

8 Analyzing Alternative Data Sets

In this chapter, you will learn how to

- ✓ Define an alternative data set.
 - ✓ Define multiple alternative data sets.
 - ✓ Vary your data to get a desired result by using Goal Seek.
 - ✓ Find optimal solutions by using Solver.
 - ✓ Analyze data by using descriptive statistics.
-

When you store data in a Microsoft Excel 2010 workbook, you can use that data, either by itself or as part of a calculation, to discover important information about your organization. When you track total sales on a time basis, you can find your best and worst sales periods and correlate them with outside events. For businesses such as Consolidated Messenger, package volume increases dramatically during the holidays as customers ship gifts to friends and family members.

The data in your worksheets is great for answering the question, “What happened?” The data is less useful for answering “what-if” questions, such as, “How much money would we save if we reduced our labor to 20 percent of our total costs?” You can always save an alternative version of a workbook and create formulas that calculate the effects of your changes, but you can do the same thing in your existing workbooks by defining one or more alternative data sets and switching between the original data and the new sets you create.

Excel also provides the tools to determine the input values that would be required for a formula to produce a given result. For example, the chief operating officer of Consolidated Messenger, Lori Penor, could find out to what level the revenues from three-day shipping would need to rise for that category to account for 25 percent of total revenue.

In this chapter, you’ll learn how to define alternative data sets and determine the necessary inputs to make a calculation produce a particular result.

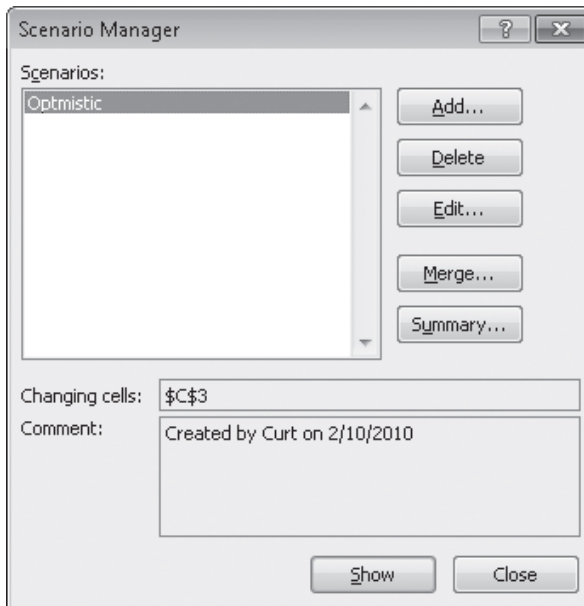
Practice Files Before you can complete the exercises in this chapter, you need to copy the book's practice files to your computer. The practice files you'll use to complete the exercises in this chapter are in the Chapter08 practice file folder. A complete list of practice files is provided in "Using the Practice Files" at the beginning of this book.

Defining an Alternative Data Set

When you save data in an Excel worksheet, you create a record that reflects the characteristics of an event or object. That data could represent the number of deliveries in an hour on a particular day, the price of a new delivery option, or the percentage of total revenue accounted for by a delivery option. After the data is in place, you can create formulas to generate totals, find averages, and sort the rows in a worksheet based on the contents of one or more columns. However, if you want to perform a what-if analysis or explore the impact that changes in your data would have on any of the calculations in your workbooks, you need to change your data.

The problem with manipulating data that reflects an event or item is that when you change any data to affect a calculation you run the risk of destroying the original data if you accidentally save your changes. You can avoid ruining your original data by creating a duplicate workbook and making your changes to it, but you can also create alternative data sets, or scenarios, within an existing workbook.

When you create a scenario, you give Excel alternative values for a list of cells in a worksheet. You can use the Scenario Manager to add, delete, and edit scenarios.



Clicking the Add button displays the Add Scenario dialog box.

The 'Add Scenario' dialog box is shown with the following details:

- Scenario name:** (empty text box)
- Changing cells:** C3 (with a selection icon)
- Comment:** Created by Curt on 2/10/2010
- Protection:**
 - Prevent changes
 - Hide
- Buttons:** OK, Cancel

From within this dialog box, you can name the scenario and identify the cells for which you want to define alternative values. After you click OK, a new dialog box opens with spaces for you to type the new values.

The 'Scenario Values' dialog box is shown with the following details:

- Instruction:** Enter values for each of the changing cells.
- Input Fields:**

1:	\$C\$3	102
2:	\$C\$4	162
3:	\$C\$5	165
4:	\$C\$6	91
- Buttons:** Add, OK, Cancel

Clicking OK returns you to the Scenario Manager dialog box. From there, clicking the Show button replaces the values in the original worksheet with the alternative values you just defined in the scenario. Any formulas referencing cells with changed values will recalculate their results. You can then remove the scenario by clicking the Undo button on the Quick Access Toolbar.

Important If you save and close a workbook while a scenario is in effect, those values become the default values for the cells changed by the scenario! You should seriously consider creating a scenario that contains the original values of the cells you change or creating a scenario summary worksheet (a topic covered in the next section).

In this exercise, you'll create a scenario to measure the projected impact on total revenue of a rate increase on two-day shipping.



