**3. Data Tools**

**In this lesson, you will learn...**

|  |  |
| --- | --- |
| 1. | To convert text to columns. |
| 2. | To use **Data Validation**to restrict the type of data that can be entered into acell. |
| 3. | To consolidate data from a number of different ranges into one new range. |
| 4. | To use **Goal Seek**to figure out the value to input to obtain a specific result. |

**Data Tools**in Microsoft Excel are simply tools which make it easy to manipulatedata. Someof them are intended to save you time by extracting or joining data andothers performcomplex calculations. This lesson covers the most commonly used**Data Tools**.

**Converting Text to Columns**

If you have a list of data in which all the information appears in one column, youcan use the**Text to Columns**command to convert the data to multiple columns.This is generally mucheasier than retyping the data!

To convert text to columns in Microsoft Excel:

|  |  |
| --- | --- |
| 1. | Select the column that holds the text you want to convert into multiple columns. |
| 2. | On the **Data**tab, in the **Data Tools**group, click the **Text to Columns**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0000_03200.lowres.png?imageVersion=1 |
| 3. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select either**Delimited**(if your data is separated by commas, tabs, or spaces) or **Fixed**  **Width**(if your data contains a certain number of characters in each field). Youwillalmost always select **Delimited**in this step. Click **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0001_03200.lowres.png?imageVersion=1 |
| 4. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, select the**Delimiters**(assuming you selected **Delimited**in the prior step). If you aren'tsure what to select, youcan select and deselect the options and see the resultsin the **Data preview**. Aftermaking your selection(s), click **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0001_04200.lowres.png?imageVersion=1 |
| 5. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, you canselect thedata format for each column or you can elect not to import a column.Simply select thecolumn under **Data preview**and then select the **Column**  **data format**above. In this step, you also specify where you want the data toshow up.After you make your selections, click **Finish**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0002_03200.lowres.png?imageVersion=1 |

**Exercise 4 Converting Text to Columns**

***10 to 20 minutes***

In this exercise, you will practice converting text to columns.

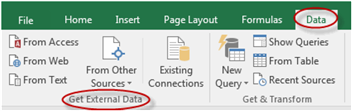
|  |  |
| --- | --- |
| 1. | Open Text to Columns.xlsx from your Excel2016.3/Exercises folder. |
| 2. | In the sheet named Presidents, convert the text in column **A** to three columns:first name,last name, dates in office. (No worries if your instructor alreadyused this example intheir demo - it will still be good practice!) |
| 3. | In the sheet named Capitols, convert the text in column **A** to two columns: cityand state.Put the converted data into columns **C** and **D**. |
| 4. | In the sheet named Contact Information, convert the text in column **A** to fivecolumns:name, address, city, state, and zip code. (Hint: You will need to dothis in two steps.) |
| 5. | In the sheet named Phone Numbers, separate the area codes by converting thetext incolumn **A** to three columns. |

**Exercise Solution**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | To convert the text in column **A** of the sheet named "Presidents" to three columns:   |  |  | | --- | --- | | A. | Select column **A**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Text to Columns**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0005_04200.lowres.png?imageVersion=1 | | C. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select**Delimited**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0005_05200.lowres.png?imageVersion=1 | | D. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, check **Space**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0006_03200.lowres.png?imageVersion=1 | | E. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, click **Finish**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0006_04200.lowres.png?imageVersion=1 | |
| 2. | To convert the text in column **A** of the sheet named "Capitols" to two columns:   |  |  | | --- | --- | | A. | Select column **A**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Text to Columns**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0007_03200.lowres.png?imageVersion=1 | | C. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select**Delimited**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0007_04200.lowres.png?imageVersion=1 | | D. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, select **Comma**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0008_03200.lowres.png?imageVersion=1 | | E. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, set the**Destination**to cell **C1** and click **Finish**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0008_04200.lowres.png?imageVersion=1 | |
| 3. | To convert the text in column **A** of the sheet named "Contact Information" to fivecolumns:   |  |  | | --- | --- | | A. | Select column **A**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Text to Columns**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0009_03200.lowres.png?imageVersion=1 | | C. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select**Delimited**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0009_04200.lowres.png?imageVersion=1 | | D. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, select **Comma**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0010_03200.lowres.png?imageVersion=1 | | E. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, click **Finish**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0010_04200.lowres.png?imageVersion=1 | | F. | Select column **D**. | | G. | Click the **Text to Columns**command. | | H. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select**Delimited**andclick **Next**. | | I. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, select **Space**andclick **Next**. | | J. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, click **Finish**. | |
| 4. | To convert the text in column **A** of the sheet named "Phone Numbers" to three columns:   |  |  | | --- | --- | | A. | Select column **A**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Text to Columns**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0012_03200.lowres.png?imageVersion=1 | | C. | In the **Convert Text to Columns Wizard - Step 1 of 3**dialog box, select**Delimited**andclick **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0012_04200.lowres.png?imageVersion=1 | | D. | In the **Convert Text to Columns Wizard - Step 2 of 3**dialog box, select **Other**,entera dash ("-"), and click **Next**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0013_03200.lowres.png?imageVersion=1 | | E. | In the **Convert Text to Columns Wizard - Step 3 of 3**dialog box, click **Finish**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0013_04200.lowres.png?imageVersion=1 | |

