MODULAR SYSTEM

MICROSOFT
EXCEL 2003

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SPREADSHEET BASICS

- ✓ Overview
- ✓ Screen Elements and Definitions
- ✓ Standard Toolbar
- ✓ Creating, Saving, Opening and Closing Workbook

Microsoft Office
Excel 2003

SPREADSHEET BASICS

1.1 OVERVIEW

Microsoft Excel is a spreadsheet program enabling the user to make calculations, prepare charts and manage data easily. When you have large amount of data, numbers and calculations (accountancy documents, personal info, marks and other info in a school, etc), it's very easy to process and get outputs from your data with a spreadsheet program like Microsoft Excel.

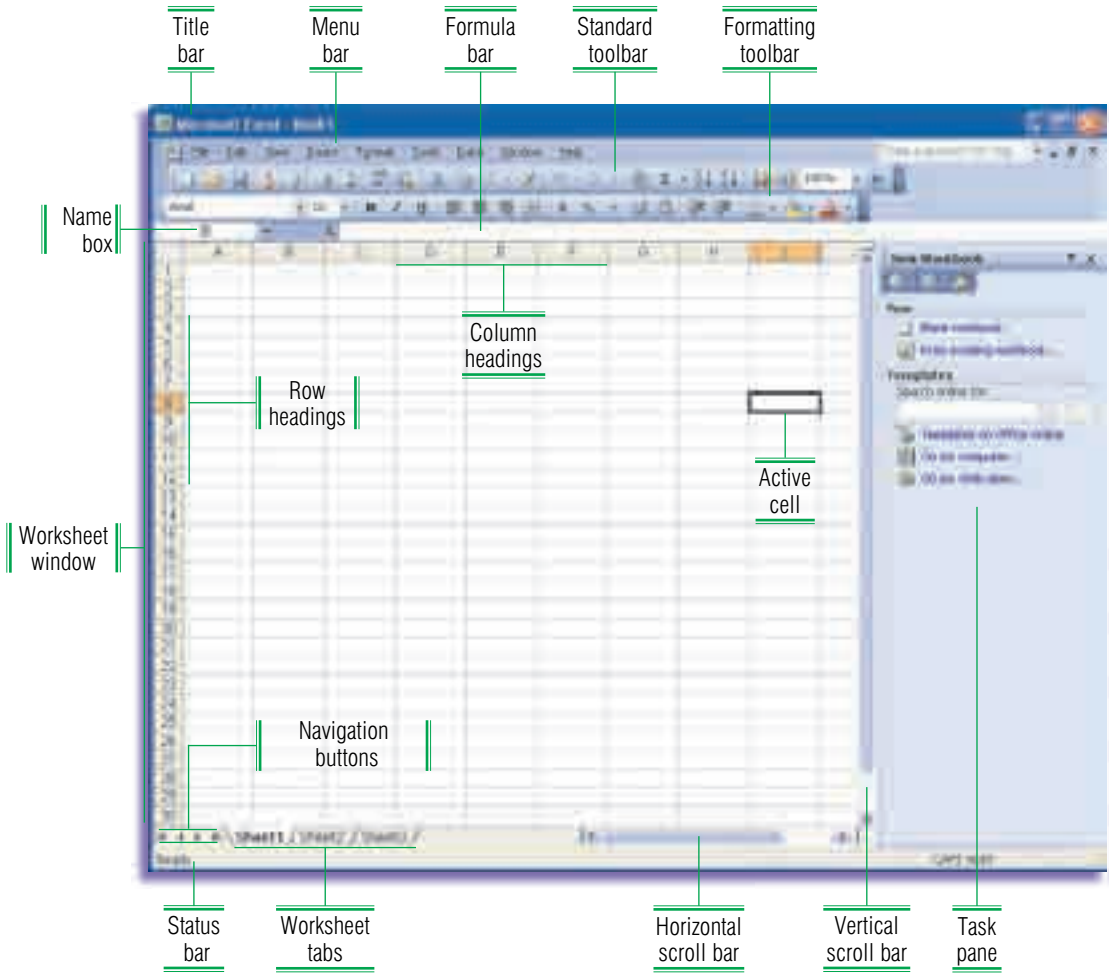


FIGURE 1.1 Excel Interface

1.2 SCREEN ELEMENTS AND DEFINITIONS

Cell: Microsoft Excel is made up of small boxes that are called **cells**. Each cell can have different properties and store different data. All cells have different addresses or names like "E5", which means "the cell in column E and row 5".

*You can change the name of a cell or a range from **Name Box***

Row: A row is the adjacent cells horizontally adjacent to one another. Each row is named with a number and contains 256 (28) cells.

Column: A column is the cells vertically adjacent to one another. Each column is named with letter(s) A, B, C, ... IV and contains 65536 (2^{16}) cells.

Worksheet: A worksheet contains both rows and columns (2^8 x 2^{16} = 2^{24} or 16.777.216 cells.)

Workbook: A workbook is made up of worksheets. Each worksheet is like a paper in a file (Workbook) that contains all formulas, links, and data in tabular format. Theoretically, a workbook can have as many worksheets as you want, but it's not suggested that you store too much information in a workbook. It's better to store it on different but related files.

Navigation buttons: They are placed at the bottom left corner of the active workbook. You can change the current worksheet using navigation buttons.

The name box: It shows the name or address information of the active cell. Using this box, you can change the reference name of the selected area. On the right side of the box, there is an arrow which is used to show the user defined area names. When you select one of these names Excel automatically selects and shows that range.

The formula bar: It is used to define formulas in the active cell.

The status bar: It shows messages or brief information about the current situation.

*To modify the formula in the active cell, press **F2***

1.3 STANDARD TOOLBAR

The Standard Toolbar provides quick access to commonly used actions. Each action is represented by an icon. When you move your mouse pointer over an icon, it is highlighted and a descriptive tool tip appears. Locate the icon for the action you want to perform click on the icon.

The Icons of the Standard Toolbar

New: Creates a new workbook.

Open: Opens an existing workbook created before.

Save: Saves the current workbook. If you're saving the file for the first time, you'll be required to give a name.

Send: Sends an entire workbook as an attachment to an e-mail or sends the current sheet as the body of an e-mail message.

Research: Displays a basic search panel to search anything that you want in the workbook.

Print: Prints a worksheet, chart or the entire workbook.

Print Preview: Displays print preview window.

Spelling: Checks a workbook for spelling errors.

Cut: Cuts the data in the selected range of cells.

Copy: Copies the data and/or formats in the selected range of the cells to MS Office clipboard.

Paste Special: Pastes the copied data and/or formats in the copied items from the clipboard to a selected range of cell(s). See Section 2.2.10 for details.

Format painter: Copies the format of the selected range cells onto another range.

Undo: Cancels the last action. You can undo upto 16 actions using the arrow from the drop down menu.

Redo: Repeats the last action. You can also redo the last 16 undo actions using the arrow from the drop down menu.

Hyperlink: Adds a hyperlink to the selected items.

Insert Function: Applies the sum function or any other function from the drop down menu

Sorts Ascending: Sorts the selected range of cells in ascending order

Sort Descending: Sorts the selected range of cells in descending order

Chart Wizard: Starts Chart Wizard for the selected range of cells

Drawing Toolbar: Displays or hides the drawing toolbar

Zoom: Zooms the worksheet to a percentage you specify.

Help: Displays the **Office Assistant** for help.

TABLE 1.1 The Icons of the Standard Toolbar

1.4 CREATING, SAVING, OPENING AND CLOSING A WORKBOOK

1.4.1 CREATING A WORKBOOK

A workbook may be created by in of these ways:

- Select **File > New. This** displays the **New Workbook** task pane. Then select **Blank Workbook** from the task pane.
- Click **New** button  on the **Standard Toolbar**.

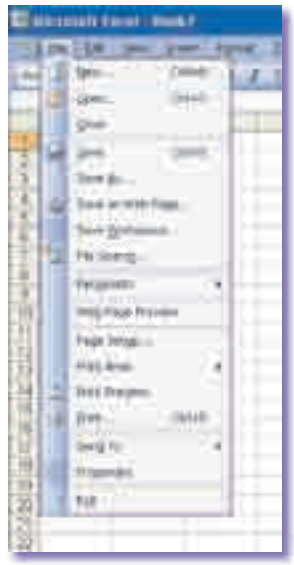


FIGURE 1.2 File menu

1.4.2 SAVING A WORKBOOK

Save As: Use the following steps when saving a workbook for the first time, or when you want to save it with a different name.

- Select **Save As ...** command from the **File** menu.
- When the Save As dialog box appears, select a location for the file.
- Type a name in the File name textbox.
- Click **Save** button.

Save: Use to save an existing file.

- Click Save button  on the standard toolbar
- or select **Save** command from the **File** Menu
- or press <Ctrl+S>.

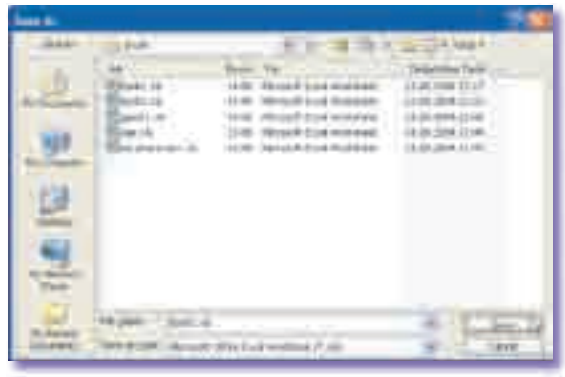


FIGURE 1.3 Save as... dialog box

1.4.3 OPENING A WORKBOOK

A workbook can be opened using one of these ways:

- Select **Open** command from the **File** menu which displays the Open dialog box. Then find and select the file to open.
- Click Open button  on the Standard toolbar.
- Or Press <Ctrl+O> key combination.

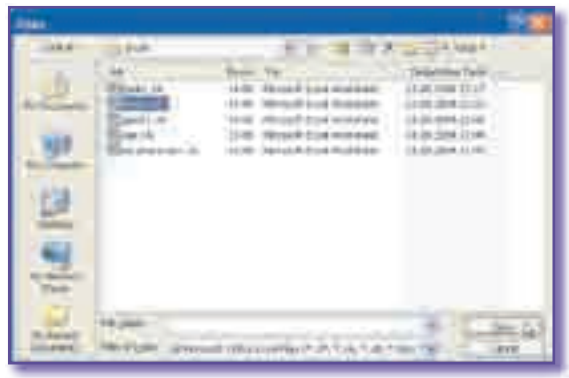


FIGURE 1.4 Open dialog box

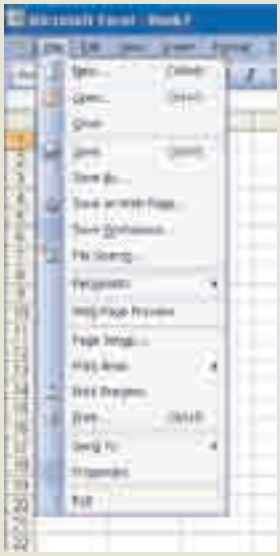
1.4.4 CLOSING A WORKBOOK

- Select **Close** command from the **File** menu to close the current workbook.
- Or Press <Ctrl+F4> key combination.

CHAPTER 1
IN BRIEF

In this chapter you have learnt what a spreadsheet is. Spreadsheet programs creates and manages the workbooks. A **workbook** is made up of worksheets. Each **worksheet** is like a paper in a file (workbook) that contains data and/or links in tabular format. A worksheet is composed of cells. A **cell** is represented by a reference like "A1", where "A" refers to column index and "1" refers to row index.

You also studied main file operations in Microsoft Excel. Some useful key combinations for Worksheet operations are:



Create a new workbook	<Ctrl+N>
Open an existing workbook	<Ctrl+O>
Save the current workbook	<Ctrl+S>
Close the current workbook	<Ctrl+W>
Print the workbook	<Ctrl+P>

SUMMARY

QUESTIONS

1. What kind of program is Microsoft Excel?

A. Word processing
B. Spreadsheet
C. Database
D. Graphics

2. Which of the followings has all commands in categories?

A. Standard toolbar
B. Formatting toolbar
C. Menu bar
D. Status bar

3. Which of the following commands is not in the standard toolbar?

A. Preview
B. Merge and center
C. Copy
D. Print

4. Which of the following displays the cell name?

A. Formula bar
B. Status bar
C. Name bar
D. Name box

5. Which is **not** the way of saving a workbook ?

A. <Ctrl+F5>
B. Click Save on the File menu.
C. Click the Save button on the Standard toolbar.
D. <Ctrl+S>

6. What file extension will normally be used for a file created by Microsoft Excel?

A.ppt
B.doc
C.xls
D.exe

7. Which icon is used to save a workbook?

A. 1
B. 2
C. 3
D. 5

8. Which icon is used to print a worksheet or chart?

A. 6
B. 10
C. 11
D. 12

9. Which icon is used to copy the format of the cells?

A. 10
B. 11
C. 12
D. 13

10. Which icon is used to undo the last action?

A. 14
B. 15
C. 18
D. 19

NOTES

CHAPTER 2

WORKSHEET AND CELL OPERATIONS

- ✓ Mouse Pointers
- ✓ Cell Operations
- ✓ Worksheet Operations

Microsoft Office
Excel 2003

WORKSHEET AND CELL OPERATIONS

2.1 MOUSE POINTERS

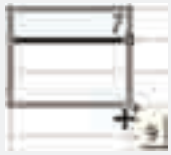
There are different mouse pointers when working with Excel.

The **Select** mouse pointer is used to select a cell or a range.

Select Column/Row is used to select rows or columns.

Unhide (show) a hidden row or column.

Copy/Fill series When you see this type of mouse pointer, and drag your mouse to another cell. A small box will appear next to the last cell with 4 different options, 



1. **Copy cells:** Copies and applies the format of the source cell to destination cells
2. **Fill series:** While applying the source format, automatically defines incrementation in the source, and fills series.
3. **Fill formatting only:** Just applies the formatting of the source cell(s) to the destination
4. **Fill without formatting:** Fill series or copy without formatting.

Move is used to move a range. Select the range that you want to move, and position your mouse pointer over a cell corner. When you see this type of mouse pointer drag it to the place that you want to move to. If the destination cells have data in them, Excel will prompt to overwrite.

Resize is used to resize columns or rows

2.2 CELL OPERATIONS

<Ctrl+A> selects all cells in a worksheet

2.2.1 SELECTING A CELL OR AN AREA

When you see the **Select** type of mouse pointer and click a cell, Microsoft Excel makes it the active cell. When you click a cell and drag the mouse pointer to another cell, all the cells between them will be selected as a range.

2.2.2 MOVING THROUGH A SELECTED AREA

In order to move throughout a selected area, without changing the selected range, four combinations can be used; Normally;

1. <Enter> : the bottom cell becomes the active cell.
2. <Shift+Enter>: the upper cell becomes the active cell.
3. <Tab> : the right cell becomes the active cell.
4. <Shift+Tab> : the left cell becomes the active cell.

On all of these options, after you reach the end of a column or row, if you again press the same key, the active cell goes automatically to the beginning of the next column or row.

<Shift+Tab>
the left cell becomes the active cell

<Shift+Enter>
moves active cell indicator to up one.

2.2.3 SELECTING MULTIPLE CELLS, ROWS OR COLUMNS

Using the SHIFT key and mouse (or with arrow keys), you can select multiple consecutive cells, rows, or columns. For this, first you select the initial cell (or row or column), then hold down the SHIFT key, using arrow keys or mouse, select the final cell (or row or column). Excel will automatically select all cells (or rows or columns) between the first and last locations. Using CTRL key and left mouse click, you can select multiple cells (and rows and columns) from different places.

To select an entire row:
Click the row heading

2.2.4 ENTERING DATA INTO A CELL

In order to write in a cell, select it and type what you need. If you need to type multiple lines of text (or other data) press **<Alt+Enter>** at the end of each line.

Use <Alt+Enter> to write multiple lines in a cell.

2.2.5 ENTERING DATA INTO AN AREA

After you select your data range, using the four combinations that we discussed in Section 2.2.2, you can move through and enter your data. In place of ENTER, use <Ctrl+Enter> to fill all the selected range with the same text.

Example 2.1:

Prepare your class list for informatics lesson marks. Select the marks as a range and enter marks for all students.

2.2.6 CLEARING DATA

In order to clear the data in a cell range, after you select the range, press DELETE on the keyboard.

Physical deletion of cells is different than clearing the data in the cells and will be explained in Section 2.2.11

2.2.7 RESIZING AND AUTO SIZING ROWS AND COLUMNS:

Using the **Resize** mouse pointer, you can change the height of rows. If you select multiple rows (with either the CTRL or SHIFT keys), when you change the height of one row, MS Excel automatically applies the same height to all other selected rows. It's the same for columns. First select the column(s), then when you see the **Resize** mouse pointer drag to the width that you want.

FIGURE 2.1
Resizing Columns

For auto sizing rows or columns, after you select your range, move your mouse pointer to a border of a row or column, when you see the Resize mouse pointer, double click it.

Select from **Format > Row > Height** to change the height. It will show you an input box. Instead of trying an approximate value, you can write a direct value in pixels for the height or width.

2.2.8 HIDING AND UNHIDING

When hiding rows or columns, they physically exist but their height or width is zero. Using the **Resize** mouse pointer, you can set the width of a column to zero and hide it. Or, from the popup menu, you can select the **Hide** command to do the same operation. Later, they can be **Unhide,** using **Format > Rows**.

FIGURE 2.2
Unhiding Columns

<Ctrl+C> Copy
<Ctrl+X> Cut
<Ctrl+V> Paste
<Ctrl+Z> Undo

2.2.9 CUT COPY PASTE OPERATIONS

Cut, Copy, and Paste operations are similar to other Windows applications. After you select a range, right click on the selected area. From the popup menu, select Cut or Copy. The cells are copied into the office clipboard and ready to be pasted. Just select the starting cell of the destination, then from the popup menu select Paste. This will paste all data and formats of the source to the destination.

2.2.10 PASTE SPECIAL

Paste special is one of the best features of Excel. In many conditions, you cannot copy all formats and data to the destination. For this purpose, Paste Special offers many useful options for users. Most of them are clear in expression and don't need to be explained further.

FIGURE 2.3 The Paste Special window

1. **All:** Pastes all, which is the same as regular paste.
2. **Formulas:** Pastes just the formula while adjusting the formula according to the destination (See Absolute and Relative Reference in Section 5.1.3).
3. **Value:** Pastes only the resulting values of formulas.
4. **Formats:** Paste the format only.
5. **Comments:** Paste the comments (refer to Comments in Section 8.5).

Operation

1. **None:** No operation
2. **Add:** When having numerical values, the source value can be arithmetically added to the destination value.
3. **Subtract:** The source value can be arithmetically subtracted from the destination value.
4. **Multiply:** Multiplies the source and destination values.
5. **Divide:** Divides the destination by the source value.

Skip blanks: It doesn't copy anything if the source cell is empty.

Transpose: Shifts the vertical and horizontal orientation of the cell range. If your cells are horizontally adjacent, it will rotate them to a vertical list.

2.2.11 DELETING – INSERTING

a. A cell or a group of cells

When you want to delete a cell itself, but not the content of that cell, right click on it and select **Delete** from the popup menu. Because the cell will be deleted physically, like a wall of bricks, the space cannot be empty, other cells will fill in the space.

FIGURE 2.4
Deleting a cell

In this case, you will have four different options:

1. **Shift cells left:** After deleting the selected range, it will move the cells from right to left, in order to fill the space.
2. **Shift cells up:** After deleting the selected range, it will move the bottom cells up, in order to fill the space.
3. **Entire row:** In order not to give a empty mid space, it will delete an entire row and move all bottom rows up.
4. **Entire column:** or you can select to delete an entire column.

*To delete a column, right click on the column heading and select **Delete** from the menu.*

The insertion process is similar to deletion. In order to add new physical space, some cells need to be moved. You can move right, or down, or you can insert an entire row or column. If you insert a row then all the rows will be moved one down. If your last row (e.g. Row 65536) contains data, it will ask you to move this data into a different location or clear it and try again.

b. Rows or columns

There is another method to delete rows. After selecting the rows heading that you want to delete, right click the selected area and select **Delete**. It will directly delete the selected rows or columns.

2.3 WORKSHEET OPERATIONS

2.3.1 DELETING A WORKSHEET:

If you are sure to delete the Entire worksheet, right click on the worksheet name and then select **Delete** from the popup menu. There is no undo after you delete a worksheet and you cannot get your data back, Excel will ask if you are sure you want to delete.

2.3.2 RENAMING A WORKSHEET:

In order to rename a worksheet, right click on the worksheet name and then select **Rename** from the menu. Or you can directly double click on worksheet name and make your change.

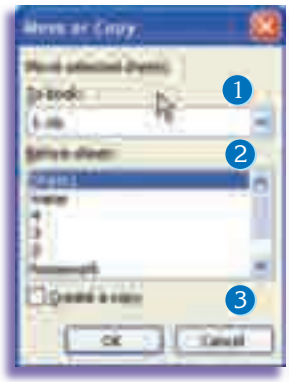


FIGURE 2.5 Copying or moving a worksheet

2.3.3 MOVING OR COPYING A WORKSHEET

This option lets you Move or Copy the selected worksheet to a different location in the same file or in another file. To Move or Copy, right worksheet name and select **Move or Copy…** A window will open. From the combo box 1, you can select to which workbook to copy to. If you check **Create a copy** 3, the source worksheet will be copied to the new location. Otherwise, it will be moved to. The list box in the middle 2 shows the worksheets of the selected workbook 1. The source worksheet will be inserted before the selected sheet.

2.3.4 INSERTING AN EMPTY WORKSHEET

Sometimes, you may need a new worksheet. Right-click on a worksheet name. From the popup menu select **Insert,** then select **Worksheet** from the window.

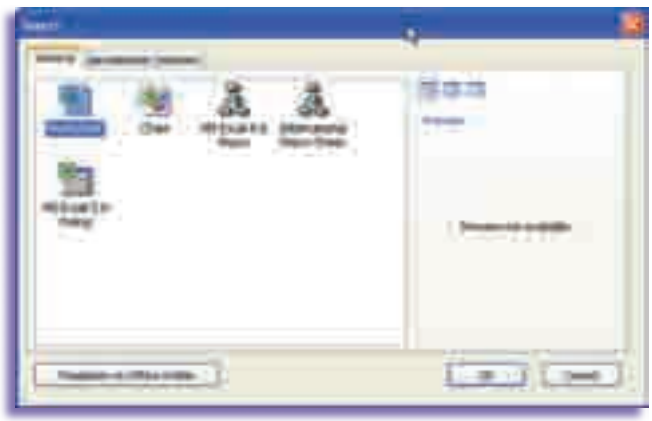


FIGURE 2.6 Inserting an empty worksheet

There are two tabs in this window. The **General** tab shows general options: Dialog, Chart, Macro or Worksheet. If you select the Worksheet option, it will insert an empty worksheet. If you select the Chart option, it will show necessary dialog boxes to prepare a chart and so on. The chart, macro and dialog box options will be studied later.

2.3.5 SELECTING MULTIPLE WORKSHEETS

Similar to selecting multiple cells, using the CTRL and SHIFT keys you can select multiple worksheets. When selecting an adjacent group of worksheets, first select the starting worksheet. Then while holding down the SHIFT key, select the last sheet of the adjacent list. All the worksheets between these two will be selected.

When selecting nonadjacent worksheets, select the first worksheet or range of worksheets, and then hold down CTRL and select the other worksheets or ranges.

To select multiple worksheets, <Ctrl+Click>

2.3.6 CHANGING AN ACTIVE WORKSHEET

Using the <Ctrl+Page up> or <Ctrl+Page down> keys, you can activate different sheets. Or, using the navigation buttons, you can move through the worksheets and use the mouse to activate the worksheet that you want. If you want to select multiple worksheets, hold down the CTRL or SHIFT keys and use the Page Up or Page Down and Space bar keys.

<Ctrl+Page up>
Previous worksheet

<Ctrl+Page Down>
Next worksheet

CHAPTER 2
IN BRIEF

In this chapter, you became familiar with the outline of Microsoft Excel and frequently used operations. First things first, you studied the common mouse pointers and operations.

You activate the cell by clicking on it. It means you might make changes to this cell. If you would like to select more than one cell, you may use the CTRL or SHIFT keys together with the left mouse click. You will use <Alt+Enter> at the end of each line if you want to enter multiple lines in a cell.

The best way of moving through a selected area and editing your data is to use the shift, tab, and enter keys.

You can hide your data easily in Microsoft Excel by setting its row height to zero using **Row** on the **Format** menu

One of the many good options you learnt in this chapter is **Paste Special**. This option lets you copy the values or formats only or add the item you copied to it's destination individually.

You have studied a dangerous option too. If you delete the entire worksheet, you cannot take it back. That is why you should read the messages carefully, before taking the next step, to avoid a mistake that would make you unhappy.

Moving a sheet is very easy in Microsoft Excel. Just select the sheet by right clicking on worksheet name tab and from the popup menu choose **Move or Copy...** With this option you can copy the sheet, move it to another workbook or to a new workbook.

If you want to create more sheets, you will click on the **Insert** menu and choose **Sheet**. A new sheet will be created.

You can group worksheets together by clicking on them while the CTRL key is pressed. With this, you can arrange the format in multiple sheets simultaneously. You can make the outline of your table and extend this to multiple sheets by using this option. Well done! You did it.

SUMMARY

QUESTIONS

1. Without using the mouse or the arrow keys, what is the fastest way of getting to cell A1 in a spreadsheet?

A. <Home>
B. <Shift+Home>
C. <Ctrl+Home>
D. <Alt+Home>

2. How do you select an entire row?

A. Edit>Select>Row from the menu.
B. Click the Row heading letter.
C. Hold down the CTRL key as you click anywhere in the row.
D. Hold down the SHIFT key as you click anywhere in the row.

3. What is <Shift+Tab> used for?

A.Moves active cell indicator down one cell.
B.Moves active cell indicator up one cell.
C.Moves active cell indicator to the right one cell.
D.Moves active cell indicator to the left one cell.

4. To delete a column,

A.Right click on a cell and then press DELETE.
B.Right click on the column heading and then select Delete.
C.Select the cells which you want to delete, and then press the delete button on keyboard.
D.Select the cells which you want to delete, and then press <Ctrl+Spacebar> button

5. Which key combination is used to change the active worksheet?

A. <Ctrl+Page Up>
B. <Shift+Page Up>
C. <Ctrl+Shift>
D. <Alt+Page Down>

6. To select the multiple cells, which keys are held down while clicking the mouse?

A. <ALT + SHIFT>
B. <ALT + CTRL>
C. <SHIFT + CTRL>
D. <ALT + SHIFT + CTRL>

7. Which key is used to modify data in a selected cell?

A.F1 B.F2 C.F3 D.F4

8. To select all cells in a workshee press,

A. <Ctrl+X>
B. <Alt+V>
C. <Ctrl+B>
D. <Ctrl+A>

9. Which of the following is **not** a way to complete a cell entry?

A. Click the Enter button on the formula bar
B. Press any arrow key on the keyboard
C. Press ENTER
D. Press INSERT

10. Which of the following is different from the others?

A. Cell
B. Row
C. Column
D. Gridline

11. Which keystrokes must be used to copy selected cells?

A. <Ctrl+X> and <Ctrl+V>
B. <Ctrl+C> and <Ctrl+V>
C. <Ctrl+V> and <Ctrl+C>
D. <Ctrl+Z> and <Ctrl+V>

12. How can you cancel the last action?

A. <Ctrl+Z>
B. <Alt+Z>
C. <Ctrl+Y>
D. <Ctrl+Backspace>

13. Which of the following is **not** a method for adjusting the width of a column?

A. Drag the column header's right border to the left or right.
B. Double-click the column header's right border.
C. Select the column header and click the Column Width button on the Standard toolbar.
D. Right-click the column header, select Column Width from the popup menu, and enter its new width.

14. Which of the following are true for inserting a row?

I. Right-click the row heading where you want to insert the new row and select Insert from the popup menu.
II. Select the row heading where you want to insert the new row and select Rows from the Insert menu.
III. Select a cell where you want to insert the new row, right click the mouse, select Insert and select Entire row.
IV. Select a cell where you want to insert the new row and select Insert > Rows from the menu.

A. I, II
B. I, II, III
C. I, II, IV
D. I, II, III, IV

15. Which of the followings is **not** a way of deleting a column ?

A. Right-click the column heading you want to delete and select Delete from the popup menu.
B. Select the column heading you want to delete and select Delete from the Edit menu.
C. Select the column heading you want to delete and select the Delete Row button on the Standard toolbar.
D. Select a cell where you want to delete the column, right click and select delete then select Entire column.

16. If you extend the following series two cells down while the first two cells are selected, what are the new dates in the 3rd and 4th rows ?

	A	B
1		Friday, October 01, 2004
2		Tuesday, October 05, 2004

A. Friday, October 01, 2005
Tuesday, October 05, 2006
B. Wednesday, October 06, 2004
Thursday, October 07, 2004
C. Friday, October 09, 2004
Tuesday, October 13, 2004
D. Saturday, October 09, 2004
Wednesday, October 13, 2004

17. To copy a format from one cell and apply it to another cell you would use:

A. The Copy Format and Paste Format commands from the Edit menu.
B. The Format Painter button on the Standard toolbar.
C. There is no way to copy and apply formatting in Excel—you would have to do it manually.
D. The Copy and Apply Formatting dialog box, which is located under the Format > Copy and Apply menu.

QUESTIONS

WORD SEARCH PUZZLE

S	P	A	R	A	B	E	C	A	P	S	S	D
P	Y	H	A	I	J	N	C	H	J	C	E	G
R	O	K	B	J	Y	W	F	E	C	R	D	K
E	C	O	L	U	M	N	N	R	L	O	H	U
A	L	O	O	V	Y	T	Z	X	F	L	K	C
D	T	B	O	P	E	R	F	X	X	L	S	U
S	S	K	T	R	D	R	D	N	E	I	G	P
H	O	R	I	Z	O	N	T	A	L	N	Z	V
E	F	O	R	M	A	T	T	I	N	G	Q	S
E	Y	W	F	M	X	W	P	W	C	H	C	J
T	P	B	M	V	B	D	C	I	L	A	T	I
B	J	O	E	V	Z	C	U	T	F	L	L	C
G	C	W	N	V	C	B	Q	P	V	K	O	J

Solve the clues and find each word in the puzzle.

WORDS	CLUES
SCROLLING	Move on-screen text or images horizontally or vertically so new information appears on one side of the screen as older information disappears from the other side.
	The longest key on the keyboard.
	Can contain buttons, menus, or a combination of both.
	A font style.
	The basic unit of a worksheet into in which you enter data.
	It's named with numbers and contains 256 cells.
	Insturction.
	A toolbar.
	Something arranged across.
	A font style.
	It is named with letters and contains 65536 cells.
	A program which allows you to enter formulas in table format and then perform calculations or create graphs.
	Perpendicular to the horizon. Up and down.
	Made up of sheets.
	Default extension of an Excel document.

PRACTICE

Use Figure 2.7 for questions 1 through 4.

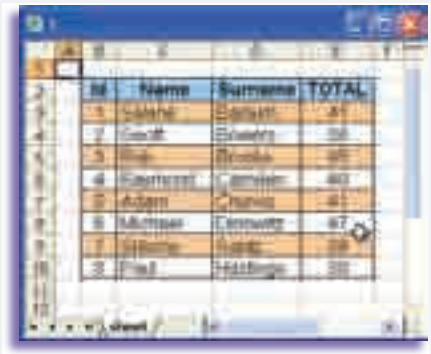


FIGURE 2.7

1. Height of the rows in the table is 12.75. Change them to 15.
2. As shown in the figure, range B2:E2 is the title of the table. Move this range to the bottom of the table.
3. Delete the 4th and 7th rows at the same time.
4. Add 3 columns between columns D and E.
5. Write numbers using the Fill Series command in Figure 2.8.

FIGURE 2.8

6. Do you know how to change the active worksheet without using the mouse?
7. Type your name to all cells in the range A1: P20 using the fastest way.
8. As shown in Figure 2.9, can you turn yellow colored cells to blue at the same time.
9. Can you select all cells using the keyboard?
10. On Figure 2.10, Copy the cell C4 to C10 and Move the cell C6 to C11.

