	A	B	C	D	E	F	G	H	I
1	Today's Date:	10/10/00							
2									
3									Years with
4	Sales Rep.	Sales	Commission	Base Pay	Total Pay	Taxes	Net Pay Due	Date Hired	Company
5	Sanchez	$52,000	=B5*5%	$175	=C5+D5	=E5*15%	=E5-F5	12/12/95	=(B1-H5)/365
6	Smith	47,000	=B6*5%	175	=C6+D6	=E6*15%	=E6-F6	1/18/98	=(B1-H6)/365
7	Jones	45,000	=B7*5%	175	=C7+D7	=E7*15%	=E7-F7	4/17/96	=(B1-H7)/365
8	Taylor	49,000	=B8*5%	175	=C8+D8	=E8*15%	=E8-F8	3/19/97	=(B1-H8)/365
9	Meyers	50,000	=B9*5%	175	=C9+D9	=E9*15%	=E9-F9	10/30/98	=(B1-H9)/365

Figure 2.10: Worksheet with Formulas

Copying Formulas

Let's say you may want to use the same basic formula down a column or across a row. Copying formulas is very efficient because you do not have to type in the same formula over and over again. You type it in once and then copy it down and/or across.

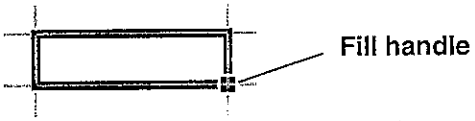

Figure 2.11: Cell with Fill Handle

There are two primary methods of copying formulas: the **Menu bar** and the **Fill handle.** Enter the formula. Select the range in which you wish to copy the formula starting with the formula cell. Click **Edit, Fill Down** or **Fill Across** from the **Menu bar** to copy your formula to the other cells. The second way, which is quicker, is to type the formula in the cell, select the **fill handle** on the lower right corner of the cell cursor, and then drag through the range you wish to update. The **fill handle** is a small bump on the lower right corner of the cell cursor. When the mouse is placed on the fill handle, the mouse turns into a thin plus sign. You then click and drag the mouse down or across to copy the formula to other cells.

Display Cell Formulas

Once a formula has been entered into a cell, the formula automatically calculates and displays the result on the screen. Sometimes it is necessary to display the formula rather than the result. To toggle the display to show either formulas or results, use the shortcut keys **Ctrl+~.**

Exercise 2-9 Copy and Display Cell Formulas - Part 1

	A	B	C	D	E
1	*Potter's Pottery*				
2	*Yearly Revenue Comparison Worksheet*				
3					
4					
5	Revenue	Last Year	This Year	Difference	% Difference
6	Sales	$ 25,000	$ 22,500	$ (2,500)	-10.00%
7	Service	15,500	16,250	750	4.84%
8	Classes	11,500	13,500	2,000	17.39%

I. Open the **Potter's Pottery** workbook from the data disk, and save it as **Ex 2-9 Potter's Pottery** to your work disk.
II. Widen **column A** to **12 characters,** and heighten **rows 5** through **8** to **20 points.**
III. Copy a formula to a range.
   a. Keyboard **=C6-B6** in **cell D6,** and press the **Enter** key.
      i. The value in **cell B6** is subtracted from the value in **cell C6,** and the result is displayed in the cell.
   b. Select **Range D6:D8**, and click **Edit, Fill, Down** from the **Menu bar.**
      i. The formula is copied down the column displaying the results.
IV. Copy a formula to a range.
   a. Keyboard **=D6/B6 in cell E6,** and press the **Enter** key.
      i. The value in **cell D6** is divided by the value in **cell C6,** and the decimal result displays.
   b. Select **Range E6:E8**, and use shortcut keys **Ctrl+D** to copy the formula down the rest of the range.
      i. The formula is copied down the column, displaying the results.


Format Painter button

V. Copy formats.
   a. Select **Range C6:C8,** and click the **Format Painter** button.
   b. Click **cell D6.**
      i. The **Difference** values are formatted identical to the **This Year's** data.
VI. Center the **% Difference** data, and format the data to **Percent Style with two decimal places.**
VII. Display formulas by using shortcut keys **Ctrl+~,** and then display the results.
VIII. Save, and close the workbook.

Exercise 2-10 — Copy and Display Cell Formulas - Part 2

	A	B	C	D	E	F	G	H	I	J	K
1	***Acme Coffin Company***										
2	***Employee Payroll***										
3											
4											
5	Employee	Rate	OT Rate	Reg Hours	OT Hours	Reg Pay	OT Pay	Total Pay	Tax Rate	Taxes	Net pay
6	Frankenstein	$ 14.00	$ 21.00	40.00	2.00	$ 560.00	$ 42.00	$ 602.00	14.00%	$ 84.28	$ 517.72
7	Dracula	15.00	22.50	40.00	3.25	600.00	73.13	673.13	14.00%	94.24	578.89
8	Wolfman	14.00	21.00	40.00	0.00	560.00	0.00	560.00	14.00%	78.40	481.60
9	Witchy Witch	15.00	22.50	32.50	0.00	487.50	0.00	487.50	14.00%	68.25	419.25
10	Grinch	16.00	24.00	40.00	3.75	640.00	90.00	730.00	14.00%	102.20	627.80
11	Ghostly Ghost	12.50	18.75	40.00	6.00	500.00	112.50	612.50	14.00%	85.75	526.75
12	Invisible Man	12.50	18.75	38.50	0.00	481.25	0.00	481.25	14.00%	67.38	413.88

I. Open the **Acme Coffin Company** workbook from your data disk, and save it as **Ex 2-10 Acme Coffin Company** on your work disk.
II. Apply the following formatting to the column headings in **row 5:**
   a. **Center**
   b. **Bold**
   c. **Thick Red Single-Line Bottom Border**
   d. **Aqua Fill Color**