SET UP You need the *2DayScenario_start* workbook located in your *Chapter08 practice file folder* to complete this exercise. Start Excel, open the *2DayScenario_start* workbook, and save it as *2DayScenario*. Then follow the steps.



1. On the **Data** tab, in the **Data Tools** group, click **What-If Analysis** and then, in the list, click **Scenario Manager**.

The Scenario Manager dialog box opens.

2. Click **Add**.

The Add Scenario dialog box opens.

3. In the **Scenario name** field, type **2DayIncrease**.



4. At the right edge of the **Changing cells** field, click the **Collapse Dialog** button so the worksheet contents are visible.

The Add Scenario dialog box collapses.



5. In the worksheet, click cell **C5** and then, in the **Add Scenario** dialog box, click the **Expand Dialog** button.

\$C\$5 appears in the Changing Cells field, and the dialog box title changes to Edit Scenario.

6. Click **OK**.

The Scenario Values dialog box opens.

7. In the value field, type **13.2**, and then click **OK**.

The Scenario Values dialog box closes, and the Scenario Manager is displayed again.

8. If necessary, drag the **Scenario Manager** dialog box to another location on the screen so that you can view the entire table.
9. In the **Scenario Manager** dialog box, click **Show**.

Excel applies the scenario, changing the value in cell C5 to \$13.20, which in turn increases the value in cell E8 to \$747,450,000.00.

Service	Base Rate	Packages	Revenue
Ground	\$ 8.15	14,000,000	\$ 114,100,000.00
3Day	\$ 10.25	9,000,000	\$ 92,250,000.00
2Day	\$ 13.20	9,000,000	\$ 118,800,000.00
Overnight	\$ 17.50	23,000,000	\$ 402,500,000.00
Priority Overnight	\$ 24.75	800,000	\$ 19,800,000.00
Total			\$ 747,450,000.00

Troubleshooting The appearance of buttons and groups on the ribbon changes depending on the width of the program window. For information about changing the appearance of the ribbon to match our screen images, see “Modifying the Display of the Ribbon” at the beginning of this book.

10. In the **Scenario Manager** dialog box, click **Close**.



11. On the Quick Access Toolbar, click the **Undo** button.

Excel removes the effect of the scenario.



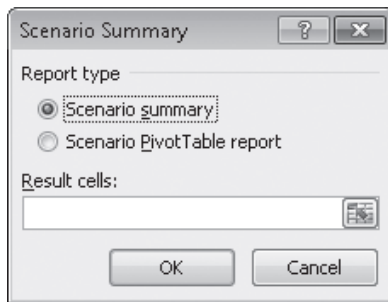
CLEAN UP Save the 2DayScenario workbook, and then close it.

Defining Multiple Alternative Data Sets

One great feature of Excel scenarios is that you're not limited to creating one alternative data set—you can create as many scenarios as you like and apply them by using the Scenario Manager. To apply more than one scenario by using the Scenario Manager, click the name of the first scenario you want to display, click the Show button, and then do the same for any subsequent scenarios. The values you defined as part of those scenarios will appear in your worksheet, and Excel will update any calculations involving the changed cells.

Tip If you apply a scenario to a worksheet and then apply another scenario to the same worksheet, both sets of changes appear. If multiple scenarios change the same cell, the cell will contain the value in the most recently applied scenario.

Applying multiple scenarios alters the values in your worksheets. You can see how those changes affect your formulas, but Excel also gives you a way to view the results of all your scenarios in a single, separate worksheet. To create a worksheet in your current workbook that summarizes the changes caused by your scenarios, open the Scenario Manager, and then click the Summary button. When you do, the Scenario Summary dialog box opens.



From within the dialog box, you can choose the type of summary worksheet you want to create and the cells you want to display in the summary worksheet. To choose the cells to display in the summary, click the Collapse Dialog button in the box, select the cells you want to display, and then expand the dialog box. After you verify that the range in the box represents the cells you want to have included on the summary sheet, click OK to create the new worksheet.

It's a good idea to create an "undo" scenario named *Normal* that holds the original values of the cells you're going to change before they're changed in other scenarios. For example, if you create a scenario named *High Fuel Costs* that changes the sales figures in three cells, your Normal scenario restores those cells to their original values. That way, even if you accidentally modify your worksheet, you can apply the Normal scenario and not have to reconstruct the worksheet from scratch.

Tip Each scenario can change a maximum of 32 cells, so you might need to create more than one scenario to ensure that you can restore a worksheet.

In this exercise, you'll create scenarios to represent projected revenue increases from two rate changes, view the scenarios, and then summarize the scenario results in a new worksheet.



SET UP You need the *MultipleScenarios_start* workbook located in your Chapter08 practice file folder to complete this exercise. Open the *MultipleScenarios_start* workbook, and save it as *MultipleScenarios*. Then follow the steps.

1. On the **Data** tab, in the **Data Tools** group, click **What-If Analysis** and then, in the list, click **Scenario Manager**.



The Scenario Manager dialog box opens.

2. Click **Add**.

The Add Scenario dialog box opens.

