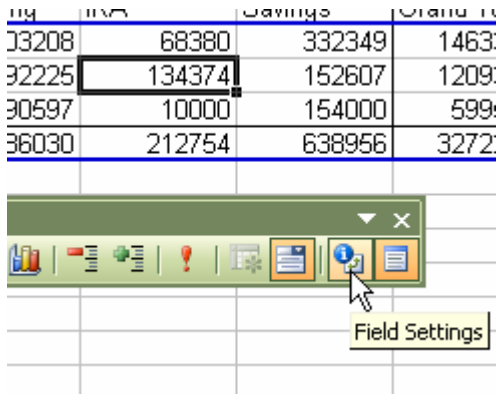
Total Amount		AcctType ▼	
Branch ▼	Customer ▼	CD	Checking
Central	Existing	34	70
	New	10	17
Central Total		44	87
North County	Existing	26	20
	New	5	5
North County Total		31	25
Westside	Existing	18	31
	New	5	3
Westside Total		23	34
Grand Total		98	146

b.

Total Amount		AcctType ▼	
Customer ▼	Branch ▼	CD	Checking
Existing	Central	34	70
	North County	26	20
	Westside	18	31
Existing Total		78	121
New	Central	10	17
	North County	5	5
	Westside	5	3
New Total		20	25
Grand Total		98	146

With the pivot table tool bar, you can customize your reports:

To add formatting to numerical data:



Click on the Field Settings button in the Pivot Table menu and choose Number from the dialog box. You will be presented with the Format menu.

To include most up-to-date information in your report:

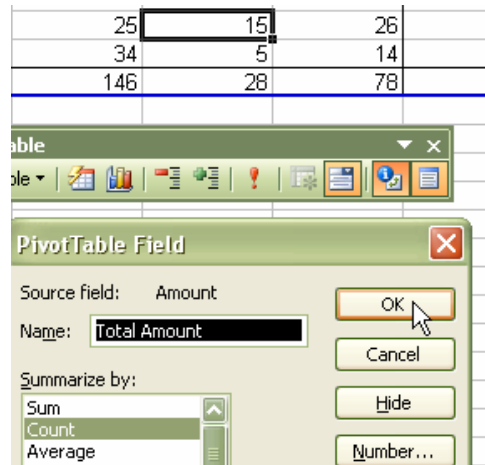
Click on the refresh data button in the Pivot Table menu



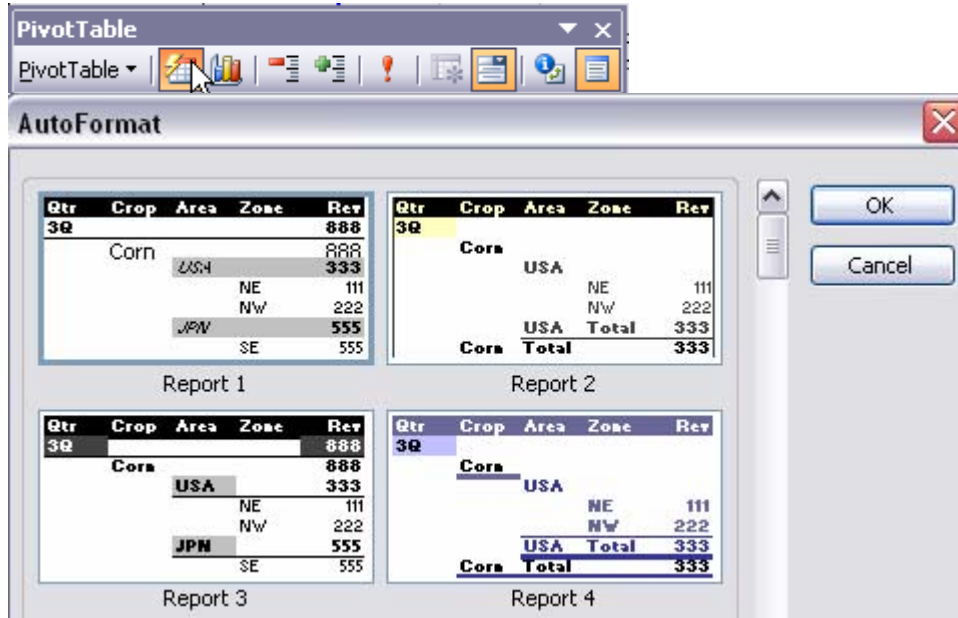
To analyze your data another way:

Click on the Field Settings button in the Pivot Table menu then select the appropriate display technique.

Example: In the above example, data is displayed as sum of bank deposits, in the example on the right same data is displayed as number of deposits.



To format your report:



What-If Analysis:

One of Excel's strengths is the ability to assist in decision making with dynamic models. What-If analysis is one of these methods. Taking advantage of Excel's ability to automatically recalculate formulas, a simple scenario can be created. Example:

	A	B	C
1		Mortgage Loan Worksheet	
2			
3		Input Cells	
4		Purchase Price:	\$325,900.00
5		Down Payment:	10%
6		Loan Term:	360
7		Interest Rate (Months):	6.50%
8			
9		Result Cells	
10		Loan Amount:	\$293,310.00
11		Monthly Payment:	\$2,059.91
12		Total Payments:	\$741,567.49
13		Total Interest:	\$448,257.49
14			
15			

Enter the formulas as follows:

In cell C10: =C4*(1-C5)

In cell C11: =PMT(C7/12,C6,-C4)

In cell C12: =C11*C6

In cell C13: =C12-C10

Then, by changing the values for purchase price, down payment percentage, loan term, and interest rate the worksheet will assist you in your decisions for home buying.