III. Enter the formula **=B6*1.5** in **cell C6,** and press the **Enter** key.
   a. This calculates the **OT Rate** by multiplying the **Rate** by **1.5.**
IV. Copy a formula to a range.
   a. Select **Range C6:C12.**
   b. Click **Edit, Fill, Down** on the **Menu bar.**
      i. The formula in **cell C6** is copied down through **cell C12,** and all **OT Rates** are calculated.
V. Copy a formula to a range.
   a. Enter the formula **=B6*D6** in **cell F6,** and press the **Enter** key.
      i. This calculates the **Regular Pay** by multiplying **Rate** by **Reg. Hours.**
   b. With **cell F6** active, click and drag the fill handle down through **cell F12.**
   c. The formula is copied to the range, and **Reg. Pay** is calculated for all employees.
VI. Copy a formula to a range.
   a. Enter the formula **=C6*E6** in **cell G6,** and press the **Enter** key.
      i. This calculates **OT Pay** by multiplying **OT Rate** by **OT Hours.**
   b. With **cell G6** active, click and drag the fill handle down through **cell G12.**
      i. The formula is copied down the range and **OT Pay** is calculated for all employees.
VII. Copy a formula to a range.
   a. Enter the formula **=F6+G6** in **cell H6,** and press the **Enter** key.
      i. **Total Pay** is calculated by adding **Reg. Pay** and **OT Pay.**
   b. Select **Range H6:H12,** and use shortcut keys **Ctrl+D.**
      i. **Total Pay** is calculated for all employees.
VIII. Copy a formula to a range.
   a. Enter the formula **=H6*I6** in **cell J6,** and press the **Enter** key.
      i. Taxes are calculated by multiplying **Total Pay** by **Tax Rate.**
   b. Use a previously learned method to copy the formula down the column.
      i. **Taxes** are calculated for all employees.
IX. Copy a formula to a range.
   a. Enter the formula **=H6-J6** in **cell K6,** and press the **Enter** key.
      i. **Net Pay** is calculated by subtracting **Taxes** from **Total Pay.**
   b. Use the fill handle to copy the formula down the column.
      i. **Net Pay** is calculated for all employees.
X. Use the format painter to copy the format of **Range B6:B12** to the **OT Pay, Reg. Pay, Total Pay, Taxes,** and **Net Pay** columns.
   a. With **Range B6:B12** selected, double-click the **Format Painter** button, and click in each of the columns.
      i. The format painter will remain on until you turn it off by clicking the **Format Painter** button again or by pressing the **Esc** key.
XI. Change **Dracula's Rate** to **15.00,** and note the change in the other columns.
XII. Change **Frankenstein's OT Hours** to **2.00,** and note the change.
XIII. Change **Tax Rate** in **cell I6** to **14.00%.** Use the fill handle to copy the new tax rate down the column, and note the change.
XIV. Make the home cell active. Save, and close the workbook.

Relative Cell References

In the last exercise, when we copied the formulas down, the cell references in the formula adjusted automatically to reflect the new figures. This happens because the underlying cell addresses in the formulas were **relative cell references.** They change when placed in a new column or row, but maintain the same relationships to the cells around them. For example, let's say that **cell A3** contains the formula **=A1+A2.** When you copy the formula into **cell B3,** the new formula is **=B1+B2.** In other words, the cell addresses in the copied formula are *relative* to other cell addresses when the formula is copied.

Absolute Cell References

There are, however, some circumstances when you do not want a specific cell address in the formula to adjust itself when copying a formula. In this case, you must use absolute cell references. **Absolute cell references** retain the same addresses when being copied to other locations. Place a dollar sign ($) in front of each element that you wish to remain constant, or absolute, in the cell address. Use the **F4** key to make a cell reference absolute automatically

	A	B	C
1	Dave's Television Sales		
2			
3	Commission %:	12.50%	
4			
5	Rep	Sales	Commission
6	Debbie	$5,000.00	=B3*B6
7	Maria	6,500.00	=B4*B7
8	John	3,800.00	=B5*B8
9	Dave	4,100.00	=B6*B8

Figure 2.12: Relative Cell References

	A	B	C
1	Dave's Television Sales		
2			
3	Commission %:	12.50%	
4			
5	Rep	Sales	Commission
6	Debbie	$5,000.00	=$B$3*B6
7	Maria	6,500.00	=$B$3*B7
8	John	3,800.00	=$B$3*B8
9	Dave	4,100.00	=$B$3*B9

Figure 2.13: Absolute Cell References

The figures above demonstrate a situation where absolute cell references are necessary. In the figure, the formula **=B3*B6** is entered into **cell C6** to calculate the amount of commission each sales representative earned. Because the **B3** in the formula is a relative cell reference, when you attempt the copy the formula down, the **B3** address adjusts to **B4, B5,** and **B6,** which are empty or incorrect cells. To prevent this from happening, the formula is entered as **=$B$3*B6.** The dollar signs tell Excel to keep the address constant when it is copied. When the formula is copied down the column, the cell address **B3** will remain constant. Figure 2.13 displays the same worksheet with the proper absolute address entered, and the formula copied down the column.

Exercise 2-11 — Cell References and Order of Operations

I. Open the **Global Auto Sales** workbook from your data disk, and save it as **Ex 2-11 World Auto Sales** to your work disk.
II. Edit **cell A1** so it reads **World Auto Sales**, and format it to **Blue 18-point Arial.**
III. Format the subtitle in **cell A2** to **Blue 14-point Arial.**
IV. Format **cells B4** and **B5** to **Percent Style with two decimal places.**
V. Keyboard **=B4** in **cell C8,** and press the **F4** key to make the cell reference absolute. Continue typing so the formula is **=$B$4*B8** and press the **Enter** key.

	A	B	C	D	E	F
1	World Auto Sales					
2	Commission Report					
3						
4	Commission %:	12.50%				
5	Tax Rate:	17.50%				
6						
7	Sales Rep	Sales	Commission	Base Pay	Taxes	Net Pay
8	Gayle	$52,000	$6,500	100	$1,155	$5,445
9	Harry	47,500	5,938	100	1,057	4,981
10	Maria	43,000	5,375	100	958	4,517
11	Charles	47,850	5,981	100	1,064	5,017
12	Juan	51,000	6,375	100	1,133	5,342

a. The **Commission** is calculated.

VI. Copy the formula down the rest of the column using the fill handle.
   a. The remaining **Commissions** are calculated.