3. In the **Scenario name** field, type **3DayIncrease**.



4. At the right edge of the **Changing cells** field, click the **Collapse Dialog** button.

The Add Scenario dialog box collapses.



5. In the worksheet, click cell **C4** and then, in the dialog box, click the **Expand Dialog** button.

\$C\$4 appears in the Changing Cells field, and the dialog box title changes to Edit Scenario.

6. Click **OK**.

The Scenario Values dialog box opens.

7. In the value field, type **11.50**.

8. Click **OK**.

The Scenario Values dialog box closes, and the Scenario Manager is displayed again.

9. Click **Add**.

The Add Scenario dialog box opens.

10. In the **Scenario name** field, type **Ground and Overnight Increase**.

11. At the right edge of the **Changing cells** field, click the **Collapse Dialog** button.

The Add Scenario dialog box collapses.

12. Click cell **C3**, hold down the Ctrl key, and click cell **C6**. Then click the **Expand Dialog** button.

\$C\$3,\$C\$6 appears in the Changing Cells field, and the dialog box title changes to Edit Scenario.

13. Click **OK**.

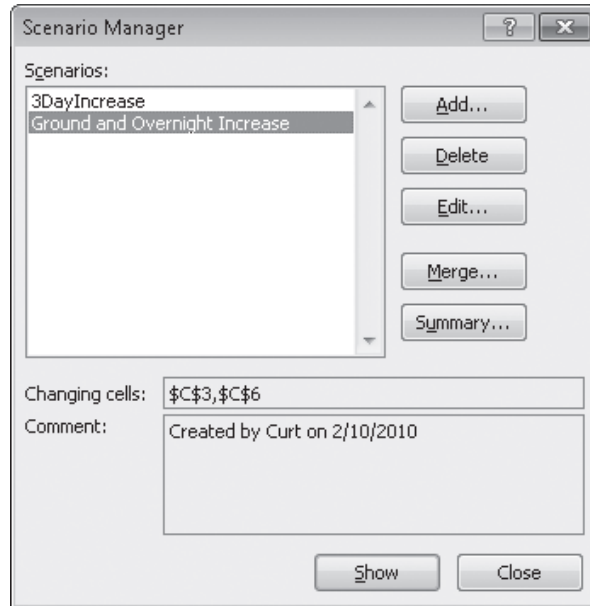
The Scenario Values dialog box opens.

14. In the **\$C\$3** field, type **10.15**.

15. In the **\$C\$6** field, type **18.5**.

16. Click **OK**.

The Scenario Values dialog box closes, and the Scenario Manager dialog box is displayed again.



17. Click **Summary**.

The Scenario Summary dialog box opens.

18. Verify that the **Scenario summary** option is selected and that cell **E8** appears in the **Result cells** field.

19. Click **OK**.

Excel creates a Scenario Summary worksheet.

		Current Values	3DayIncrease	Ground and Overnight Increase
Changing Cells:				
\$C\$4	\$	10.25	\$ 11.50	\$ 10.25
\$C\$3	\$	8.15	\$ 8.15	\$ 10.15
\$C\$6	\$	17.50	\$ 17.50	\$ 18.50
Result Cells:				
\$E\$8	\$	739,800,000.00	\$ 751,050,000.00	\$ 790,800,000.00

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

Varying Your Data to Get a Desired Result by Using Goal Seek

When you run an organization, you must track how every element performs, both in absolute terms and in relation to other parts of the organization. Just as you might want to reward your employees for maintaining a perfect safety record and keeping down your insurance rates, you might also want to stop carrying products you cannot sell.

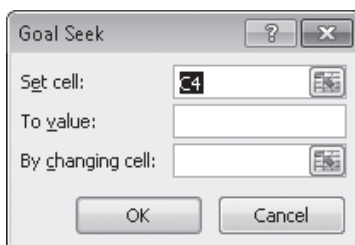
When you plan how you want to grow your business, you should have specific goals in mind for each department or product category. For example, Lori Penor of Consolidated Messenger might have the goal of reducing the firm's labor costs by 20 percent as compared to the previous year. Finding the labor amount that represents a 20-percent decrease is simple, but expressing goals in other ways can make finding the solution more challenging. Instead of decreasing labor costs 20 percent over the previous year, Lori might want to decrease labor costs so they represent no more than 20 percent of the company's total outlay.

As an example, consider a worksheet that holds cost figures for Consolidated Messenger's operations and uses those figures to calculate both total costs and the share each category has of that total.

	A	B	C	D	E	F	G	H
1								
2								
3		Cost	Labor	Transportation	Taxes	Facilities	Total	
4		Share	\$ 18,000,382.00	\$35,000,000.00	\$ 7,000,000.00	\$ 19,000,000.00	\$ 79,000,382.00	
5			22.79%	44.30%	8.86%	24.05%		

Important In the worksheet, the values in the Share row are displayed as percentages, but the underlying values are decimals. For example, Excel represents 0.3064 as 30.64%.

Although it would certainly be possible to figure the target number that would make labor costs represent 20 percent of the total, there is an easier way to do it in Excel: Goal Seek. To use Goal Seek, you display the Data tab and then, in the Data Tools group, click What-If Analysis. On the menu that is displayed, click Goal Seek to open the Goal Seek dialog box.



