

ungroup the sheets when you are done. You may end up accidentally typing over existing data and thus compromising the integrity of the worksheet.

### Exercise 4-7

### Group Worksheets

- I. Open a new workbook, and insert three worksheets.
  - a. The workbook has a total of six worksheets.
- II. Rename the worksheets **Jan, Feb, Mar, Apr, May, Jun** going from left to right.
- III. Group several worksheets.
  - a. With the **Jan** sheet active, hold the **Shift** key and click the **Jun** tab.
    - i. All sheets are selected and the word **[Group]** appears in the **Title bar**.
- IV. In cell **A1** of the **Jan** worksheet, enter **Joe's Bar and Grill** and format it to **Red 18-point Arial Bold Italic**.
- V. In cell **A2**, enter the **TODAY** function to show the date.
- VI. Right-click any sheet tab, and select **Ungroup** from the **Shortcut menu**.
  - a. The worksheets are ungrouped.
- VII. Click each tab, and notice that the data you entered is on every sheet.
- VIII. Close the workbook without saving.

### Internal Reference Formulas

Now that you know how to work with multiple worksheets, you should learn about internal reference formulas. An **internal reference formula**, or **linking formula** is a formula that links data on two or more worksheets within a workbook. When there are multiple related worksheets, you may want to consolidate the information. For example, let's say you have five revenue worksheets for five separate stores. Each store has its own worksheet. To have one master worksheet with the combined information from the five individual sheets, you would create linking formulas from every worksheet to the summary sheet.

When creating formulas that contain cell addresses from other worksheets, specify which worksheet the address is coming from. In a cell address, place the worksheet name before the cell references separated with an exclamation point. This is known as a **sheet reference**. A cell address that contains both cell and sheet references is known as a **3-D reference**.

Let's say that in the master workbook for the **Acme Grocery Store** there are four sheets named **Store1, Store2, Store3, and Store4**. You are asked to create a **Summary** worksheet, and on this worksheet you need to refer to cell **A1** of the **Store1** worksheet. Enter **Store1!A1**. If you want to add together cell **A1** from all four store worksheets, you can enter the formula **=Store1!A1+Store2!A1+Store3!A1+Store4!A1** in the appropriate cell on the **Summary** worksheet. The **SUM** function can also be used to add the values of the four stores. The function would look like **=SUM(STORE1:STORE4!A1)**.

### Exercise 4-8

### Group Worksheets

- I. Open the **Wave Runner Surf Shop** workbook from the data disk, and save it as **Ex 4-8 Wave Runner Surf Shop** on your work disk.

	A	B	C	D	E	F
1	<b>Wave Runner Surf Shop</b>					
2	<b>Summary Inventory Worksheet</b>					
3						
4						
5						
6						
7						
8	<b>Item Sales</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>October</b>
9	T-shirts	\$ 10,375	\$ 12,887	\$ 12,451	\$ 7,141	\$ 5,129
10	Sunglasses	5,754	2,932	10,333	7,229	9,197
11	Boogie Boards	8,856	10,812	14,609	6,350	10,263
12	Hobie Surfboards	5,611	7,913	8,860	4,988	9,416
13	Wave Runner Surfboards	8,539	6,859	7,379	6,399	9,310
14						
15	<b>Total</b>	<b>\$ 39,135</b>	<b>\$ 41,403</b>	<b>\$ 53,632</b>	<b>\$ 32,107</b>	<b>\$ 43,315</b>