FIGURE 2.9

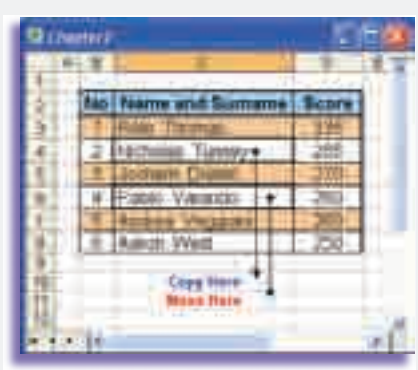


FIGURE 2.10

PRACTICE

11. How can you add the records from Table-1 to Table-2 to produce Table-3.

FIGURE 2.11

12. On Figure 2.11, copy the format of Table-1 to Table-2 using **Paste-special**.

13. Sometimes you need to change the direction of your lists from vertical to horizontal or vice versa. Show how you can change the list in Table 1 as in Table 2.

FIGURE 2.12

PROJECT

1. Find the cell AZ150 in the active worksheet.
2. Using the skills you've learned in this chapter, create a worksheet similar to the one shown here (you can fill it in using your own numbers if you want.)
3. Create a "Total" row in row 11. Calcute and write the sum for each quarter.

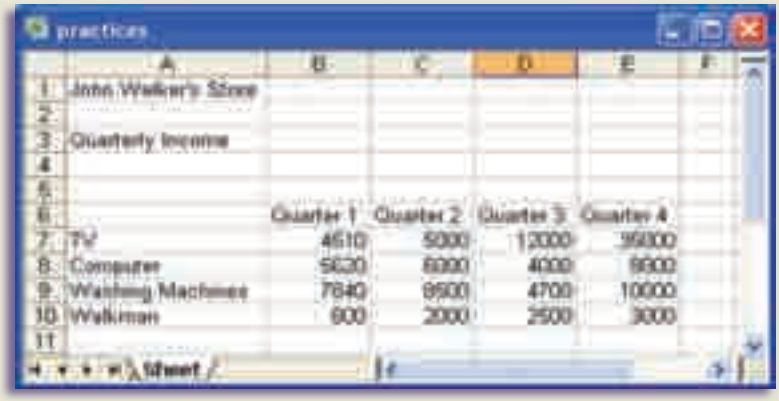


FIGURE 2.13

4. Write weekdays horizontally as shown in Figure 2.14. Then use the paste-special feature to shift to vertical.

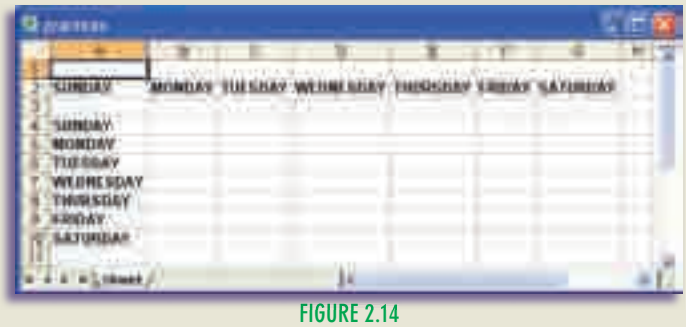


FIGURE 2.14

PROJECT

CHAPTER 3

FORMATTING CELLS

- Formatting Toolbar
- Format Cells Dialog Box
- Format Painter
- Auto Format
- Conditional Formatting
- Style

Microsoft Office
Excel 2003

FORMATTING CELLS

3.1 THE FORMATTING TOOLBAR

FIGURE 3.1 Tool tips

The Formatting Toolbar provides quick access to commonly used formatting actions. Each action is represented by an icon. When you put your mouse pointer over an icon, it is highlighted and a descriptive tool tip appears.

The following are brief explanations of the icons on the formating toolbar.

Icons of The Formatting Toolbar

Arial **Font:** Selects font from a drop down list.	
10 **Size:** Selects font size from a drop down list.	**Percent Style:** Applies percentage style.
Bold: Applies bold formatting.	**Comma Style:** Applies comma style for numeric values.
Italic: Applies italic formatting.	**Increase Decimal:** Increases the number of decimal points displayed.
Underline: Underlines the selected range of text.	**Decrease Decimal:** Decreases the number of decimal points displayed.
Align left: Aligns the contents of the selected range to the left.	**Decrease Indent:** Decreases the level of indentation.
Center: Positions the text in the center.	**Increase Indent:** Increases the level of indentation.
Right: Aligns selected range contents to the right.	**Borders:** Used to add / modify borders.
Merge and Center: Centers the text in a selected cell and merges multiple cells into one cell.	**Fill Color:** Used to change / apply fill color.
Currency Style: Applies currency style.	**Font Color:** Used to change / apply font color.

3.2 USING THE FORMAT CELLS DIALOG BOX

This section explains changing formats such as numbers, alignment, font, border, patterns and protection of a range of cells. The The Format cells dialog box can be accessed in by clicking **Format>Cell** or from the popup menu.

FIGURE 3.2 Number Tab in Format Cells

3.2.1 NUMBER

Category: Select the desired format from the **Category** box. Each item forms a special formatting on the selected cells.

Sample: Shows how the selected number format looks like.

Example 3.1:

Do you wonder which day of the week you were born? Excel will help you, simply enter your birthday in the format month/day/year.

Solution:

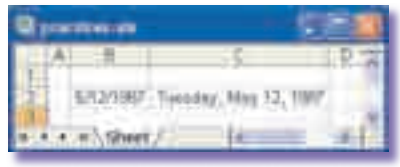


FIGURE 3.3 Changing date format

1. Type your birthday into B2, for example 5/12/1987
2. On the **Format** menu, click **Cells**, and then click the **Number** tab.
3. Then, select **Date** and select "Tuesday, May 12, 1987" from the type box.
4. Click OK.

3.2.2 ALIGNMENT

Alignment changes the horizontal or vertical alignment of cell contents, based on options you choose.

Horizontal: Select an option in the horizontal list box (1) to change the horizontal alignment of cell contents. Changing the alignment of data does not change the data or the type.

Vertical: Select an option in the vertical list box (2) to change the vertical alignment of cell contents.

Indent: (3) Puts distance between any edge of the cell and a character, depending on your choice in horizontal and vertical. Each increment in the indent box is equivalent to the width of one character.

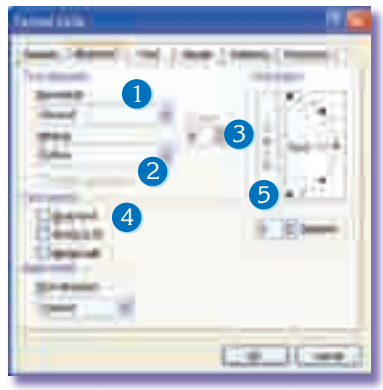


FIGURE 3.4 Alignment Tab on Format Cells

Text Control: 4 You can adjust how you want the text to appear in the cell.

Wrap Text into multiple lines. The number of wrapped lines depend on the width of the column and the length of the cell content.

Shrink to fit: If you check this option you will reduce the apparent size of font characters so that all data in the selected cell fits within the column. If you change the column width the character size is adjusted automatically, but the applied font size is not changed.

Merge cells: Combine two or more selected cells into a single cell, or unmerges the merged cells.

Right to Left: Select an option in the text direction box to specify.

Orientation: 5 You can change the orientation of text in selected cells.

Degree: You can enter a number to change orientation. Use a positive number in the degree box to rotate the selected text from lower left to upper right in the cell. Use a negative number in the degree box to rotate the selected text from upper left to lower right in the cell.

New fonts can be installed from Fonts on the Control Panel.

<Ctrl+B>Bold
<Ctrl+I>Italic
<Ctrl+U>Underline

3.2.3 FONT

Font: select a font name in your computer to change the font of the selected cell text.

Font style: select a font style fo the selected cell text.

Size: select a font size for the selected cell text. You can type any number between 1 and 409 to change size.

Underline: select an underline type format to apply to the selected cell text.

Color: select a color from the list to apply to the selected cell text.

Effects: select effects to apply from the Effets group box.

Strikethrough: draws a line through the selected text.

Superscript: changes format of the selected text to superscript

Eg. x^2

Subscript: changes format of the selected text to subscript

Eg. H_2O

Preview: shows how the selected text will appear.

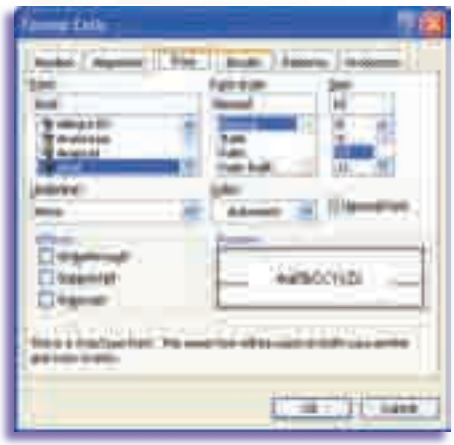


FIGURE 3.5 Font Tab on Format Cells

3.2.4 BORDERS

Presets: Apply a border style using the **Presets** options (1) and remove an old border style.

Line Style: Choose a border **Line Style** (3), then click the border to which you want to apply the new line style.

Line Color: (4) Select a color from the list to change line color.

Border: You can add/remove any **Border** lines (2) by clicking on them. The new lines will have the color and style you selected.

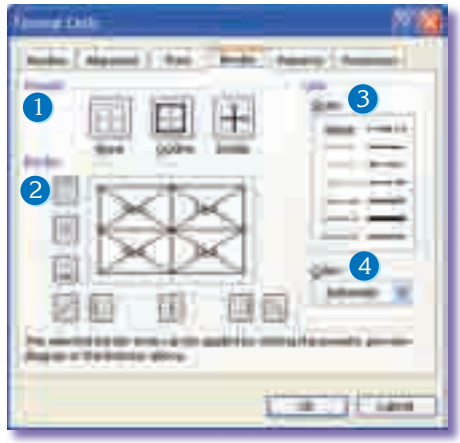


FIGURE 3.6 Border Tab on Format Cells

3.2.5 PATTERNS

Select a background color in the Color box, then select a Pattern from the Pattern box to format the selection with a color pattern.

FIGURE 3.7 Patterns Tab on Format Cells

3.2.6 PROTECTION

You can protect a sheet from the **Tools>Protection>Protect Sheet** menu. You can unlock any range of the cells before protecting the sheet.

Locked: Prevents selected cells from being changed, moved, resized, or deleted. Locking cells has no effect unless the sheet is protected.

Hidden: If you check this option you will hide a formula in a cell, so that it doesn't appear in the formula bar when the cell is selected. Hiding cells has no effect unless the sheet is protected.

Example 3.2:

Select the range of the cells that you want to unlock. Then uncheck the Locked check box from the Protection tab.

When you select **Protect sheet** from the **Tools** menu, all cells are protected except the ones you unlocked.

FIGURE 3.8 Protection Tab on Format Cells

3.3 USING THE FORMAT PAINTER

After you design one of your cells to fit your needs, you can use the **Format Painter** to apply the same format to others.

1. Select a source range
2. Click the **Format Painter** button on the standard toolbar
3. Click on the destination

With this, you apply the selected format to another range. But, you can apply only once. After you select the range, double click on Format Painter icon, to apply the format onto more than one range, until you press the ESC key.

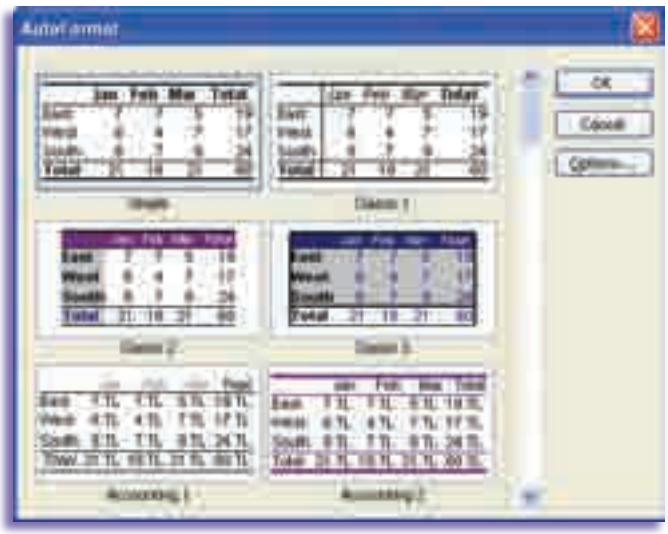


FIGURE 3.9 Auto Format menu

3.4 USING AUTO FORMAT

Excel can automatically format your worksheets with the AutoFormat command. AutoFormat is a built-in collection of formats: font sizes, patterns, and alignments which you can quickly apply to a cell range or an entire worksheet. AutoFormat lets you select from 16 different preset formats.

You can display auto format when you select **Format>Auto Format** from the menu bar.

Options: The AutoFormat dialog box expands to show six check boxes. You can control the type of formatting that is applied by checking or unchecking any of these boxes. If you want AutoFormat to skip one of the formatting categories, simply uncheck the appropriate box.

3.5 CONDITIONAL FORMATTING

Conditional Formatting formats cells only if a specified condition is satisfied. For example, you could use conditional formatting to display a student's mark that is 5 in bright blue boldface formatting, and in red italic formatting if the student's grade is 2. If the value of the cell changes and no longer meets the specified condition, the cell returns to its original formatting.

Example 3.3:

Conditional Formating for a Cell or Cell Range:

1. Select the cell or cell range you want to format conditionally.
2. Select **Format > Conditional Formatting** from the menu.
3. Enter the condition (for example, Cell Value is greater than 10).

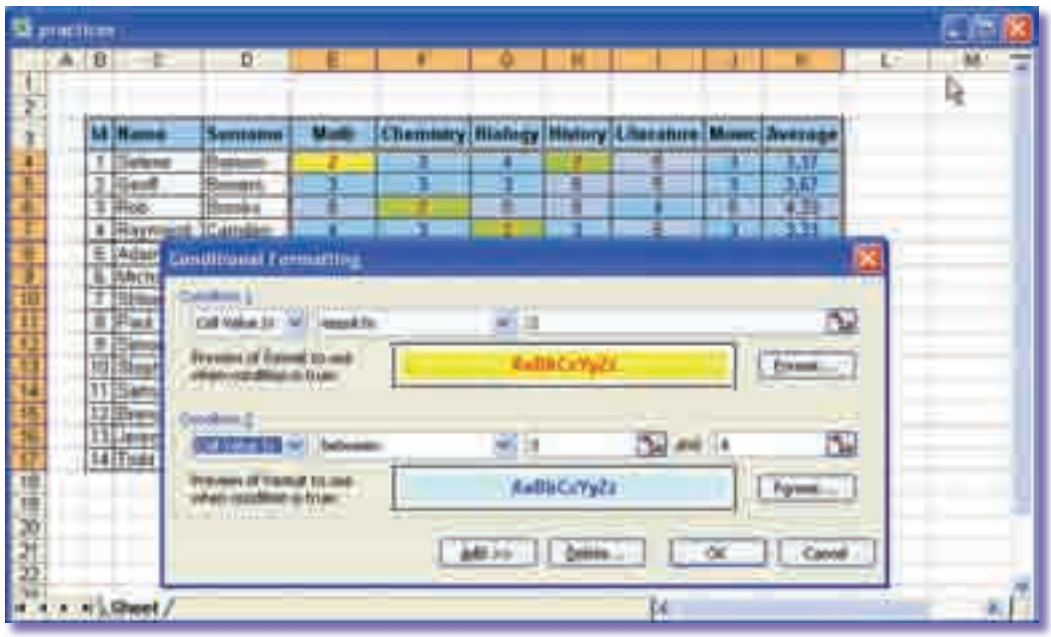


FIGURE 3.10 Conditional Formatting

You can use up to three conditions for a cell.

4. Click the **Format** button and specify the formatting you want to use if the condition is true.

5. If you want to specify additional conditions for the selected range, click the Add button and repeat Steps 3 and 4.

6. If you want to delete conditions you can delete by clicking Delete button.

3.6 USING STYLE

A **Style** is a collection of formats such as font size, color, patterns, and alignment that you can predefine and save as a group. Once you have defined and saved a style, you can apply all of the formatting elements at once.

A **Style** can contain any (or all) of the following formatting attributes:

- Number
- Font (type, size, and color)
- Borders
- Alignment
- Pattern
- Protection (locked and hidden)

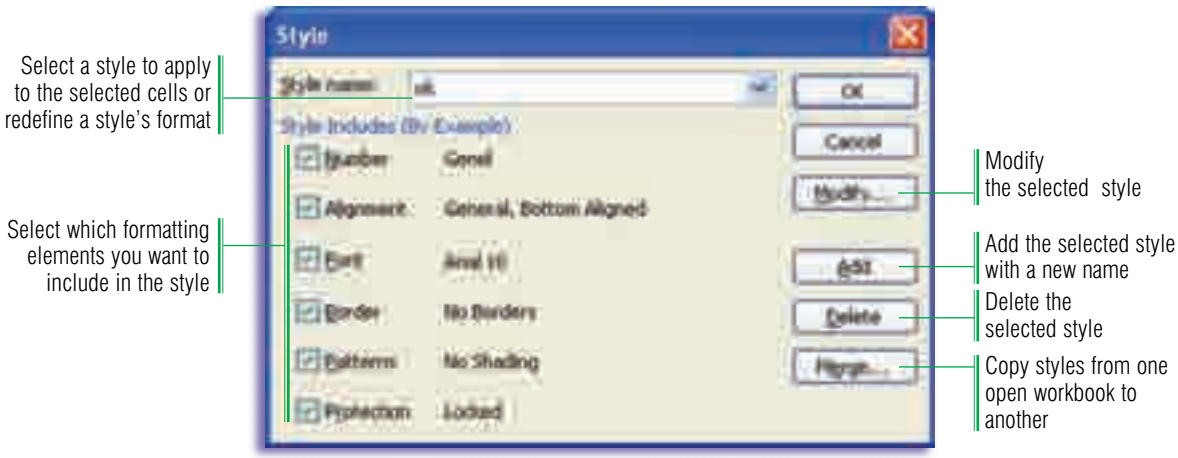


FIGURE 3.11 Style dialog box

CHAPTER 3
IN BRIEF

SUMMARY

This chapter explains formatting operations such as changing background, font color and so forth.

Microsoft Excel has a useful and flexible toolbar to accomplish most of the formatting operations. The formatting toolbar provides quick access to frequently used operations.

- You can add a pattern for your data-using **Category** under the **Number** tab in the **Format Cells** window.
- It is possible to change the direction of the text to fit it in the cell area, or join cells together from the **Alignment** tab.
- The third tab on the **Format Cells** window is **Font**. You can change the size, type, name or you can add some effects to your text.
- Since Microsoft Excel is best with tables, you will mostly create tables. You may want to modify borders so that you have a nice looking tables. From the **Border** tab you can apply various border colors or styles.
- You can change each cell's background individually in Microsoft Excel. This increases its functionality. You can even select a picture background instead of conventional color or pattern.
- The last tab is **Protection,** which helps you to create templates. After you apply protection to sheet and workbook, other users can modify only the cells you want. You can easily create an invoice template leaving the product name and amount ranges unprotected so that the other users can modify only these areas. The rest of the worksheet is calculated or processed according to your formulas.

On the Format menu, you will find preset table templates that have various collections of formats. Just select a table and then choose **Auto Format** on the **Format** menu. Among the templates, choose the appropriate one for your use. That is it. You created a nice looking table with a little effort.

Sometimes you may want to emphasize some data in your list. To do this, Microsoft Excel provides formatting options dependant on your criteria. In **Conditional Formatting** on the Format menu, you define your criteria and all the values. Values which meet the criteria will have the proper formatting. For example, you can differentiate the salespersons who sold above the average by arranging your criteria in the table.

If you do not want to apply the same formatting one by one, you can define your favorite formatting as a style, and you can use it in your later tasks with one click.

QUESTIONS

1. Which of the following is used to write multiple lines in a cell?

A. Shrink to fit
B. Wrap text
C. Merge cells
D. Orientation

2. Which of the following adjusts the selected text to superscript in the Format Cell window?

A. Font
B. Alignment
C. Underline
D. Effects

3. You can move a cell by dragging when the CTRL key is held down.

TRUE ☐ FALSE ☐

4. Locked cells have no effect unless the worksheet is .....?

A. Protected
B. Hidden
C. Read only
D. Shared

5. Which of the following is **not** an example of a value?

A. May 10, 2001
B. Serial Number 50671
C. 57%
D. 350

6. Which of the following is **not** a way of changing the font size ?

A. Select the cell(s), select Format>Cells from the menu, click the Font tab, select the font size, and click OK.
B. Select the cell(s) and right-click the selection, select Format Cells from the popup menu, click the Font tab, select the font size, and click OK.
C. Select the text and choose a point size from the Font size box on the Formatting toolbar.
D. Select the text and select Format>Column. Change the value of width.

7. You have four cells that you want to combine into one. How can you do this?

A. Select the cells and click the Merge Cells button on the standard toolbar.
B. Select the cells and select Tools>Merge Wizard from the menu.
C. Select the cells and click the Merge and Center button on the Formatting toolbar.
D. Select the cells and select Edit>Merge Cells from the menu.

8. Which symbol is used before a number to make it a label?

A. =(equal)
B. ' (apostrophe)
C. " (quote)
D. _ (underscore)

QUESTIONS

QUESTIONS

9. How can you rotate text in a cell?

A. Select Format>Cells from the menu and click the Alignment tab.
B. Click the Alignment button arrow from the Formatting toolbar and select the desired alignment.
C. Select Format>Text Direction from the menu.
D. Right-click the cell and select Text Direction from the popup menu.

10. You want to change the dates in a worksheet so that they appear as 21 Oct 04, instead of 10/21/04. How can you do this?

A. Select the cells and click the Long Date button on the Formatting toolbar.
B. You will have retype all the dates, as there is no way to reformat them.
C. Select the cells and select Format>Cells from the menu, click the Number tab, select Date from the Category list and select the date format you want.
D. You need to call your system administrator and have him or her install the Microsoft Long Date patch for you.

11. Which is **not** a method for applying boldface to the selected cell range?

A. Select Format>Cells from the menu, click the Font tab, and select Bold from the Font style list.
B. <Ctrl+B>.
C. Right-click the text and select Boldface from the shortcut menu.
D. Click the Bold button on the Formatting toolbar.

12. To display additional decimal places in a cell, click the ..... button on the Formatting toolbar.

A. Increase Decimal
B. Percent style
C. Increase Indent
D. Decrease Indent

13. Which of the following statements is **not** true:

A. Clicking the Center button on the formatting toolbar centers the text or numbers within the cell.
B. The Merge and Center button merges several cells into a single larger cell and centers the contents inside the cell.
C. You can change cell alignment by clicking Cell from the Format menu and clicking the Alignment tab.
D. Cells can only display one line of text.

PRACTICE

1. Make the following table. You may use different contact and company names.

SALESMEN OF THE INTERNATIONAL TRADE COMPANY

	Company Name	Contact Name	Address	City	Country
SALESMEN	Alfreds Futterkiste	Jelena Berlum	Obere Str. 57	Berlin	Germany
	Ana Trujillo Emparedados y helados	Geoff Elevers	Avda. de la Constitución 2222	México D.F.	Mexico
	Antonio Moreno Taquería	Rob Brooks	Mataderos 2312	México D.F.	Mexico
	Around the Horn	Raymond Cantero	120 Hanover Sq.	London	UK
	Berglunds snabbköp	Adam Churies	Berguvsvägen 8	Luleå	Sweden
	Blauer See Delikatessen	Michael Dewitz	Forsterstr. 57	Mannheim	Germany
	Centros Publishers	Tiffany Gentz	Carrera 52A	Istanbul	Turkey
	Dulces Corridas preparados	Paul Hastings	C/ Araquil, 67	Madrid	Spain
	Ernst app.	Simon Howells	12, rue des Bouchers	Marseille	France
	Galería Other Markets	Stephen Milligan	23 Tsawassen Blvd.	Tsawassen	Canada
	Ete Beverages	Sylvia Ball	Fauntleroy Circus	London	UK
	Cactus Comidas para llevar	Brooke Hsu	Cerrito 333	Buenos Aires	Argentina
	Centro comercial Moctezuma	Jeremy Peterson	Sierras de Granada 9993	México D.F.	Mexico
	Chop-suey Chinese	Todd Rafferty	Hauptstr. 29	Bern	Switzerland
	Comércio Mineiro	Karin Schmidt	Av. dos Lusíadas, 23	São Paulo	Brazil
	Consolidated Holdings	David Shadowitz	Berkeley Gardens 12 Brewery	London	UK
	Drachenblut Delikatessen	Pete Thomas	Walserweg 21	Aachen	Germany
	Du monde entier	Pascal Varadis	67, rue des Cinquante Otages	Nantes	France

FIGURE 3.12

2. Prepare this table.

Name & Surname	Exam 1	Exam 2	Average
Adam Churies	4	4	4
Michael Dewitz	5	3	4
Tiffany Gentz	3	4	3,5
Paul Hastings	4	5	4,5
Simon Howells	4	5	4,5
Stephen Milligan	5	4	4,5
Average	4,17	4,17	4,17

FIGURE 3.13

PRACTICE

PRACTICE

3. Write the following expression in an Excel worksheet.

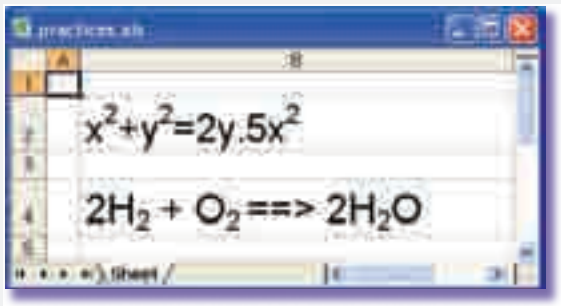


FIGURE 3.14

4. Try to prepare these tables by using **Auto format**.

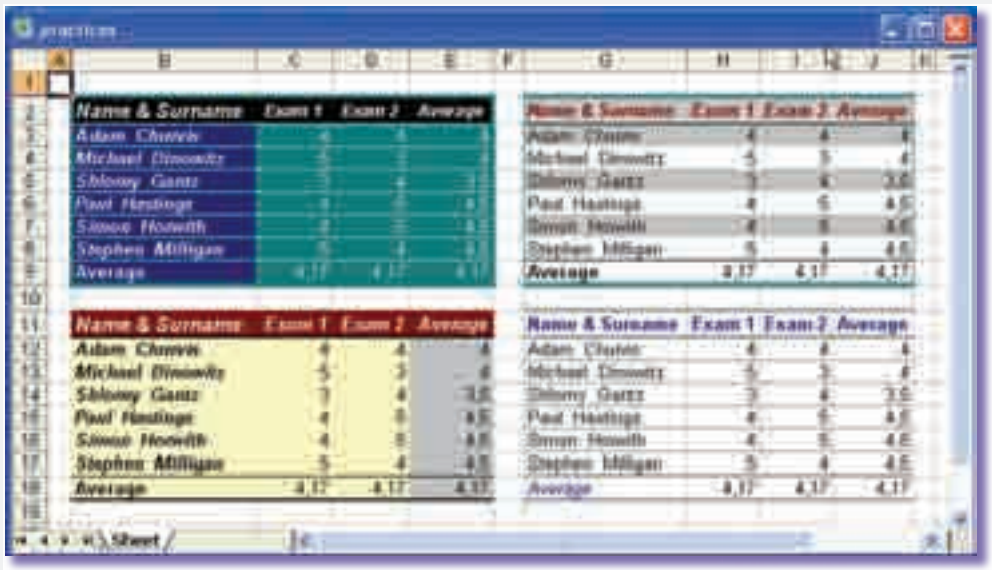


FIGURE 3.15

5. Make the table below. Avoid writing the currency symbol directly.

Reminder : You will use wrapping, merge cell and currency format.

(You may customize the currency symbol from the Windows Control Panel)

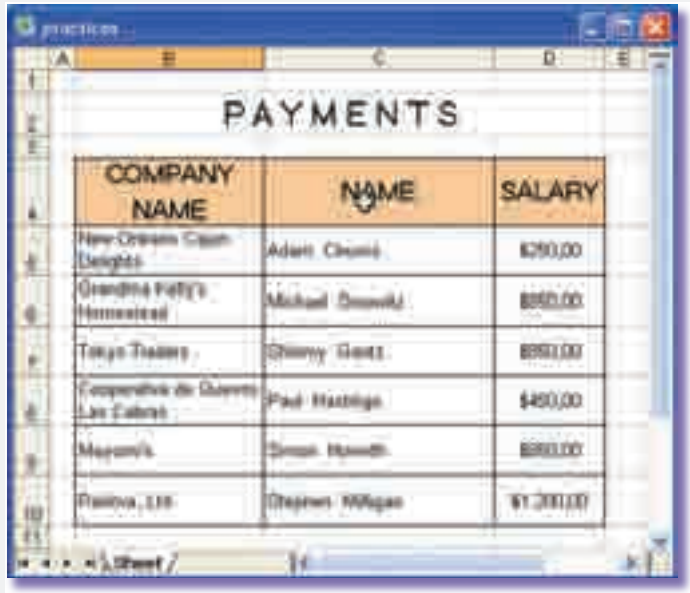


FIGURE 3.16

6. Create the following table and apply conditional formatting as shown in the figure.

Reminder: If the average of a student is less than or equal to 3, the background color is red, the font color is yellow

If any grade is 5, the background color is green, the font color is white.

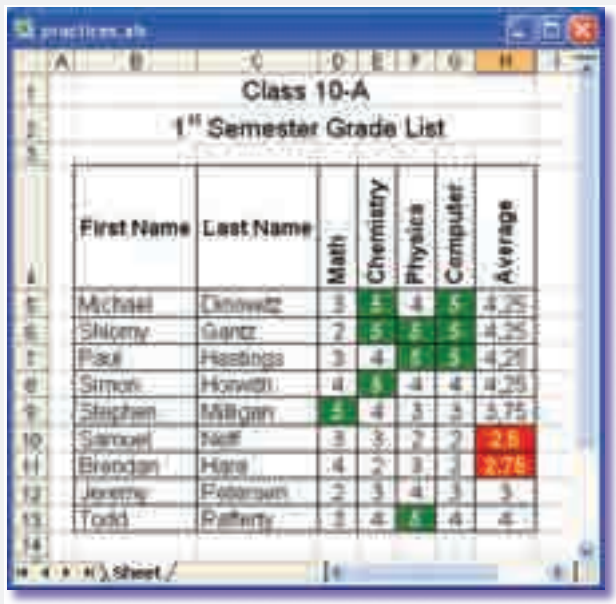


FIGURE 3.17

PRACTICE

WORD SEARCH PUZZLE

S	T	P	I	R	C	S	B	U	S	W	A
H	M	C	U	R	R	E	N	C	Y	R	U
R	B	K	J	N	H	D	D	Y	S	A	T
I	D	P	L	R	E	P	K	I	O	P	O
N	S	H	A	R	E	D	Z	B	A	L	F
K	E	M	L	T	R	E	D	R	O	B	O
O	R	I	E	N	T	A	T	I	O	N	R
T	N	O	F	R	C	E	O	E	H	E	M
E	W	H	C	H	G	E	R	P	Q	N	A
C	D	J	O	S	K	E	J	N	H	H	T

Solve the clues and find each word in the puzzle.

CLUES	WORDS
AUTOFORMAT	Applies a set of predefined formatting choices to worksheets and tables.
	Money that is used by a country.
	A set of letters, numerals, and shapes, which conform to a specific set of design criteria.
	The edge or margin of a range of cells.
	Combining two or more cells.
	Invisible.
	The alignment of an object in relation to the cardinal directions.
	Automatic moving of text to the subsequent line after completion of the previous one.
	An artistic or decorative design created by the regular repetition of shapes.
	A character or symbol printed partly below the base line of the text.
	Reducing the size of an content to fit it in a cell.
	Horizontal line underneath something written.
	The physical magnitude of the font.
	A network resource exported by a server or workstation.

PROJECT

1. Suprize to your parents, by finding out the day of the week they were born?

2. Write down a chemical expression in an Excel sheet.

3. Perform the following using Figure 3.18.

a. Create the following table.

b. Resize column A so that you can see all data within cells A7 through A10.

c. Change the font of the worksheet title to Times New Roman. (A1, A3)

d. Make the worksheet title bold, change its color to dark blue and its size to 14 pt.

e. Change the quarterly income amounts to currency formatting.

f. Center the column headings (from Quarter 1 to Total) and amounts, then apply bold formatting.

g. Add a bottom border to the cell, range B10:F10.

h. Merge the cell range A1:F1 into a single cell.