Important If you save a workbook with the results of a Goal Seek calculation in place, you will overwrite the values in your workbook.

In the dialog box, you identify the cell with the target value; in this example, it is cell C4, which has the percentage of costs accounted for by the Labor category. The To Value field has the target value (.2, which is equivalent to 20 percent), and the By Changing Cell field identifies the cell with the value Excel should change to generate the target value of 20 percent in cell C4. In this example, the cell to be changed is C3.

Clicking OK tells Excel to find a solution for the goal you set. When Excel finishes its work, the new values appear in the designated cells, and the Goal Seek Status dialog box opens.

	Labor	Transportation	Taxes	Facilities	Total
Cost	\$ 15,224,031.93	\$35,000,000.00	\$ 7,000,000.00	\$ 19,000,000.00	\$ 76,224,031.93
Share	19.97%	45.92%	9.18%	24.93%	

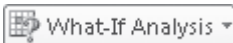
Tip Goal Seek finds the closest solution it can without exceeding the target value. In this case, the closest percentage it could find was 19.97 percent.

In this exercise, you'll use Goal Seek to determine how much you need to decrease transportation costs so those costs make up no more than 40 percent of Consolidated Messenger's operating costs.

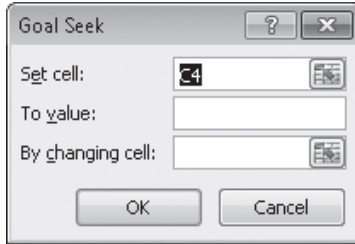


SET UP You need the *TargetValues_start* workbook located in your Chapter08 practice file folder to complete this exercise. Open the *TargetValues_start* workbook, and save it as *TargetValues*. Then follow the steps.

1. On the **Data** tab, in the **Data Tools** group, click **What-If Analysis** and then, in the list, click **Goal Seek**.



The Goal Seek dialog box opens.



2. In the **Set cell** field, type **D4**.
3. In the **To value** field, type **.4**.
4. In the **By changing cell** field, type **D3**.
5. Click **OK**.

Excel displays the solution in both the worksheet and the Goal Seek Status dialog box.

	Labor	Transportation	Taxes	Facilities	Total
Cost	\$ 18,000,382.00	\$29,336,849.65	\$ 7,000,000.00	\$ 19,000,000.00	\$ 73,337,231.65
Share	24.54%	40.00%	9.54%	25.91%	

6. Click **Cancel**.

Excel closes the Goal Seek Status dialog box without saving the new worksheet values.

✖ CLEAN UP Save the TargetValues workbook, and then close it.

Finding Optimal Solutions by Using Solver

Goal Seek is a great tool for finding out how much you need to change a single input value to generate a desired result from a formula, but it's of no help if you want to find the best mix of several input values. For example, marketing vice president Craig Dewar might want to advertise in four national magazines to drive customers to Consolidated Messenger's Web site, but he might not know the best mix of ads to reach the greatest number of readers. He asked the publishers for ad pricing and readership numbers, which he recorded in a spreadsheet, along with the minimum number of ads per publication (three) and the minimum number of times he wants the ad to be seen (10,000,000). Because one of the magazines has a high percentage of corporate executive readers, Craig does want to take out at least four ads in that publication, despite its relatively low readership. The goal of the ad campaign is for the ads to be seen as many times as possible without costing the company more than the \$3,000,000 budget.

Magazine	Cost per Ad	Readers	Number of Ads	Total Cost	Audience
Mag1	\$ 30,000.00	100,000	8	\$ 240,000.00	800,000
Mag2	\$ 40,000.00	400,000	8	\$ 320,000.00	3,200,000
Mag3	\$ 27,000.00	350,000	8	\$ 216,000.00	2,800,000
Mag4	\$ 80,000.00	200,000	10	\$ 800,000.00	2,000,000
Totals				\$ 1,576,000.00	8,800,000