- II. Group the three worksheets, and format the title in cell A1 to **Red 18-point Arial Bold Italic**.
- III. With the sheets still grouped, format the subtitle in cell A2 to **Red 14-point Arial Bold Italic**.
- IV. Ungroup the sheets and make the **Summary** worksheet active.
- V. Create a linking formula.
  - a. Enter the = sign in cell B9 on the **Summary** worksheet, and then click the **Daytona Beach** sheet tab.
    - i. Excel goes into **Point** mode.
  - b. Click cell B9 on the **Daytona Beach** worksheet.
    - i. A scrolling marquee surrounds cell B9, and the formula displays in the input line in the **Formula bar**.
  - c. Type the + sign, and click the **New Smyrna Beach** sheet tab.
    - i. The **New Smyrna Beach** worksheet is active, and the formula continues to build in the input line on the **Formula bar**.
  - d. Click cell B9 on the **New Smyrna Beach** worksheet.
    - i. A scrolling marquee surrounds cell B9, and the final formula displays on the input line in the **Formula bar**.
  - e. Press the **Enter** key.
    - i. A 3-D reference formula displays the result of adding cells B9 in the **Daytona Beach** worksheet and the **New Smyrna Beach** worksheet.
- VI. Copy the linking formula down through row 13 and then across through column F.
  - a. The 3-D reference formula is copied.
- VII. With the **Summary** worksheet active, group the worksheets and then select **Range B15:F15**. Click the **AutoSum** button on the **Standard toolbar**.
- VIII. Ungroup the worksheets.
- IX. Format the **Summary** worksheet to appear like the others.
- X. Save, and close the workbook.



## MULTIPLE WORKBOOKS

Now that you know how to link worksheets, let's take the linking concept one step further. In addition to linking worksheets, you can also link workbooks. Linking workbooks is becoming more and more common due to the numerous computer networks that many businesses now use.

Assume you work at the home office of **Computer Learning Associates**, and there are several smaller branch schools throughout the city. Each school has its own workbook. These branch workbooks are linked to one master workbook in the home office where you work. Whenever a change is made in a branch office workbook, the change is automatically reflected in the master workbook.

When linking multiple workbooks, you work with source workbooks and target workbooks. The **source workbook** is the workbook where the data is coming from. The **target workbook** is the workbook receiving the data from the source workbook(s). In our example, the smaller branch office workbooks would be the source workbooks and the home office master workbook would be the target workbook. The workbooks below demonstrate a small multi-workbook environment.

	A	B	C	D
1	Computer Learning Associates			
2	South Branch			
3				
4	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
5	Tuition	\$ 2,700	\$ 2,900	\$ 2,875
6	Cert. Exams	1,300	1,350	1,200
7	Books	900	1,000	1,100
8	Supplies	500	550	500
9				
10	<b>Total</b>	<b>\$ 5,400</b>	<b>\$ 5,800</b>	<b>\$ 5,675</b>

Figure 4.3: Source Workbook

	A	B	C	D
1	Computer Learning Associates			
2	East Branch			
3				
4	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
5	Tuition	\$ 3,200	\$ 3,000	\$ 2,700
6	Cert. Exams	1,500	1,250	1,400
7	Books	475	675	550
8	Supplies	700	500	650
9				
10	<b>Total</b>	<b>\$ 5,875</b>	<b>\$ 5,425</b>	<b>\$ 5,300</b>

Figure 4.4: Source Workbook

	A	B	C	D
1	Computer Learning Associates			
2	West Branch			
3				
4	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
5	Tuition	\$ 2,400	\$ 2,250	\$ 2,225
6	Cert. Exams	1,200	1,000	1,100
7	Books	475	485	400
8	Supplies	200	150	175
9				
10	<b>Total</b>	<b>\$ 4,275</b>	<b>\$ 3,885</b>	<b>\$ 3,900</b>