VII. Enter the formula **=(C8+D8)*B5** in **cell E8,** and press the **F4** key to make the **cell B5** reference absolute. The formula should be **=(C8+D8)*$B$5.** Press the **Enter** key if the formula is correct.
   a. The formula adds **Commission** to **Base Pay,** and then multiplies the result by **Tax Rate.**

VIII. Copy the formula down from **cell E8** to fill in the remaining tax amounts.
   a. The **Taxes** are calculated for all the sales representatives.

IX. Enter the formula **=C8+D8-E8** in **cell F8** to calculate **Net Pay.** Copy the formula down the column.
   a. **Net Pay** is calculated for all **Sales Reps.**

X. Use the format painter to copy the format of **Range B8:B12** to the **Commission, Base Pay, Taxes,** and **Net Pay** columns.

XI. Save, and close the workbook.

FUNCTIONS

In Excel, a **function** is a predefined formula. There are over 300 functions available in Excel (with a full installation). Since there are so many functions, they are broken up into categories to organize them. To see a list of the available functions and their categories, click **Insert, Functions** on the **Menu bar.** The following will demonstrate some of the most common functions, their basic structures, and applications.

Function Structure

There are several properties that all functions share that should be learned before using individual functions. The diagram below illustrates the basic structure for all functions. For the purpose of clarity, function names in this text are capitalized. Functions in Excel are not case-sensitive.

=FUNCTION(ARGUMENT)

Every function begins with the equals sign, just like a regular formula. The equals sign indicates to Excel that a calculation is to be performed. Following the equals sign is the function name. The function name tells Excel what built-in formula to apply to the argument values. Every function has a name. Following the function name, the argument will be enclosed in parentheses. There is always at least one open and one close parenthesis in a function, even if the function requires no arguments. Parentheses are also used when determining the order of operations as in the previous exercises. The **argument** can consist of numbers, text, logical values such as **True** or **False,** arrays, error values, or cell references. There are very few functions that do not use arguments.

SUM

The **SUM** function is probably the most commonly used function. The **SUM** function falls under the **Math & Trig** function category and is used to add a series of values. It is easy to see why the **SUM** function is the most popular. Adding values is a very common task on a worksheet. In fact, the **SUM** function is so popular, that it is the only function to have a toolbar button assigned to it. The **AutoSum** button is located on the **Standard toolbar.** The syntax of the **SUM** function is shown below.

=SUM(Number1,Number2,...)

The **SUM** function, as with all functions, begins with an equals sign, the function name, and an open parenthesis. The argument for the **SUM** function contains a series of cell references separated by commas. You may also use a range where the beginning and ending cell references are separated by a colon. Remember to include a close parenthesis at the end of the function. Examine the examples below to become more familiar with using the **SUM** function.

=SUM(A1:A10)
Explanation: Adds all values in the **Range A1** through **A10.**

=SUM(A1:A10,B1)
Explanation: Adds all values in **Range A1:A10** along with the value in **cell B1.** The comma acts as an **argument separator** in a multi-argument function.

AVERAGE

The **AVERAGE** function is used to average a series of values. It falls under the **Statistical** function category. The syntax of the **AVERAGE** function is shown below followed by several examples.

=AVERAGE(Number1,Number2,...)

=AVERAGE(A1:A10)
Explanation: Calculates the average of values in **Range A1:A10.**

=AVERAGE(A1:A10,B1)
Explanation: Calculates the average of values in **Range A1:A10** and **Cell B1.**

MAX

The **MAX** function is used to identify the highest number in a series of values. It falls under the **Statistical** function category. The syntax of the **MAX** function is shown below followed by several examples.

=MAX(Number1,Number2,...)

=MAX(A1:A10)
Explanation: Displays the highest value in **Range A1:A10.**

=MAX(A1:A10,B1)
Explanation: Displays the highest value in **Range A1:A10** and **cell B1.**

MIN

The **MIN** function is used to find the lowest number in a list of values. This is useful if you want to see the lowest sales amount in a large list of sales values. It falls under the **Statistical** function category. The syntax of the **MIN** function is shown below followed by several examples.

=MIN(Number1,Number2,...)

=MIN(A1:A10)
Explanation: Displays the lowest value in **Range A1:A10.**

=MIN(A1:A10,B1)
Explanation: Displays the lowest value in **Range A1:A10** and **cell B1.**

Exercise 2-12 **Use the SUM, AVERAGE, MAX, and MIN Functions**

	A	B	C	D	E	F	G	H	I
1	*High Rollers Bowling League*								
2	*Bowl-A-Rama*								
3									
4									
5									
6	Bowler	Game 1	Game 2	Game 3	Game 4	Game 5	Average	High	Low
7	Harris	135	300	289	200	200	225	300	135
8	Sanchez	200	299	265	275	300	268	300	200
9	Meyers	250	254	200	255	255	243	255	200
10	Simpson	255	175	300	214	214	232	300	175
11	Miller	246	199	300	278	221	249	300	199
12	Jamison	123	258	214	200	199	199	258	123
13									
14	Total	1,209	1,485	1,568	1,422	1,389			
15	Average	202	248	261	237	232			
16	High	255	300	300	278	300			
17	Low	123	175	200	200	199			

I. Open the **High Rollers** workbook from your data disk, and save it as **Ex 2-12 My Bowling League** to your work disk.

II. Use AutoSum.
   a. Select **Range B14:F14,** and click the **AutoSum** button.
      i. The **SUM** function is automatically applied to the range above, and values appear in **Range B14:F14.**
   b. Center and format **Range B14:F14** to **Comma Style with no decimal places.**
   c. Analyze the formulas by clicking in the individual **Total** cells and examining the function in the **Formula bar.**

III. Use the **AVERAGE** function.
   a. Enter the function **=AVERAGE(B7:B12)** in **cell B15,** and press **Enter** key.
      i. The average is calculated for the scores in the **Game 1** column.
   b. Center and format **cell B15** to **Number Style with no decimal places.**
   c. Use the fill handle and copy the formula from **cell B15** across through **cell F15.**
      i. The averages for the other four games are calculated and formatted because formatting also copies when a formula/function is copied.

IV. Use **MAX** function.
   a. Enter the function **=MAX(B7:B12)** in **cell B16,** and press the **Enter** key.
      i. The highest score for **Game 1** is displayed.
   b. Center the high score for **Game 1,** and then use the fill handle to copy the function across to **cell F16.**
      i. The high scores for the other four games are displayed.