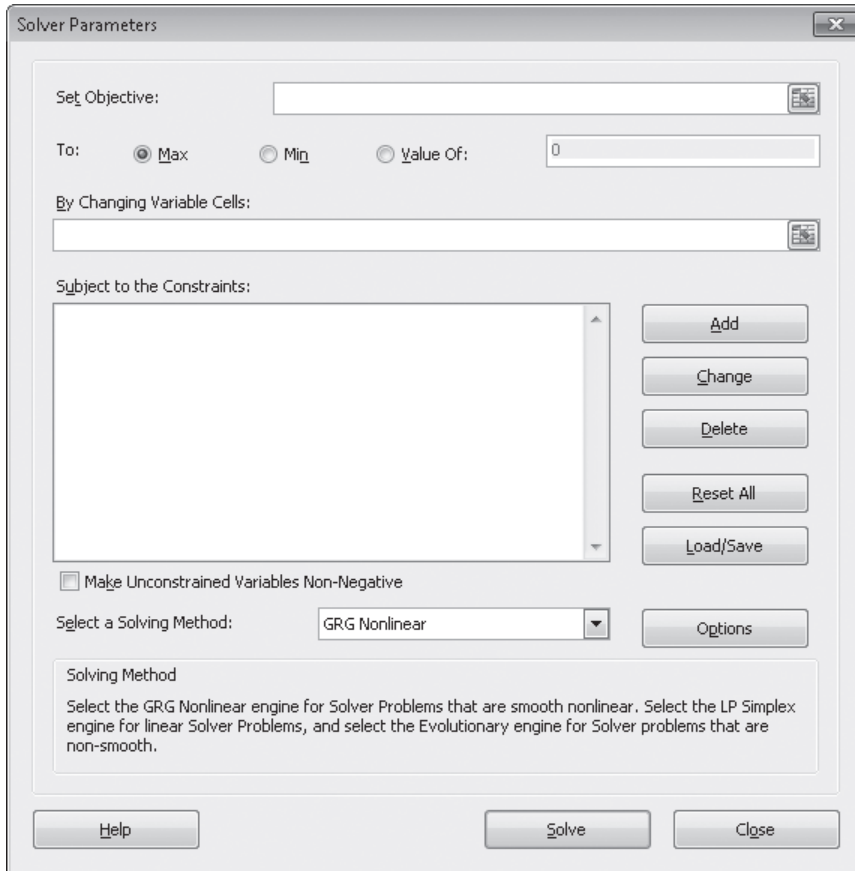
Constraints	Total Budget
Total Budget	\$ 3,000,000
Minimum Audience	10,000,000
Minimum Ads for Magazines 1 through 3	8
Minimum Ads for Magazine 4	10
Maximum Ads in Any Magazine	20

Tip It helps to spell out every aspect of your problem so that you can identify the cells you want Solver to use in its calculations.

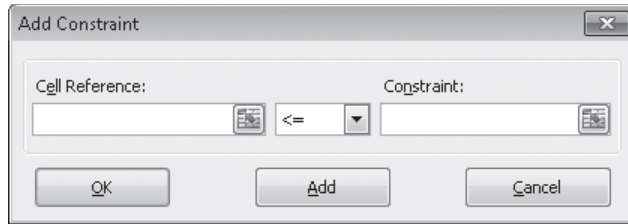
If you performed a complete installation when you installed Excel on your computer, you see the Solver button on the Data tab in the Analysis group. If not, you need to install the Solver Add-In. To do so, click the File tab, and then click Options. In the Excel Options dialog box, click Add-Ins to display the Add-Ins page. At the bottom of the dialog box, in the Manage list, click Excel Add-Ins, and then click Go to display the Add-Ins dialog box. Select the Solver Add-in check box and click OK to install Solver.

Tip You might be prompted for the Microsoft Office system installation CD. If so, put the CD in your CD drive, and click OK.

After the installation is complete, Solver appears on the Data tab, in the Analysis group. Clicking Solver displays the Solver Parameters dialog box.



The first step of setting up your Solver problem is to identify the cell that contains the summary formula you want to establish as your objective. To identify that cell, click in the Set Objective box, click the target cell in the worksheet, and then select the option representing whether you want to minimize the cell's value, maximize the cell's value, or make the cell take on a specific value. Next, you click in the By Changing Variable Cells box and select the cells Solver should vary to change the value in the objective cell. Finally, you can create constraints that will set the limits for the values Solver can use. To do so, click Add to open the Add Constraint dialog box.



You add constraints to the Solver problem by selecting the cells to which you want to apply the constraint, selecting the comparison operation (such as less than or equal to, greater than or equal to, or must be an integer), and clicking in the Constraint box to select the cell with the value of the constraint. You could also type a value in the Constraint box, but referring to a cell makes it possible for you to change the constraint later without opening Solver.

Tip After you run Solver, you can use the commands in the Solver Results dialog box to save the results as changes to your worksheet or create a scenario based on the changed data.

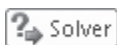
In this exercise, you'll use Solver to determine the best mix of ads given the following constraints:

- You want to maximize the number of people who see the ads.
- You must buy at least 8 ads in 3 magazines and at least 10 in the fourth.
- You can't buy part of an ad (that is, all numbers must be integers).
- You can buy no more than 20 ads in any one magazine.
- You must reach at least 10,000,000 people.
- Your ad budget is \$3,000,000.