Figure 4.5: Source Workbook

	A	B	C	D
1	<b>Computer Learning Associates</b>			
2	<b>Home Office</b>			
3	<b>Summary Worksheet</b>			
4				
5	<b>South Branch</b>			
6	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
7	Tuition	\$ 2,700	\$ 2,900	\$ 2,875
8	Cert. Exams	1,300	1,350	1,200
9	Books	900	1,000	1,100
10	Supplies	500	550	500
11				
12	<b>Total</b>	<b>\$ 5,400</b>	<b>\$ 5,800</b>	<b>\$ 5,675</b>
13				
14	<b>East Branch</b>			
15	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
16	Tuition	\$ 3,200	\$ 3,000	\$ 2,700
17	Cert. Exams	1,500	1,250	1,400
18	Books	475	675	550
19	Supplies	700	500	650
20				
21	<b>Total</b>	<b>\$ 5,875</b>	<b>\$ 5,425</b>	<b>\$ 5,300</b>
22				
23	<b>West Branch</b>			
24	<b>Revenue</b>	<b>January</b>	<b>February</b>	<b>March</b>
25	Tuition	\$ 2,400	\$ 2,250	\$ 2,225
26	Cert. Exams	1,200	1,000	1,100
27	Books	475	485	400
28	Supplies	200	150	175
29				
30	<b>Total</b>	<b>\$ 4,275</b>	<b>\$ 3,885</b>	<b>\$ 3,900</b>
31				
32	<b>Grand Total</b>	<b>\$ 15,550</b>	<b>\$ 15,110</b>	<b>\$ 14,875</b>

Figure 4.6: Target Workbook

It is much easier to create linking formulas between workbooks when all of the workbooks are open at the same time. You can open multiple workbooks using the **Open** dialog box. To open multiple workbooks that are stored together in the same folder, click the first workbook, and then hold the **Shift** key while clicking the last workbook file name in a series. All workbooks between the first one and the last one are selected. Clicking the **Open** button will open all of the selected workbooks. To open workbooks that are not contiguous in the **Open** dialog box, hold down the **Ctrl** key while clicking on the desired workbook file names.

Once the workbooks are open, you will have to navigate between them. There are three primary ways to navigate between multiple open workbooks: selecting the workbook file name in the **Window** menu, clicking the workbook icon on the **Windows taskbar**, or using the shortcut keys **Alt+Tab** on the keyboard.

### Exercise 4-9

### Open and Close Multiple Workbooks

- I. Open multiple workbooks.
  - a. Click **File, Open** on the **Menu bar**.
  - b. Click any workbook file name to select it, and then hold the **Shift** key while clicking another workbook file name three workbooks down.
    - i. Four workbooks are selected.
  - c. Click **Open**.
    - i. Excel opens all four workbooks.
- II. Move between multiple workbooks.
  - a. Click **Window** on the **Menu bar**, and select a different workbook name from the list.
    - i. The active workbook is changed.
  - b. Click another workbook icon in the **Windows taskbar**.
    - i. The active workbook is changed.
- III. Practice navigating workbooks using the **Window** menu and the **Windows taskbar**.
- IV. Close all workbooks.

## External Reference Formulas

Now that you know how to open, close, and navigate among multiple workbooks, let's learn how to link them together with formulas. An **external reference formula** is the term used to refer to a formula that uses data from another workbook. An external reference formula is not difficult to create. They are not that much different than formulas that link worksheets together. An external reference formula contains the disk location, workbook name, sheet name, and cell address inside square brackets.

The actual linking process is fairly simple. You select the range in the source workbook, and then copy the range to the clipboard. Activate the target workbook by using one of the methods demonstrated in the previous exercise, and place the cell cursor in the cell where you wish to place the linking data. Select **Edit, Paste Special** on the **Menu bar**, and click the **Paste Link** button in the **Paste Special** dialog box. After pasting the link in the external reference formula on the target worksheet, any changes made to the source workbook will display in the target workbook. You can also use the pointing method to create an external reference formula.