FIGURE 3.18

4. Create an interactive crossword puzzle in an Excel worksheet as shown in the Figure 3.19.

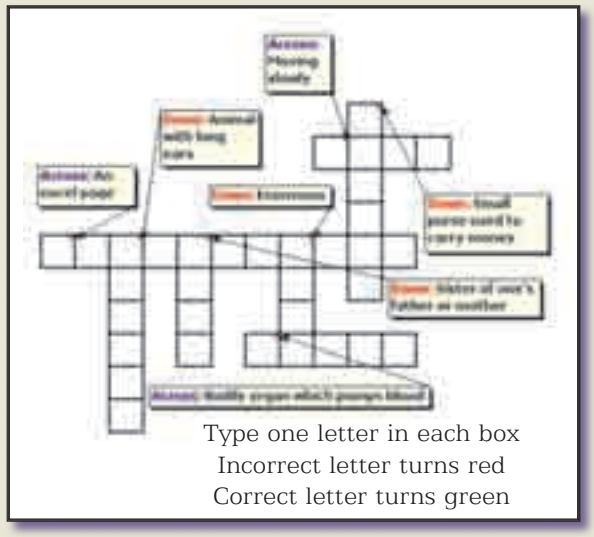


FIGURE 3.19

Hints: Use conditional formatting to check if the letter matched or not.

PROJECT

CHAPTER 4

PAGE SETUP AND PRINTING

- Page Setup
- Print Preview
- Print

Microsoft Office
Excel 2003

PAGE SETUP AND PRINTING

4.1 PAGE SETUP

You can use the **Page Setup** dialog box to customize the document to your preferences for printing. From the **File** menu, choose **Page Setup** to display the dialog box.

FIGURE 4.1 Page Tab on Page Setup

4.1.1 PAGE TAB

Orientation specifies the page orientation for the printed page using Landscape and Portrait radio buttons to choose what you want.

Scaling reduces or enlarges the worksheet, or fits the worksheet to a specific number of pages when you print. For example, if you want to arrange just the width of the document and leave the height as it is: In the first box beside Fit to, enter 1 (or your page width), in the second box beside Fit to, delete any value so that the number of height pages tall is unspecified.

Paper size: You can choose letter, A4, or other size options to indicate the size of your document. Ex. A4 is 210x297mm in size, Letter is 216x279mm in size.

Print Quality: You can choose the resolution to specify print quality for the active worksheet. Resolution is the number of dots per inch (dpi) that appear on the printed page. Higher resolution produces better printing quality.

First page number: Enter **Auto** to start numbering pages from 1 (if it is the first page of the print job) or write the starting page number for your workbook.

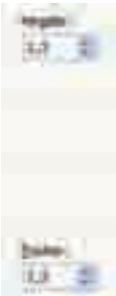
4.1.2 MARGINS TAB

Margins are the printing boundaries of the paper. **Left Margin** means the limit at the left of the page where your text starts. From this tab of the **Page Setup** you can enter margin settings and see result in the print preview box. Adjust measurements in the Top, Bottom, Left, and Right boxes to specify the distance between your data and the edge of the printed page.

FIGURE 4.2 Center on Page

Center on page: Centers the data on the page vertically, horizontally, or both.

Margin of the Header and footer



Changes the distance from the top edge to the header, when you enter a new margin size in the Header box.

Or to change the distance from the bottom edge to the footer, enter a new margin size in the Footer box.

These settings should be less than your top and bottom margin settings and greater than or equal to the minimum printer margins.

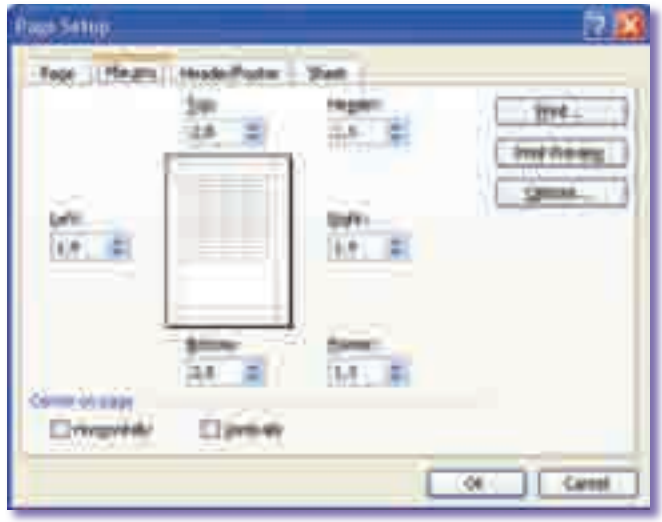


FIGURE 4.3 Margins Tab on Page Setup

4.1.3 HEADER/FOOTER TAB

You can enter a preset Header and/or Footer using the drop down menus.

You can change the Header/Footer using the **Custom Header** and **Custom Footer** buttons.

- **Font Button**: Changes font name, size, and style of the selected text in the section box.
- **Page Number Button**: Inserts an automatic page number in the header and/or footer when you print the worksheet or the chart.
- **Total Page Number Button**: Inserts the total number of pages in the worksheet.
- **Date Button**: Inserts the current date on your computer.
- **Time Button**: Inserts the current time on your computer.
- **Path & File Name Button**: Inserts the path and file name of the active workbook..
- **File Name Button**: Inserts the name of the active workbook.
- **Sheet Name Button**: Inserts the name of the active worksheet.
- **Insert Picture Button**: Allows you to insert a picture in the header/footer.
- **Format Picture Button**: Allows you to adjust the image.

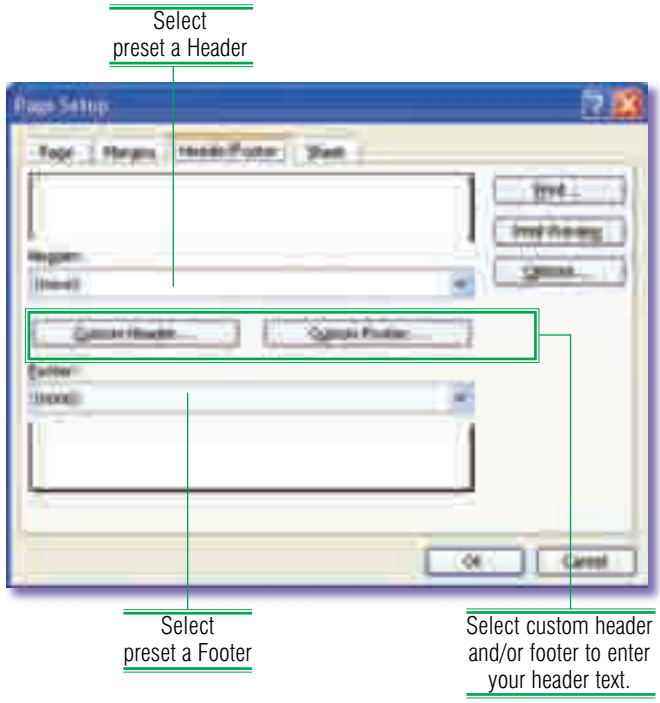


FIGURE 4.4 Header/Footer Tab on Page Setup

FIGURE 4.5 Custom Header

FIGURE 4.6 Sheet Tab on Page Setup

FIGURE 4.8 Chart Tab on Page Setup

Custom Header / Custom Footer

You can have only one custom header and one custom-footer on each worksheet. If you create a new custom header or footer, it replaces any other in the worksheet.

4.1.4 SHEET TAB

Print Area: You can specify a range to be printed, if you do not print all data.

Print Titles: When you have a large list that doesn't fit into one page, you can print the same columns or rows as titles on every page.

Print: You can select and decide what to print from your document: Gridlines, Comments, Cell errors, etc.

Print Order: Choose order of the pages in printing.

FIGURE 4.7 Page Order

4.1.5 CHART TAB

If the current worksheet contains an Excel sheet, the last tab of the **Page Setup** window shows sheet properties. If it is an Excel **Chart** object then the **Page Setup** window shows the **Chart** properties tab.

Printed chart size:

- If you select **Use full page** it will expand the chart to fit the full width and height of the page margins.
- If you select **Scale to fit page** it will scale the chart to the nearest page margin before printing.
- If you select **Custom** you can adjust the chart size.

Printing Quality:

You may select the **Printing Quality** you want. (Black and white or color)

4.2 PRINT PREVIEW

4.2.1 PRINT PREVIEW TOOLBAR

After you prepare your document, you may check and see the preview of the document. Use the Print preview button  on the Standard Toolbar to look over the page or to make your final adjustments before printing.

This will open a new window with buttons that are necessary for previewing.

FIGURE 4.9 Print Preview window

Next and Previous buttons: If you have multiple pages to be printed the **Next** and **Previous** buttons help you to move through the pages and see them.

Zoom button switches between a full-page view and a magnified view. The Zoom feature doesn't affect print size. Depending on your resolution settings, you may not see certain graphics properly, such as thin borders, in full-page view.

Setup… button will let you see and modify the **Page Setup** settings

Margins button allows you to see the page margins and fix them using your mouse.

Page break preview button shows the page breaks in an Excel sheet so you can modify them using your mouse. You can drag the page border to the new location you want. After you make changes to page breaks, Excel will automatically adjust the print scaling to fit into your preferences.

Close button closes the print preview window and goes back to the Excel worksheet.

4.3 PRINT

After you finish processing your document, you generally may want to print the document. To open Print window click **Print** from the **File** menu, or press **<Ctrl+P>** from the keyboard,

Hint: If you use the Print button from the standard toolbar, it will not open the print window but send the entire worksheet directly to the printer.

Microsoft added a new feature: Document Image Writer. With the help of this feature you can save your page as a picture and process it later. It provides

FIGURE 4.10 Print window

black and white 300dpi tiff format or MDI format for color outputs.

If you want to print from a local or a network printer, first of all, you must have a printer installed. You can see how to install a printer from the Windows XP book of this series. After you install your printer and plug all the cables in properly, select a printer from the **Printer Name** combo box at the top of the Print window. When printing, it is strongly recommended to follow this order;

- Firstly, give a final check and save your document
- Adjust page setup properties
- Adjust printer properties
- Send to a printer

Because all printers have different properties, the Properties page will be different for each printer. In general they have a page for Layout (page orientation, page order, paper size, etc.) and another for Print quality.

<Ctrl+P>
*Opens **Print** dialog box*

4.3.1 PRINT RANGE

If you select **All**, you will print all pages in the active sheet. If you select the **Page(s)** option button, you can define the range of pages to be printed.

In the **Print What** section, using radio buttons, you can select active sheet(s), an entire workbook or only the selected region to print. You may also print multiple worksheets by selecting with <Ctrl+Left click> combination.

If you select active sheet(s) from the **Print What** section, Excel will include all of the selected worksheets for printing. You can define the number of copies for each page using the **Copies** option button. Using the Collate check box you can adjust the print order of the pages.

FIGURE 4.11 Print Range

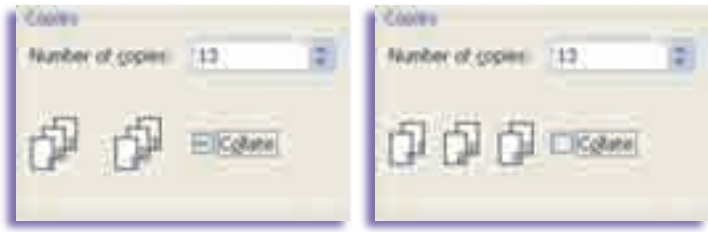


FIGURE 4.12 Collating print out

SUMMARY

CHAPTER 4
IN BRIEF

This chapter explains how to print in Microsoft Excel. It provides a wide range of printing preferences. You are already aware of margins, which define the empty space on each side of the paper. You arrange margins from **Page Setup**. It contains not only page margins but also many other useful options.

You modify page options by **Page Setup** on the **File** menu. On the **Page** tab, you can define the orientation of the page as portrait 1 or landscape 2. Also on the same tab, you will find a quite useful tool: **Scale**. For example, let us suppose you have prepared a document, which overflows a page a little bit. You can fit it in the page, using **Scale** in the **Page** tab. According to your printer's quality, you can rearrange the resolution. (Greater **dpi** means better quality, but also means more cartridge usage)

You can modify the **Header and Footer** from the second tab called **Margins**. You may need to print not the entire worksheet but some range instead. In such case, you will define the range of cells from the **Sheet** tab.

There is another useful option on the **Sheet** tab. Let us suppose you have a list with titles on columns, however, your list extends to several pages. You want your titles to go at the top of each page. This time, you will define the **Row to Repeat at the top** of each page, without having to copy on the top of each page. (It is meaningful where you cannot always decide where a page finishes or starts) If you create a chart as a sheet, you will see the **Chart** tab in place of the **Sheet** tab. With this, you will be able to scale your chart on the page, or change the print quality as draft or black&white.

Have you done everything all right? After changing the properties related to page, you can see whether you did right or not without having to print the page. From the **File** menu, you can access **Print Preview** or just click the  icon on the standard toolbar. You can check the page(s) out and make the final adjustments before printing.

After you make all the adjustments you can print the document. You can print using the **Print** button on the Standard Toolbar but it is better to print from the **File** menu (or <Ctrl+P>) where you can make additional changes.

When you open the Print dialog box from the File menu, you get the opportunity of printing individual pages rather than the entire worksheet. Moreover, you can define the number of copies for the page(s).

When you print multiple copies the **Collate** check box lets you change the print order as 1, 2... 1, 2... or 1, 1, 2, 2...

QUESTIONS

1. Which of the following options is **not** located in the Page Setup dialog box?

A. Page Orientation
B. Margins
C. Header / Footer
D. Page Break Preview

2. How do you set a Print Area, so that Excel only prints a part of a worksheet?

A. Select the area you want to print then select File>Print >Selection from the menu.
B. Select the area you want to print then click the Print Preview button on the Standard toolbar.
C. Select the area you want to print then click the Print button on the Standard toolbar.
D. There is not a way of doing this.

3. The page break is not at the place you want when you print a worksheet. How can you fix this?

A. Click the Page Break button on the Standard toolbar, and then click where you want the page to break.
B. Click the cell where you want the page to break and select Window>Freeze Panes from the menu.
C. Click the Print Preview button on the Standard toolbar and click the Fit to Print button on the toolbar.
D. Select View>Page Break Preview from the menu and drag the page break indicator line to where you want the page to break.

4. How can you view and/or add a page header to a worksheet?

A. Click the Header button on the Formatting toolbar.
B. Select File>Page Setup from the menu and click the Header/Footer tab.
C. Select the area you want to print and click the Print button on the Standard toolbar.
D. There is no way to do this.

5. ..... reduces or enlarges or fits the worksheet to a specific number of pages.

A. Orientation
B. Scaling
C. Paper size
D. Print quality

6. ..... is the number of the dots per inch (dpi) that appears on the printed page.

A. Scaling
B. Margins
C. Resolution
D. Print quality

7. ..... are the printing limits of the paper.

A. Scalling
B. Print Quality
C. Measurement
D. Margins

8. ..... settings should be smaller than the top and bottom margin settings and larger than or equal to the minimum printer margins.

A. Header and footer margin
B. Print area
C. Date button
D. Chart tab

9. If you select ..... you will expand the chart to fit the full width and height of the page margins.

A. Use full page
B. Scale to fit page
C. Draft quality
D. Printing quality

10. If you have multiple pages to be printed ..... help you to move through the pages and see them in the Print Preview window.

A. Active sheet(s)
B. Entire workbook
C. Next and previous buttons
D. Zoom button

QUESTIONS

WORD SEARCH PUZZLE

Solve the clues and find each word in the puzzle.

H	P	W	V	A	H	D	D	P	X	D	F
E	U	L	A	V	I	J	F	O	G	H	O
X	X	L	L	V	Z	O	U	R	R	E	O
K	T	N	I	G	R	A	M	T	I	A	T
A	N	D	D	M	M	D	D	R	D	D	E
F	E	P	A	C	S	D	N	A	L	E	R
E	M	T	T	J	P	N	G	I	I	R	F
Y	M	I	I	D	R	K	E	T	N	C	B
O	O	F	O	R	M	U	L	A	E	Y	N
Y	C	T	N	E	R	I	K	Z	S	G	X

WORDS	CLUES
LANDSCAPE	Page orientation in which the page width exceeds the page length.
	A function that allows you to add the numbers in multiple cells.
	To be the right size or shape.
	Starts with "=" signs and represents what the calculations for each cell.
	One or more lines of text that appear at the bottom of every page of a document.
	The size, style, type page, margins, printing requirements, etc.
	The horizontal and vertical lines on the spreadsheet.
	Text that appears at the top of every page of a document when it is printed.
	Area between the edge of a page and the written or printed text.
	The orientation of a page in which the longer dimension is vertical.
	Comparing data with known information (patterns, ranges, check digits) to verify that the data is correct.
	A number that can be entered into a cell.

PROJECT

1. Make a nice looking table which has the names and surnames of your classmates with their grades in computer lesson. Then show a print out to your teacher.

2. Find and write down the results of a General Assessment Test in your school in an Excel worksheet.

   a. Print the table sorting by class then sort by average in descending order.

   b. Assuming you have multiple pages, on the top of each page you must have the same title.

PROJECT

CHAPTER 5

FUNCTIONS AND FORMULAS

- ✓ Understanding Functions and Formulas
- ✓ Simple Functions
- ✓ Using Functions and Formulas

Microsoft Office
Excel 2003

FUNCTIONS AND FORMULAS

5.1 UNDERSTANDING FUNCTIONS AND FORMULAS

Using formulas is the essential part of Excel. Microsoft Excel is best when you have lots of numbers and different calculations with these numbers. Each box (cell) is like a different address and can be used with its referring address or name.

TO REFER TO	USE
The cell in column A and row 10	A10
The range of cells in row 15 and columns B through E	B15:E15
All cells in row 5	5:5
All cells in rows 5 through 10	5:10
All cells in column H	H:H
All cells in columns H through J	H:J
The range of cells in columns A through E and rows 10 through 20	A10:E20

FIGURE 5.1 Reference style

The A1 reference style

By default, Excel uses A1 reference style. This refers to columns with letters (A, B, C... IU, IV a total of 256 columns) and to rows with numbers (1 through 65536). These letters and numbers are called row and column headings. To refer to a cell, enter the column letter followed by the row number.

For example, B2 refers to the cell at the intersection of column B and row 2.

Referring to another worksheet

When referring to a cell in another worksheet. The worksheet name is followed by an exclamation mark and then the cell name is written.

=10C!A2 (refers to cell A2 in sheet 10C)

5.1.1 WRITING YOUR FIRST FORMULA

To write a formula, you must start with an equal sign "=". Then, using references, numeric values and arithmetic operators, you can write your own formulas. (You can see the cell reference name in **Name Box** on the left of Formula Bar).

Example 5.1:

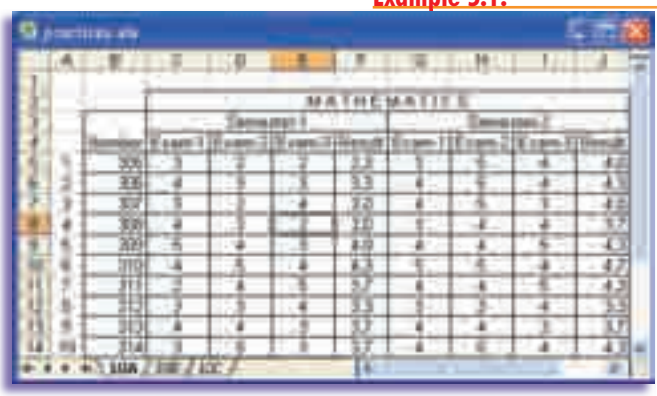


FIGURE 5.2 Writing Formula

You have a worksheet that lists all lessons, semesters and exams for each student. In order to calculate a student's average first semester average, you need to calculate the sum of Exam1, Exam2 and Exam3 and then divide the result by 3.

Solution:

You can not write Exam1 in your formula. You have to write referring address. According to Figure 5.2 the cell containing Exam1 is C4 for the first student. First, you select the cell where the result will appear (F4) and then write the formula.

= (C4+D4+E4)/3

After you press the ENTER key, it will display the average of the first student. Now, you can copy this formula for the other students. If you did not define the cells as an absolute address reference, Excel will automatically make the necessary changes to the formulas. (For absolute and relative addresses refer to Section 5.1.3). For the second student the Exams are stored in the 5th row and the formula has to be = (C5+D5+E5)/3. Since you used relative reference here, Excel automatically makes the necessary changes to the formula for every row and column.

5.1.2 OPERATORS IN EXCEL FORMULAS

Example 5.2:

Your math teacher needs some help. He wants to write all students' marks in the computer, but, he doesn't know how to do it. He wants you to prepare an Excel sheet in which he will write the students' marks. He has two written exams and a final exam. When calculating the semester average, written exams weigh 25% each, and the final exam 50%. Help him prepare an Excel sheet like the following one.

Analyses and Solution:

Since you want to calculate the final as 50% of the grade, you will multiply Final Exam (F2) by 50 and the other exams by 25. Then the sum of all will be divided by 100 to get the student's average. In cell G2 write the formula = (F2*50+E2*25+D2*25)/100 to get the average of the first student. Copy the formula for the other students in the list.

	A	B	C	D	E	F	G
1	Id	Name	Surname	Exam 1	Exam 2	Final Exam	Average
2	1	Stephen	Milligan	70	70	80	75
3	2	Samuel	Hall	100	100	80	90
4	3	Brendan	Hara	10	10	100	55
5	4	Jeremy	Petersen	100	100	10	55
6	5	Todd	Rafferty				
7	6	Kevin	Schmidt				
8							

FIGURE 5.3 Finding Average

OPERATOR	MEANING	EXAMPLE	RESULT
+	Addition	=3+2	5
-	Subtraction	=3-2	1
/	Division	=3/2	1.5
*	Multiplication	=3*2	6
%	Percentage (Divides number by 100)	=50%	0.5
^	To the power	=3^2	9

FIGURE 5.4.a Arithmetic Operators

OPERATOR	MEANING	EXAMPLE	RESULT
=	Equal sign	=3=2	FALSE
>	Greater than	=3>2	TRUE
<	Less than	=3<2	FALSE
>=	Greater than or equal to	=3>=2	TRUE
<=	Less than or equal to	=3<2	FALSE
<>	Is not equal to	=3<>2	TRUE

FIGURE 5.4.b Logical Operators

OPERATOR	MEANING	EXAMPLE	RESULT
:	Range	A2:C7	All the cells from A2 to C7
,	Union (to define more than one reference)	A1,B1:B6	The cells from B1 to B6 and A1
space	Intersection	=B7:D7 C6:C8	produces reference to common cells to the two references

FIGURE 5.4.c Other Operators

FIGURE 5.4 Operators in Excel

5.1.3 ABSOLUTE AND RELATIVE REFERENCE

A1 ➔ Relative column, Relative row.
$A1 ➔ Absolute column, Relative row.
A$1 ➔ Relative column, Absolute row.
$A$1 ➔ Absolute column, Absolute row.

A relative reference is an address that keeps the relative difference of the source from destination cells. When you copy this formula to another location. Microsoft Excel automatically adjusts the new addresses relatively, according to the new location.

Sometimes, you may not want an address to change when you copy it to another location. In such conditions, you add '**$**' sign to the front of the cell reference. You place a '**$**' sign at the front of row or column separately. This provides flexibility.

Example 5.3:

In an Excel worksheet, you have exchange rates and your expenses. Because you are a foreign company in this country, you pay in Euro but all your budget is built on USD. So, for every payment you convert from Euro to USD. You place exchange rates at the top of the page and you write your formula to convert the payment into USD.

	A	B	C	D	E
1	TOTAL EXPENSES				
2	Type	Euro			
3	CAD	1.61			
4	CHF	1.53			
5	GBP	0.66			
6	JPY	134.64			
7	MXN	14.02			
8	USD	1.22			
9					
10	Id	Date	Explanation	Euro Payment	USD
11	1	21-Apr	Michael Young - Seminar in Boston	2,500	$3,050
12	2	19-Apr	Michael Young - Seminar Participation fee	380	$463.6
13	3	17-Apr	Computer for Secretary	1,280	$1,561.6
14	4	15-Apr	Staff Salary	7,380	$9,003.6

FIGURE 5.5 Absolute and Relative Reference

Solution:

You will study more complicated conversions later. For now we will only explain converting Euro to USD. In this case the USD conversion cell has to be absolute reference and will not change from one payment to another: $B$8

Since, every conversion will take the left cell as payment, the payment cell has to be relative address. It's D11 for the first payment, D12 for the second payment, and D13 for the third one.

Then the formula for the first payment in column E becomes

=D11 * $B$8

Now your formula is ready.

When you copy this formula to other payments, USD conversion cell will be absolute reference but the payment cell will be relative and change automatically for every copy.

The formula for the second payment =D12 * $B$8
The formula for the third payment =D13 * $B$8
The formula for the fourth payment =D14 * $B$8

5.2 SIMPLE FUNCTIONS: SUM, AVERAGE, COUNT, MAX, MIN

Excel provides a wide range of predefined functions.

You will study in this section some basic functions and their uses, and the way to access these functions.

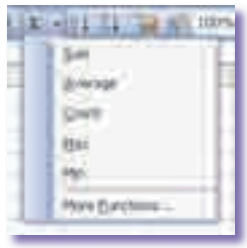


FIGURE 5.6 Insert Function button on Standard Toolbar

If you click on the small arrow next to the **AutoSum** button on the Standard toolbar and then select **More functions** (or if you select **Function** from the **Insert** menu), you will see the **Insert Function** window.

There are three main parts in this window. If you remember the function name write it in the **Search for a function** box. If you know the function name and category for sure, you can first select the category 1 and then select the function from the Select a function list box 2. Below the list box 3 , a brief usage and explanation is shown. There is also a link for help 4 for the current function at the bottom left corner of the dialog box.

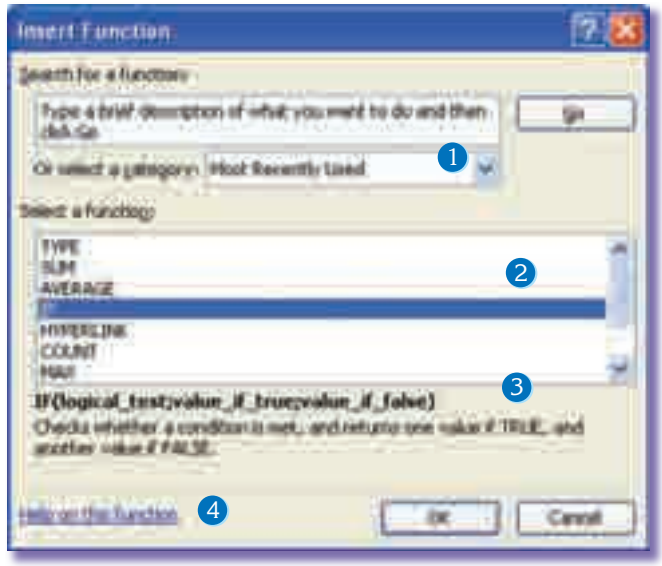


FIGURE 5.7 Insert Function window

5.2.1 SUM FUNCTION

This function calculates the sum of the numbers within the range. Any cell that is not a number format will be ignored. For the Sum function you can write single cell addresses with commas or you can also use a colon(:) to define a range.

Example 5.4:

If your Excel worksheet contains the data shown in Figure 5.8, the the following formulas give the results described in the table above.

FORMULA	DESCRIPTION	RESULT
=SUM(3, 12)	Adds 3 and 12 (Using direct numeric values)	15
=SUM(A5,A6, 2)	Adds the values in the last two rows above, and 2. Since text values in references are not translated, the values in the column above are ignored	2
=SUM("5", 15, TRUE)	Adds 5, 15 and 1, because the text values in parameters are translated into numbers, and the logical value TRUE is translated into the number	21
=SUM(A2:A4)	Adds the first three numbers in column A	40
=SUM(A2:A4, 15)	Adds the first three numbers in column A, and 15	55

	A	B
1	DATA	
2	-5	
3	15	
4	30	
5	'5	
6	TRUE	

FIGURE 5.8
Formulas and Descriptions

5.2.2 AVERAGE FUNCTION

The **Average** function returns the average of selected cells containing numbers.

If your Excel worksheet contains the data shown in Figure 5.9, the following formulas give the results described in the table.

FORMULA	DESCRIPTION	RESULT
=AVERAGE(A2:A4)	Average of the numbers 7,7,10	8
=AVERAGE(A2:A6; 5)	Average of the numbers in A2:A6 and 5	10

	A
1	DATA
2	7
3	7
4	10
5	27
6	4

FIGURE 5.9
Average Function

Example 5.5:

You start working in the sales department of the SURAT Company which sells computer peripherals and devices. Your boss wants you to prepare reports for every quarter. In this report you will have a list of products. Your task is to prepare the sum of each quarter and average. You also need to prepare the sum and average of each product. The list will be similar to the following:

	A	B	C	D	E	F	G	H
1	Id	Reseller	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Reseller	
2							Annual Total	Company Average
3	1	Sony Computer	500	500	600	700	2300	575
4	2	Compaq Computer	300	350	300	300	1250	312,5
5	3	Dell Computer	600	600	500	620	2320	580
6	4	Toshiba Computer	600	650	680	700	2630	657,5
7	5	Acer Computer	1200	1100	1100	1150	4550	1137.5
8		TOTAL	3200	3200	3180	3470	13050	652,5
9		AVERAGE	640	640	639	694		

FIGURE 5.10 Using Average Function

Analyses and Solution:

You have four formulas; Total and average formulas for every product and Total and Average formulas for every quarter. The first product Total formula will be in cell G3, it will find the sum of C3…F3. You can use the Sum function here and your formula will be =Sum(C3:F3). The average formula for products is also similar and will be placed in cell H3 =Average(C3:F3). Having written these formulas, you may copy them to other resellers.

The Total for the first quarter will be in cell C8. You can use the Sum function again here. =Sum(C3:C7). Average function for the first quarter will be in C9 =Average(C3:C7). Finally, your table is ready as in Figure 5.10.

5.2.3 MAX FUNCTION

Returns the largest value within the range of cells.

5.2.3 MIN FUNCTION

Returns the smallest value within the range of cells.

Example 5.6:

According to the following Figure 5.11, write the necessary formulas into cells D9 and D10 to find the highest and the lowest averages.

Solution:

Write "=max(H3:H9)" into cell D9 and "=min(H3:H9)" into cell D10 to find the maximum and minimum averages.

	A	B	C	D	E	F	G
1	Id	Name	Surname	Maths	Physics	Phy. Edu.	Average
2	1	Laurence	Lebihan	9	7	8	8.0
3	2	Elizabeth	Lincoln	7	5	6	6.0
4	3	Victoria	Ashworth	6	9		7.5
5	4	Patricio	Simpson	10	9	9	9.3
6	5	Francisco	Chang	6	10	8	8.0
7	6	Yang	Wang	6	10	9	8.3
8	7	Pedro	Afonso	4	9		7.7
9		The highest average		9.3			
10		The lowest average		6			

Write a formula to find the Max average

Write a formula to find the Min average

FIGURE 5.11 Using Max and Min Functions

5.2.4 COUNT FUNCTION

Counts the number of cells that contain numeric values. You can use this function to avoid #DIV/0! errors. (division by zero)

Formula	Description	Result
=Count (A2:A8)	Counts the number of cells that contain numbers in the list above	3
=Count (A5:A8)	Counts the number of cells that contain numbers in the last 4 rows of the list	2
=Count (A5:A8,2)	Counts the number of cells that contain numbers in the list, and the number 2	3

	A
1	DATA
2	Sales
3	12.08.2008
4	
5	19
6	22,24
7	TRUE
8	#DIV/0!

FIGURE 5.12 Count Function

Example 5.7:

Your teacher wants to keep track of class attendance in an Excel workbook. The table will contain names and dates. If a student is absent from school for a day, he writes the number of lessons the student missed. He wants you to write a formula to count the number of days that the students have not attended. In another formula you write the total missed hours missed.