**Linking to External Data**

In Excel 2016 (and Excel 2013), you can use the options in the Get External Datagroup of the**Data**tab to link to data in different sources, such as text files, MicrosoftAccess, and theInternet.



**Controlling Calculation Options**

In Excel, calculation refers to Excel's ability to automatically compute formulas anddisplaythe results. You can alter the calculation options.

To control calculation options:

|  |  |
| --- | --- |
| 1. | From the **File**menu tab, select **Options**. |
| 2. | In the **Excel Options**dialog box, select **Formulas**on the left.  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0015_03200.lowres.png?imageVersion=1 |
| 3. | Set options under **Calculation options**and click **OK**to save the changes.  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0015_04200.lowres.png?imageVersion=1 |

**Data Validation**

To protect against incorrect data entry, you can use data validation to restrict thetype of datathat can be entered into a cell. You can choose to allow only certaintypes of data, such aswhole numbers or dates, or you can allow only items from aspecified list.

To apply data entry restrictions:

|  |  |
| --- | --- |
| 1. | Select the cells for which to verify data. |
| 2. | On the **Data**tab, in the **Data Tools**group, click the **Data Validation**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0017_03200.lowres.png?imageVersion=1 |
| 3. | Click **Data Validation**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0017_04200.lowres.png?imageVersion=1 |
| 4. | In the **Data Validation**dialog box:   |  |  | | --- | --- | | A. | On the **Settings**tab, choose which types of values to allow:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0017_05200.lowres.png?imageVersion=1 | | B. | Note that when you select a type of value to allow, the **Data**options changeaccordingly. Set the criteria (**between**, **greater or less than**, **equal to**,**Source**,etc.) for those values. You can type the criteria or select it byclicking the redarrows to the right of the data entry boxes. If you are onlyallowing values from alist, you must click the red arrow and select thesource:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0018_03200.lowres.png?imageVersion=1 | | C. | If you want to, you can enter a message telling the person entering thedata whatthe restrictions are. They will see this message when selectingany of the cells forwhich the restriction has been set. To enter thismessage, select the **Input Message**tab, make sure that**Show input message when cell is selected**is checked, andenter the **Title**and **Input message**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0018_04200.lowres.png?imageVersion=1 | | D. | You also have the option of entering an error alert that pops up wheninvalid data isentered. To enter an error alert, select the **Error Alert**tab,make sure that **Showerror alert after invalid data is entered**is checked,and enter the **Style**(choose tostop the person from entering the data, warnthem that this data does not meet thecriteria, or simply let them know),**Title**, and **Input message**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0019_03200.lowres.png?imageVersion=1 | | E. | Click **OK**.  Watch and follow along as your instructor demonstrates how to use **DataValidation**to set restrictions on what data can be entered. | |

**Exercise 5 Using Data Validation**

***15 to 25 minutes***

In this exercise, you will practice using **Data Validation**to restrict the data that canbeentered in specific cells in a worksheet.

|  |  |
| --- | --- |
| 1. | Open Data Validation.xlsx from your Excel2016.3/Exercises folder. |
| 2. | Use the **Data Validation**command to restrict the data that can be entered intocells**C2:C17** to the list of salespeople on the sheet named "Salespeople". |
| 3. | Use **Data Validation**to restrict the data that can be entered into cells **D2:D17**to a datein 2012. |
| 4. | Use **Data Validation**to restrict the data that can be entered into cells **E2:E17**to the listof territories on the sheet named "Territories". Enter an **Input Message**and an **ErrorAlert**to help the person entering data. |