**Exercise 4-10**

**Create External Reference Formulas**

- I. Simultaneously open all five workbooks relating to the **Dallas Public Works Department** on the data disk.
- II. Save workbooks as **Ex 4-10 Dallas Public Works Department-East District**, **Ex 4-10 Dallas Public Works Department-Master Summary**, **Ex 4-10 Dallas Public Works Department-North District**, **Ex 4-10 Dallas Public Works Department-South District**, and **Ex 4-10 Dallas Public Works Department-West District**, respectively, on your work disk.
- III. Go to the **North**, **South**, **East**, and **West** district workbooks, and calculate the **Expense** totals using the **AutoSum** button.
- IV. Create external reference formulas to link workbooks.
  - a. Make the **North District** workbook active.
  - b. Select **Range B7:M10**, and click **Edit, Copy** on the **Menu bar**.
    - i. The data is placed on the Windows clipboard, and a scrolling marquee surrounds the copied range.
  - c. Make the **Master Summary** workbook active.
  - d. With **cell B7** active in the **Master Summary** workbook, click **Edit, Paste Special** on the **Menu bar**.
    - i. This activates the **Paste Special** dialog box.
  - e. Click the **Paste Link** button.
    - i. The data from the **North District** workbook is now linked to the range on the **Master Summary** workbook.
- V. Analyze the formulas in the cells, and note the syntax.
- VI. Create external reference formulas to link workbooks.
  - a. Make the **South District** workbook active.
  - b. Select the **Range B7:M10**, and click **Edit, Copy** on the **Menu bar**.
    - i. The range is copied to the Windows clipboard.
  - c. Make the **Master Summary** workbook active, and then make **cell B17** the active cell.
  - d. Select **Edit, Paste Special** on the **Menu bar**, and click the **Paste Link** button.
    - i. The **South District** data is linked to the **Master Summary** workbook.
- VII. Repeat the above procedures for the **East** and **West** districts. Save the **Master Summary** workbook when finished.
- VIII. In the **Master Summary** workbook, use the **AutoSum** button to calculate **Expense** totals in rows 12, 22, 32, and 42.
- IX. Enter the formula **=B12+B22+B32+B42** in **cell B45**, and copy it across to calculate the **Subtotals**.
- X. In **cell B48**, use the **SUM** function to add all of the **Subtotals** to give us the **Grand Total**.
- XI. Format each section appropriately and identical with each other.
- XII. Save, and close the **Master Summary** workbook.
- XIII. Close the remaining workbooks, saving them if necessary.



**AutoSum**  
button

## Viewing, Editing, and Updating Links

Once your linked workbooks are set up, you may wish to make changes. For example, what if the workbook name is changed in one of your source workbooks? Your external reference formulas will then be using a workbook name that no longer exists, and you will get error messages. To make changes to your current links or just to see what workbooks are linked into the source workbook, click **Edit, Links** on the **Menu bar**. The **Links** dialog box is used to maintain your workbook links.

### Exercise 4-11

### View and Update Links

- I. Rename workbook.
  - a. Click **File, Open** on the **Menu bar**.
  - b. Select the **Ex 4-10 Dallas Public Works Department-North District** workbook but do not open it.
    - i. The workbook is selected.
  - c. Press and release the **F2** key.
    - i. The workbook name can now be edited.
  - d. Edit the workbook name so it reads **Ex 4-11 Dallas Public Works Department-Northside District**, and press the **Enter** key.
    - i. The workbook name is changed.
- II. Update links.
  - a. Open the **Ex 4-10 Dallas Public Works Department-Master Summary** workbook.
    - i. The workbook link dialog box appears.
  - b. Read the text in the workbook link dialog box, and click **Yes**.
    - i. The **File Not Found** dialog box appears because the **North District** workbook name has been changed and the **Master Summary** workbook is looking for the data from the old workbook name.
  - c. Click **Cancel** to close the **File Not Found** dialog box.
    - i. The dialog box closes and the worksheet displays with possible erroneous information in the **North District** section of the workbook.
  - d. Click **Edit, Links** on the **Menu bar**.
    - i. This activates the **Links** dialog box.
    - ii. Note the four workbook names in the window.
  - e. Click the **Change Source** button.
    - i. This activates the **Change Links** dialog box.
  - f. Select the **Ex 4-11 Dallas Public Works Department-Northside District** workbook file name, and click **OK**.
    - i. The source workbook has been changed to the proper workbook.
  - g. Click the **Update Now** button to update any possible changes to the **Master Summary** workbook, and then click **OK**.
- III. Click **Edit, Links** on the **Menu bar**.
- IV. Select the **South District** workbook file name in the source file window, and click the **Open Source** button.
  - a. The **South District** workbook opens.
- V. Close the **South District** workbook.
- VI. Save, and close the **Master Summary** workbook.