	A	B	C	D	E	F	G	H	Y	Z
1	1st Semester Attendance Form									
2	Id	Name and surname	15.09.2003	16.09.2003	17.09.2003	18.09.2003	19.09.2003	.....	Total Days	Total Hours
3	1	Rob Brooks		2	7			.....	2	9
4	2	Raymond Camden						.....	0	0
5	3	Michael Dinowitz	1				1	.....	2	2
6	4	Adam Churvis	7	7	7			.....	3	21
7	5	Shlomy Gantz						.....	0	0
8	6	Paul Hastings				5		.....	1	5

FIGURE 5.13 Using Count Function

Analyses and Solution:

Your first formula will count the days that had at least one or more hours missed. Use the Count function to count the number of days the student skipped lessons. In the other column you will count the total number of lessons that the student skipped. For days, use the Count function, and for lessons, use the Sum function. For the first student, in cell Y2, write the formula =Count(C2:X2) and for the total hours skipped, in cell Z2, write =Sum(C2:X2)

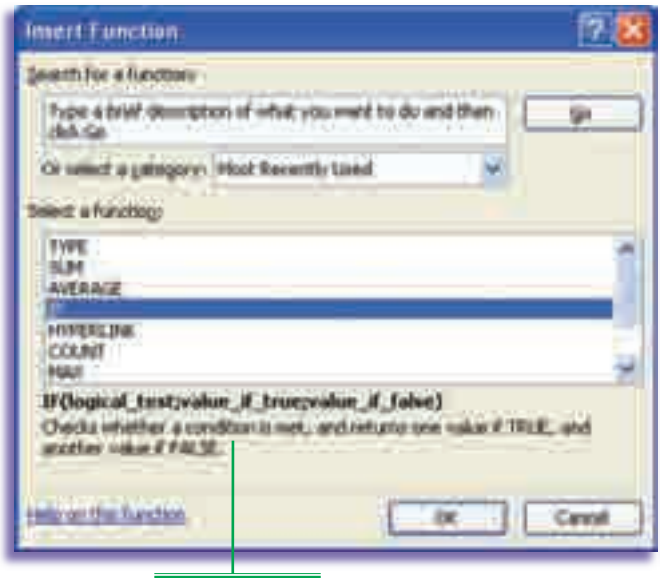


FIGURE 5.14 Insert Function

5.3 USING FUNCTIONS AND FORMULAS

In the previous section you studied how to define your own formulas and use some common functions. In this section you will study the usage of other predefined formulas and to use the help about them.

You already know how to open the **Insert Function** Window. When you select a function in this window, it will show the usage and brief information for the selected item. There is another link to get more help on the function at the bottom of the window.

After you press Enter, it will show another window that will guide you with the function arguments.

In the **Function Arguments window**, you are asked to fill in all the required parameters in separate boxes. If you can't remember a cell name, click the **Cell Name** button; it will minimize the function arguments window, letting you select a cell or a range. After you click the same button or press ENTER , it'll return the address to the Function arguments window.

So far you have studied some of the common predefined functions.

There are 9 main function groups with around 235 predefined functions. These groups are

- Financial
- Date & Time
- Math & Trig
- Statistical
- Lookup & Reference
- Database
- Text
- Logical
- Information

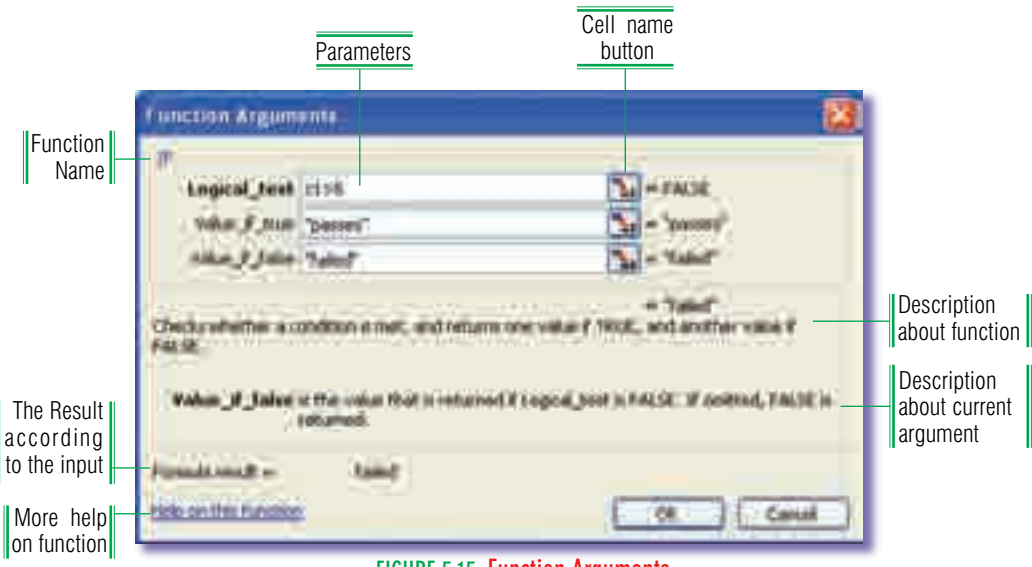


FIGURE 5.15 Function Arguments

5.3.1 DATE AND TIME FUNCTIONS

Now:

Shows current date and time. If the cell format was General before the function was entered, the result is formatted as a date.

Example 5.8: =Now () 01/15/2005 15:00

Today:

Shows current date. If the cell format was General before the function was entered, the result is formatted as a date.

Example 5.9: =Today () 01/15/2005

The output or input formats of the functions may vary from one computer to another, according to the Regional settings in Control Panel in Windows.

5.3.2 MATH AND TRIGONOMETRIC FUNCTIONS

Abs:

Calculates the absolute value of a number.

Example 5.10

=ABS(2)	returns 2
=ABS(-2)	returns 2
=ABS(-2.345)	returns 2.345

Pi:

Gives the value of Pi with an accuracy of 15 digits.

Example 5.11: =Pi() returns 3.14159265358979

Radians:

$\pi/6$=.0.523598776

Converts degrees into radians

Example 5.12: =Radians(30) returns 0.523598776

Degrees:

Converts radians into degrees

Example 5.13: =Degrees(Pi()) returns 180
=Degrees(Pi()/3) returns 60

Sin:

Returns the sine of a given angle. If your argument is in degrees, multiply it by PI()/180 or use the radians function to convert it to radians. You can also use the cosine function in the same way.

Example 5.14: =Sin(Radians(30)) returns 0.5
=Sin(30*Pi()/180) returns 0.5
=Cos(Radians(60)) returns 0.5
=Cos(60*Pi()/180) returns 0.5

*n factorial is the product of the numbers 1 through n. n! = 1*2*3*…*n.*

Fact:

Returns the factorial of a number. n factorial is the product of the numbers 1 through n. n! = 1*2*3*…*n.

Example 5.15: =Fact(5) returns 120
=1*2*3*4*5 returns 120

Int:

Rounds the given real number down to the nearest integer

Example 5.16: =Int(2.768) returns 2
=Int(-2.768) returns -3

Mod:

Returns the remainder after the number is divided by divisor. The result has the same sign as the divisor.

Example 5.17: =Mod(23,5) returns 3

Power:

Returns the result of a number raised to a power

Example 5.18: =Power(2,10) returns 1024

Product:

Multiplies the numbers within the range of cells.

Example 5.19:

According to Figure 5.16, the following formulas give the results shown below

=Product(A1:A4) returns 16
=Product(B1:B4) returns 12
=Product(A1:B4) returns 192

	A	B
1	2	2
2	1	3
3	4	1
4	2	2

FIGURE 5.16

Round:

Rounds a number to the specified number of digits.

=Round (number, num_digits)

- Number: is the number you want to round.
- Num_digits: specifies the number of digits to which you want to round a number.

If Num_digits is greater than 0 (zero), then Number is rounded to the specified number of decimal places.

If Num_digits is 0, then Number is rounded to the nearest integer.

If Num_digits is less than 0, then Number is rounded to the left of the decimal point.

Example 5.20: =Round (3.785645,3) returns 3.786
=Round (3.785645,5) returns 3.78565

Trunc:

Removes the fractional part of the number.

=Trunc (number, num_digits)

- Number: is the number you want to truncate.
- Num_digits: is a number specifying the precision of the truncation. The default value for Num_digits is 0 (zero).

Example 5.21: =Trunc(253.268569,3) returns 253.268
=Trunc(253.268569,5) returns 253.26856

SumIf:

Calculates the sum of the numbers within the range according to the given criteria.

=Sumif (range,criteria,sum_range)

- **Range:** Is the range of cells you want to be manipulated.
- **Criteria:** Is the criteria in the form of a number, expression, or text that defines which cells to be added.
- **Sum_Range:** are the actual cells to sum.

Criterion can be	
a direct number	7
a text	"Book"
an expression	">=5"

FIGURE 5.17 SumIf Criteria

	A	B
1	2	23
2	4	54
3	1	76
4	8	45
5	4	98
6	5	34
7	3	27
8	RESULT	126

FIGURE 5.18 Sumif Function

Example 5.22: Write a formula to calculate the sum of the numbers in the range of cells B1:B7. The corresponding number in the range of cells A1:A7 is less than 4.

Solution:

Write this formula in cell C10 =SumIf(B2:B8,"<4",C2:C8)

Sqrt:

Returns the square root of a number.

Example 5.23: = Sqrt(4) returns 2
= Sqrt(25634) returns 160.1062147

Rand:

Returns an evenly distributed random number greater than or equal to 0 and less than 1. A new random number is returned every time the worksheet is calculated.

5.3.3 STATISTICAL FUNCTIONS

Count:

Counts the number of cells that contain number.

=Count(value1, value2, value3,....)

Example 5.24: According to Figure 5.11 in Example 5.6 to find the number of students who take Phy Edu write this formula in cell F9

=Count(F2:F8) .

CountBlank:

Counts the number of empty cells in the selected range.

CountBlank(range)

Counta:

Counts the number of cells that are not empty within the selected range.

=Counta(value1,value2,...)

CountIf:

Counts the number of cells within the selected range that comply with the given criteria.

=CountIf(range, criteria)

Example 5.25:

According to Figure 5.11, in Example 5.6, write the necessary formula in cell F10 to calculate the number of students whose average is greater than or equal to 9.

Solution:

Write the formula in cell F10 = CountIf (F1:F8; ">= 9")

5.3.4 TEXT FUNCTIONS

Mid:

Returns Num_Chars characters from the text starting from the start_num character

=Mid(text, start_num, num_chars)

- **Text:** is the text string containing the characters you want to extract.
- **Start_num:** is the position of the first character you want to extract from the text.
- **Num_chars:** specifies the number of characters you want Mid to return from the text.

Find:

Finds one text string (find_text) within another text string (within_text), and returns the starting position of find_text, from the first character of within_text. You can also use Search to find one text string within another, but unlike Search, Find is case sensitive and doesn't allow wildcard characters.

=Find(find_text, within_text, start_num)

- **Find_text:** is the text you want to find.
- **Within_text:** is the text containing the text you want to find.
- **Start_num:** specifies the character at which to start the search.

Len:

Returns the number of characters in a text string.

=Len(text)

Left:

Returns the first character or characters in a text string, based on the number of characters you specify from the left.

=Left(text, num_chars)

Right:

Returns the last character or characters in a text string, based on the number of characters you specify from the right.

=Right(text, num_chars)

- **Text:** is the text string containing the characters you want to extract.
- **Num_chars:** specifies the number of characters you want to extract.

Example 5.26:

According to the **Figure 5.19**, write these formulas into suitable cells, and examine the results.

	A	B	C	D	
1	Id	Name and surname	Phone	City	
2	1	Simon Horwith	546532	New York	
3					
4	Find	6			=FIND(" ",B2)
5	Len	13			=LEN(B2)
6	Left	Simon			=LEFT(B2,B4)
7	Right	Horwith			=RIGHT(B2,B5-B4)
8	Mid	Horwith			=MID(B2,B4+1,B5-B4)

FIGURE 5.19 Text Functions

=Find(" ",B2)	returns 6
=Len(B2)	returns 13
=Left(B2,B4)	returns Simon
=Right(B2, B5-B4)	returns Horwith
=Mid(B2,B4+1, B5-B4)	returns Horwith

5.3.5 LOOKUP & REFERENCE

VLookUp:

Searches for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify in the table.

=VLookUp (lookup_value, table_array,col_index_num, range_lookup)

- **Lookup_value:** is the value to be found in the first column of the array. Lookup_value can be a value, a reference, or a text string.
- **Table_array:** is the table of information in which data is searched. Use a reference to a range or a range name, such as Database or List.
- **Col_index_num:** is the column number in table_array from which the matching value must be returned.
- **Range_lookup:** is a logical value that specifies whether you want VLookUp to find an exact match or an approximate match.

HLookUp:

Searches for a value in the top row of a table or an array of values, and then returns a value in the same column from a row you specify in the table or array.

=HLookUp(lookup_value,table_array,row_index_num,range_lookup)

- **Lookup_value:** is the value to be matched in the first row of the table. Lookup_value can be a value, a reference, or a text string.
- **Table_array:** is a table of information in which data is looked up. Use a reference to a range or a range name.
  The values in the first row of table_array can be text, numbers, or logical values.
- **Row_index_num:** is the row number in table array from which the matching value will be returned.
- **Range_lookup:** is a logical value that specifies whether you want HLookUp to find an exact match or an approximate match.

Example 5.27 :

In order to improve the Excel document that you have given to your math teacher, now you can prepare another formula, which defines the letter grades for each student. If the average of a student is lower than 60 it will write 'F' and so on.

Analyses and Solution:

According to your worksheet design you can use both; HLookUp or VLookUp. If you design the worksheet as in Figure 5.18, you need to use VLookUp.

Now you can design a complete worksheet for your math teacher. When looking up the letter grade of the first student, write the formula in F4 referring to the average in E4. The table is in J4: K9 and you want the VLookUp function to return the value in the second column as the result. The formula for the first student becomes

=VLookUp(E4, J4:K9,2,TRUE)

This is an absolute address formula, because you do not change the address of **Letter Grade Table** (J4:K9) for every student. As you know from Section 5.13, you place a '$' sign front of an absolute address; $J$4:$K$9.

The Lookup value cell is relative address because it changes for every student. Finally the formula becomes

=VLookUp(E5, $J$4:$K$9, 2, TRUE)

The formula is ready and can be copied to other students.

	J	K
4	Grade	Letter
5	0	F
6	60	D
7	70	C
8	80	B
9	90	A
	101	Undefined

FIGURE 5.20
Letter Grade Table

	A	B	C	D	E	F
2	11A Mathematics Lesson The Results of First Semester					
3	Id	Name and Surname	Exam-1	Exam-2	Average	Grade Letter
4	1	Kevin Schmidt	100	60	80	B
5	2	Todd Rafferty	91	100	95.5	A
6	3	David Shadowitz	80	40	60	D
7	4	Pele Thomas	86	70	78	C
	5	Pablo Varando	55	45	50	F
	Class Average		82	63	72.5	C
	Class Success Percentage		72 %			
					Teacher	
					John Walker	

FIGURE 21. VLookup Project

5.3.6 DATABASE FUNCTIONS

There are two important things:

- to get information as much as and as fast as possible
- to process and decide as fast as possible

For a good analysis of data, you need to have a well organized data list. This is called as database. Microsoft Excel provides a flexible environment for you to prepare well organized lists and powerful functions to process and decide fast. For this purpose, it includes many functions that analyze data stored in lists or databases. Each of these functions, referred to collectively as the Dfunctions, uses three arguments: **database, field,** and **criteria**. These arguments refer to the worksheet ranges that are used by the function. When placing criteria:

- Take care that your criteria field does not overlap with your database.
- Do not place your criteria field beneath your database, because when you use Data form it may cause conflicts with your criteria field.

	A	B	C	D	E	F
1	CRITERIA					
2	Class	Name and Surname	Date	Subject	Hours	Motivates
3		Todd Rafferty				FALSE
4		**RESULT**	**4**			
6	**DATABASE**					
7	Class	Name and Surname	Date	Subject	Hours	Motivates
8	11A	David Shadovitz	14-Feb-04	Maths	2	TRUE
9	11A	Todd Rafferty	17-Feb-04	Maths	2	FALSE
10	11A	Pablo Varando	18-Feb-04	Chemistry	2	TRUE
11	11A	Brendan Hara	19-Feb-04	Informatics	2	TRUE
12	11A	Pete Thomas	20-Feb-04	Informatics	2	FALSE
13	11A	Todd Rafferty	21-Feb-04	Physics	1	TRUE
14	11A	Todd Rafferty	24-Feb-04	Physics	2	FALSE
15	11A	Simon Horwith	25-Feb-04	Physics	1	TRUE
16	11A	David Shadovitz	26-Feb-04	Physics	2	TRUE
17	11A	David Shadovitz	27-Feb-04	Chemistry	2	FALSE
18	11A	David Shadovitz	28-Feb-04	Informatics	1	TRUE

FIGURE 5.21 Atlanta High Scool Attendance Form

Example 5.28:

The Assistant director of Atlanta High School is using an Excel worksheet to keep track of student attendance. In his form he has 6 columns of information; Class, Name, Date, Subject, Hours, and Motivation. But, because it's quite difficult to count or to filter and then process all the data, he wants a formula that counts automatically all the data with the given criteria. In the example below, he wants to search all data for Todd Rafferty's unmotivated absences. (Design all the data in a worksheet and write your formula using the DSum function)

Analyses and Solution:

As it is explained in the question, we need six fields: Class, Name and Surname, Date of absence, Subject, Number of hours, and if the absence is Motivated or not.

The criteria field should not be beneath the database. So, we can place it at the top of the sheet starting from B3 till the end of F3. Every time we add another absence, our database will grow. We'll use the **DSum** function which adds the numbers in the field column of records in the database that match the criteria.

DSum (Database, Field, Criteria)

We want the result to appear in the 4th row, so we will write the formula into the cell C4.

The **Database** range is A7:F20, where A7 is the start address of **Database** and F20 is the **Criteria.** The range is A2:F3 and we want the **Hours** field to be added according to the **Criteria**. Then the formula becomes;

=DSum(A7:F20, "Hours", A2:F3)

It will calculate the sum of the numbers in **Hours** column with the records complying with the criteria described in the **Criteria** field. When you enter a name in the criteria name part, all the absences with that name will be processed. If you want to see the total unmotivated attendance of this student, in the motivation field, write **FALSE**. Or, if you want absences from a specific subject then write the subject name. The function will return the sum of the **Hours** column with the records satisfying your criteria.

CHAPTER 5
IN BRIEF

SUMMARY

Microsoft Excel is best when you have lots of numbers, calculations, and complex formulas. The first thing you studied is how to implement your own formulas. For this reason, the range term is very important in Excel. Below is an example of range. (Letters refer to the column indexes where numbers refer to the row indexes)

A1:A10	All cells A1 through A10
A1, A10	Only A1 and A10 are included in the formula (pay attention to the difference)
A:A	All the values of column A

A formula starts with an equal sign (=). When you type the formula, you see it on the formula bar; on the other hand, by default, the cells show the result only. For example, Assuming A1 has 3 and A10 has 7 in them, the formula =A1+A10 can be seen on the formula bar where the result 10 will be seen in the cell.

Excel changes the range relatively when you copy the formula onto another location. To prevent this, you must add $ symbol before column and/or row reference. For example, let us suppose you have a simple formula on A4 as =A3+5. When you copy this formula onto B4, it will turn to =B3+5. If you type your formula in A4 as =$A$3+5, and copy it onto B4, the formula will remain the same.

Seperators in formulas differ from country to country according to the Regional Settings. For example the separator and floating point digit operator in the following IF statements changes according to regional settings.

Country	Formula
England	=IF (A2>=3.5,10,15)
France	=IF(A2>=3,5;10;15)
Germany	=IF(A2>=3,5;10;15)
Romania	=IF(A2>=3,5;10;15)
Russia	=IF(A2>=3,5;10;15)
Turkey	=IF (A2>=3,5;10;15)
USA	=IF (A2>=3.5,10,15)

The examples in this book use USA Regional settings. If you have difficulty in having results from the examples in this book check your regional settings.

From the **Insert-Function** menu, you can select the formula you want. The formulas are categorized for easy selection:

- Financial
- Date & time
- Math & trig
- Statistical
- Lookup & reference
- Database
- Text
- Logical
- Information

Now let us have a look at some formulas and results for confirmation.

	A	B	C
1	1	2	3
2	4	5	6
3	7	8	9
4	10	11	12
5	13	14	15

For the table above, if you type the following formulas you will get the results.

The Formula	Result	Explanation
=SUM(A1:C1)	6	
=SUM(A1,C1)	4	
=AVERAGE(A1:C1)	2	
=AVERAGE(B1,C1)	2.5	
=AVERAGE(C2,A1:C1)	3	
=MAX(A1:C5)	15	
=MAX(A1:C5)-MIN(A1:C5)	14	15 - 1
=MIN(A1:C5)	1	
=SUM(A1:C5)/COUNT(A1:C5)	8	120 / 15
=AVERAGE(A1:C5)	8	
=IF(A3>B4,"TRUE","NOT TRUE")	NOT TRUE	
=NOW()	05.01.2005 12:48	Returns current date of your computer
=ABS(-3.425)	3.425	
=ABS(3.425)	3.425	
=RADIANS(45)	0.7853	π / 4
=RADIANS(360)	6.2831	2π
=DEGREES(PI()/4)	45	
=DEGREES(2*PI())	360	
=SIN(30)	-.098803	
=SIN(30*PI()/180)	0.5	

SUMMARY

QUESTIONS

1. If cell A5 contains a formula which produces 10, what can be the formula in A5?

   A.=Sum (A1 : A4)
   B.=Min (A1 : A4)
   C.=Average (A1 : A4)
   D.=Count (A1 : A4)

	A
1	10
2	20
3	30
4	40
5	?

2. According to the figure in question 1, if value of A5 is 40, what can be the formula in A5?

   A.=Count (A1 : A4)
   B.=Sum (A1 : A4)
   C.=Average (A1 : A4)
   D.=Max (A1 : A4)

3. If you want to type a formula in a cell, you must start your formula with a ..... sign.

   A.= B.! C.$ D.?

4. Which of the followings is **not** a Microsoft Excel function?

   A. If B. List
   C. Max D. Count

5. Look at the next figure. What can be the reason for the error message #VALUE!?

   A. The column is too narrow
   B. A3 contains text
   C. One of the columns is deleted
   D. Formula is misspelled

	A
1	10
2	20
3	January
4	
5	#VALUE!
6	

This cell contains the formula =A1+A2+A3

6. What is the result of the function =Max(B1:D4)

	A	B	C	D
1	100	12	128	20
2	200	22	601	60
3	400	68	288	80
4	800	21	204	97

A.800 B.68 C.601 D.288

7. Which function returns the result of the mathematical expession Sin (30)?

   A. =Sin(30)
   B. =Sin(30*P/180)
   C. =Sin(30*180/Pi())
   D. =Sin(30*Pi()/180)

8. What is the result of the function in A4?

	A	B	C
1	5	2	
2	5	3	
3	1	7	
4	=AVERAGE(A2:B3)+SUM(A2:B3)		

A.26.8 B.3.8 C.16 D.20

9. The result of =Int(-1.5) is less than the result of=Trunc(-1.5)

   TRUE ☐ FALSE ☐

10. According to the formulas in C1 and C2, which one is true?

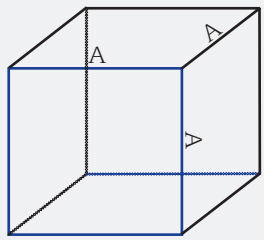
	A	B	C
1	John	3	=If(B1<=2,"Very bad" ,If(B1<4,"Bad","Perfect"))
2	Smith	4	=If(B2<=2,"Very bad" ,If(B2<4,"Bad","Perfect"))

A. John : Very bad Smith : Bad
B. John : Bad Smith : Bad
C. John : Very bad Smith : Very bad
D. John : Bad Smith : Perfect

11. Which formula must be written into cell B2 to calculate the volume of the cube in the figure?

A. = A1*A1*A1
B. = B2*B2*B2
C. = B1*B1*B1
D. = Cube(B1)

	A	B
1	A :	4
2	Volume	64



12. Find the result of the formula =VLookUp(2,A2:D4,3)

	A	B	C	D
1	Id	Name	Surname	1st Term
2	1	Andrew	Jackson	3
3	2	Thomas	Ericsson	4
4	3	Laura	Callahan	5

A.2 B.Andrew C.Ericsson D.4

13. What is the result of the formula =Int(3.141596)+Round(36.9245,2)

A. 40.1 B. 40 C.39.92 D.39

14. Match the following functions with the definitions?

Functions	Definitions
Min	Calculates the average value of a list of numbers
Max	Adds a list of numbers.
Average	Finds the smallest value in a list of numbers.
Sum	Finds the largest value in a list of numbers.

15. In cells B1 through G1 these values are entered arbitrarily.

	A	B	C	D	E	F	G
1	Excel	1	2	7	5.5	Word	-12

What is the result of the formula =CountIf(B1:G1, ">5")

A.0 B.7 C.1 D.2

16. The LookUp functions allow you to

A.Retrieve the names of workbooks and worksheets.
B.Dynamically change information in different workbooks and worksheets.
C.Retrieve information according to given criteria.
D.Retrieve information stored in different workbooks and worksheets.

QUESTIONS

PRACTICE

1. According to the figure below write the necessary formulas to
   - calculate the average salary of all employees
   - find the maximum salary
   - find the minimum salary
   - find the total salary

	A	B	C
1	Tree Star Trade Company		
2	Employee	City	Salary
3	Selena Bainum	Berlin	$ 1520
4	Raymond Camden	Mexico	$ 2500
5	Paul Hastings	Moscow	$ 1800
6	Kevin Schmidt	London	$ 3200
7	Pete Thomas	Istanbul	$ 5210
8	Nicholas Tunney	Madrit	$ 850
9			
10	The Average salary of all employees :		?
11	Maximum salary :		?
12	Minimum salary :		?
13	Total salary :		?

2. Use the following functions on the table below.

	A	B	C	D	E	F
1	Id	Students	Grades	Int	Round	Trunc
4	1	Raymond Camden	2.460	?	?	?
5	2	Paul Hastings	3.689			
6	3	Kevin Schmidt	4.840			
7	4	Pete Thomas	4.118			
8	5	Nicholas Tunney	2.060			

3. In the following Figure, write a formula
   - in A3 to calculate the multiplication of the numbers in range A1:F1.
   - in B6 to calculate the absolute value of a given number.
   - in D6 to calculate the square-root of the given number.
   - in F7 to calculate x^y

	A	B	C	D	E	F
1	6	7	8	9	10	11
2	Write the multiplication of the numbers above using "product" function.					
3	Formula					
4						
5	x	ABS	Y	SQRT	Enter base (X)	2
6	-8	Formula	256	Formula	Enter power(Y)	3
7					Power(X Y)	Formula

4. In an apartment building, you have 5 floors and 5 different entrances. On each floor, there are three apartments. Write a formula that will take an apartment number from cell A2 and show the floor and entrance numbers in cells B2 and C2.

	A	B	C
1	Apartment #	Entrance #	Floor #
2	43	?	?

PRACTICE

5. Create a mini trigonometric table below.

	A	B	C	D	E
1	Mini Trigonometric Table				
2	Degree	Radian	Sinus	Cosine	Tangent
3	0				
4	10				
5	20				
6	30				
7	40				
8	50				
9	60				
10	70				
11	80				
12	90				

6. Write a formula which can calculate the Average salary of the employees in the city given by cell C2.

	A	B	C	D
1	Id	Employee	City	Salary
2			London	
3	Total salary of employees live in given city?			
4	1	Samuel Neff	New York	400
5	2	Brendan Hara	London	400
6	3	Jeremy Peterson	London	400
7	4	Todd Rafferty	New York	350
8	5	Kevin Schmidt	London	400
9	6	David Shadovitz	New York	615
10	7	Pete Thomas	London	540
11	8	Nicholas Tunney	London	1000

7. Draw the following chart using **Sin** and **Cos** functions.

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

8. Write the necessary formula,

- in column B to show the lengths of adjacent names in column A.
- to separate the texts in column A to the columns C and D as shown in the figure.

	A	B	C	D
1	Name and surname	Length of the text	Name	Surname
2	Samuel Neff	12	Samuel	Neff
3	Brendan Hara	13	Brendan	Hara
4	Jeremy Peterson	16	Jeremy	Peterson
5	Todd Rafferty	14	Todd	Rafferty
6	Kevin Schmidt	14	Kevin	Schmidt
7	David Shadovitz	16	David	Shadovitz
8	Pete Thomas	12	Pete	Thomas
9	Nicholas Tunney	16	Nicholas	Tunney

PRACTICE

9. Write the necessary formulas into the cells between B11 and G11 that will accept C9 as student id using the "Vlookup" function.

	A	B	C	D	E	F	G
1	EXAMINATION RESULTS						
2	Id	Name	Surname	Maths	Physics	Chemistry	AVERAGE
3	1	Samuel	Neff	5	5	5	5
4	2	Brendan	Hara	3	2	4	3
5	3	Jeremy	Peterson	2	4	3	3
6	4	Todd	Rafferty	4	5	3	4
7	5	Kevin	Schmidt	3	4	5	4
8							
9		Enter Id :	4				
10		Name	Surname	Maths	Physics	Chemistry	AVERAGE
11		Todd	Rafferty	4	5	3	4

10. Write the necessary formulas into range B9:C12 that will read class name from C7 and show the requested class list in the cells.

	A	B	C	D	E
1	Index	11A	11B	11C	11D
2		Name and surname	Name and surname	Name and surname	Name and surname
3	1	Simon Horwith	Pete Thomas	Selene Bainum	Hanna Moos
4	2	Stephen Milligan	Nicholas Tunney	Geoff Bowers	Bob Hanks
5	3	Samuel Neff	Jochem Dieten	Rob Brooks	Martin Sommer
6	4	David Shadovitz	Pablo Varando	Raymond Camden	Victoria Ashworth
7		Enter Class :	11C		
8		Index	Name and surname		
9		1	Selene Bainum		
10		2	Geoff Bowers		
11		3	Rob Brooks		
12		4	Raymond Camden		

11. Everyday in exchange offices, everyday, money from many different currencies are exchanged. Because they are afraid of making mistakes, they decided to have an exchange program. In this document, the first part will have a table of conversion from all other currencies into a base one. (In this figure, the base currency is TL.) They want to write exchange currencies into cells A12 and B12. When they write the amount of the first currency into A13, they want to see the converted value in B13.

	A	B
1	EXCHANGE RATES	
2	Currencies	TL
3	Dollar	1.38
4	Euro	1.82
5	TL	1
6	Pound	2.57
7	Ruble	0.47
8	Yen	1.5
9	Dinar	1.3
10		
11	From	To
12	Dollar	Euro
13	10	7.58

PRACTICE

12. There is an international Informatics Olympiad in your country. They prepared a table after the exam. For some statistical purposes, they want to get some information from the table. Write a formulas

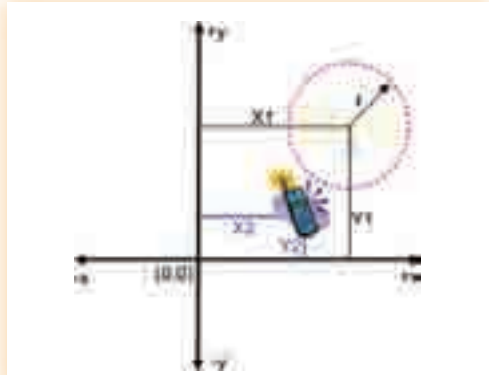
- In cell F18 to show the number of students who did not participate on the first day;
- to show each student's total points
- How many students from each country? (in cell F20)

	A	B	C	D	E	F
1	The Results of Informatics Olympiad					
2	Rank	Name and Surname	Country	1st Day	2nd Day	TOTAL
3	4	Selena Bainum	England	140	120	260
4	8	Geoff Bowers	France	150	80	230
5	3	Rob Brooks	England	120	150	270
6	9	Raymond Camden	Switzerland		210	210
7	6	Adam Churvis	Germany	150	100	250
8	12	Michael Dinowitz	USA		180	180
9	1	Shlomy Gantz	Germany	180	155	335
10	14	Paul Hastings	USA		100	100
11	11	Alexandra Kim	Korea	52	150	202
12	9	Viktoria Shay	Korea		210	210
13	2	Olga Nam	Korea	85	200	285
14	7	Brendan Hara	Spain		240	240
15	13	Jeremy Peterson	England	50	120	170
16	14	Todd Rafferty	Switzerland		100	100
17	4	Kevin Schmidt	England	80	180	260
18	How many contestants are absent on the 1st Day ?					6
19	How many contestants are there at 2nd Day ?					15
20	Country	Korea	Number of the contestants			3

13. A cellular base-station is located at the coordinates (x1,y1) and it has a transmit range of "r" . A person using a mobile phone is located at the coordinates (x2,y2) .

Write a function that asks for (x1,y1), (x2,y2) coordinates and the radius of the transmitter and then decides if the mobile phone is in use or not . If the phone works, the message will be "The phone is working in this location", otherwise, "The phone is out of range"

	A	B	C	D
1	x1 :	100	x2 :	60
2	y1 :	100	y2 :	40
3	r "	50	The phone is out of range	



14. In the following sheet, if the correct user name and password are entered, the message of A3 will be "Welcome to the Matrix" otherwise "Incorrect user name or password".