V. Use the **MIN** function.
   a. Enter the function **=MIN(B7:B12)** in **cell B17,** and press the **Enter** key.
      i. The lowest score for **Game 1** is displayed.
   b. Center the result, and use the fill handle to copy the function across to **cell F17** to calculate the low scores for the other four games.

VI. Use the **AVERAGE, MAX,** and **MIN** functions.
   a. Enter the function **=AVERAGE(B7:F7)** in **cell G7,** and press the **Enter** key.
      i. The average for **Harris's** five games is calculated.
   b. Enter the function **=MAX(B7:F7)** in **cell H7,** and press the **Enter** key.
      i. **Harris's** highest score is calculated.
   c. Enter the function **=MIN(B7:F7)** in **cell I7,** and press the **Enter** key.
      i. **Harris's** lowest score is calculated.

VII. Center and format **Range G7:I7** to **Comma Style with no decimal places.**

VIII. With **Range G7:I7** still selected, use the fill handle to copy the formulas down to **cell I12.** Deselect the range.
   a. The statistical data is calculated and formatted for the remaining five players.

IX. Use the format painter to copy the format from **cell F12** to **Range G12:I12.**
   a. The border is replaced.

X. Fix any formatting inconsistencies.
XI. Save, and close the workbook.

TODAY

The **TODAY** function is a **Date & Time** function and is used to display the current date. The function tells Excel to display the computer's system date. When the **TODAY** function is used, the cell is updated every day to reflect the current date. The **TODAY** function is very handy if you use worksheets that need to be updated every day like a vacation tracking analysis worksheet. Notice that this function does not include an argument. If you wish the date to display differently, then pick a date format from the **Format Cells** dialog box. The syntax for the **TODAY** function is shown below followed by an example.

=TODAY( )

=TODAY( )
Explanation: Displays the computer's system date.

NOW

The **NOW** function another **Date & Time** function and is used to calculate the current date and time. The function tells Excel to display the computer's system date and time in the cell. When the **NOW** function is used, the date and time are updated automatically. Notice the function does not have an argument. If you wish the date and/or time to display differently, pick a date and time format from the **Format Cells** dialog box. The syntax for the **NOW** function is shown below followed by an example.

=NOW( )

=NOW( )
Explanation: Displays the computer's system date and time.

COUNT

The **COUNT** function is used to count the number of cells that contain values with the parameters established in the argument. This function is useful if you need to count a list of entries that contain numbers. It falls under the **Statistical** function category. The syntax for the function is shown below followed by two examples.

=COUNT(Value1,Value2,...)

=COUNT(A1:A10)
Explanation: Counts the number of cells that contain numeric entries in **Range A1:A10.**

=COUNT(A1:A10,B1)
Explanation: Counts the number of cells that contain numeric entries in **Range A1:A10** and **cell B1.**

COUNTA

The **COUNTA** function is used to count the number of cells that contain text. This is useful if you wish to count a list of sales reps or a list of customers. It falls under the **Statistical** function category. The syntax for the **COUNTA** function is shown below.

=COUNTA(Value1,Value2,...)

=COUNTA(A1:A10)
Explanation: Counts the number of cells that contain text entries in **Range A1:A10.**

=COUNTA(A1:A10,B1)
Explanation: Counts the number of cells that contain text entries in **Range A1:A10** and **cell B1.**

Formula Palette

Beginning Excel users may want to use the formula palette to enter functions. The **Formula palette** is specially designed to assist users creating formulas with functions by taking them through the process one argument at a time. It is kind of like having "training wheels" on your bicycle. To open the formula palette, choose **Insert, Function** on the **Menu bar,** or click the **Paste Function** button on the **Standard toolbar,** to first open the **Paste Function** dialog box. Choose the function you wish to enter, and click **OK** to call up the **Formula palette** for that function. The Formula palette walks you through the process of entering the proper arguments for your function. Either type a range in the **Value** fields manually, or click the **Collapse Dialog** button to the right, and select the range by clicking and dragging. Once a range has been selected the Formula palette will reappear. Click **OK** to enter the formula into the worksheet.

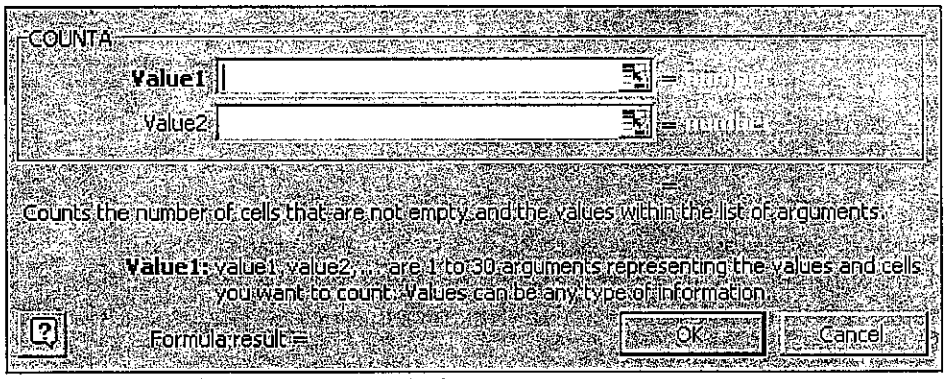

Figure 2.14: COUNTA Formula Palette

Enter an Argument by Dragging

In addition to entering functions manually or using the formula palette, you may enter arguments in a function by clicking and dragging to select the argument range while entering the formula manually. But first you must enter an equals sign and the function name followed by an open parenthesis. For example, if you wish to enter the **SUM** function into **cell A11** to add the values in **Range A1:A10,** simply type **=SUM(** in **cell A11**, click and drag to select **Range A1:A10,** and press the **Enter** key. This method of entering arguments is called **pointing.** The word **Point** displays in the lower left corner of the **Status bar** when entering an argument by dragging