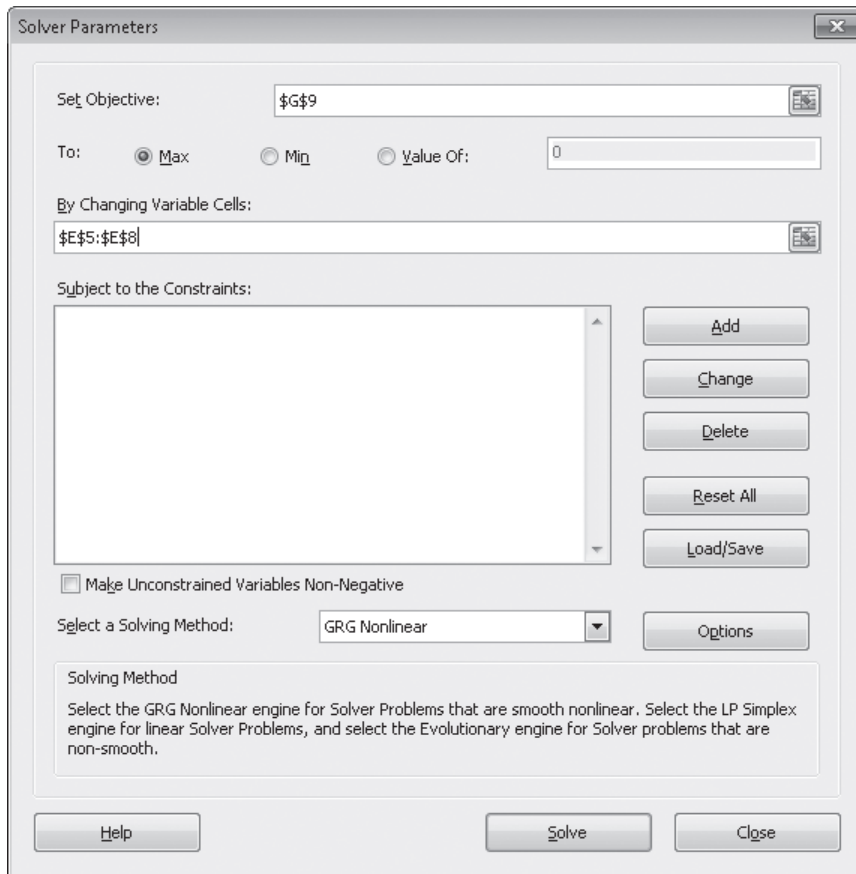


SET UP You need the *AdBuy_start* workbook located in your Chapter08 practice file folder to complete this exercise. Open the *AdBuy_start* workbook, and save it as *AdBuy*. Then follow the steps.

1. If the **Solver** button doesn't appear in the **Analysis** group on the **Data** tab, follow the instructions from earlier in this section to install it.
2. In the **Analysis** group on the **Data** tab, click **Solver**.
The Solver Parameters dialog box opens.
3. Click in the **Set Objective** box, and then click cell **G9**.
\$G\$9 appears in the Set Objective field.



4. Click **Max**.
5. Click in the **By Changing Variable Cells** field, and select cells **E5:E8**.
 $\$E\$5:\$E\8 appears in the By Changing Variable Cells field.



6. Click **Add**.
The Add Constraint dialog box opens.
7. Select cells **E5:E8**.
 $\$E\$5:\$E\8 appears in the Cell Reference field.

8. In the operator list, click **int**. Then click **Add**.

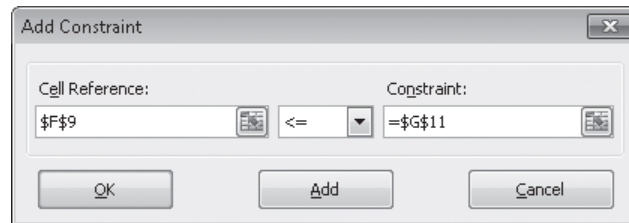
Excel adds the constraint to the Solver problem, and the Add Constraint dialog box clears to accept the next constraint.

9. Click cell **F9**.

= $F\$9$ appears in the Cell Reference field.

10. Click in the **Constraint** field, and then click cell **G11**.

= $G\$11$ appears in the Constraint field.



11. Click **Add**.

Excel adds the constraint to the Solver problem, and the Add Constraint dialog box clears to accept the next constraint.

12. Click cell **G9**.

$G\$9$ appears in the Cell Reference field.

13. In the operator list, click **>=**.

14. Click in the **Constraint** field, and then click cell **G12**.

= $G\$12$ appears in the Constraint field.

15. Click **Add**.

Excel adds the constraint to the Solver problem, and the Add Constraint dialog box clears to accept the next constraint.

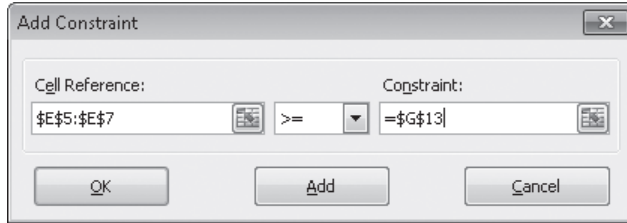
16. Select cells **E5:E7**.

$E\$5:E\7 appears in the Cell Reference field.

17. In the operator list, click **>=**.

18. Click in the **Constraint** field, and then click cell **G13**.

=G\$13 appears in the Constraint field.



19. Click **Add**.

Excel adds the constraint to the Solver problem, and the Add Constraint dialog box clears to accept the next constraint.

20. Click cell **E8**.

\$E\$8 appears in the Cell Reference field.

21. In the operator list, click **>=**.

22. Click in the **Constraint** field, and then click cell **G14**.

=G\$14 appears in the Constraint field.

23. Click **Add**.

Excel adds the constraint to the Solver problem, and the Add Constraint dialog box clears to accept the next constraint.

24. Select cells **E5:E8**.

\$E\$5:\$E\$8 appears in the Cell Reference field.