## CHAPTER SUMMARY

---

- Range names** are meaningful names assigned to ranges of cells.
- Range names can be used in formulas and functions.
- Range names are created by selecting the range to be named, and clicking **Insert, Name, Define** on the **Menu bar**, or by typing the name directly into the **Name box** in the **Formula bar**.
- Use the sort feature to arrange your data in alphabetic or numeric order.
- The **Sort Ascending** and **Sort Descending** buttons on the **Standard toolbar** or the **Sort** dialog box from the **Data** menu can be used to sort.
- The act of extracting data from a table to meet specific user-defined criteria is called **filtering**.
- AutoFilter** is used to extract information from a table, and display the results in the table range.
- Advanced Filter** is used to extract information from a table and display the filtered data in a separate range or worksheet.
- To access **AutoFilter** and **Advanced Filter**, use **Data** on the **Menu bar**.
- Use the **Subtotals** feature to quickly display summary information of a table.
- Rename a worksheet either by double-clicking the sheet tab or by right-clicking the sheet tab and selecting **Rename** from the **Shortcut menu**.
- Rearrange worksheets by clicking and dragging their corresponding sheet tab to a different location.
- Insert additional worksheets in a workbook by clicking **Insert, Worksheet** on the **Menu bar**.
- Delete worksheets by right-clicking the sheet tab and selecting **Delete** from the **Shortcut menu**. You cannot use **Undo** to bring back a deleted sheet.
- Use the worksheet navigation buttons next to the sheet tabs to move among multiple sheets.
- To open multiple *contiguous* workbooks, activate the **Open** dialog box, click the first workbook, and press the **Shift** key while clicking the last workbook.
- To open multiple *noncontiguous* workbooks, activate the **Open** dialog box, and press the **Ctrl** key while clicking each workbook you wish to open.
- An **external reference formula** is a formula used to link data in separate workbooks.
- An **internal reference formula** is a formula used to link data in separate worksheets within a workbook.
- Viewing and maintaining links are done with the **Links** dialog box.

## CHAPTER 4 PROJECTS

### Project 4-1 Range Names, Sorting, Filtering, and Subtotals

- I. Open the **Movie Buster Video** workbook from the data disk, and save it as **Proj 4-1 Movie Buster Video** on your work disk.
- II. Apply a thick, blue single-line bottom border to the worksheet column headings.
- III. In cell **A6**, press the **Ctrl+Shift+End** keys simultaneously on the keyboard to select the entire table of movies.
- IV. Name the range **MOVIELIST**.
- V. Name **Range A7:A303 TITLE**.
- VI. Name **Range D7:D303 PRICE**.
- VII. Keyboard **Average Price**: in cell **E2** and **# of Movies**: in cell **E3**.
- VIII. Use the correct function to find the **Average Price** and **# of Movies**. Place them in **Range E2:F3**. Be sure to use range names in the function.
- IX. Use **AutoFilter** for the following tasks.
  - a. Extract all **PG-rated Action** movies.
    - i. Redisplay all of the movies.
  - b. Extract all **PG 13** movies.
    - i. Redisplay all of the movies.
  - c. Extract **Disney** movies where there are **three** copies.
    - i. Redisplay all of the movies, and turn off **AutoFilter**.
- X. Sort the movies by **Category** and then by **Price** in ascending order.
- XI. Activate the **Subtotals** dialog box, and select **Category** in the **At each change in** section. Use the **Count** function, and place a check mark in the **Category** box in the **Add subtotal to** section. Remove any other check marks in the **Add subtotal to** section. Click **OK**.
- XII. Scroll down the worksheet clicking every collapse (minus sign) button in the **Level 2** subtotal column to the left of the worksheet row heading numbers until only a small summary count table is visible. Widen **Column B**.
- XIII. Print the worksheet to one page. Remove the subtotals from the worksheet.
- XIV. Save, and close the workbook.