Exercise 2-13 TODAY, NOW, COUNT, and COUNTA, and the Formula Palette

	A	B	C	D	E	F	G
1	***Movie World***						
2	*Inventory Worksheet*						
3	*Today's Date:*	17-Apr-01					
4	*Current Time:*	10:11 AM					
5							
6	**Title**	**Rating**	**Category**	**Price**	**In/Out**	**Date Released**	**No. of Copies**
7	Jaws	R	Horror	2.00	Yes	06/30/96	1
8	And Justice For All	R	Drama	4.00	No	06/30/96	3
9	Apocalypse Now	R	War	5.00	No		1
10	Michael	PG	Drama	4.00	Yes	07/01/96	1
11	Valley Girl	PG	Comedy	2.00	No	07/02/87	1
12	Event Horizon	PG	Action	2.00	Yes	07/04/96	1
13	Rocky II	PG	Action	3.00	Yes		2
14	Alien	R	Horror	4.00	No	07/12/96	2
15	King Arthur	PG	Comedy	1.00	No		1
16	Hook	G	Disney	1.00	Yes	07/15/96	2
17							
18	***Summary Information***						
19							
20	**# of Movies**	10					
21							
22	**# of Movies with**						
23	**Known Release Dates**	7					
24							
25	**Average Movie Price**	2.60					
26							

I. Open the **Movie World** workbook from your data disk, and save it as **Ex 2-13 Movie Inventory** to your work disk.

II. Use formula palette.
   a. With the cell cursor in **cell B3,** click **Insert, Function** on the **Menu bar.**
      i. The **Paste Formula** dialog box is activated.
   b. Select **Date & Time** in the **Function category** list, choose **TODAY** in the **Function name** list, and click **OK.**
      i. The **Formula palette** is activated.
   c. Read about the **TODAY** function, and click **OK.**
      i. The current date is inserted into **cell B3.**
   d. Right-align the contents of **cell B3.** Use the **Format Cells** dialog box to format the date to the **14-Mar-98** format.

III. Use formula palette.
   a. In **cell B4,** click the **Paste Function** button on the **Standard toolbar.**
      i. The **Paste Function** dialog box is activated.
   b. If necessary, select the **Date and Time** in the **Function category** list, choose the **NOW** function on the **Function name** list, and click **OK.**
      i. The **Formula palette** is activated.
   c. Read about the **NOW** function, and click **OK.**
      i. The date and time are inserted into **cell B4.**
   d. Use the **Format Cells** dialog box to format the date and time to the **1:30 PM** format. Widen the column if necessary.

IV. Enter a formula by pointing.

a. Enter =COUNTA(in **cell B20.** Click and drag through **Range A7:A16,** and press the **Enter** key.
   i. This counts the number of movies in the inventory.

V. Enter a formula by pointing.
   a. Enter =COUNT(in **cell B23.** Select **Range F7:F16,** and press the **Enter** key.
      i. This counts the number of movies that have release dates.

VI. Enter the function **=AVERAGE(D7:D16)** in **cell B25,** and press the **Enter** key.
   a. The average price for a movie is calculated.

VII. Save, and close the workbook

DATA ENTRY SHORTCUTS

When using Excel, you will often find yourself keyboarding the same data over and over again. This can be very tedious and time-consuming. Excel has many features to help you enter data more efficiently. Excel has four primary data entry shortcut features: **AutoFill, AutoComplete, Pick From List, AutoCorrect,** and **Replace.**

AutoFill

Excel's AutoFill feature can be used to enter sequential data quickly. With **AutoFill** you can automatically fill in the days of the week, months of the year, and numeric sequences based on existing data. When entering a numeric series, such as **5, 10, 15, 20,** you can enter just the first two numbers in the sequence. Then select the two cells, and use the fill handle to fill in the rest of the series' values. The first value in your series is called the **start value,** the last value in your series is known as the **stop value,** and the increments that your series is going in is the **step value.**

Exercise 2-14 **Use AutoFill**

I. Open a new workbook.

II. AutoFill a series of months.
   a. Enter **January** in **cell A1.**
   b. Select **cell A1,** and click and drag the fill handle down to **row 12.**
      i. Labels for the twelve months are entered into **Range A1:A12.**

III. AutoFill a series of days.
   a. Type **MON** in **cell B4,** and then click and drag the fill handle across the row through **cell H4.**
      i. Labels for the seven days of the week are entered in **Range B4:H4.**

IV. Select **Range A1:I12,** and press the **Delete** key.
   a. The data is erased.

V. AutoFill a series of values.
   a. Type **500** into **cell B5,** and **1,000** into **cell B6.**
   b. Select **cells B5** and **B6.**

c. Click and drag the fill handle down until you see **3000** in the small yellow box, and then release the mouse button.
   i. The series **500** through **3000** is entered with increments of **500.**

VI. AutoFill a series of dates.
   a. Enter **1/1/98** in **cell A1.**
   b. Select **Range A1:A15.**
   c. Click **Edit, Fill, Series** on the **Menu bar.**
      i. The **Series** dialog box is activated.
   d. Make sure **Day** is selected as the **Date** unit, and click **OK.**
      i. **Range A1:A15** displays dates in increments of 1.

VII. Practice typing in different types of series.

VIII. Close the workbook without saving.

AutoComplete

Another data entry feature is AutoComplete. **AutoComplete** is used to repeat the same text entry down a column. When you type the first few letters of a previously entered label, Excel automatically fills in the rest of the entry. You then have the option of pressing the **Enter** key to accept the AutoComplete entry, or you can keep keyboarding the rest of the new entry.

Pick From List

The **Pick From List** feature allows the user the option to select from a drop-down list of the entries that are in the cells above. If you are entering repeated labels down a column and the AutoComplete feature is impractical, then use the Pick From List feature. First, type in your beginning entries. In the next empty cell, right-click the mouse, and select **Pick From List** from the **Shortcut menu.** A small drop-down list of previously entered labels appears. Click the desired choice.