25. Verify that the **<=** operator appears in the operator field, click in the **Constraint** field, and then click cell **G15**.

=G\$15 appears in the Constraint field.

26. Click **OK**.

Excel adds the constraint to the Solver problem and closes the Add Constraint dialog box, and the Solver Parameters dialog box opens again.

27. Click **Solve**.

The Solver Results dialog box opens, indicating that Solver found a solution. The result is displayed in the body of the worksheet.

Magazine	Cost per Ad	Readers	Number of Ads	Total Cost	Audience
Mag1	\$ 30,000.00	100,000	18	\$ 540,000.00	1,800,000
Mag2	\$ 40,000.00	400,000	20	\$ 800,000.00	8,000,000
Mag3	\$ 27,000.00	350,000	20	\$ 540,000.00	7,000,000
Mag4	\$ 80,000.00	200,000	14	\$ 1,120,000.00	2,800,000
Totals				\$ 3,000,000.00	19,600,000

28. Click **Cancel**.

The Solver Results dialog box closes.

✘ CLEAN UP Save the AdBuy workbook, and then close it.

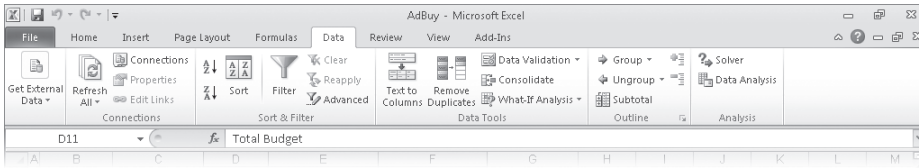
Analyzing Data by Using Descriptive Statistics

Experienced business people can tell a lot about numbers just by looking at them to see if they “look right.” That is, the sales figures are about where they’re supposed to be for a particular hour, day, or month; the average seems about right; and sales have increased from year to year. When you need more than an informal assessment, however, you can use the tools in the Analysis ToolPak.

If you don’t see the Data Analysis item in the Analysis group on the Data tab, you can install it. To do so, click the File tab, and then click Options. In the Excel Options dialog box, click Add-Ins to display the Add-Ins page. At the bottom of the dialog box, in the Manage list, click Excel Add-Ins, and then click Go to display the Add-Ins dialog box. Select the Analysis ToolPak check box and click OK.

Tip You might be prompted for the Microsoft Office system installation CD. If so, put the CD in your CD drive, and click OK.

After the installation is complete, the Data Analysis item appears in the Analysis group on the Data tab.



You then click the item representing the type of data analysis you want to perform, click OK, and use the commands in the resulting dialog box to analyze your data.

In this exercise, you'll use the Analysis ToolPak to generate descriptive statistics of driver sorting time data.

➔ SET UP You need the *DriverSortTimes_start* workbook located in your **Chapter08 practice file folder** to complete this exercise. Open the *DriverSortTimes_start* workbook, and save it as *DriverSortTimes*. Then follow the steps.

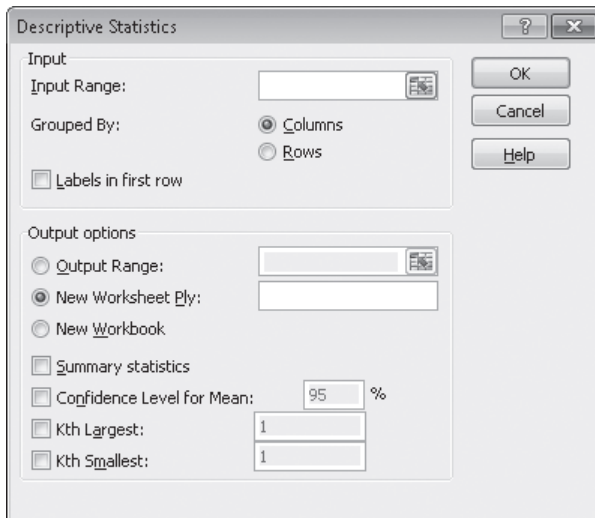


1. On the **Data** tab, in the **Analysis** group, click **Data Analysis**.

The Data Analysis dialog box opens.

2. Click **Descriptive Statistics**, and then click **OK**.

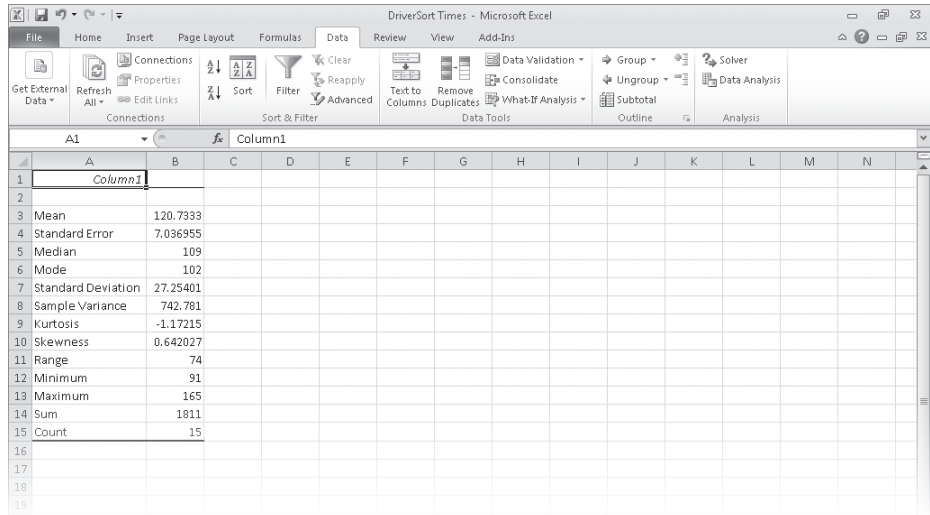
The Descriptive Statistics dialog box opens.