**Exercise Solution**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | To restrict the data that can be entered into cells **C2:C17** to the list of salespeople on thesheetnamed "Salespeople":   |  |  | | --- | --- | | A. | Select cells **C2:C17**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Data Validation**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0021_04200.lowres.png?imageVersion=1 | | C. | Click **Data Validation**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0021_05200.lowres.png?imageVersion=1 | | D. | In the **Data Validation**dialog box, on the **Settings**tab, under **Allow**, select **List**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0021_06200.lowres.png?imageVersion=1 | | E. | Click the red arrow to the right of the **Source**data entry box to collapse the  **Data Validation**dialog box:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0022_03200.lowres.png?imageVersion=1 | | F. | Navigate to the sheet named Salespeople, select cells **A2:A6**, and then click the redarrowat the right of the collapsed **Data Validation**dialog box to restore it:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0022_04200.lowres.png?imageVersion=1 | | G. | Back in the main **Data Validation**dialog box, click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0022_05200.lowres.png?imageVersion=1 | | H. | Note that selecting any of cells **C2:C17** in the sheet named "Sales" opens a drop-downlist from which you can select one of the allowed entries:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0023_03200.lowres.png?imageVersion=1 | |
| 2. | To restrict the data that can be entered into cells **D2:D17** to a date in 2012:   |  |  | | --- | --- | | A. | Select cells **D2:D17**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Data Validation**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0024_03200.lowres.png?imageVersion=1 | | C. | Click **Data Validation**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0024_04200.lowres.png?imageVersion=1 | | D. | In the **Data Validation**dialog box, on the **Settings**tab, under **Allow**, select **Date**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0024_05200.lowres.png?imageVersion=1 | | E. | Under **Data**, select **between**. Under **Start date**, enter "1/1/12" and under **Enddate**, enter"12/31/12". Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0025_03200.lowres.png?imageVersion=1 | | F. | Only dates in 2012 are allowed in cells **D2:D17** now. Entering another date willresultin an error message:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0025_04200.lowres.png?imageVersion=1 | |
| 3. | To restrict the data that can be entered into cells **E2:E17** to the list of territories on thesheetnamed "Territories", and to enter an **Input Message**and an **Error Alert**to help thepersonentering data:   |  |  | | --- | --- | | A. | Select cells **E2:E17**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Data Validation**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0026_03200.lowres.png?imageVersion=1 | | C. | Click **Data Validation**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0026_04200.lowres.png?imageVersion=1 | | D. | In the **Data Validation**dialog box, on the **Settings**tab, under **Allow**, select **List**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0026_05200.lowres.png?imageVersion=1 | | E. | Click the red arrow to the right of the **Source**data entry box to collapse the  **Data Validation**dialog box:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0027_03200.lowres.png?imageVersion=1 | | F. | Navigate to the sheet named Territories and select cells **A2:A6**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0027_04200.lowres.png?imageVersion=1 | | G. | Click the red arrow at the right of the **Data Validation**dialog box to restore it:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0027_05200.lowres.png?imageVersion=1 | | H. | Select the **Input Message**tab and enter a **Title**and an **Input message**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0028_03200.lowres.png?imageVersion=1 | | I. | Select the **Error Alert**tab, enter a **Title**and an **Error message**, and then click**OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0028_04200.lowres.png?imageVersion=1 | | J. | Note that selecting any of the cells **E2:E17** in the sheet named "Sales" opens adrop-downlist from which you can select one of the allowed entries. In addition,your **Input Message**is displayed and entering an invalid entry results in your**Error Message**popping up:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0029_03200.lowres.png?imageVersion=1 | |

**Consolidating Data**

Use the **Consolidate**command to join values from a number of different rangesinto one newrange. You can use **Consolidate**to sum the values in other ranges, toget an average of thevalues, to find the min or max value, and more.

To consolidate data from different ranges:

|  |  |
| --- | --- |
| 1. | On the **Data**tab, in the **Data Tools**group, click the **Consolidate**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0031_03200.lowres.png?imageVersion=1 |
| 2. | In the **Consolidate**dialog box:   |  |  | | --- | --- | | A. | Select the **Function**to use. | | B. | Click the red arrow to the right of the **Reference**data entry box. | | C. | Select the first series of cells you want to consolidate and then click thered arrowin the **Consolidate - Reference**dialog box to return to the**Consolidate**dialog box. | | D. | Click **Add**to add the series of cells to the **All references**box. | | E. | Repeat steps B, C, and D until you have selected all series of cells thatyou want toconsolidate. | | F. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0031_04200.lowres.png?imageVersion=1  Watch and follow along as your instructor demonstrates how to consolidatedata. | |