Exercise 2-15 **Use AutoComplete and Pick From List**

	A	B	C	D	E	F
1	**Current Employees**					
2						
3						
4						
5						
6	**Name**	**Position**	**Address**	**City**	**State**	**Zip**
7	Barnes	Manager	44 Oak St.	Lakeland	FL	33658
8	Jamison	Data Entry	PO Box 33	Lakeland	FL	33565
9	Savalas	Accounting	67 Hull Ave.	Lakeland	FL	32102
10	Meyer	Sales	PO Box 21	Bartow	FL	32154
11	Tillman	Sales	98 Perkins St.	Lakeland	FL	33584
12	Jones	Marketing	8848 Happy St.	Tampa	FL	33565
13	Taylor	Sales	3932 Hwy 98	Lakeland	FL	32102
14	Meyerson	Sales	PO Box 9949	Tampa	FL	32154
15	Sanchez	Manager	884 Perkins	Lakeland	FL	33584
16	Jackson	Marketing	998 Crescent St.	Lakeland	FL	32565
17	Levine	Marketing	PO Box 887	Tampa	FL	33422
18	Perkins	Sales	431 Winter Ave.	Bartow	FL	33878

I. Open the **Current Employees** workbook from your data disk, and save it as **Ex 2-15 Current Employees** to your work disk.
II. Type **Levine** in **cell A17.**
III. Use AutoComplete to fill a cell.
    a. In **cell B17,** enter the letters **Mar** and let AutoComplete fill in the rest of the word **Marketing**, and then press the **right** arrow key.
        i. AutoComplete fills in the word **Marketing,** and the cell cursor moves to **cell C17.**
IV. Enter the address **PO BOX 887** in **cell C17,** and press the **right** arrow key.
V. Use Pick From List to fill a cell.
    a. Use the mouse and right-click on **cell D17.** Select **Pick From List** in the **Shortcut menu.**
        i. This displays a list of cities that are used in the above range.
    b. Click **Tampa**, and press the **right** arrow key.
        i. Tampa is entered in **cell D17.**
VI. Use AutoComplete to fill a cell.
    a. Type **F** in **cell E17** and let AutoComplete fill in the **L**. Press the **right** arrow key.
        i. **FL** is entered in **cell E17** using the AutoComplete feature.
VII. Enter the zip code **33422** in **cell F17.**
VIII. Use the AutoComplete and Pick From List features to enter another record for **Perkins.** She works in the **Sales** department. Her address is **431 Winter Ave., Bartow, FL 33878.**
IX. Save, and close the workbook.

AutoCorrect

AutoCorrect is the feature that corrects common spelling mistakes, capitalizes the first word of every sentence, and capitalizes the names of the month automatically among other things. To access AutoCorrect controls, click **Tools, AutoCorrect** on the **Menu bar**.

Replace

One last method to cut down data entry time is to use Excel's **Replace** feature. With this feature, you can have Excel find a certain cell entry, and then replace it with another. For example, let's say you have a movie inventory table, and in it there is a column labeled **Movie Category** with several different categories. You could select all of the categories, and then use Excel's Replace feature to find all occurrences of **Disney** in the **Movie Category** column and replace them with **Family.** The **Replace** dialog box can be activated by clicking **Edit, Replace** from the **Menu bar** or by using the shortcut keys **Ctrl+H.** Once the dialog box is open, enter data in the **Find what** and **Replace with** fields, and click the **Replace** or **Replace All** button.

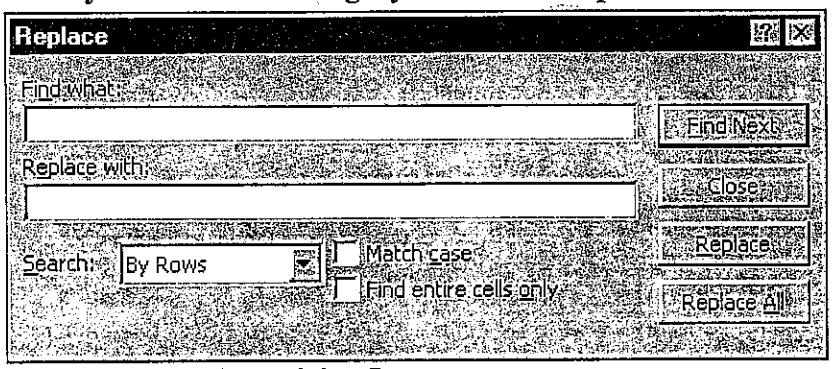

Figure 2.15: Replace Dialog Box

Exercise 2-16 — Use Replace

	A	B	C	D	E	F
1	**Current Employees**					
2	Full-Time and Part-Time					
3						
4						
5						
6	**Name**	**Position**	**Address**	**City**	**State**	**Zip**
7	Barnes	Leader	44 Oak St.	Orlando	FL	33658
8	Jamison	Data Entry	PO Box 33	Orlando	FL	33565
9	Savalas	Accounting	67 Hull Ave.	Orlando	FL	32102
10	Meyer	Sales	PO Box 21	Bartow	FL	32154
11	Tillman	Sales	98 Perkins St.	Orlando	FL	33584
12	Jones	Promotion	8848 Happy St.	Tampa	FL	33565
13	Taylor	Sales	3932 Hwy 98	Orlando	FL	32102
14	Meyerson	Sales	PO Box 9949	Tampa	FL	32154
15	Sanchez	Leader	884 Perkins	Orlando	FL	33584
16	Jackson	Promotion	998 Crescent St.	Orlando	FL	32565
17	Levine	Promotion	PO Box 887	Tampa	FL	33422
18	Perkins	Sales	431 Winter Ave.	Bartow	FL	33878

I. Open the **Ex 2-15 Current Employees** workbook from your work disk, and save it as **Ex 2-16 Current Employees** to your work disk.

II. Use the Replace feature.
   a. Select all of the positions in **column B.**
   b. Click **Edit, Replace** from the **Menu bar.**
      i. The **Replace** dialog box is activated.
   c. In the **Find what** field, enter **Marketing.**
   d. In the **Replace with** field, enter **Promotion.**
   e. Click the **Replace All** button.
      i. All occurrences of **Marketing** are replaced with **Promotion.**

III. Use the Replace feature.
   a. With the positions still selected, use the shortcut keys **Ctrl+H.**
      i. The **Replace** dialog box is activated.
   b. In the **Find what** field, enter **Manager.**
   c. In the **Replace with** field, enter **Leader.**
   d. Click the **Replace All** button.
      i. All occurrences of **Manager** are replaced with **Leader.**

IV. Use the Replace feature in the **City** column to find all occurrences of **Lakeland** and replace them with **Orlando.**

V. Use AutoCorrect.
   a. Enter **Full-Time adn Part-Time** (as spelled) into **Cell A2.**
      i. AutoCorrect automatically corrects **adn** to **and.**