	A	B
1	User Name :	admin
2	Password :	x-man
3	Welcome to The Matrix	

WORD SEARCH PUZZLE

1. Match

Write the following functions under their categories in the table on the right.

abs	and	count
pi	if	int
left	len	lower
max	mid	not
now	or	hlookup
right	rank	round
today	upper	vlookup
weekday		

CATEGORIES					
Date & Time	Logical	Lookup & Reference	Math & Trig	Statistical	Text

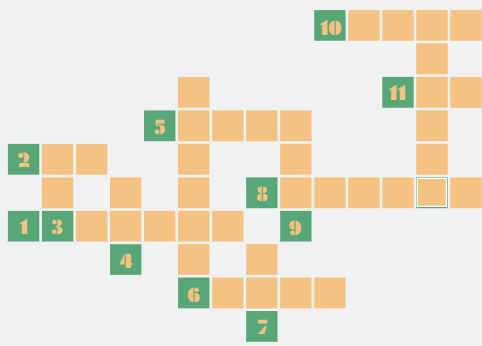
2. Puzzle

Across

1. Searches for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify in the table.
2. Rounds a number down to the nearest integer.
5. Returns the last character or characters in a text string, based on the number of characters you specify.
6. Counts the number of cells that contain numbers, and also numbers within the list of arguments.
8. Returns the day of the week corresponding to a date. The day is given as an integer, ranging from 1 (Sunday) to 7 (Saturday), by default.
10. Converts all uppercase letters in a text string to lowercase.
11. Returns the largest value in a set of values.

Down

3. Returns the number of characters in a text string.
4. Returns the serial number of the current date and time.
6. Counts the number of cells within a range that meet the given criteria.
7. Adds all the numbers in a range of cells.
9. Returns the first character or characters in a text string, based on the number of characters you specify.
12. Returns the average (arithmetic mean) of the arguments.



PROJECT

1. Cell B4 has a formula which is used by cells B1, B2 and B3. But nobody knows the formula in cell C5. Find out the value in the cell C2 when the result is 10.

   (Hint: Use "Goal seek")

	A	B
1	A:	4
2	B:	7
3	C:	1
4	Result	28

2. You have the following data on your Excel sheet. How can you divide each word into seperate cells as shown in the table below?

	A	B	C	D	E	F	G	H
1	Name Surname Exam1 Exam2 Exam3 Average		Name	Surname	Exam1	Exam2	Exam3	Average
2	Kevin Schmidt 100 60 94 85	==>	Kevin	Schmidt	100	60	94	85
3	Todd Rafferty 91 100 100 97		Todd	Rafferty	91	100	100	97
4	David Shadovitz 80 40 72 64		David	Shadovitz	80	40	72	64

3. In a document, write and explain the usage of 25 different Excel functions from five different groups.

4. Visit an accountant (or your school Assistant Director) and ask they what kind of documents they uses. Try to prepare the same document in Excel using formulas.

PROJECT

CHAPTER 6

SORTING AND FILTERING

- ✓ Preparing Lists
- ✓ Sorting
- ✓ Filtering

Microsoft Office
Excel 2003

SORTING AND FILTERING

In most cases, the vision and prestige of your company is much more important than the money you spend. If you don't spend some money and time for data processing, or for technology, it will most probably cost much more. The smallest mistake that you may make can ruin your company's image. Especially when working with huge lists and lots of numbers, fast and accurate results need some investments.

6.1 PREPARING LISTS

Microsoft Excel is perfect when you have huge lists with lots of numbers and calculations. It has many fast and easy to use tools to analyze and process the data. Sorting and Filtering are two examples of this.

A simple example that shows the advantage of sorting is the telephone guide. In telephone guides for many cities, you have hundreds of thousands of names. Can you imagine what would happen if the names in these guides were not in order? You would need to search, sometimes for many days, to find a single name. But since the names are in order you easily find a name in minutes.

For a good analysis of data, first you need to prepare well organized data lists. This is called a **Database**. There are some rules when preparing lists.

1. Before you start any other operation, perhaps the most important part is to think carefully and decide the titles of the list. After you start collecting data, it can be very difficult to add another field to your list. The same type of information must be entered to each column. For example; for a travel agency's records, you may assign name, date of reservation, hotel, suite type, payment type, and total price as column titles.
3. It is better to prepare single purpose clear titles. Try avoiding mixed columns. For example, if you store hotel name and suit type in the same column, you might have difficulty later.
4. Try to avoid blank rows and columns.

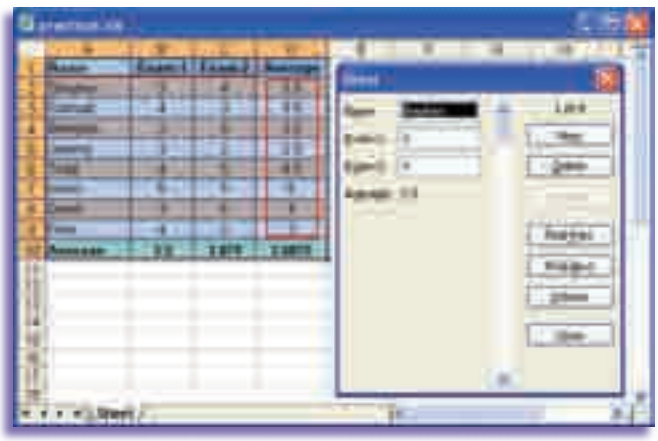


FIGURE 6.1 Viewing a table on Data form

6.2.1 DATA FORMS HOW TO ACCESS

Microsoft Excel has a built-in **Data Form** feature that allows you to add, find, edit, and delete records quickly and easily. Data Form is a custom dialog box that is created by Excel from the data in your list.

The **Data Form** displays all of your column labels in a single dialog box, with a blank space beside each label for you to fill in data for the column. You can enter new data, find rows based on cell contents, update existing data, and delete rows from the list.

Use a Data Form when a simple form listing the columns is sufficient and you do not need more complex or custom features. A data form can make data entry easier than typing across the columns when you have a wide list with more columns then will fit on the screen at once.

First, select the range of the data to which you want to apply Data Form. When you click **Form** on the Data menu, Excel will display a dialog box as in Figure 6.1. You can

- Enter new data in your data range using the New button.
- Delete data in your data range using the Delete button.
- Find data in order using the **Find Prev** or **Find Next** buttons.
- You can also use your own criteria using the **Criteria** button. After that, you use the **Find Prev** or **Find Next** buttons.
- **Edit** the data and Restore.

6.2.2 USING A FORM TO FIND SPECIFIC LIST INFORMATION

There are many ways to find data in Excel, but data form offers a quick way to **search data** with many conditions. In Data Form, there is a Criteria button that allows you to find a record using different criteria.

FIGURE 6.2 Finding a record on Data Form

After you click the **Criteria** button, it will open a window with empty text boxes. Type what information you know about the searching data into these boxes and click the **Find Next** button. The first record with your information will be shown in the Data Form. You can use Find Next and Prev to go through the records, to search for more records satisfying your criteria.

6.3 SORTING

Sorting means putting or arranging items in order, according to some criteria. Sorting is commonly used with lists. In many conditions, you prepare lists and put them in order. Microsoft Excel provides an easy feature to put the items in order; the **Sort** dialog box.

- You can click on a cell in the range that you want to sort. Excel will automatically determine the extent of the list. If you don't want to include an entire list and want to sort only a part of it, after selecting the range of cells which you want to sort, click the **Sort** command from **Data** menu to display the Sort dialog box.
- Click on the **Sort by** down arrow to select the column you want to sort.
- Click on the Ascending or Descending radio button.

FIGURE 6.3 Sort Buttons

- If you want to use more than one criterion, you can use **Then by** to sort using more criteria.
- Click **Header row** to exclude the first row from the sort, if your list has column labels in the uppermost row. Click **No header row** to include also the first row in the sort, if the list doesn't have column labels in the uppermost row.

FIGURE 6.4 Adjusting Sort Options

You can also use the Standard toolbar **Sort ascending** or **Sort descending** buttons, to do all of the process above with a single click. However, it does not always give the desired result. For accurate results, it is better to use the **Sort** window.

The **Options** button lets you specify a custom sort order, such as Low, Medium, High, or Jan, Feb, Mar, so forth. For the column selected in the Sort by box, you can also specify a case-sensitive sort and sort either from top to bottom or from left to right.

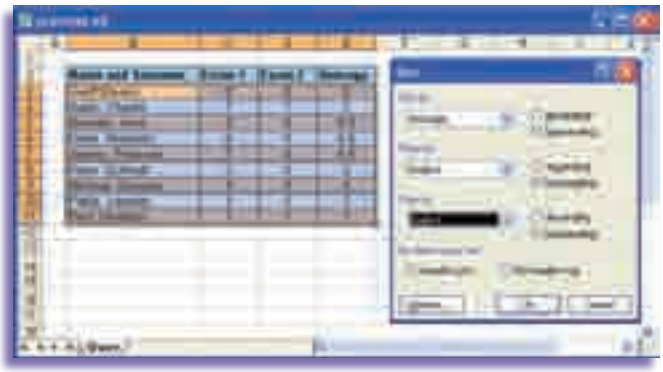


FIGURE 6.5 Sorting data in the table by 'Average' then by 'Exam-2' then by 'Exam-1'

Example 6.1: Look at the Figure 6.5

- Data is first sorted by 'Average', and then sorted by 'Exam-2' and 'Exam-1'.
- If you sort data by 'Average', then by 'Exam-1' and then by 'Exam-2', David and Brendan will swap order

6.4.1 FILTERING

Filtering is a quick and easy way to find and work with a subset in a data list. A filtered list displays only the rows that meet the criteria you specify for a column. Microsoft Excel provides two commands for filtering lists:

- **AutoFilter**, which includes filter by selection, for simple criteria
- **Advanced Filter**, for more complex criteria

Filtering does not rearrange a list. Filtering temporarily hides rows which don't meet the criteria. When Excel filters rows, you can edit, format, chart, and print your subset list without rearranging or moving it.

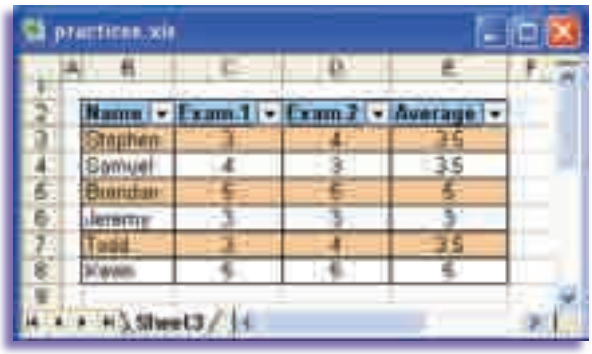


FIGURE 6.6 Unfiltered data

6.4.2 AUTOFILTER

When you use the **AutoFilter** command, arrows appear to the right of the column labels in the filtered list. AutoFilter puts all the different column items together, and you select the one to be listed.

You can use **Custom AutoFilter** to display rows with more complicated filtering conditions. Custom AutoFilter lets you display rows that meet more than one condition for a column. For example, you want to apply conditional filter for the average

FIGURE 6.7 Filtered to show only the students whose Exam1 is equal to 3

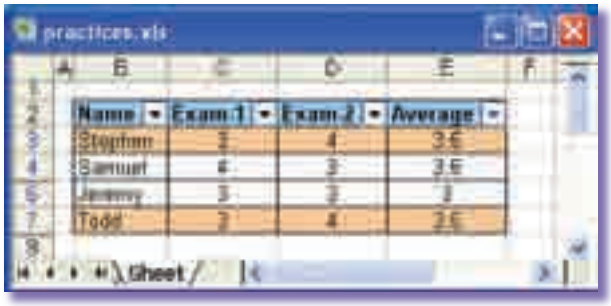


FIGURE 6.9 Custom AutoFilter

FIGURE 6.8 Custom Auto filter

column to show only the students whose average is between 3 and 4. Select **Custom** from the drop down menu and write as in Figure 6.8.

When you press the OK button, it will display conditional filtered data as in Figure 6.9.

6.4.3 ADVANCED FILTER

The **Advanced Filter** command can filter a list in place like the AutoFilter command, but it does not display drop-down lists for the columns. Instead, you type the criteria by which you want to filter in a separate criteria range above the list. A criteria range allows for more complex criteria to be filtered.

The following wildcard characters can be used as comparison criteria for filters when searching and replacing content.

Use	To Find
? (question mark)	Any single character. For example, sm?th finds "smith" and "smyth"
* (asterisk)	Any number of characters. For example, *east finds "Northeast" and "Southeast"
~ (tilde)	A question mark, asterisk, or tilde. For example, fy91~? finds "fy91?"

Example 6.2:

You want to apply a conditional filter using **Advanced filter**. You can write a condition for each column, after that, you can apply these conditions to your main range of data.

Advanced Filter can copy the result of filtering onto another location. First select the **Copy to another location** radio button to activate the **Copy to** combobox, then select the location where the result will be copied.

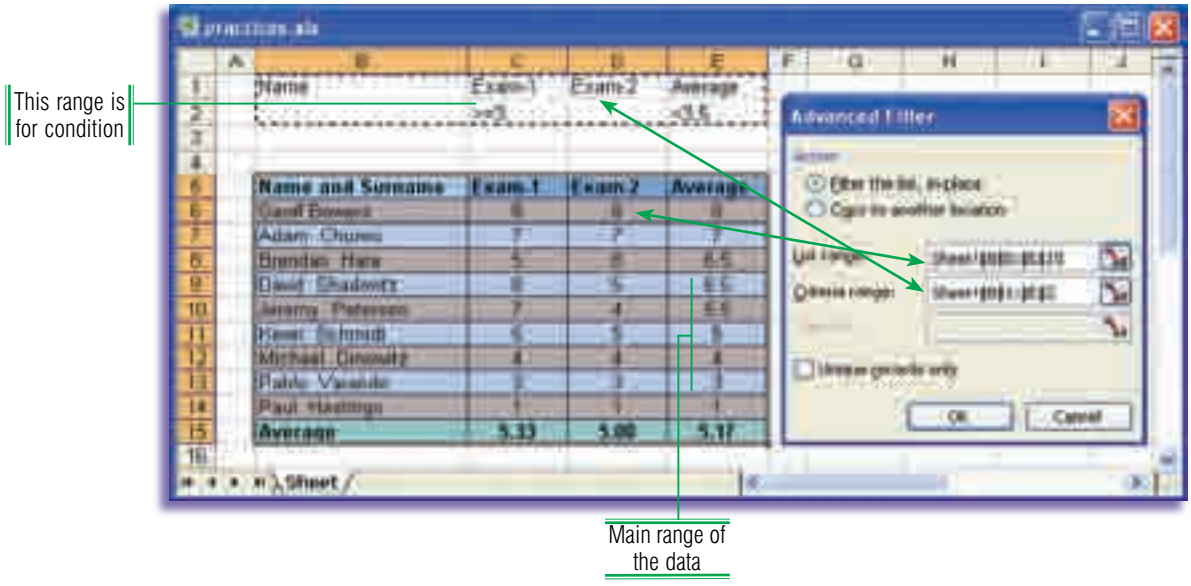


FIGURE 6.10 Using Advanced Filter

CHAPTER 6
IN BRIEF

SUMMARY

In this chapter you have reached the heart of Excel. Preparing custom lists is one of most important events in business analysis and reporting.

Data Form will help you to create tables via form. It makes filing, modifying, or searching tasks simple. To access this form, go to **Form** on the **Data** menu.

After you create a list, you can sort your list in ascending or descending order. You can do it simply by clicking the  or  icons from the **Standard Toolbar** or you can apply advanced criteria from the **Sort Dialog Box** on the **Data** menu. This option lets you specify custom sorting orders meeting up to three criteria.

You can make a custom list from a general one. Let us suppose that you are running a company. You gathered all your annual sales information in a table. You can make a table of sales for specific customers. Sales which are above a specific value can be another table. You can extend these examples according to your needs.

If you are new to Microsoft Excel, the best way to filter data is with **Auto Filter**. You apply it by clicking in the sequence **Data**, **Filter**, and **Auto Filter**. When applied, all the column titles will have an arrow  symbol on the right side of each cell. by clicking on it, you will access a list of the items in the column and your selection will be the criteria for the column. You can apply more than one criterion at a time by applying a filter to other columns.

You may need filters that are more complex for your use. In this case, you may apply the **Advanced Filter** option, which is the second option in the **Filter** sub-menu.

QUESTIONS

1. What is the meaning of this button? 
   A.Sort ascending
   B.Sort descending
   C.Enter formula
   D.Autosum

2. Which of the followings is **true** for filtering data?
   A.Filtering data deletes the row(s) which meet criteria.
   B.Filtering data moves the row(s) which meet criteria.
   C.Filtering data hides the row(s) which meet criteria.
   D.Filtering data displays the row(s) which meet criteria.

3. You applied AutoFilter to the table in Figure 6.11. Then from column 'No', you applied a custom filter as shown in Figure 6.12. How many students will be displayed?

FIGURE 6.11

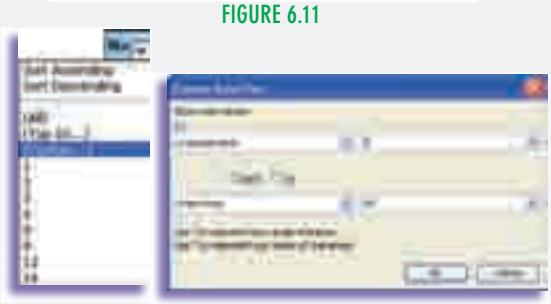


FIGURE 6.12

A)5 B)2 C)3 D)4

4. Which of the followings is used to arrange selected cells in an order (alphabetically or numerically)?
   A.Data / Sort
   B.Data / Form
   C.Data / Table
   D.Data / Filter

5. ..... means putting or arranging items in order, according to some criteria.
   A.Listing
   B.Auto filtering
   C.Filtering
   D.Sorting

6. You have a list which contains all students' information from all classes. But, you want to see only one class. Which Excel feature should you use?
   A.Validation
   B.Auto filter
   C.Conditional formatting
   D.Auto series

7. Which of the following is a way to sort numbers in decreasing order?
   A.Select all numbers and click Sort ascending or Sort descending from the Formatting toolbar.
   B.Select all numbers and click Sort from the Data menu and click on Descending order.
   C.Select all numbers and click Sort from the Data menu, then check, Sort left to right from Sort Options.
   D.All of them

QUESTIONS

8. ..... is a quick and easy way to find and work with a subset in a data list.

A.Sorting
B.Filtering
C.Spelling
D.Subtotals

9. Which one of the following is **not true** about sorting in ascending order?

A.Numbers are sorted from the smallest negative number to the largest positive number.
B.When you sort text, Excel sorts left to right, character by character.
C.In logical values, FALSE is placed before TRUE.
D.Blanks are always placed first.

10. In Figure 6.11 you add the custom formula to column B as follows. Which rows are visible?

A. 3, 4, 5
B. 3, 4, 5, 9 10
C. 9, 10
D. 6, 7, 8

PRACTICE

1- Create a table including your friends' names, surnames, birth dates, addresses, etc. Copy this table onto two more sheets. On the second sheet sort the friends' table so that you can have their birthdays in order. On the third sheet you can rearrange your friends according to their addresses.

2- Collect different price lists from the companies in your town. For the same device create a custom list as shown below, and sort the list according to the price in ascending order so that you can have a good reference of cheaper prices.

3- Create the table in the following figure and then make the following arrangements on the table by using Auto Filter. Determine the most successful salesperson who carries out the best sale. Also determine the top 3 salespersons.

	A	B	C
1	SalesPerson	region	sales
2	David	east	1900
3	Mikahel	west	1800
4	Eric	east	1300
5	Bruce	central	2100
6	Kate	west	1400
7	David	south	1700
8	Kate	south	1600
9	Eric	east	1400
10	David	west	1300
11	Mikahel	south	1900
12	Bruce	central	1900
13	Eric	central	1800

4. For Figure 6.11, write a criterion to list students from class 10.

PRACTICE

CHAPTER 7

CHARTS

- ✓ Chart Wizard
- ✓ Chart Toolbar

Microsoft Office
Excel 2003

CHARTS

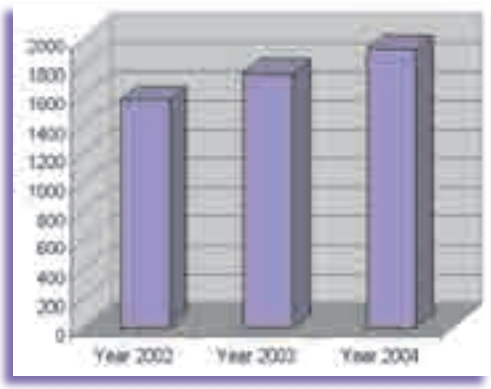


FIGURE 7.1 A Graphical Chart

After you process your data, you take outputs. Printing and Charts are the two most common output forms of Excel. In Chapter 4, you studied Printing and Page Setup. In this chapter, you are going to prepare **Charts** from your data.

Numbers can definitely present a lot of information, but people get lost in too many numbers. Especially when presenting data to a crowd. People are more interested in visual and graphical representations and they are much easier to remember. For example, with a graphical chart, as in Figure 7.1, you can see whether your company sales are increasing or decreasing, without having to analize any number.

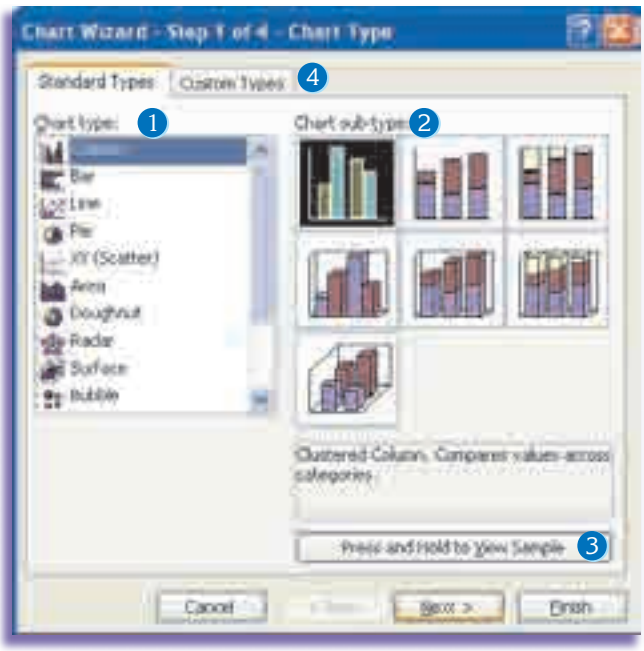


FIGURE 7.2 Chart Wizard step 1

7.1 CHART WIZARD

Excel offers a powerful and easy to use **Chart Wizard** to create the charts automatically. You can run chart wizard from **Chart** button on the **Standard Toolbar** or from the **Chart** command in the **Insert** menu. It will guide you through 4 steps.

Example 7.1

As a simple example, you are going to prepare a chart of the monthly weather statistics for Istanbul.

First, data range A1:B12, then click the **Chart Wizard** button from the **Standard Toolbar**.

	A	B
1	Jan	2
2	Fer	5
3	Mar	12
4	Apr	25
5	May	30
6	Jun	34
7	Jul	36
8	Aug	37
9	Sep	29
10	Oct	15
11	Nov	6
12	Dec	-2

FIGURE 7.3 Monthly weather statistics for Istanbul

Step 1

- Select the type of chart that you want 1
- Then, from the **Chart sub-type** window 2, select the exact chart format.
- You can see how the selected chart will look by clicking 3 The **Press and hold to view sample** button

- The **Custom Types** tab (4) offers predefined charts. You can also add your own design as a custom type.
- When you finish selecting, you can press the **Next** button to pass to the 2nd step of chart wizard.

By clicking Finish at any time, you can finish the steps and create the chart.

You may use different types of charts for different purposes. For example, for annual sales, you could select **Column** or **Line with markers displayed**. On the other hand, for market shares or for the results of an election, you could prefer a **Pie** chart.

FIGURE 7.4 Pie Chart

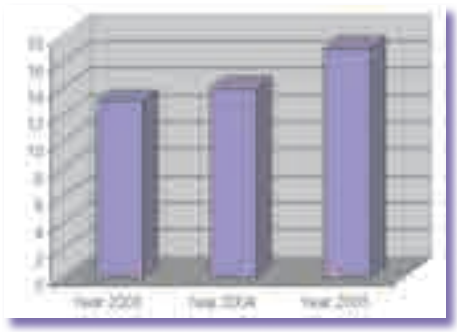


FIGURE 7.5 Column Chart

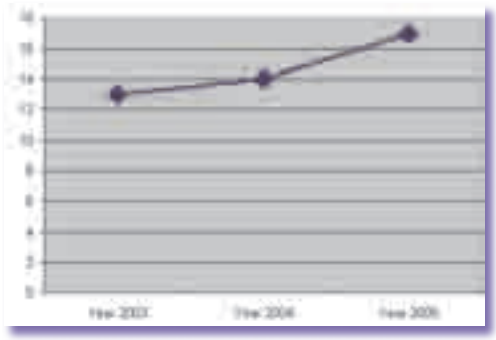


FIGURE 7.6 Line Chart

Step 2

- When you select data before you starting the **Chart Wizard**, the data range will appear in the **Data range** box. If you did not select any range or if you want to change your data range, you can click on **Cell name** in the Data range box, and then select the data on your worksheet that you want to plot.

- Using the **Series in** radio button, you can set up your chart to either to show your series in **Rows** or in **Columns**. For this example, the List items are in columns, so you select Columns option button. You can also add, remove, or define a data series from the Series tab.

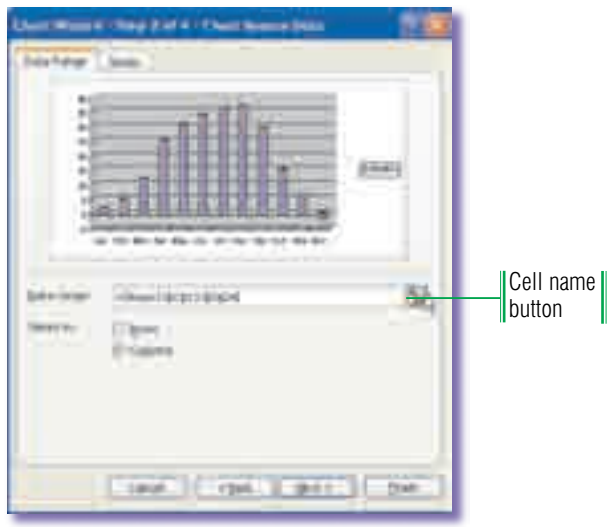


FIGURE 7.7 Chart Wizard Step 2

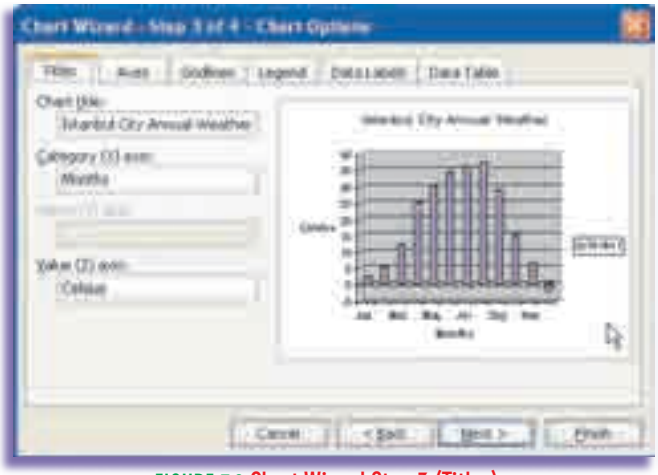


FIGURE 7.8 Chart Wizard Step 3 (Titles)

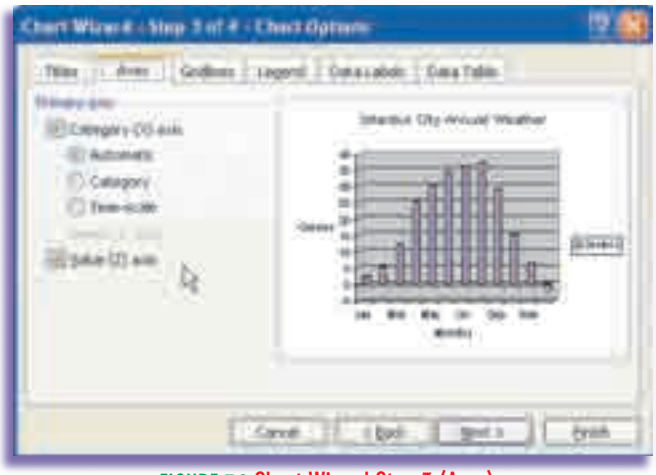


FIGURE 7.9 Chart Wizard Step 3 (Axes)

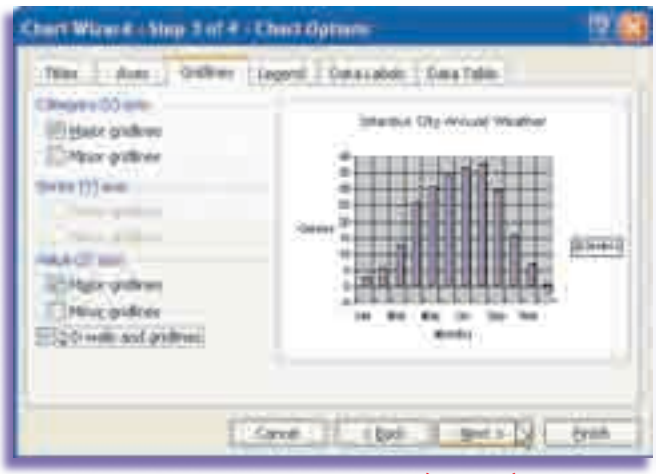


FIGURE 7.10 Chart Wizard Step 3 (Gridlines)

Step 3

the third step has many tabs which facilitate your chart preparations.

1. Titles: Descriptive text that briefly explains the purpose of a chart. It's located at the top of the chart.

To edit Titles:

Click on one of the following tabs to customize your chart.

- Enter the title in the Chart title text box.
- Enter the X-Y-Z axis name in the Category axis text boxes.

2. Axes:

Charts typically have two axes (axis: A line bordering the chart plot area used as a frame of reference for measurement. The Y-axis is usually the vertical axis and contains data values. The X-axis is usually the horizontal axis and contains categories or items) used to categorize and measure data: a category (X) axis and a value (Y) axis. 3-D charts have a third (Z) axis. Pie and doughnut charts do not have any axis.

To Modify Axes

- Select the Category (X) axis checkbox to display the X-axis labels.
- Select the Value (Y) axis checkbox to display the Y axis labels.

3. Gridlines

Lines you can add to a chart that make it easier to view and evaluate data. Gridlines extend from the tick marks on an axis across the plot area. Choose proper options, either you want to display the major and/or minor gridlines for the X and Y axis. Usually, minor gridlines are not displayed.

4. Legend:

A box that identifies the patterns or colors that are assigned to the data series or categories in a chart. Select the **Show Legend** checkbox to display the legend. You can choose the legend location by selecting the Bottom, Corner, Top, Right, or Left radio button.

5. Data Labels

A label that provides additional information about a data marker, which represents a single data point or value that originates from a worksheet cell. Choose to display and/or format data labels. Click **Label contains** options to add or remove data labels.

- **Series name** displays data on the selected axis as the default category (x) axis, even if data is date formatted.
- **Category name** displays the category name assigned to all data points. For scatter and bubble charts, the X value is displayed.
- **Value** displays the value represented for all data points.
- **Percentage** displays the percentage of the whole for all data points in pie and doughnut charts.
- **Bubble size** displays the size for each bubble in a bubble chart, based on the values of the third data series.
- **Separator** allows you to choose how the contents of the data label are separated. Choose from the options available or type in a custom separator.
- You can place **Legend keys** with the assigned format and color, next to the labels in the chart.

6. Data Table:

A grid that contains the numeric data used to create the chart. The data table usually is attached to the category axis of the chart and replaces the tick-mark labels on the category axis. Choose to display the chart data in a data table.

- The **Show data table** option displays the value for each data series in a grid below the chart. This option is not available for pie, XY (scatter), doughnut, bubble, radar, or surface charts.
- Click the **Show legend keys** option to display legend keys, with the assigned format and color for each plotted series, next to series label in the data table.