**Exercise 6 Consolidating Data**

***15 to 25 minutes***

In this exercise, you will consolidate students' grades on four different exams toshow theiraverage, lowest, and highest grades on a summary sheet.

|  |  |
| --- | --- |
| 1. | Open Consolidate.xlsx from your Excel2016.3/Exercises folder. |
| 2. | Students' grades on four exams are stored on the first four sheets in thisworkbook. Usethe **Consolidate**command to show the average, lowest, andhighest grade for eachstudent on the sheet named Consolidate. |

**Exercise Solution**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | To show the average grade for each student:   |  |  | | --- | --- | | A. | On the sheet named Consolidate, select cells **B2:B11**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Consolidate**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0033_04200.lowres.png?imageVersion=1 | | C. | In the **Consolidate**dialog box, set the **Function**to **Average**and then click the redarrowto the right of the **Reference**data entry box:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0033_05200.lowres.png?imageVersion=1 | | D. | Navigate to the sheet named Exam 1 and select cells **B2:B11** and then click the redarrowat the right of the **Consolidate - Reference**dialog box:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0033_06200.lowres.png?imageVersion=1 | | E. | Back in the **Consolidate**dialog box, click **Add**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0034_03200.lowres.png?imageVersion=1 | | F. | Repeat steps C, D, and E, selecting cells **B2:B11** on the sheets named Exam 2,Exam 3,and Exam 4. | | G. | Now that all four series of data have been added to the **All references**box, click**OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0034_04200.lowres.png?imageVersion=1 | |
| 2. | To show the lowest grade for each student:   |  |  | | --- | --- | | A. | On the sheet named Consolidate, select cells **C2:C11**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Consolidate**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0035_03200.lowres.png?imageVersion=1 | | C. | In the **Consolidate**dialog box, set the **Function**to **Min**. Note that the series ofdata fromthe prior exercise already appears in the **All references**box. Were weusing differentdata, you could delete these references and add others. As we areusing the same data inthis exercise, simply click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0035_04200.lowres.png?imageVersion=1 | |
| 3. | To show the highest grade for each student:   |  |  | | --- | --- | | A. | On the sheet named Consolidate, select cells **D2:D11**. | | B. | On the **Data**tab, in the **Data Tools**group, click the **Consolidate**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0036_03200.lowres.png?imageVersion=1 | | C. | In the **Consolidate**dialog box, set the **Function**to **Max**. Once again, as we areusingthe same data as in the prior exercises and it already appears in the **Allreferences**box,simply click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0036_04200.lowres.png?imageVersion=1 | |

**Goal Seek**

If you know the result of a formula but not the value of a specific variable on whichtheformula depends, you can use **Goal Seek**to adjust the variable to display thedesired value.**Goal Seek**can only adjust one variable in a formula, so if a formuladepends on more thanone variable, you will need to decide which variable to adjust.To use **Goal Seek**:

|  |  |
| --- | --- |
| 1. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013),click the**What-If-Analysis**command:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0038_03200.lowres.png?imageVersion=1 |
| 2. | Click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0038_04200.lowres.png?imageVersion=1 |
| 3. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | A. | In the **Set cell**box, enter the cell for which you know the result (if youselected thiscell before clicking **Goal Seek**, then it is already filled in). | | B. | In the **To value**box, enter the value for the cell above. | | C. | In the **By changing cell**box, enter the cell to adjust in order to obtain thevalue. (Remember, this cell must be related via a formula to the cell aboveor elsechanging one won't impact the other.) | | D. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0038_05200.lowres.png?imageVersion=1 | |
| 4. | In the **Goal Seek Status**dialog box, after the calculation has completed, click**OK**toaccept the change or **Cancel**to reject it:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0038_06200.lowres.png?imageVersion=1 |

Watch and follow along as your instructor demonstrates how to use **Goal Seek**.