VI. Save, and close the workbook.

CHAPTER SUMMARY

- A contiguous block of cells that are to be affected by an action is called a **range.**
- A range has a range address. **Range addresses** consist of two cell addresses separated with a colon. The upper left and lower right cell addresses define a range address.
- Select a range either by using the mouse, the **Shift** key in conjunction with the arrow keys, the **Name** box, or the **Go To** dialog box.
- Bold, italics, underline, font, font size, and font color are examples of general formats. Numeric formats are formats that you apply to numbers such as **Currency Style, Comma Style, Date,** and **Fraction.** Use the **Format Cells** dialog box to format cells.
- Displayed values may be different than true values if the cell has been formatted to fewer decimal places than the actual (true) value. The true value of the cell is unchanged. Numbers can also be formatted manually by typing the desired numeric symbol, like commas or dollar signs, when the value is entered.
- Worksheet formatting consists of widening columns and heightening rows, applying cell borders, applying cell shading, and inserting columns and rows.
- A **formula** is a set of instructions that tell Excel to perform a calculation. A **function** is a built-in formula you use for complex calculations.
- Copy formulas to other cells by clicking and dragging the fill handle, using the **Fill** command from the **Edit** menu, or using the shortcut keys **Ctrl+D.**
- When copying formulas, cell addressing is important. **Relative cell references** automatically adjust when copied to another cell. **Absolute cell references,** indicated by the currency symbol ($), remain constant when copied. The **F4** key can be used to automatically convert relative addresses to absolute addresses in a formula by placing a $ character before both the column and row labels in a cell address.
- **SUM, AVERAGE, COUNT, COUNTA, MIN, MAX, NOW, TODAY** are examples of commonly used functions.
- The **AutoSum** button on the **Standard toolbar** is used to automatically enter the **SUM** function.
- **Order of operations** is the sequence of calculations solved when numerous mathematical operators are used in the same equation.
- **AutoComplete, AutoFill, AutoCorrect** and **Pick From List** are useful shortcuts for entering data.

CHAPTER 2 PROJECTS

Project 2-1 Build a Worksheet with Formulas and Functions

	A	B	C	D	E	F
1	Computer Learning Center					
2	Payroll Worksheet					
3						
4						
5						
6						
7	Tax Rate:	13.50%				
8						
9		Hourly	Hours	Regular		Net
10	Employee	Rate	Worked	Pay	Taxes	Pay
11	Meyers	$ 12.00	40.00			
12	Simpson	12.00	35.00			
13	Jenkins	11.00	33.00			
14	Meryerson	9.00	23.00			
15	Jones	8.00	39.00			
16	Smith	10.00	40.00			

I. Build the worksheet as shown above, and then save it as **Proj 2-1 Computer Leaning Center** to your work disk.
II. Widen **column A** to **14 characters** and **columns B** through **F** to **10 characters.**
III. Format the title in **cell A1** to **Aqua 18-point Tahoma Bold Italic.**
IV. Format the subtitle in **cell A2** to **Aqua 12-point Tahoma Bold Italic.**
V. Using the format painter, paint the format from **cell A2** to **Range A9:F10,** and then center-align the column headings.
VI. Widen columns as necessary to allow entire labels and values to be displayed.
VII. Enter a formula in the **Regular Pay** column that multiplies the **Hourly Rate** by the **Hours Worked,** and copy the formula down the column.
VIII. Enter a formula with absolute addressing in the **Taxes** column that multiplies the **Regular Pay** by the **Tax Rate,** and copy the formula down the column.
IX. Enter a formula in the **Net Pay** column that subtracts the **Taxes** from the **Regular Pay**, and copy the formula down the column.
X. Use the format painter to copy the formats from **Range B11:B16** to the **Regular Pay**, **Taxes,** and **Net Pay** columns.
XI. Format the **Hours Worked** column to **no decimal places**, and center.
XII. Format the **Range D12:F16** to **Comma Style.**
XIII. Enter your own last name in **cell A17.** Give yourself an **$11.50 Hourly Rate** for **40** hours of work.
XIV. If necessary, copy the formulas from the row above to calculate your **Regular Pay, Taxes,** and **Net Pay.**
XV. Keyboard **Date:** in **cell A4,** and then enter the **TODAY** function in **cell B4.**
XVI. Keyboard **# of Employees:** in **cell A5,** and then use the **COUNTA** function in **cell B5** to count the number of employees in **Range A11:A20.**

XVII. Print a copy of the worksheet.
XVIII. Save, and close the workbook.

Project 2-2 Build a Worksheet with Formulas and Functions

	A	B	C	D	E
1	Carl's Carpet Sales				
2	Commission Worksheet				
3					
4	**Tax Rate:**	12.5%			
5	**Commission %:**	14.5%			
6					**Net**
7	**Sales Rep**	**Sales**	**Commission**	**Taxes**	**Pay**
8	Thomas	$ 45,000			
9	Sanchez	60,000			
10	Harris	56,000			
11	Larkins	34,000			
12	Perkins	29,500			
13					
14	**Summary Information**				
15	**# of Reps:**				
16	**Total Sales:**				
17	**Highest Commission:**				

I. Create the workbook above, and save it as **Proj 2-2 Carl's Carpet Sales** to your work disk.
II. Widen **column A** to **20 characters** and **columns B** through **E** to **12 characters.**
III. Format the title in **cell A1** to **Blue 22-point Arial.**
IV. Format the subtitle in **cell A2** to **Blue 14-point Arial.**
V. Format **cells B4** and **B5** to show **two decimal places.**
VI. Enter a formula in **cell C8** that multiplies the **Sales** by the **Commission %** using absolute cell addresses, and then copy the formula down the column.
VII. Enter a formula in **cell D8** that multiplies the **Commission** by the **Tax Rate,** and then copy the formula down the column.
VIII. Enter a formula in **cell E8** that subtracts **Taxes** from **Commission,** and then copy the formula down the column.
IX. Format **Range B8:E8** to **Currency Style with two decimals.**
X. Format **Range B9:E12** to **Comma Style with two decimals.**
XI. Format **Summary Information** in **cell A14** to **16-point Arial Bold Underline.**
XII. Use the **COUNTA** function in **cell B15** to count the data in the **Range A8:A12.**
XIII. Use the **SUM** function in **cell B16** to add the **Sales.**
XIV. Use the **MAX** function in **cell B17** to calculate the **Highest Commission.**
XV. Format the values in the **Summary Information** section appropriately.
XVI. Center and format **# of Reps** to **Comma Style with no decimal places.**

XVII. Format **Total Sales** and **Highest Commission** values to **Currency Style with no decimals.**
XVIII. Print a copy of the workbook showing formulas.
XIX. Save, and close the workbook.