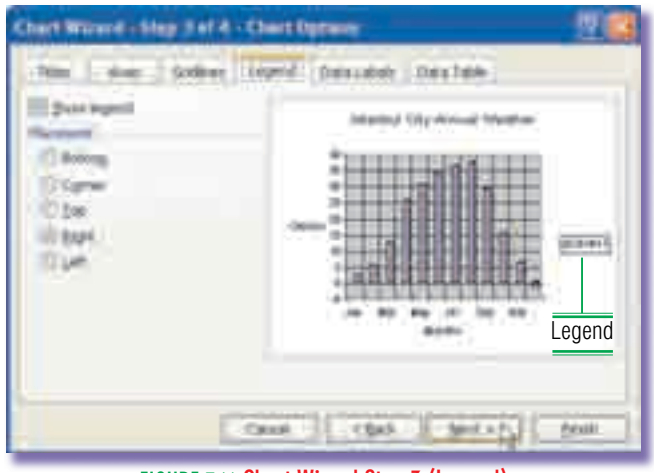


FIGURE 7.11 Chart Wizard Step 3 (Legend)

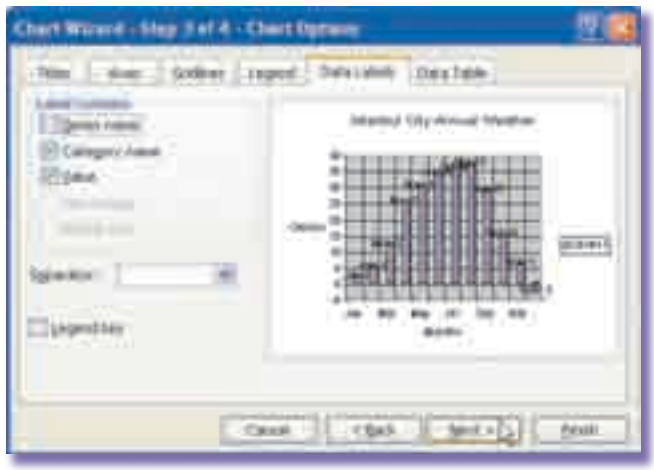


FIGURE 7.12 Chart Wizard Step 3 (Data Labels)

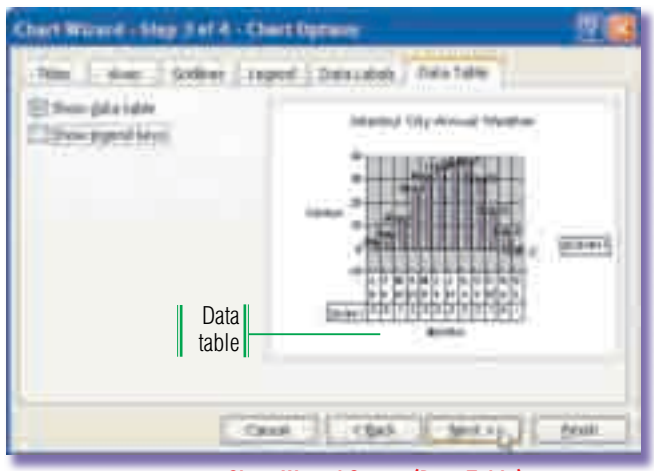


FIGURE 7.13 Chart Wizard Step 3 (Data Table)

FIGURE 7.14 Chart Wizard 4 (Chart Location)

Step 4

Choose the location for your new chart.

- Select the **As new sheet** radio button to place the chart on a new worksheet, and enter the worksheet name in the text box. This option makes printing on a page easier.
- Select the **As object in** radio button to place the chart as an object in an existing worksheet, and select the worksheet you want from the dropdown list. This option is helpful when the chart is used as a part of document.

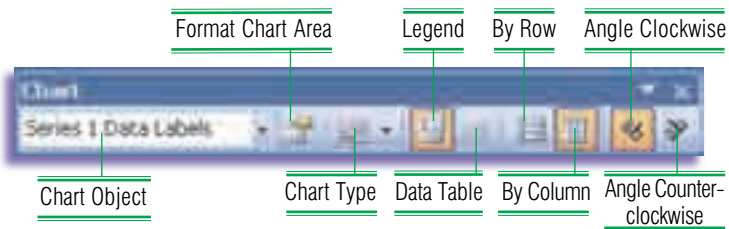


FIGURE 7.15 Chart Toolbar

7.2 CHART TOOLBAR

The **Chart Toolbar** provides quick access to commonly used actions. When you put your mouse pointer over an icon, it is highlighted in blue and a descriptive tool tip appears. Position your mouse pointer over the icon you want and click on the icon.

Plot Area	Click on the **Chart Object** down arrow, and select the chart object you want to edit.
	Click this icon to change the **Formatting** of the selected object in the chart.
	Click the **Chart Type** down arrow, and select the new chart type.
	Add or remove the **Legend key** from the chart.
	Add or remove the **Data table** from the chart.
	Display your **Series in rows**.
	Display your **series in columns**.
	Change angle of the selected text 45° clockwise.
	Change angle of the selected text 45° counterclockwise.

To display the chart toolbar choose **View>Toolbars>Chart** from the main menu.

If you double click these buttons you will change the direction of the selected text to default format.

Example 7.2

Your math teacher heard about Charts and he wants to prepare a chart for his lesson. He has 2 exams and an average column. Now, help him prepare this chart.

Solution:

Step 1 of the Chart Wizard

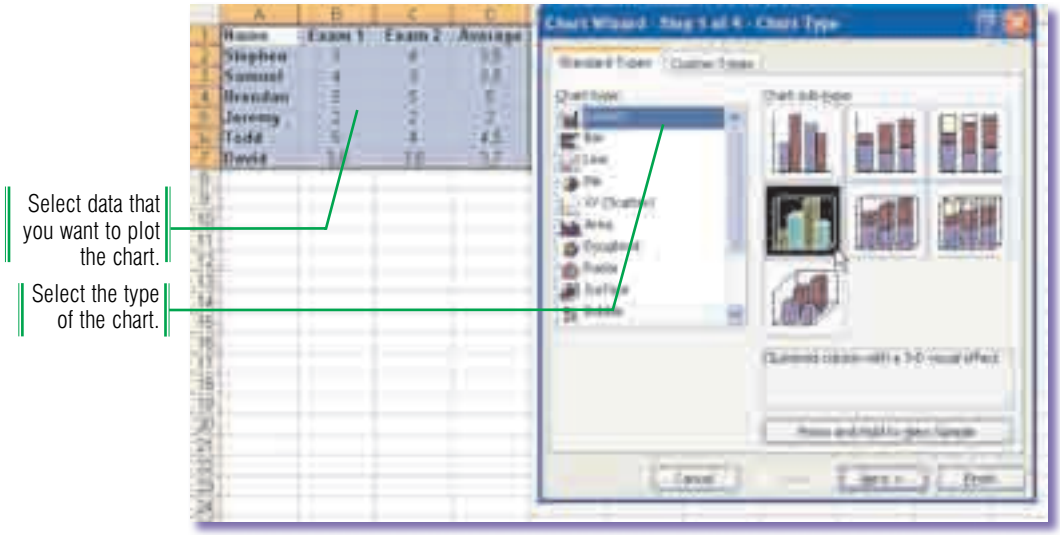


FIGURE 7.16 Chart type

Step 2 of the Chart Wizard

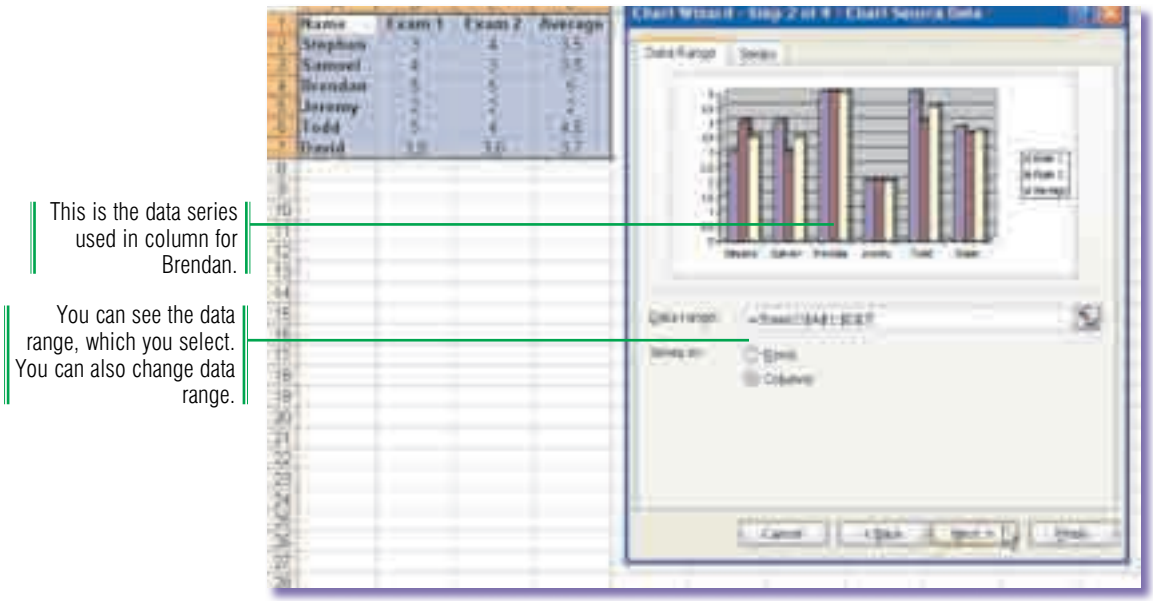


FIGURE 7.17 Data range

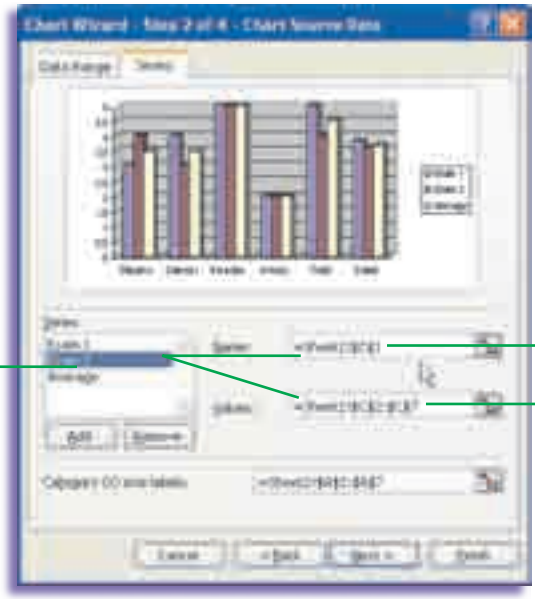


FIGURE 7.18
Chart source data

Press the Next button to go to step 3.

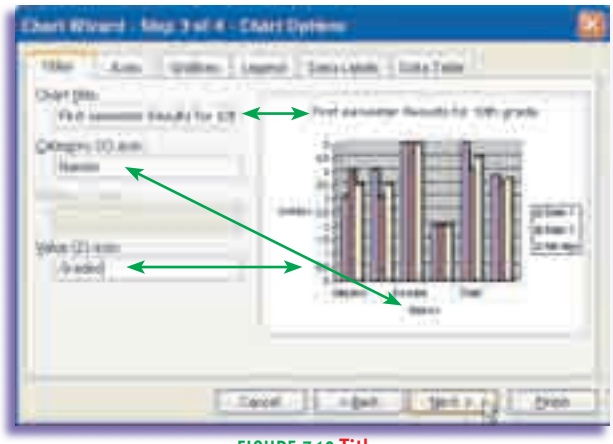


FIGURE 7.19 Titles

Step 3 of the Chart Wizard

- Enter 'First semester Results for 10th grades' in the chart title box.
- Enter '**Names**' in Category (X) axis box.
- Enter '**Grades**' in Category (Z) axis box.

They are displayed in preview when you have written these names.

Then also arrange the Axes and other options in the third step. And click **Next**.

FIGURE 7.20 Chart Location

FIGURE 7.21 Chart toolbar

Step 4 of the Chart Wizard

Select **As object in** and then select the sheet and press the Finish button. Now your teacher's chart is ready. You can continue modifications from the Chart toolbar. It has many handy tools to make-up your charts.

For example, in order to change the direction of student names, select Category Axis from the **Chart Object** combo box and click the **Format Chart Area** button next to it. It will show the **Format Axis** window. This window has five tabs. From the alignment tab you can change the direction, orientation or offset the Category Axis values. From the Font tab, you can modify the font name, size or color and other font options.

FIGURE 7.22 Format Axis window

You can use your imagination and productivity to prepare nice looking charts using fill effects. From the **Chart Toolbar**, select the **Chart area**, **Plot Area** or **Series** options, to define fill effects for your charts. They contain hundreds of different fill options. You can even place one of your pictures as a background. The **Shadow** and **Round corners** options will definitely give a nice look to your charts.

Now you know how to modify charts. The rest is up to you. Use your imagination and ability.

FIGURE 7.23 Format Chart Area window

CHAPTER 7
IN BRIEF

In this chapter you learned how to create and modify charts in Excel. the best part of creating a chart in Microsoft Excel is that it automatically updates the chart when you change the data values. It means you create your report once and then just change the values as you need. You prepared an automatic report for yourself.

When you click on the **Chart** icon on the **Standard Toolbar**, a graphical **Chart Wizard** will guide you to create a chart through four steps. You create the data select your favorite chart type and fill in the necessary part of the chart like title, axis' name and so on. Finally you have your own chart.

After creating your chart, you can modify it by clicking the part that you want to change. The **Chart Toolbar** will allow you to select the item you want to modify from a drop-down menu.

Example

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

SUMMARY

QUESTIONS

1- If you want to show percentages of a whole in a chart, what type of chart would you prefer?

A.Line chart
B.Bar chart
C.Pie chart
D.Bubble chart

2 - A bar chart is useful for .....

A.Showing the amount of change in data over time.
B.Showing the relationship of parts to a whole.
C.Showing changes to data at regular intervals.
D.Comparing individual items.

3 - Which command must be selected from the popup menu (right click menu) of a chart to open the Window including Titles, Legend and Data Labels?

A.Chart Options
B.Source Data
C.Location
D.Chart Type

4 - In an Excel chart, you can display:

A.Only gridlines.
B.Gridlines, tips with data-point values, and a legend.
C.Only tips with data-point values.
D.Only a legend.

5 - Can you add more data series to a pie chart?

A.Yes B.Sometimes
C.No D.It depends

6 - An area chart is useful for .....

A.Showing the amount of change in data over time.
B.Comparing individual items.
C.Showing the relationship of parts to a whole.
D.Showing changes to data at regular intervals.

7. Which of the following menus contains the Chart command?

A.Data
B.Format
C.Tools
D.Insert

8. Charts typically have two axes used to categorize and measure data: a category (x) axis and a value (y) axis. Pie and doughnut charts do not have any axes.

TRUE ☐ FALSE ☐

9. Which chart type(s) **can not be** used for the table below?

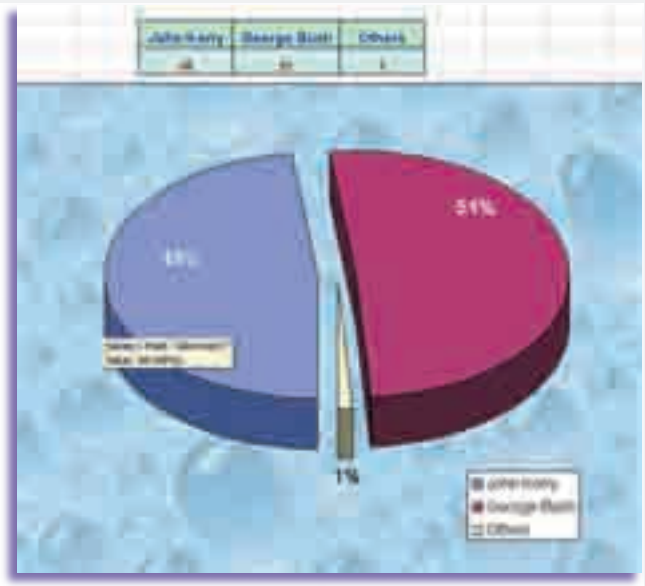
NAME	GRADE
John S.	80
Jack W.	65
Adreea T.	92
Bob C.	76

I-Doughnut II-Column III-Pie IV-Cone

A.III
B.I-III
C.III-IV
D.I-III-IV

10- Which chart type is used to show the relationship or proportion of parts to a whole?

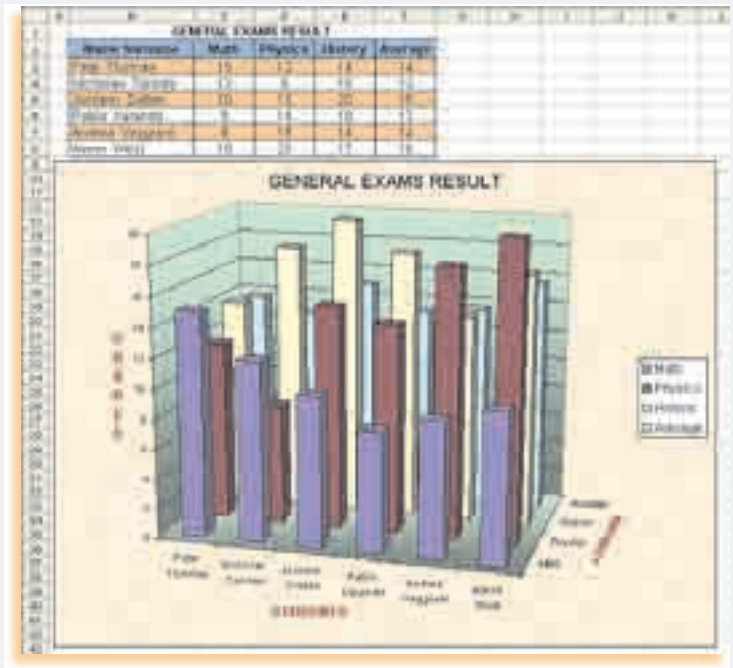
A: Column
B: Bar
C: Pie
D: Pyramid



1- Make the following chart according to the results of the USA 2004 Presidential election.

2- Make the following chart for the given data.

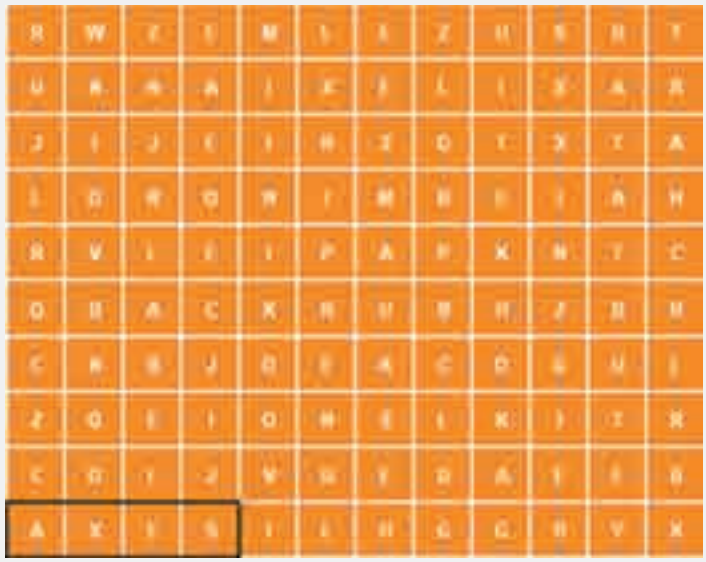
Solve the clues and find each word in the puzzle.



PRACTICE

WORD SEARCH PUZZLE

Solve the clues and find each word in the puzzle.



WORDS	CLUES
AXES	Pulural form of a straight line around which an object rotates.
	A chart type.
	Visual display of information.
	A chart type.
	Information.
	Brief description which appears on a computerized note.
	Used to identify each bar in a 3-D column chart.
	A chart type.
	The secondary gridlines on the background of a chart.
	General or descriptive heading for a chart.
	A chart type used especially on limited data.
	The main gridlines on the background of a chart.

PROJECT

1. What type of chart, would work best to represent the information in this worksheet?

	A	B	C	D	E
1	John Walker's Store				
2	Quarterly Sales				
3		Quarter 1	Quarter 2	Quarter 3	Quarter 4
4	TV	4510	5000	12000	35000
5	Computer	5620	6000	4000	8000
6	Washing Machines	7840	8500	4700	10000
7	Walkman	800	2000	2500	3000

2. Use the Chart Wizard to create a chart that plots the cell range A4:E7. Title chart the Chart "Quarterly Sales" and place the chart in a separate sheet.

3. Click the legend to select it, and change the font size used in the legend to 12 pt.

4. Make the legend taller by about ½", and drag it to the bottom right of the chart.

5. Change the chart type to a 3-D Bar chart.

6. Change the color of the **Walkman** series to light green.

7. Use the drawing toolbar to add an arrow that points to the largest number in the chart and add a textbox at the other end of the arrow that says "Super!"

8. Change the chart's data source so that only the totals for each component (cell range F4:F7) are plotted in the chart.

PROJECT

CHAPTER 8

EXTRA OPTIONS

- ✓ Data Validation
- ✓ Freeze and Split Panes
- ✓ Group and Outline
- ✓ Comment
- ✓ Tracking
- ✓ Sharing a Workbook
- ✓ Options Window

Microsoft Office
Excel 2003

EXTRA OPTIONS

There are many options in Microsoft Excel that facilitate data processing. It is very difficult to include all Excel tools in such a small book. Therefore we are going to briefly analyze some new tools and commands in this chapter.

8.1 DATA VALIDATION

You can help users to enter accurate and appropriate information into worksheets with Excel's **Data Validation** feature. Data validation can restrict the type of information that is entered in a cell and can provide the user with instructions on entering information.

	A	B	C	D	E	F
1	ID	Name	Surname	Exam1	Exam2	Average
2	1	Stephen	Milligan	9	8	8.5
3	2	Samuel	Neff	5	6	5.5
4	3	Brendan	Hara	7	10	8.5
5	4	Jeremy	Petersen	9	7	8
6	5	Todd	Rafferty	10	10	10
7	6	Kevin	Schmidt	9	10	9.5
8	7	David	Shadovitz	10	8	9
9	8	Pete	Thomas	8	7	7.5

FIGURE 8.1 Worksheet for Data Validation

Example 8.1

Back to your math teacher's worksheet, to improve the worksheet, he asks you to restrict the data entrance. Because the school uses a 10-grade system, he wants to be able to enter only decimal numbers between 1 and 10.

FIGURE 8.2 Data Validation, Settings

Analyses and Solution

Before you open the Data Validation dialog window, you must select the range of cells to which you want to apply validation. Select the range D2:E9 range. Now you can open **Data Validation** from the **Data** menu. In the **Settings** tab of the Validation dialog box, you can enter validation criteria.

You can choose the type of data that you want to enter in your selected area from the **Allow** drop down menu. For this example, select **Decimal** type.

From the **Data** drop down menu you can select conditional criteria for your selected range.

You can enter the range of the values, depending on the conditional criteria that you selected in the data drop down menu.

Set the minimum value to 1 and maximum value to 10.

Input Message:

You can enter a title and an input message that will be displayed when you select any cell(s) in the selected range. If you clear the check box Input Message will be disabled.

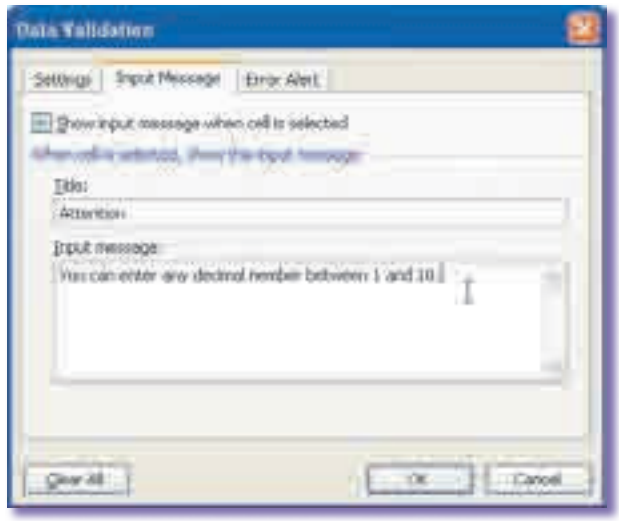


FIGURE 8.3 Data Validation, Input Message

Error Alert:

You can also enter a title and an error message that will be displayed when someone enters an incorrect value which you restricted from your settings.

There are three options; Stop, Warning, and Information in the **Style** drop down menu.

- **Stop:** Prevents you from entering an incorrect value.
- **Warning and Information:** displays the error message and asks if you are sure or not. If you say OK, it'll accept the value.

If you clear the check box at the top, the error alert will be disabled.

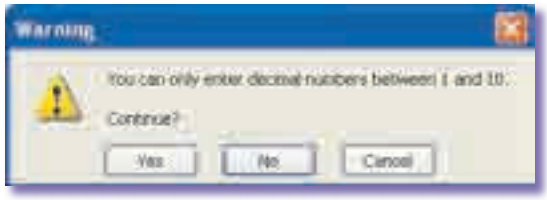


FIGURE 8.3 Warning Message

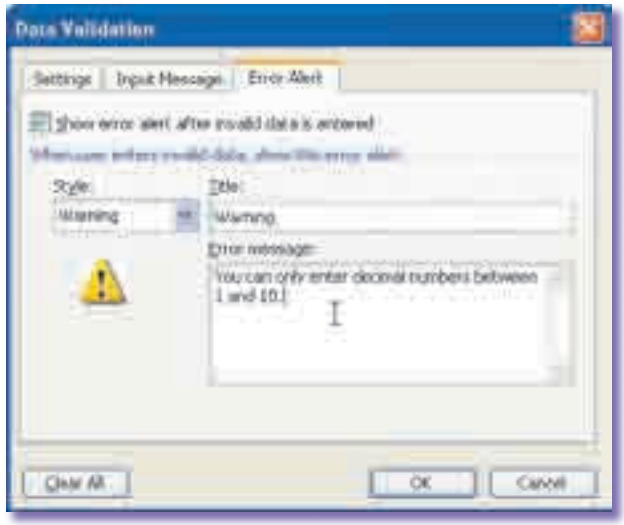


FIGURE 8.4 Data Validation, Error Alert

8.2 FREEZE AND SPLIT PANES

While working with large worksheets, you sometimes, need to see different parts at the same time. It can be difficult to go forward and backward continuously. Microsoft Excel offers you two different options for such a situations Freeze and Split.

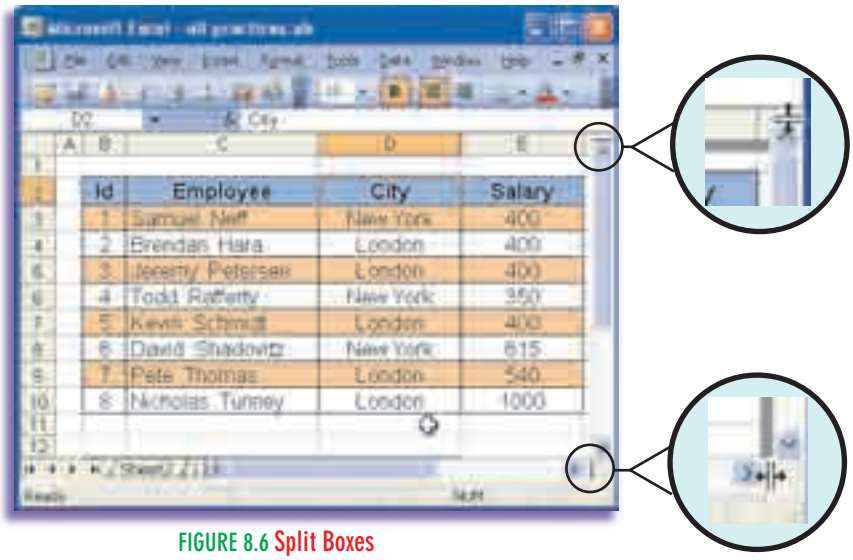
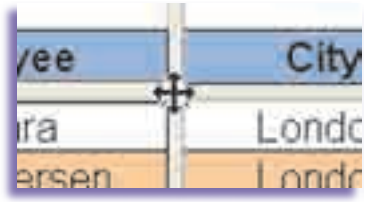


FIGURE 8.6 Split Boxes

8.2.1 SPLITTING PANES

You **Split** a worksheet in order to view and scroll different parts of it independently. Splitting a worksheet into panes allows you to view different parts of the same worksheet side by side. It is useful



when you want to copy-paste data between different areas of a large worksheet.

- To set the horizontal pane, drag the split box (located above the vertical scrollbar) down.
- To set the vertical pane, drag the split box (located to the right of the horizontal scrollbar) left.

When you want to remove a split, you can double click on it, or select **Remove Splits** from the Window menu.

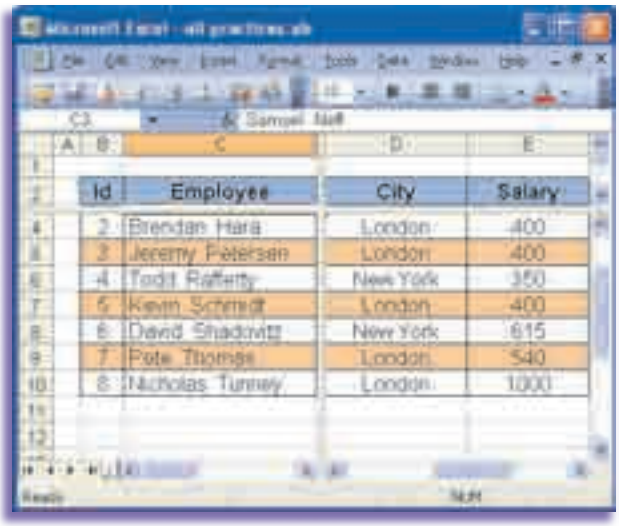


FIGURE 8.7 Split into 4 panes

8.2.2 FREEZING PANES

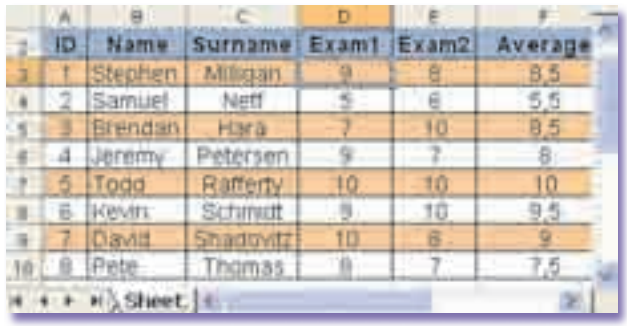
To keep row and column labels or other data visible as you scroll through a sheet, you can **Freeze** the top rows and/or left columns. The frozen rows and columns do not scroll but remain visible while you move through the rest of the worksheet.

How to freeze;

- Begin by selecting the top-left cell that will not be part of the frozen panes (Figure 8.8).
- From the main menu, choose **Freeze Panes** from the **Window** menu (Figure 8.9).

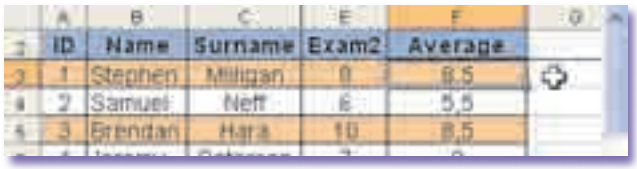
Example 8.2

For example, to freeze the top row and the left column in Figure 8.8, select cell D3, and then click **Freeze Panes** from the **Window** menu. Thick lines will appear on the intersecting corner of the selected cell representing the freezing point. Later on, while scrolling down or right the Name and Surname columns, together with the column headings line will remain visible while you move through the rest of the sheet.



	ID	Name	Surname	Exam1	Exam2	Average
3	1	Stephen	Milligan	9	8	8,5
4	2	Samuel	Neff	5	6	5,5
5	3	Brendan	Hara	7	10	8,5
6	4	Jeremy	Petersen	9	7	8
7	5	Todd	Rafferty	10	10	10
8	6	Kevin	Schmidt	9	10	9,5
9	7	David	Shadovitz	10	8	9
10	8	Pete	Thomas	8	7	7,5

FIGURE 8.8 Before Freeze

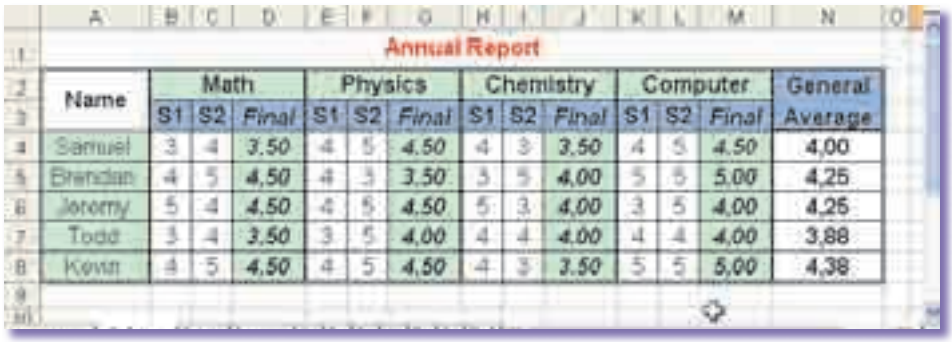


	ID	Name	Surname	Exam2	Average
3	1	Stephen	Milligan	8	8,5
4	2	Samuel	Neff	6	5,5
5	3	Brendan	Hara	10	8,5

FIGURE 8.9 After Freeze

8.3 GROUP AND OUTLINE

Microsoft Excel can create an outline for your data to let you show and hide levels of details with a single mouse click.