**Exercise 7 Using Goal Seek**

***15 to 25 minutes***

In this exercise, you will practice using **Goal Seek**to adjust the number of periodsit will taketo pay off a loan based on varied payments and to figure out what gradea student needs ontheir final exam to achieve a target grade for a course.

|  |  |
| --- | --- |
| 1. | Open Goal Seek.xlsx from your Excel2016.3/Exercises folder. |
| 2. | The worksheet named Loans contains information on four loans. The **Payment**iscalculated via the PMT formula. Use **Goal Seek**to determine:   |  |  | | --- | --- | | A. | How many months (periods) it will take to pay off your boat if you canonly pay$100 per month. | | B. | How many months (periods) it will take to pay off your first car if youcan onlypay $250 per month. | | C. | How many months (periods) it will take to pay off your second car if youcan pay$200 per month. | | D. | How many months (periods) it will take to pay off your house if you canpay$1,000 per month. | |
| 3. | The worksheet named Grades contains scores for a number of students on fourexams,an empty column where the score for the fifth exam will go, and acolumn showing theaverage score on all exams. Use **Goal Seek**to figure out:   |  |  | | --- | --- | | A. | What grade Babe Ruth needs to get on the last exam to raise his final gradeto 90. | | B. | What grade Barry Bonds needs to get on the last exam to achieve a passinggrade (65). | | C. | What the lowest grade Cal Ripken can get on the last exam to finish witha finalgrade of 90. | |

**Exercise Solution**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | To determine how many months it will take to pay off your boat if you can only pay$100 permonth:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0041_04200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **B2**. | | ii. | In the **To value**box, enter **-100**. | | iii. | In the **By changing cell**box, enter **D2**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0041_05200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0041_06200.lowres.png?imageVersion=1 | | D. | The correct result is 63 months. | |
| 2. | To determine how many months it will take to pay off your first car if you can only pay$250per month:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0042_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **B3**. | | ii. | In the **To value**box, enter **-250**. | | iii. | In the **By changing cell**box, enter **D3**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0042_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0042_05200.lowres.png?imageVersion=1 | | D. | The correct result is 148 months. | |
| 3. | To determine how many months it will take to pay off your second car if you can pay$200per month:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0043_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **B4**. | | ii. | In the **To value**box, enter **-200**. | | iii. | In the **By changing cell**box, enter **D4**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0043_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0043_05200.lowres.png?imageVersion=1 | | D. | The correct result is 42 months. | |
| 4. | To determine how many months it will take to pay off your house if you can pay $1,000permonth:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0044_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **B5**. | | ii. | In the **To value**box, enter **-1000**. | | iii. | In the **By changing cell**box, enter **D5**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0044_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0044_05200.lowres.png?imageVersion=1 | | D. | The correct result is 252 months. | |
| 5. | To figure out what grade Babe Ruth needs to get to raise his final grade to 90, go to thesheetnamed Grades and then:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0045_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **G2**. | | ii. | In the **To value**box, enter **90**. | | iii. | In the **By changing cell**box, enter **F2**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0045_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0045_05200.lowres.png?imageVersion=1 | | D. | Babe Ruth needs a 100 on the final exam to raise his average to 90. | |
| 6. | To figure out what grade Barry Bonds needs to get on the last exam to achieve a passinggrade(65):   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0046_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **G8**. | | ii. | In the **To value**box, enter **65**. | | iii. | In the **By changing cell**box, enter **F8**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0046_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0046_05200.lowres.png?imageVersion=1 | | D. | Barry Bonds needs a 133 on the final exam to achieve a passing grade. Poor BarryBonds. | |
| 7. | To figure out the lowest grade Cal Ripken can get on the last exam to finish with a finalgradeof 90:   |  |  | | --- | --- | | A. | On the **Data**tab, in the **Forecast**group (the **Data Tools**group in Excel 2013), clickthe**What-If-Analysis**command and then click **Goal Seek**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0047_03200.lowres.png?imageVersion=1 | | B. | In the **Goal Seek**dialog box:   |  |  | | --- | --- | | i. | In the **Set cell**box, enter cell **G9**. | | ii. | In the **To value**box, enter **90**. | | iii. | In the **By changing cell**box, enter **F9**: | | iv. | Click **OK**:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0047_04200.lowres.png?imageVersion=1 | | | C. | In the **Goal Seek Status**dialog box, after the calculation has completed, click **OK**toaccept the change:  https://az756479.vo.msecnd.net/assets/Additions/44f2d427-bf87-4131-81b8-c343dc8a6e78/images/55167a03-image_0047_05200.lowres.png?imageVersion=1 | | D. | Cal Ripken needs at least a 79 on the final exam to finish with a final grade of 90. | |

**Conclusion**

In this lesson, you learned to convert text to columns, to use **Data Validation**torestrict thetype of data that can be entered into a cell, to consolidate data from anumber of differentranges into one new range, and to use **Goal Seek**to figure outthe value to input to obtain aspecific result.