Project 2-3 Shade and Apply Borders to a Range

	A	B	C	D	E
1	Carl's Carpet Sales				
2	Commission Worksheet				
3					
4	Tax Rate:	12.50%			
5	Commission %:	14.50%			
6					Net
7	Sales Rep	Sales	Commission	Taxes	Pay
8	Thomas	$ 45,000.00	$ 6,525.00	$ 815.63	$ 5,709.38
9	Sanchez	60,000.00	8,700.00	1,087.50	7,612.50
10	Harris	56,000.00	8,120.00	1,015.00	7,105.00
11	Larkins	34,000.00	4,930.00	616.25	4,313.75
12	Perkins	29,500.00	4,277.50	534.69	3,742.81
13					
14	Summary Information				
15	# of Reps:	5			
16	Total Sales:	$ 224,500.00			
17	Highest Commission:	$ 8,700.00			

I. Open the **Proj 2-2 Carl's Carpet Sales** workbook from your work disk, and save it as **Proj 2-3 Carl's Carpet Sales** to your work disk.
II. Use the **Borders** button on the **Formatting toolbar** to format **Range A8:E12** to **All Borders.**
III. Apply an **Aqua** fill color to the **Summary Information** area.
IV. Apply a **thick red bottom border** to **Range A7:E7.**
V. Print the workbook with formulas displayed.
VI. Save, and close the workbook.

Project 2-4 Enter Formulas and Functions

	A	B	C	D	E
1	Harry's Hardware Store				
2	Product List				
3	Date:	18-Apr-01			
4					
5	Item #	Cost	Price	Difference	% of Difference
6	445	5.99	9.99	4.00	66.8%
7	322	4.99	7.99	3.00	60.1%
8	233	12.99	18.99	6.00	46.2%
9	124	11.99	16.99	5.00	41.7%
10	566	9.99	13.99	4.00	40.0%
11	655	5.99	8.99	3.00	50.1%

I. Open the **Proj 1-5 Harry's Hardware Store** workbook from your work disk, and save it as **Proj 2-4 Harry's Hardware Store** to your work disk.
II. Widen **columns A** through **E** to **16 characters.**
III. Place a formula in the **Difference** column that subtracts the **Cost** from the **Price.** Copy the formula down, and format the range to **two decimal places.**
IV. Place a formula in the **% of Difference** column that divides the **Difference** by the **Cost.** Copy the formula down the column, and format the range to **Percent Style with one decimal place.**
V. Place a **double-line border** around the whole table and **single line border** within the table.
VI. Bold the title and subtitle.
VII. Bold and center the column headings.
VIII. Keyboard **Date:** in **cell A3** and boldface it. Enter a **TODAY** function in **cell B3.** Use the **14-Mar-98** date format.
IX. Print a copy of the worksheet.
X. Save, and close the workbook.

Project 2-5 Inserting, Deleting, and Hiding Columns and Rows

	A	B	C	D	E	F	G	H	I	J
1	City Temperatures									
2										
3										
4										
5										
6	**City**	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Average**	**High**	**Low**
7	Tampa	71	66	65	72	69	81	71	81	65
8	Phoenix	72	70	69	72	70	72	71	72	69
9	Lexington	65	64	65	67	69	68	66	69	64
10	Boston	69	73	71	68	67	67	69	73	67
11	LA	66	65	70	71	74	73	70	74	65
12	Seattle	69	73	66	74	73	71	71	74	66
13										
14	**Average**	69	69	68	71	70	72			
15	**High**	72	73	71	74	74	81			
16	**Low**	65	64	65	67	67	67			

I. Open the **City Temperatures** workbook from the data disk and save it as **Proj 2-5 City Temperatures** to your work disk.
II. Use the **AVERAGE, MAX,** and **MIN** functions to calculate the statistical data.
III. Center and format the statistical data to have no decimal places.
IV. Insert two rows between **Tampa** and **Boston,** and add the cities **Phoenix** and **Lexington.**
V. Enter the temperatures for the two new cities as illustrated above, and then copy the formulas down from the **Tampa** cells to calculate the statistical data.
VI. Insert a column between **Fri** and **Average,** and enter the day **Sat.**
VII. Enter the temperatures for the new day as illustrated above, including **81** for **Orlando.**

VIII. Copy the functions from **Range F15:F17** to calculate the statistical data for **Sat.**
IX. Center and format all values to have no decimal places.
X. Hide the **Tue** and **Wed** columns, and then redisplay the columns.
XI. Hide the **Tampa** and **LA** rows, and then redisplay the rows.
XII. Delete the **Orlando** row.
XIII. Format **Columns A-J** to **8-character** width.
XIV. Print the worksheet.
XV. Save, and close the workbook.

CHAPTER CHALLENGE

Computer Operator

Please open the **Ex 2-2 Pete's Computer Store** workbook, and insert a row at **row 9.** Keyboard the label **Total** in **cell A9** and **cell A17.** Use the **AutoSum** button to calculate the totals for **Revenue** and **Expenses.**

In **cell A20,** keyboard the label **Profit/Loss.** Enter a formula in **cell B20** that subtracts the monthly **Expenses** total from the monthly **Revenue** total, and copy the formula across the worksheet.

Format **Ranges B9:G9, B17:G17,** and **B20:G20** to **Currency Style with no decimal places.** Use the **Borders** button to apply **All Borders** around the **Revenue** and **Expense** sections, and shade the **Profit/Loss** area **Light Yellow.**

Make sure all the values and labels are visible. Print the worksheet with the **Salaries** row hidden, and then redisplay the row. Save the workbook as **Challenge 2-1 Pete's Computer Store.** Close the workbook.

Thanks
The Boss