Annual Report

Name	Math			Physics			Chemistry			Computer			General
	S1	S2	Final	S1	S2	Final	S1	S2	Final	S1	S2	Final	Average
Samuel	3	4	3,50	4	5	4,50	4	3	3,50	4	5	4,50	4,00
Brendan	4	5	4,50	4	3	3,50	3	5	4,00	5	5	5,00	4,25
Jeremy	5	4	4,50	4	5	4,50	5	3	4,00	3	5	4,00	4,25
Todd	3	4	3,50	3	5	4,00	4	4	4,00	4	4	4,00	3,88
Kevin	4	5	4,50	4	5	4,50	4	3	3,50	5	5	5,00	4,38

FIGURE 8.10 Group and Outline

Example 8.3

You want to group columns B, C and D. Before applying Group and Outline, first select a range of cells from columns B to C. After that, select **Group** from **Group and Outline** in the **Data** menu. The **Group** dialogue window will be displayed. Select the **Columns** radio button.

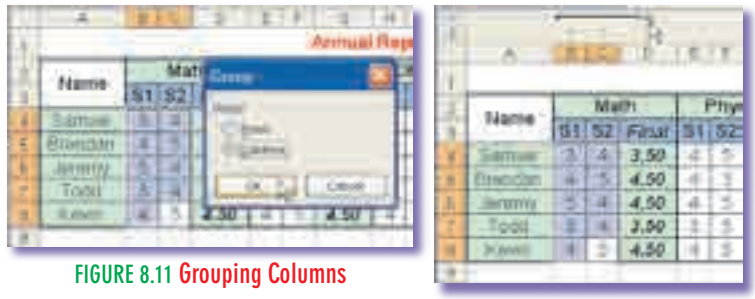


FIGURE 8.11 Grouping Columns

When you press the OK button, you group columns B, C and D together. You can show or hide these columns using the minus or plus buttons above the column headings.

When you use **Auto Outline** from the Group and Outline command, Microsoft Excel will automatically apply grouping to your worksheet according to your formulas.

FIGURE 8.12 Auto Outline

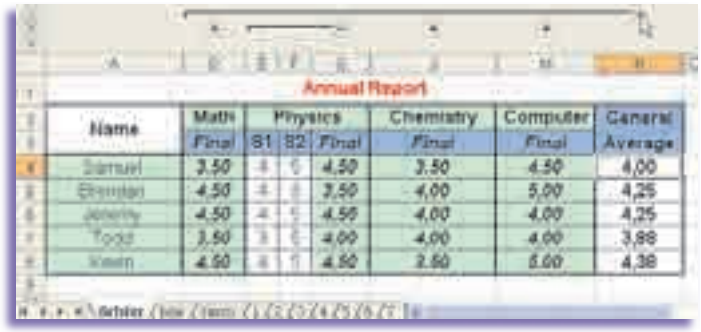


FIGURE 8.13 After applying Auto Outline

8.4 COMMENT

Sometimes you may need to add notes to document complicated formulas, questionable values, or leave a comment to another user. Microsoft Excel's **Cell Comments** command helps you document your worksheets and make them easier for others to understand. Think of Cell Comments as Post-It Notes that you can attach to any cell. Cell Comments appear whenever you point at the cell they are attached to.

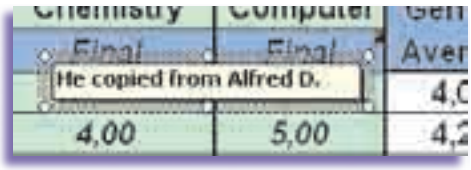


FIGURE 8.14 Insert Comment

To Insert a Comment:

1. Right-click the cell you want to attach a comment to.
2. Select **Insert Comment** from the popup menu.
3. Type in the comment.
4. Click anywhere outside the comment area when you are finished.

FIGURE 8.15 Edit Comment

To Edit a Comment:

1. Right-click the cell that contains the comment you want to edit.
2. Select **Edit Comment** from the popup menu.
3. Edit the comment.
4. Click anywhere outside the comment area when you are finished.

To Delete a Comment:

1. Right-click the cell that contains the comment you want to delete.
2. Select **Delete Comment** from the popup menu.

To Format a Comment:

1. Right click the comment.
2. Select **Format Comment** from the shortcut menu.
3. Adjust the comment from the **Format Comment** dialog box.

FIGURE 8.16 Format Comment

8.5 TRACKING

Microsoft Excel can maintain and display information about how a worksheet was changed. **Change Tracking** logs details about workbook changes each time you save a workbook. You can use this history to understand what changes were made, and to accept or reject revisions.

This capability is particularly useful when several users edit a workbook. It is also useful when you submit a workbook to reviewers for comments, and then want to merge input into one copy, selecting which changes and comments to keep.

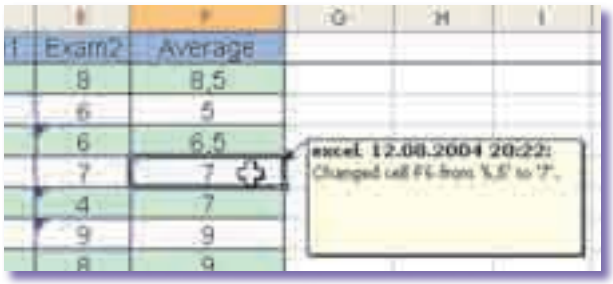


FIGURE 8.17 Tracking

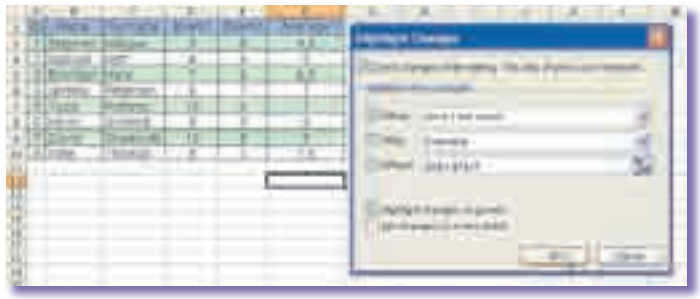


FIGURE 8.18 Highlight Changes

8.5.1 HOW TO USE CHANGE TRACKING

You can share your Excel workbook files with other people, so that you can work on the data collaboratively. Sharing a workbook has several benefits

- Several people can use the same shared workbook simultaneously.
- Excel keeps track of any changes made to a shared workbook, when they were made, and who made them.
- You can review and accept or reject any changes made to a shared workbook.

This lesson explains how you can share a workbook when you need to collaborate on a project with other people.

- To activate sharing and tracking changes, click **Highlight changes** from **Track changes** in the **Tools** menu.

Track changes while editing. This also shares your workbook. It turns on both workbook sharing and the change history so that you can highlight subsequently made changes. If the workbook is already shared and you clear this check box, the workbook is removed from shared use and the change history is turned off so that changes to the workbook can no longer to be highlighted.

When: Check this box to display changes for the interval of the elapsed time.

Who: Check this box to highlight changes in the workbook made by the person or persons selected in the 'Who' box.

Where: Check this box to highlight changes only for a specified range of cells. Hold down CTRL and click to select the nonadjacent cells you want to highlight changes for. The collapse Dialog button at the right end of this box temporarily moves the dialog box so that you enter the range by selecting the cell on the worksheet. When you finish, you can click the button again to display the entire dialog box.

Highlight changes on screen: Shows details about changes. Position the arrow over over a highlighted cell. The row number for the row that contains a highlight cell will also be highlighted.

List changes on a new sheet: Displays the changes on a separate history worksheet that you use to filter the information to find the changes you want. This check box available only after the workbook has been saved as a shared workbook.

FIGURE 8.19 Share Workbook (Editing)

8.6 SHARING A WORKBOOK

You can also share a workbook using **Share Workbook** from the **Tools** menu. You can share a workbook to allow changes by more than one user at the same time. This also allows workbook merging. You can remove any users you do not want to use the shared workbook.

You can adjust more options in the advanced menu window.

Track Changes: Specifies whether to maintain the change history when you share the workbook.

Update Changes: Specifies how often you want to see changes from other users.

Conflicting changes between users: Specifies how you want to review conflicting changes when you save the shared workbook.

Include in personal view: specifies personal printing and filtering options for the shared workbook. If you select one or

both of the options below, your choices are independently saved with your copy of the shared workbook

After you share the workbook you can check who changed the document.

Display changes: Using **Accept or Reject Changes** from **Track changes** in the **Tools** menu, you can Accept or Reject at any change that you want. After saving and closing your document, any time you can open the document and select the **Accept or Reject Changes** command and then continue **Tracking changes**.

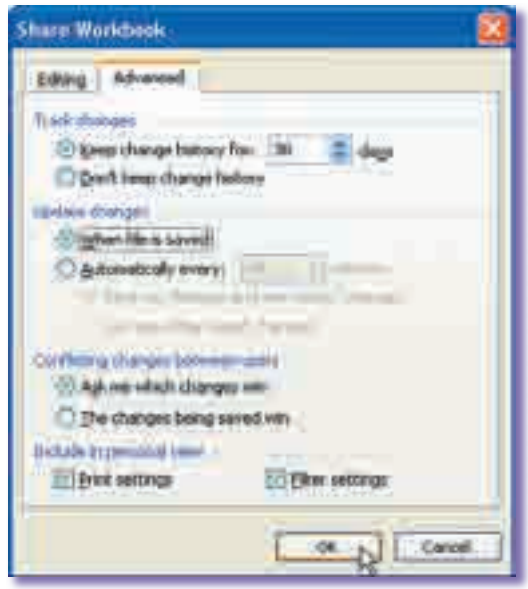


FIGURE 8.20 Share Workbook (Advanced)

Untracked changes

Not all the changes are tracked. So take care when you make the following changes.

- Change sheet names
- Insert or delete worksheets
- Format cells or data
- Hide or unhide rows or columns
- Add or change comments
- Cells that change because a formula calculates a new value
- Unsaved changes

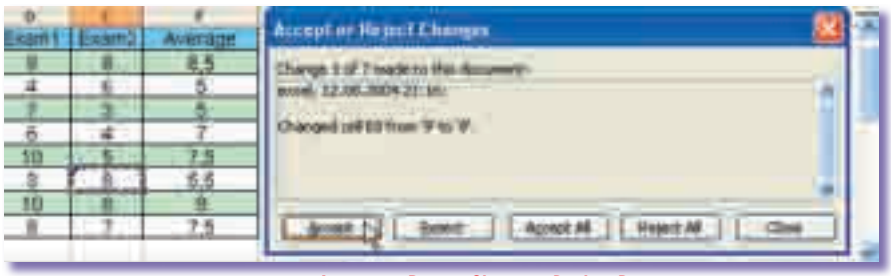


FIGURE 8.21 Accept or Reject Changes Dialog Box

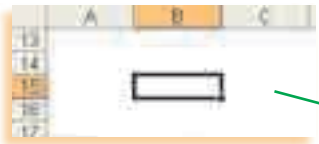
8.7 OPTIONS WINDOW

The Options window is like the headquarters of Microsoft Excel. It provides flexibility according to user demands, which is very important in user interface and user friendly environments. The options window contains hundreds of different options for user interface. You can open the **Options window** from **Options** command in the **Tools** menu. In the Options window there are 13 Tabs containing; View, Calculation, Custom Lists, Security, General, International, etc.

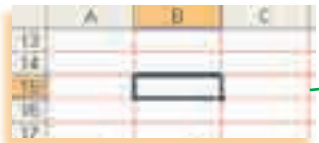
8.7.1 VIEW TAB

The View Tab contains visual options. You can show or hide Startup the Task Pane, Formula bar, Status bar, or Windows on the Taskbar. You also have different Comments and Objects options. In window options: You can show or

Show Gridlines



Hide Gridlines



Gridlines Color

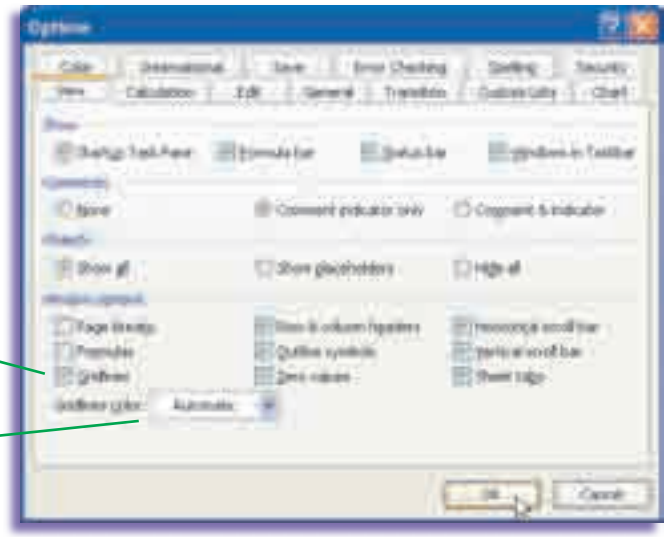


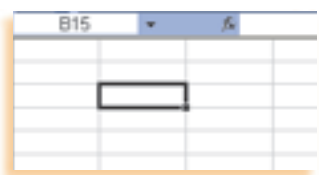
FIGURE 8.22 Options Window

Hide Formulas, Gridlines, and Row and Column headers. Or you can change Gridlines color.

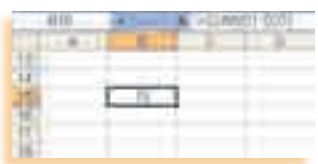
If you check the Formulas option, it will show formulas inside the cells. Otherwise, it will show the calculated result of operations.

Show Page breaks is also another good option that helps us in the design phase.

Show Row and Column headers



Hide Row and Column headers



Hide Formula

Show Formula

FIGURE 8.23 Some options in View tab

8.7.2 GENERAL TAB

Contains the Settings, web, Standard font and File location options.

Using the **Default file location** box, you can change your document folder. You can also change the number of sheets in a new workbook. The File menu can list recently used files and you can change the number of recently used files.

Using an option on the General tab, you can switch between A1 and R1C1 reference styles. The R1C1 reference style may be preferred when you have complex macros and formulas. There can be some difficulty when writing

formulas with A1 reference style, while R1C1 style referencing enables you to write numbers directly in your references.

Note: Using your programming capabilities, you can also write your own functions that converts R1C1 into A1 reference style. (This can be a good case study).

You can change **Web options**, for the files that you create especially for web pages. It has six different tab pages; General, Browsers, Files, Pictures, Encoding, and Fonts.

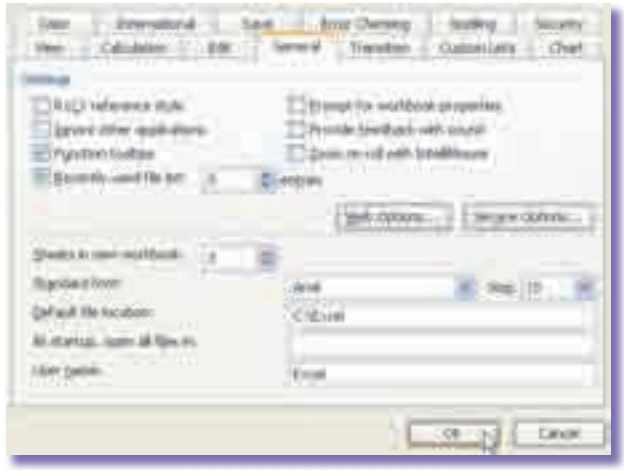


FIGURE 8.24 General Tab

FIGURE 8.25 General Tab (Web Options)

8.7.3 CUSTOM LISTS

Using this option, other than regular numerical ones, you can create your own lists.

You commonly use day or month lists. After you define something as a list, you can automatically fill series of days, months, etc… by using Fill Series option,

First, write your series in cells in a worksheet. Then, open Custom Lists from options and click the **Cell Name** button (2) to select your custom list range. After you select the range of the list, press ENTER. This will take the address of the list to the **Import list from cells** box (1). After that, click the **Import** button (3), your list will be added into **Custom Lists** (4).

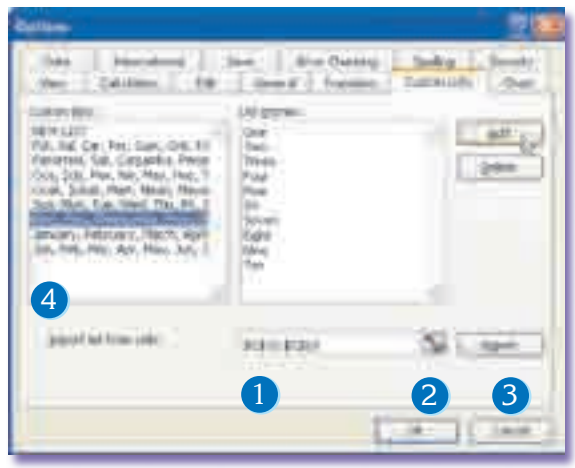


FIGURE 8.26 Custom List

FIGURE 8.27 Write your series

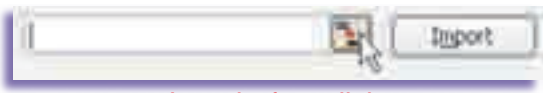


FIGURE 8.28 Import list from cells box

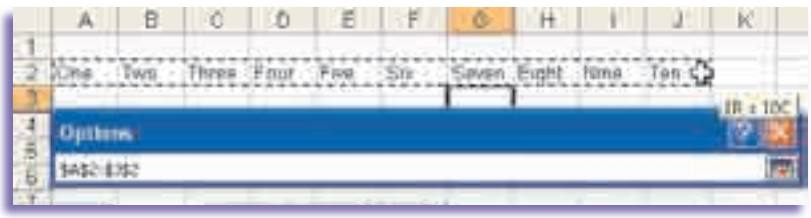


FIGURE 8.29 Select your custom list range

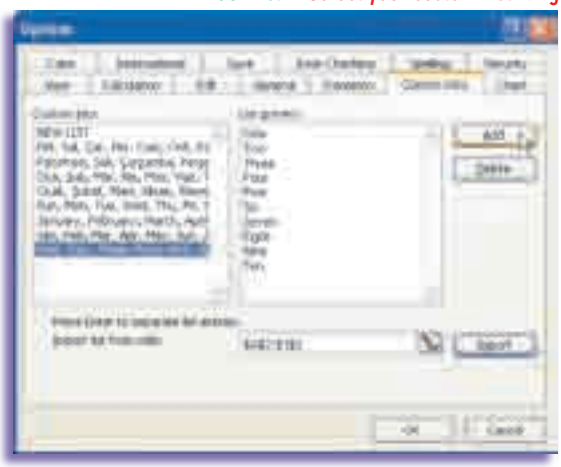


FIGURE 8.30 Custom List

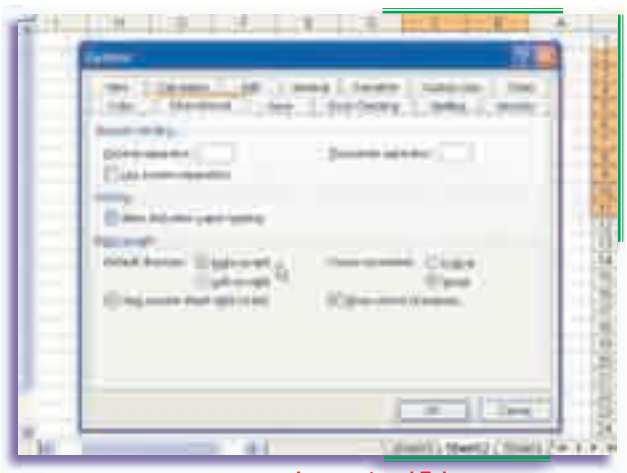


FIGURE 8.32 International Tab

Example 8.4

As a series, Days and Months are predefined. Let's now create another list for numbers from 1 to 10. First write your list into cells in a worksheet.

And then, open Custom lists and press the Cell name button next to **Import list from cells**.

It will show a small window and let you select the range. After you select the range and press enter, then click the Import button.

This will take your list into Excel Custom Lists. Now you can use your list in Excel when filling a series. First write one of the elements in the series and using the Fill Series mouse pointer, drag your mouse till the number you want to. According to your options on the Edit Tab, it can also show the Paste options button next to your cells. Using this button, you can change your fill series options.

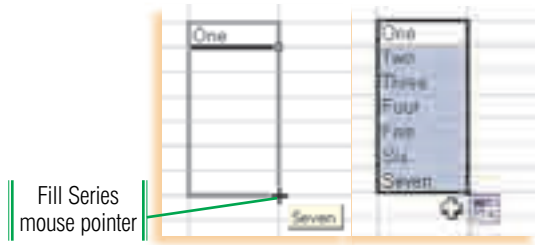


FIGURE 8.31 Fill Series

8.7.4. INTERNATIONAL TAB

International tab contains the commands for alphabets like Arabic whose text flows from right to left. It also has number handling options. If you check the **View current sheet right to left** option, your row and column will flow from right to left.

In order to define your own numbering separators clear the box next to **Use system separators** and then define your own separators above it.

8.7.5. SECURITY TAB

The Security tab contains passwords, Macro security and Digital signature options;

File Encryption and **Password Options** are the same as **Save Options** that you studied in earlier sections. **Macro security** gives you the possibility to select the Macro security level. In most cases, high or very high levels are recommended. You will study Macros as a separate chapter. The privacy option gives the chance to remove personal information from the active file on save.

Microsoft Office uses an Authentication technology that lets you use digital signature in your documents. There are some tools that let you create your own digital signatures but this digital signature will not be internationally authenticated. There are also some companies that give you an internationally authenticated digital signature. Using this digital signature lets your clients or friends recognize the files that are coming directly from you.

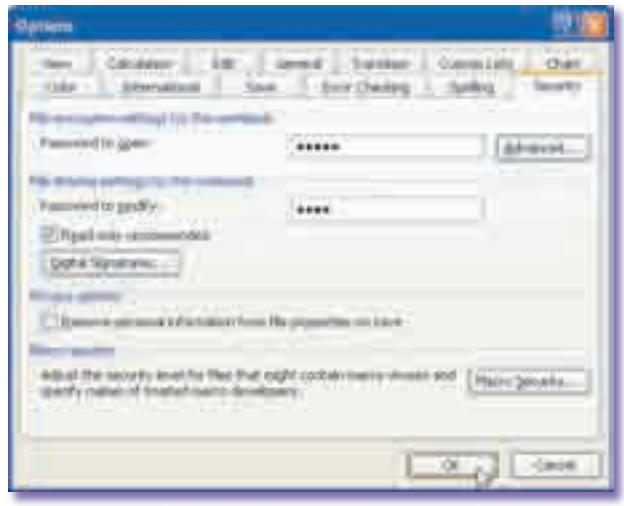


FIGURE 8.33 Security Tab

8.7.6. EDIT TAB

The Edit tab contains the options related to cell edit settings.

Most of the options are clear in meaning.

Enable automatic percent entry, enables you to enter a number using a percentage sign.

Show Paste options button; after you paste from the clipboard, the paste options button will appear next to pasted cell.

By changing the option here, you can move a selection, after the ENTER key; up, down, left or right.

FIGURE 8.34 Edit Tab

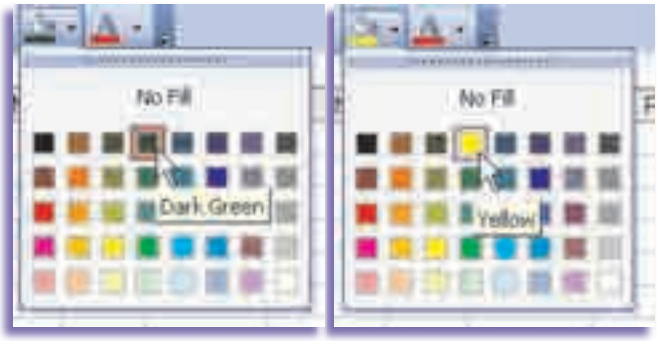


FIGURE 8.35 Color Scheme

8.7.7. COLOR TAB

From the color tab, you can change the default color scheme for text or fill colors and define your own color scheme. Your color scheme will be saved with your active document but will not be saved for all documents. If you want to save your color scheme for all documents you need to save this color option in your main template file. Figure 8.35 below shows the default and modified color schemes.

FIGURE 8.36 Spelling Tab

8.7.8 SPELLING OPTIONS

Similar to MS Office Word, you can use different languages in MS Excel. Your own words are added into Custom.dic file. This file can be changed.

CHAPTER 8
IN BRIEF

SUMMARY

Chapter 8 explains some useful options that will help you while creating tables.

What happens if the users enter the wrong information as data? You can limit the cell content to specific values to prevent making mistakes. You can limit the cell values to "Yes" or "No" using the **Validation** tool on the **Data** menu. The users can be led through information and warning messages.

The next option you learned is another quite useful tool when entering large amount of data. You may want to see your titles at all times. Therefore, you can use **Freeze Panes** on the **Window** menu. Now you never have to chase after the data titles.

If you want to copy some data from the 135th row to the 23rd row, another tool will assist you to see both rows on screen simultaneously. Just click **Split** on **Window** menu and you can split your window. Now you can locate the 23rd row in one window, and the 135th row in the other window.

You can group your data into levels for better editing or viewing. You can hide/ reveal part of the data from the **Group and Outline** option on the **Data** menu.

Sometimes you need to add explanations for later processing. Adding notes is useful when multiple users work on the same task. They can be attached to any cell and they appear when you point your mouse on a cell. You can add notes from the **Insert** menu choosing **Comment**.

The **Tracking** option lets you remember your steps. It keeps record of each users' changes to cells. It is very useful while sharing your workbook on a network and working on a document simultaneously. You can see from the information box who changed what and when. By clicking **Tools, Track Changes, Highlight Changes**, you start both the **Share Workbook** option and the **Track Changes** option.

You can change the properties of Microsoft Excel such as, spelling, security or custom lists from the **Option** window. You can access it from **Tools** menu.

QUESTIONS

1. .....validation criteria allows the user to enter anything in the cell.

   A.Decimal
   B.Any value
   C.List
   D.Custom

2. The .....validation criteria allows you to enter your birthday to the cell.

   A.Decimal
   B.Date
   C.Time
   D.Text Length

3. To add a new record to the database, click the ..... button on the Data Form window.

   A.Add
   B.Record
   C.Next
   D.New

4. Use the ..... command on the Data menu to display and change the data in records.

   A.View
   B.Change
   C.Form
   D.Modify

5. Which menu contains the Options window?

   A.Format
   B.Tools
   C.Data
   D.Window

6. Which menu tab from the Options window is used to give a password to open an Excel workbook?

   A.Security
   B.Save
   C.Edit
   D.General

According to the view settings below, choose the right one.

FIGURE 8.33 Question 7, 8, 9, 10, 11

7. On this sheet, gridlines are hidden.

   TRUE ☐ FALSE ☐ NOT DEFINED ☐

8. The resulting value of any formula can be seen in cells.

   TRUE ☐ FALSE ☐ NOT DEFINED ☐

9. The Horizontal scroll bar can **not** be seen on this worksheet.

   TRUE ☐ FALSE ☐ NOT DEFINED ☐

10. This 'View settings' does not effect to other sheets on the same workbook.

    TRUE ☐ FALSE ☐ NOT DEFINED ☐

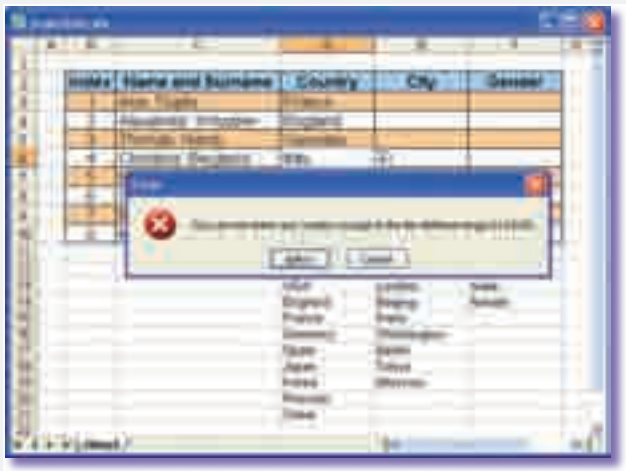
11. Function tooltips are visible.

    TRUE ☐ FALSE ☐ NOT DEFINED ☐

QUESTIONS

PRACTICE

1- The City police department wants a computerized system to accept visas. In order to avoid mistakes, they want to keep the lists for countries and cities in separate ranges. So any input that is in this list will be accepted as valid input. The police department wants Microsoft Excel to warn for any other inputs.



2- Create the following table and apply grouping as shown in the figure.

3- Use the split command on the table in the first practice.

4- Show how to remove multiple sheets in a workbook at the same time.

5- Suppose that your workbook contains 4 sheets. Show how you can write the same data to all sheets simultaneously.

6- Can you hide

- sheet tabs,
- vertical & horizontal scroll bar,
- column & row headers,
- formula bar,
- status bar.

7- Change the gridlines color to dark blue.

8- Change the cell calculation style to manual so that it won't calculate results automatically.

9- Add a list showing the days of the week for your country.

10- How can you secure your Excel document?

PRACTICE

PUT THE WORDS IN GROUPS

Write the following commands into their own Tab on the Options menu.

1. Standard color
2. Disable AutoRecover
3. Show formula
4. Password to modify
5. Show insert option button
6. Copy colors from
7. Show gridlines
8. Show values on chart
9. AutoCorrect options
10. Standard colors
11. Show status bar
12. Password to open
13. Dictionary language
14. Show paste option button

Tab	Color	Save	View	Chart	Security	Spelling	Edit
Commands							
			Show Status Bar				

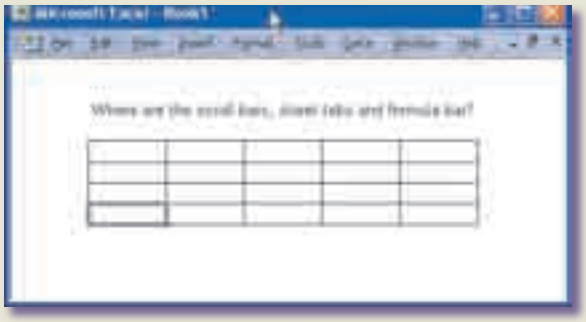
ENTERTAINMENT

PROJECT

1. If the manual option is selected from the calculation tab on the Options window, which key is used to recalculate the formulas?

2. Find and change the default font properties in your Excel environment.

3. In the following Excel sheet, there are no scroll bars, sheet tabs, formula bar and status bar. Setup your Excel sheet to look the same.



4. Use Data Form to add a new record with the following information:

   Date: 5/6/2004
   Last: Smith
   First: Alfred
   Amount: 300
   Ticket: 4

5. For column A, use Excel's Data Validation feature to restrict entering any date later than 5/7/2006

6. Use the **Freeze** command to make the title row and names columns always visible.

7. Prepare a questionnaire for your friends and put it in an Excel workbook. Start **Tracking changes** on the document and give this diskette to 5 friends. After you take the diskette back, prepare charts for every question in it and present the results of your survey to the class.

8. Find and add your country's language dictionary to spelling options.

9. Put a password in your Excel workbook to open and modify.

NOTES

CHAPTER 9

MACROS

- ✓ Recording Macros
- ✓ Forms Toolbar
- ✓ User Forms

Microsoft Office
Excel 2003

FIGURE 9.1 Tools > Macro menu

FIGURE 9.2 Record Macro window

FIGURE 9.3 Stop Recording Macro window

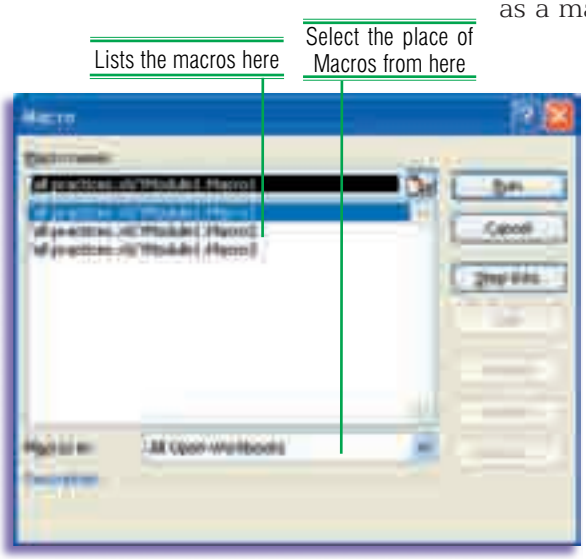


FIGURE 9.4 Load All styles

MACROS

A macro is a series of commands and functions that are stored in a Microsoft Visual Basic module and can be run whenever you need to perform the task.