### Project 4-2 Name, Insert, Delete, and Rearrange Worksheets

	A	B	C	D	E	F
1	<b>Paul's Lumber Company</b>					
2	<b>Employee Payroll</b>					
3						
4						
5						
6	<b>Name</b>	<b>Hourly Rate</b>	<b>Hours Worked</b>	<b>Gross Pay</b>	<b>Taxes</b>	<b>Net Pay</b>
7	Sanchez	\$ 12.00	40			
8	Meyers	12.00	37			
9	Smith	13.00	40			
10	Hester	12.25	40			
11	Bergquist	10.00	45			



## Chapter 4: Large Worksheets, Multiple Worksheets and Workbooks

- I. Open a new workbook, and save it as **Proj 4-2 Company Payroll** to your work disk,
- II. Name the three default worksheets **January Payroll**, **February Payroll**, and **March Payroll**.
- III. Arrange the worksheets in alphabetical order.
- IV. Group the worksheets, and enter the information as shown above. Format appropriately.
- V. Enter the proper formulas in the **Gross Pay**, **Taxes** (the tax rate is **18%**), and **Net Pay** columns and use the format painter to copy the format from the **Hourly Rate** column to the last three columns.
- VI. Ungroup the worksheets.
- VII. Delete the **March Payroll** worksheet.
- VIII. Copy the **January Payroll** worksheet, and place at the end.
- IX. Rename the copied worksheet **April Payroll**.
- X. Print the **January Payroll** worksheet, and then clear the hours from the **Hours Worked** column.
- XI. Save the workbook as a template to your work disk.
- XII. Close the workbook.

### Project 4-3

### Link Worksheets with 3D References

	A	B	C	D	E
1	<b>Books-A-Trillion</b>				
2	<b>Summary Inventory Report</b>				
3					
4					
5					
6					
7					
8					
9	<b>Item</b>	<b>Reference</b>	<b>Periodicals</b>	<b>Non-Fiction</b>	<b>Fiction</b>
10	Childrens	825	465	389	418
11	Pre-Teens	907	603	400	311
12	Adults	690	554	567	700
13					
14	<b>Total</b>	2,422	1,622	1,356	1,429
15					
16	<b>Grand Total:</b>	6,829			

- I. Open the **Books-A-Trillion** workbook from the data disk, and save it as **Proj 4-3 Books-A-Trillion** on your work disk.
- II. Create a 3-D reference formula in **cell B10** of the **Summary** worksheet that adds **cell B10** from the **Dallas** and **Houston** worksheets, and copy it down and across the table.
- III. Group the worksheets, and calculate the totals using the **AutoSum** button.
- IV. Ungroup the worksheets, and calculate the **Grand Total**.
- V. Format the **Totals** to **Comma Style with no decimal places**.
- VI. Print the **Summary** worksheet. Save, and close the workbook.

## **CHAPTER 4 CHALLENGE**

---

Computer Operator

Please open the workbook named **Proj 4-3 Books-A-Trillion** from your work disk. Then open a new workbook and save it as **Challenge 4-1 Books-A-Trillion Master Summary**. Create a new worksheet in this workbook entitled **Master Summary**.

Paste link the data from the **Dallas** worksheet in the **Proj 4-3 Books-A-Trillion** workbook into the **Master Summary worksheet** starting in row **5**. Paste link the **Houston** worksheet data in the same worksheet beginning in row **10**.

Calculate **Totals** for both sections in row **16**, and calculate a **Grand Total** in row **18**.

Shade the column headings for both sections and use the **Borders** button to apply **All Borders** to both sections.

Save, and print the **Master Summary** worksheet.

Thanks  
The Boss