3. Click in the **Input Range** field, and then select cells **C3:C17**. $\$C\$3:\$C\17 appears in the Input Range field.

4. Select the **Summary statistics** check box.
5. Click **OK**.

A new worksheet that contains summary statistics about the selected data appears.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Column1													
2														
3	Mean	120.7333												
4	Standard Error	7.036955												
5	Median	109												
6	Mode	102												
7	Standard Deviation	27.25401												
8	Sample Variance	742.781												
9	Kurtosis	-1.17215												
10	Skewness	0.642027												
11	Range	74												
12	Minimum	91												
13	Maximum	165												
14	Sum	1811												
15	Count	15												
16														
17														
18														
19														

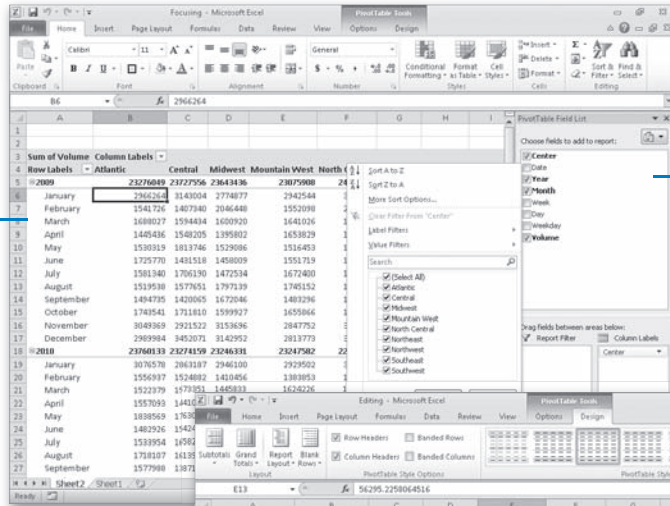
✘ CLEAN UP Save the *DriverSortTimes* workbook, and then close it. If you're not continuing directly to the next chapter, exit Excel.

Key Points

- Scenarios enable you to describe many potential business cases within a single workbook.
- It's usually a good idea to create a "normal" scenario that enables you to reset your worksheet.
- Remember that you can change up to 32 cells in a scenario, but no more.
- You can summarize your scenarios on a new worksheet to compare how each scenario approaches the data.
- Use Goal Seek to determine what value you need in a single cell to generate the desired result from a formula.
- If you want to vary the values in more than one cell to find the optimal mix of inputs for a calculation, use the Solver Add-In.
- Advanced statistical tools are available in the Analysis ToolPak—use them to examine your data thoroughly.

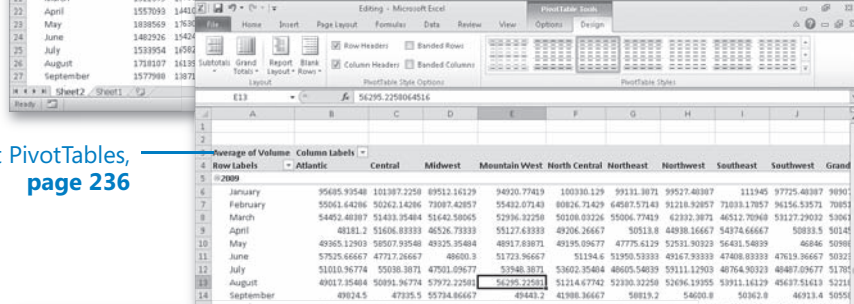
Chapter at a Glance

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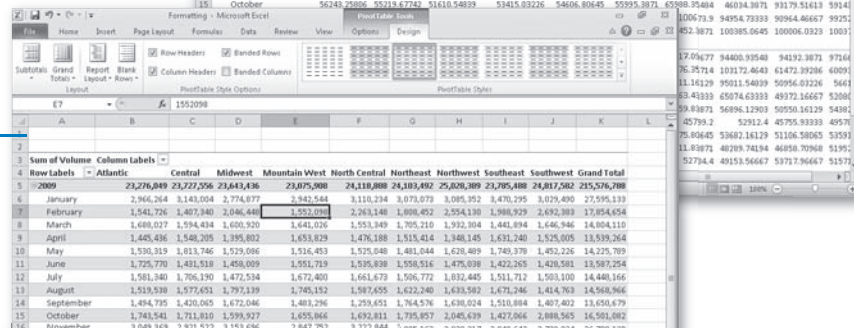


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Format PivotTables, page 242



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