If you perform a task repeatedly, you can save the steps as a macro. Anytime you wish to carry out this task, you can simply choose the appropriate macro from the **Macro Menu** on the **Tools** bar.

In order to run macros, set security to 'Medium' from ***Tools > Macro > Security***

9.1 RECORDING MACROS

You can **record a new macro** by opening the **Record New Macro… window from Tools** menu **Macro**.

In this window, you can give your macro a name and create a shortcut to your macro. Many programmers forget the details about their programs after some time. It is a good idea to give some brief information about the macro for later use.

After you click the OK button, it will start recording your macro. It will show another small window to stop recording after you finished.

All of your cell operations and other Excel commands will be stored as a macro until you press the **Stop recording macro** button.

Example 9.1:

Your brother prepares a document for his school homework and in this document he uses the insert and delete cell commands frequently. He wants you to do something to simplify this.

- Select a range that you want to delete.
- Select **Record New Macro…** command from **Tools** menu
- Write your macro name and give a shortcut for your macro
- Press OK.

Now, it starts recording all your commands. So,

- Right click on the selected area
- Select **Delete** command from the popup menu.
- It will ask you to move the cells up or left.
- Select left and press Enter.

Now you have finished recording macro and you can pressthe **Stop** button to stop the Record Macro process.

You can see your macro using **Macros…** from the Tools menu. This is the main window for Macros. You can do all operations related to Macros from here. You can Run, Delete, Edit or Create another macro from this window.

When you press **Edit** button, it will open Microsoft Visual Basic Editor.

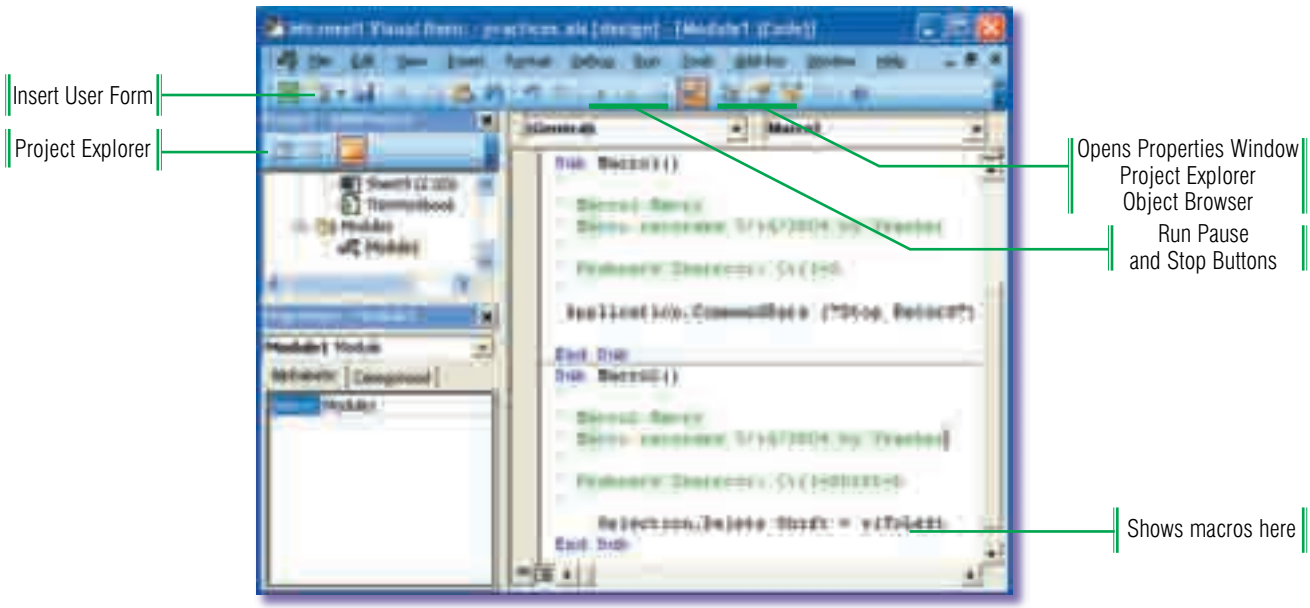


FIGURE 9.5 Visual Basic Editor

9.1.1 OBJECT BROWSER

Gives a short description and usage information about commands and objects. It shows class names and Members of the selected class. It also gives the properties of the member; the member is either a property or a function of the class.

Now, let's go back to our example. If you edit your macro, it will open MS Visual Basic Editor and show your macro here.

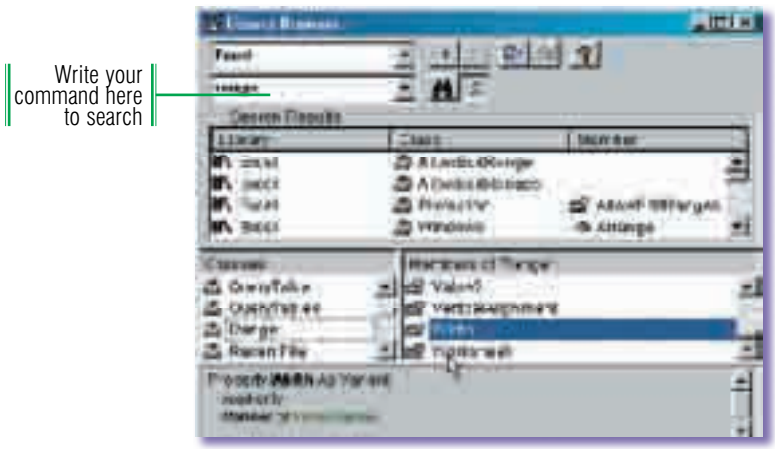
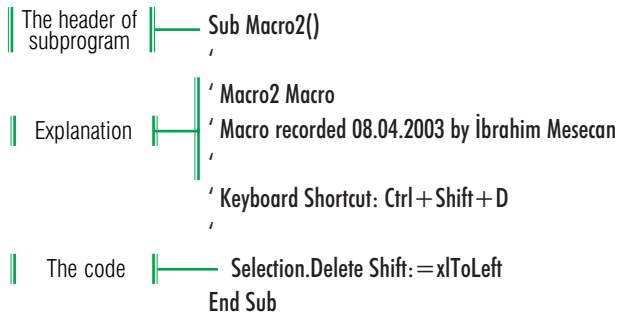


FIGURE 9.6 Object Browser



In the Edit window, you can edit your Visual Basic code or you can rewrite the entire code. Here, most commands from Basic Programming Language, Excel and Visual Basic can be used. The text after the apostrophe is an explanation, not a programming code. **Sub** is a command that says to VB (Visual Basic) that a subprogram with the name Macro2 is starting. And **End Sub** shows that the subprogram has ended. So we have just one line of code here.

```
Sub Macro2()
    Selection.Delete Shift:=xlToLeft
End Sub
```

Now, you finished recording a macro and it is ready to use. Any time you press **<Ctrl+Shift+D>**, it will delete the selected range of cells and move the right cells to left.

9.1.2 ASSIGNING VALUE TO CELLS

Using the **Range** command in Excel, we can define ranges or assign a value to a range.

```
Range("B2") = 7                 'Puts 7 to cell B2
Range("C1:D3") = 5              'Puts 5 to all cells in the range C1:D3
Range("A:A") = 3                'Puts 3 to all cells in column A
Range("5:5") = 4                'Puts 4 to all cells in Row 5
Range("B1") = Range("D7")       'Copies the value of D7 to B1
```

9.1.3 CONCATENATING TWO STRINGS

Using "**&**" sign you can concatenate two strings. When you execute the following command

```
Result =Range("C1") & "A"
```

a second string will be added to the end of the first one. So, if **Range("C1")** contains "5" and we add "A" to the end, the value for Result becomes "5A"

Example 9.2:

Your physics teacher heard about your fame at programming from other teachers. He is preparing a multiple choice exam and he wants to check this

exam using Excel. He designed a worksheet similar to the following figure.

He is going to write the answers of a student in this sheet. At the end, he wants to check the answers using a macro. The Macro will take the result and name at the end of a list.

FIGURE 9.7 Worksheet design of the Macro

Analyses and Solution

According to your teacher's design:

- The current student's name will be written into C1
- Student answers will be written in to B4:B13
- The cells C4:C13 already contain the correct answers,
- The cells D4:D13 have the formulas to check if the student answer is the same as the correct answer.
- F, G and H columns contain the result list.

Arranging formulas first

Result is a formula that checks if the answer of current student is the same as the correct answer. For the first question, it will check if C4 is equal to B4 (=C4=B4). If both are the same then it will give **TRUE**, otherwise **FALSE**. Total correct is another formula that uses the 'Countif' function to count the number of TRUEs.

=COUNTIF(D4:D13,TRUE)

Cell E4 will contain the active student order. The name and the result will be copied into that row in columns G and H. In the example above, Todd Williams will be saved into the 7th row in columns F, G and H.

Before running a macro

These are the formulas that will remain throughout all macro runs. After that, for each student, the teacher will write the name into C1 and student's answers into B4 through B13. Then the formulas will give the total correct answers of the current student and it is ready to run the macro.

Record your macro

After entering all data, we will call the macro for this student.

- For the row number of the destination, we will use the number in E4.
- Copy the student name from C1 into destination row in column G
- Copy result from D14 into column H.
- After that increment the number in E4
- And clear old data (The cells B4:B13 and C1)
- Select C1

If you record this macro, it will be something similar to the following code:

```
Sub Macro1()
'
' Macro1 Macro
' Macro recorded 03/01/2005 by Ibrahim Mesecan
'
' Keyboard Shortcut: Ctrl+Shift+D
'
    Range("C1").Select       'Copies name
    Selection.Copy
    Range("G7").Select
    Selection.PasteSpecial Paste:=xlPasteValues

    Range("D14").Select      'Copies result
    Selection.Copy
    Range("H7").Select
    Selection.PasteSpecial Paste:=xlPasteValues

    Range("E4").Select       'Copies order
    Selection.Copy
    Range("F7").Select
    Selection.PasteSpecial Paste:=xlPasteValues

    Range("E4").Select       'Assigns the new value   for order
    ActiveCell.FormulaR1C1 = "8"

    Range("C1").Select       'Clear old name
    Selection.ClearContents
    Range("B4:B13").Select   'Clear old answers
    Selection.ClearContents
    Range("C1 ").Select      'Select name cell
End Sub
```

Record finished but we need to make some modifications to this code. First of all, this macro will always write the results in the 7th row. So, we need to modify the resulting row order. For this purpose we can use a variable for RowOrder. We will take RowOrder from E4 with,

```
RowOrder = Range("E4")
```

Then, instead of writing G7, we can concatenate and form the new storing address as

```
Range("G" & RowOrder)
```

Secondly, we don't have to say copy paste every time. Instead, we can directly assign the source value to destination cell.

```
Range("G" & RowOrder) = Range("C1")    'Copies the name into column G
```

Then, our final program becomes:

```
Sub Macro1()
'
' Macro1 Macro
' Macro recorded 03.01.2005 by Orhan Karslı
'
' Keyboard Shortcut: Ctrl+Shift+P
' & sign is used to concatenate 2 strings
  RowOrder = Range("E4")                'Takes the row order from E4
  Range("G" & RowOrder) = Range("C1")  'Copy the name into column G
  Range("H" & RowOrder) = Range("D14")'Copy the result
  Range("F" & RowOrder) = RowOrder     'Copy Student order
  Range("E4") = RowOrder + 1           'Increment row order for the next student
  Range("B4:B13") = ""                 'Clear the answers
  Range("C1") = ""                     'Clear name cell for next student

  Range("C1").Select                   'select C1 for the next student
End Sub
```

Example 9.3:

In your school, the science teachers decided to have a general exam every month. It is getting more and more difficult to process data every time, so they decided to use some Macros to quicken the process. They will have a list similar to the following figure.

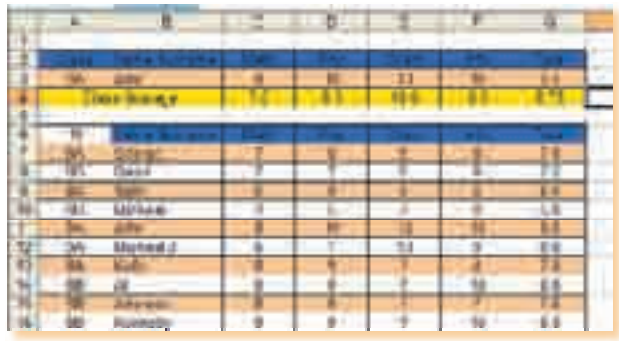


FIGURE 9.8 Analyzing General Exam Results

In data columns, they have class, name information and lessons results. At the end, they want to place the average. The sheet has two main parts. At the bottom part of the sheet, starting from the 6th row, they will place all data. At the top they want to see the results of the query.

The class and name information will be provided into cells A3 and B3. And then, with a shortcut key, the macro will be run. The macro will search all the data for the specified class and student. In the fourth row, they want to see individual lesson averages for the selected class. In the third row, they want specific student's marks.

Solution

It is quite normal that nobody can know everything. So, for the parts we do not know, we can ask **Record Macro** to show us. Let us say that we do not know how to add a range over another.

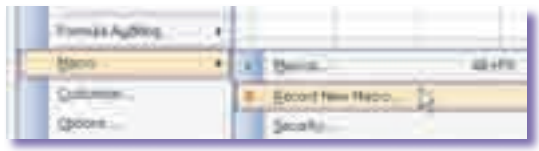


FIGURE 9.9 Running Record New Macro...

FIGURE 9.10 Record Macro window

We run **Record Macro** from **Tools** > **Macro** menu. It will ask for a macro name and a shortcut. After you press Enter, it will start recording the Macro.

In Record Macro, we want Excel to help us add the value of a cell range onto another. Therefore, we select a range and, from the **Edit** menu we select **Copy**.

After that, we select a destination and call the **Paste Special** command from the **Edit** menu. Finally, from the **Paste special** window, we select

Paste: Value, **Operation**: Add.

Our macro is ready. Now, we can press the **Stop** button. And from edit macro window, we can see and analyze the code.

When writing shortcuts be careful not to overwrite the predefined (standard) shortcuts.

```
Sub GetData()
' Getdata Macro
' Macro recorded 12/30/2003 by Ibrahim Mesecan
'
' Keyboard Shortcut: Ctrl+Shift+D
  Range("C11:F11").Select                    'Select source
  Selection.Copy                             'Copy
  Range("C4").Select                         'Select destination
  Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlAdd,  SkipBlanks  :=False, Transpose:=False
  Application.CutCopyMode = False
End Sub
```

Now you know how to add a range onto another range. In this code, we can skip **Transpose** and **Skipblanks**, because we are not dealing with them. So, we only need to write:

```
Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlAdd
```

Now you are ready to write the entire code. To make it easy, your teachers placed the number of students in the A6 cell. First, we get the, Name and Class information, from cells A3 and B3

```
CName = Range("A3")   ' Get Class Name from the cell A3
StName = Range("B3")  ' Get Student Name from the cell B3
LastSt = Range("A6")  ' Get The number of Students from the cell A6
StNum = 0             ' Because, we take the class average, we need to
                      ' count the number of students in the class


Range("C4:F4") = ""   ' Clear the range for the next operation
```

After we get the initial data and prepare our result part to run, we can start searching from the first until the last student. There is a **For** loop structure in Basic Programming Language which is used to repeat commands or a code.

```
For x = 1 To N
  ' The code here will be repeated N times
Next x
```

Here is the entire code

```
Sub Calculate()
  CName = Range("A3")       ' Get Class Name from the cell A3
  StName = Range("B3")      ' Get Student Name from the cell B3
  LastSt = Range("A6")      ' Get The number of Students from the cell A6
  StNum = 0                 ' Because, we take the class average, we need to
                            ' count the number of students in the class

  Range("C4:F4") = ""       ' Clear the range for the next operation

  For x = 1 To LastSt
   ' y is the row order that contains current student name
   y = 6 + x

   ' If Class Name is the same as the current line info then
   If Range("A" & y) = CName Then

      ' Increment the number of students in the class
      StNum = StNum + 1

      'Copy this line to average part
      Range("C" & y & ":F" & y).Select
      Selection.Copy
      Range("C4").Select

      ' By saying Operation:=xlAdd we take
      ' the sum of each subject when pasting
      Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlAdd

     ' If St Name is also the same as the search info then
      If Range("B" & y) = StName Then
        Range("C3").Select
        Selection.PasteSpecial Paste:=xlPasteValues
      End If
   End If
  Next x
```

```
'Calculate the averages
  If StNum<> 0 Then
    Range("C4") = Range("C4") / StNum
    Range("D4") = Range("D4") / StNum
    Range("E4") = Range("E4") / StNum
    Range("F4") = Range("F4") / StNum
  End If
  Application.CutCopyMode = False
  Range("C3").Select
End Sub
```

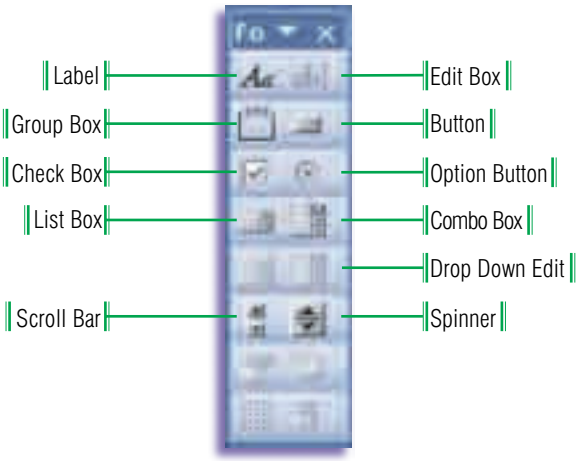


FIGURE 9.11 Forms Toolbar

FIGURE 9.12 Assign Macro window

9.2 FORMS TOOLBAR

Until now, we studied how to record a macro; how to modify it; and some main Excel Macro elements. However, there are some other tools which facilitate many operations in Microsoft Excel Macro. The **Forms Toolbar** is one of these tools.

Now we will study the Forms toolbar and use it together with Macro. Writing code is very easy with these buttons. As with all other toolbars, you can open the Forms toolbar from **View>Toolbars>Forms.**

9.2.1 BUTTON

When you select the **Button** tool, It will let you draw the size and place of the button. After you define the place, it automatically opens the **Assign Macro** window and asks you the name of the macro. You can write a new macro name and press the **New** or **Record** buttons. You can also select one of the existing macros from the list to assign.

Any time you need, you can see this macro using the **Macros...** command from the **Tools** menu (or right click on the button and select **Assign Macro**) and edit it as you wish.

9.2.2 COMBOBOX

The **ComboBox** is used to list some items and allows you to select one of these items. A selected item will appear in the main box. Different than other objects, Forms toolbar items have another tab in the **Format Control**

window: The **Control** tab. Using this tab, you can change the controls like; **Input Range, Cell Link** and some other status options for the **ComboBox**.

Input Range defines the items that will appear in the list box. **Cell Link** defines the cell that will have the result of the selection. Using the **Drop down lines** box, you can define the number of lines in the drop down list. Similar to buttons and other **Forms Toolbar** items, you can assign a macro to the drop down ComboBoxes. This macro will be automatically called every time you change the value in the ComboBox. You can use the same methods, which we described for buttons, to assign a macro.

FIGURE 9.13 Format Control window

9.2.3 CHECKBOX

CheckBox is usually used in true false questions. You can find samples of CheckBox in many programs. Except the initial state, CheckBox has two possible states; **Selected** or **Unselected**. For the initial state, there is a third option: **Mixed** which means **State is not available** (not True but also not False). Same as ComboBoxes, from

Format Control > Control Tab, you can assign a cell link and define other status options. The Cell Link will contain a TRUE value if the check box is checked. Otherwise it will be FALSE.

FIGURE 9.14 ComboBox

9.2.4 OPTIONBUTTON

The **OptionButton** is also a common button in many programs. It is used when you have many different options but can select only one. When you have two possible options, it is better to use a **CheckBox**. If you have three or more options and only one of them can be selected at a time, then, it is better to use the ComboBox or OptionButtons group.

For example, the **Security** option in **Macros** has four possible choices; Very high, High, Medium, and Low. You can select only one of the choices. In most multiple choice exams only one answer can be selected: A, B, C, D or none.

The OptionButton has also the **Assign Macro** option and **Format Controls**. In control tab it has **Cell Link**, **Value** and **3-D effect** options.

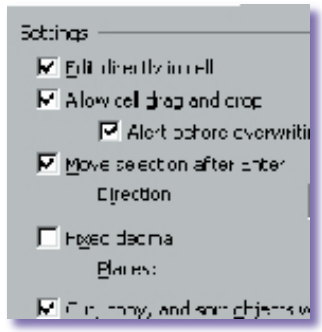


FIGURE 9.15 Some examples of check boxes

Example 9.4:

The accountant in your father's company is using Excel worksheets in his balances but he has some difficulties. So, he wants to automate his balance operations. As it is shown below, he designed two main panes. First part is for entering data. Second part is the database that keeps all records and is beneath the data entrance part. At the top, he wants to see the total cash amount.

For his expenses, he prepared a list of categories and numbered them. Instead of memorizing many categories with their numeric values, he wants to select the category type from a ComboBox, and write the date, explanation and the amount. After pressing a button or a shortcut, he wants to put this record into the database.

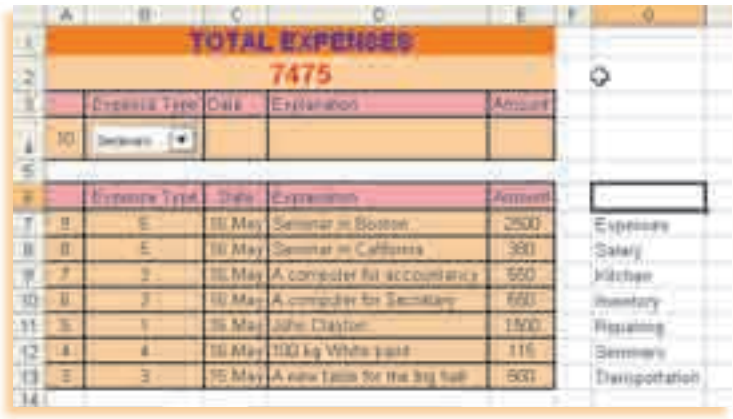


FIGURE 9.16 Accountancy Balance Sheet

Analyses and Solution

First, we design the worksheet as in the figure below. We write our new expenses in row four. We have just one ComboBox and its cell link is B4. The ComboBox input range can also be in another sheet showing the expenses (the table on the right).

Secondly, we select the expense type from the ComboBox. Since the cell link of the ComboBox is B4, the result will appear at the back of the ComboBox. We will then write the date, explanation and the amount of payment. After we call the Macro, it will copy and insert range A4:E4 to the top of the list, A7:E7. After then, it will clear range C4:E4 and increment the number in A4 for the next operation.

The sum of the numbers will appear in A2. But for this **Sum** formula our starting cell must be less than 7 (6 is OK). When we take seven as a starting point, every time we insert to the top of the list, the starting address of the **Sum** formula will also move down and the new inserted record will not be included in the formula.

Now we know what to do, and all this can be recorded by the Macro recorder. But for incrementation, you need to change the formula,

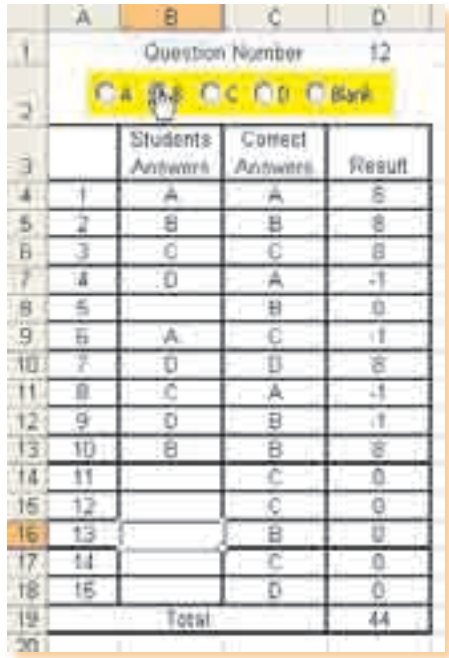
```
Range("A4") = Range("A4") + 1
```

Otherwise, the number you have written will be shown as a direct value and will be repeated every time.

```
Sub Save()
'
' Save Macro
' Keyboard Shortcut: Ctrl+Shift+S
    Range("A4:E4").Select                'Select
    Selection.Copy                       'Copy
    Range("A7:E7").Select                'Select destination
    Selection.Insert Shift:=xlDown       'insert
    Range("A4") = Range("A4") + 1        'Increment A4
    Range("C4:E4") = ""                  'Clear for the next operation
End Sub
```

Example 9.5:

Your math teacher is organizing a contest throughout the school. Since there are many students participating, he does not want to read answer sheets one by one. He wants to use a macro to enter the answers and check them. To simplify the process for you, he does not need to keep the student results in the computer (after you design this level, he can ask once more to upgrade it :)



	A	B	C	D
1		Question Number		12
2		A B C D Blank		
3		Students Answers	Correct Answers	Result
4	1	A	A	8
5	2	B	B	8
6	3	C	C	8
7	4	D	A	-1
8	5		B	0
9	6	A	C	-1
10	7	D	D	8
11	8	C	A	-1
12	9	D	B	-1
13	10	B	B	8
14	11		C	0
15	12		C	0
16	13		B	0
17	14		C	0
18	15		D	0
19		Total		44
20				

FIGURE 9.17 Multiple Choice Exam Automation

In the table, he has correct answers in column C. And a formula in column D; giving +8 points, if the answer is correct; zero points, if the answer is left blank; otherwise -1. For now, he wants some option buttons. Every time he clicks on an answer button, that answer will be put into the student's answers table in Column B.

Analyses and solution

After we design our worksheet and insert 5 option buttons, we can select a cell as a cell link (for example C2) of the option buttons. Student's answers will appear in column B, column C will have correct answers and column D will have the result for every question.

When writing the formula for the first question, we will first check if B4=C4 or not. If it is, then the result is 8. Otherwise, we will have another 'If' to check whether cell B4 is empty or not. If B4 is empty then the result is 0, otherwise the result is -1. So, the formula is clear then;

```
=IF(C4=B4,8,IF(B4="",0, -1))
```

The main program is actually with option buttons. Every time we click on an option button, we want the answer we click to appear in the cell that **Question Number** gives in the cell D1. For example, when **Question Number** in D1 is 11 and we click C, we want the Macro to write C in cell B14 and increment the Question Number to 12.

```
Sub Answers()                       'Option button has been clicked
  answer = Range("C2")              'Check, which one has been clicked?
  QN = Range("D1") + 3              'Get current Question Number

  If answer = 1 Then Result = "A"   'Convert option button to a letter
  If answer = 2 Then Result = "B"
  If answer = 3 Then Result = "C"
  If answer = 4 Then Result = "D"
  If answer = 5 Then Result = ""

  Range("B" & QN) = Result          'Write the result in column B

  QN = QN + 1                       'Increment QN for next operation and
  Range("D1") = QN – 3              'store QN
```

```
    QN = QN - 3

    If QN > 15 Then                    'After the last question show a MsgBox
      res = Range("D19")
      C=MsgBox("The result is" & res & ", Clear the answers?", vbOKCancel,"Information")
      If C = 1 Then
        Range("D1") = 1
        Range("B4:B19") = ""
      End If
    End If
  End Sub
```

For the Macro, when we click on an OptionButton, it will read the button from the cell link (C2) and convert it to a letter. After that, it will read the question number, (initially it is 1). But, because we have 3 more lines at the top and our first answer is in the 4th row, we add 3 to **QN** every time and write the result the cell B4 ("B" & QN). For other clicks, it will repeat the same process, until it exceeds the last question. When it exceeds the last question, it is going to show the result and ask whether to clear the old data or not. If you say OK then the old answers will be cleared. Otherwise, you can reset them yourself.

FIGURE 9.18 User Forms

9.3 USER FORMS

Using the Insert **UserForm** button, you can insert **Form**s that have the same properties as the Visual Basic environment.

UserForm contains a nearly similar toolbox. These tools have Visual Basic environment properties, and have some more functions. After you design your Form using controls and arrange their properties, you can show it any time from any macro in the workbook using the command

```
Userform1.show
```

Here **Userform1** is the name of the Form and it can be changed from the **Properties window**. Similarly, in order to hide the User Form you can use the command:

```
Userform1.hide
```

Example 9.6:

A nation-wide company wants to prepare a questionnaire for their future product. In the questionnaire there are 20 questions, each having five choises. Because of the high expense the administration decided not to buy

an optical reader for just one questionnaire, and they want you to write a macro that will take all the data into an Excel workbook for analyses.

Your task is to read and concatenate all 20 answers of each interviewer into a cell and all questionnaires into a column. In order to simplify the process, you decided to use option buttons. First you will be asked to enter some specific data; pollster id and number of children in the family. Then, for the other 20 multiple choice questions, every time you click on an option button A B C D or E, it will concatenate the current choice to the end of the answers of the current examinee. After that, it will increment the answer number by one. After the 20th answer, we want Macro to ask whether to save the data or not. If you choose to save, the data will be stored in a special column otherwise the data will be cleared.

Analyses and Solution

Before starting macros, first design the worksheet. You will have 5 option buttons for answers, and a combo box for pollsters. You can have two macros. First macro is Answers() which is assigned to the option buttons. Second macro, Save, will be called from the Answers() macro after processing question number 20. You can select the cell link for Option buttons as E3 and for the Combo box as E4. E2 and E5 are Questionnaire and Question numbers and will be changed from the macros.

FIGURE 9.19 Questionnaire Automation

The process; first, you are going to select the Pollster and write the number of children into cell B4. Now you are ready to enter the answers. Every time you click on an option button its number will appear in the linked cell E3. So, using E3, you can decide which option button has been clicked.

If E3 is 1 then converted result will be concatenated "A",
If E3 is 2 then converted result will be concatenated "B" or
If E3 is 5 then converted result will be concatenated "E". Then the code can be like,
If Range("E3") = 1 then Result = Result & "A"

The concatenation operator "&" is used to add the second string to the end of the first one. So, if Result is "DDBC" and we concatenate "A", the new value for result will be "DDBCA".

After we assign the proper letter to the end of the Resulting string, we increment Question number and save it to cell E5. Check, every time, whether the question number's greater than 20 or not. If it is greater, then you call the **Save** sub program; otherwise, we put the new value of Question back to E5.

```
Sub Answers()                 'Option button was clicked
  Answer = Range("E3")        'Get the Answer for the current question
  QN = Range("E2") + 2        'Get Questionnaire number
                              'QN is for Questionnaire Number

  Question = Range("E5")      'Get Question Number
  Result =Range("J" & QN)     'Get the answers of current examinee

   'Convert the Answer into letter
   If Answer = 1 Then Result = Result & "A"
   If Answer = 2 Then Result = Result & "B"
   If Answer = 3 Then Result = Result & "C"
   If Answer = 4 Then Result = Result & "D"
   If Answer = 5 Then Result = Result & "E"

   Question = Question + 1    'Increment the Question number and
   Range("E5") = Question     'Store back into E5
   Range("J" & QN) = Result   'Store current answers in column J
   If Question > 20 Then Call Save 'If we finish all questions ask for saving
End Sub
```

In Subprogram **Save**, first we ask whether the user wants to save or not. If he clicks the **OK** button, C will get the result 1, otherwise 2. If C is 1 then, we save our data and increment QN by one. Otherwise, we clear our data resetting Question number to 1 and QN will remain the same.

```
Sub Save()
   C=MsgBox("Do you want to Save?", vbOKCancel, "Warning") 'Ask for saving
   Question = Range("E5")              'Get Question Number
   QN = Range("E2") + 2                'Get Questionnaire Number
   Result = Range("J" & QN)            'Get Answers

   If C = 1 Then                       'You clicked OK and you want to save
     Range("G" & QN) = QN – 2          'Put Questionnaire number into column G
     Range("H" & QN) = Range("E4")     'Put PollsterID into column H
     Range("I" & QN) = Range("B4")     'Put Number of children into column I
     Range("J" & QN) = Result          'Put Answers into column J
     Range("E2") = Range("E2") + 1     'Increment the Questionnaire number
   Else                                'You cancel
      Range("H" & QN & ":J" & QN) = "" 'Clear written data
   End If
   Range("E5") = 1                     'Reset Question Number
End Sub
```

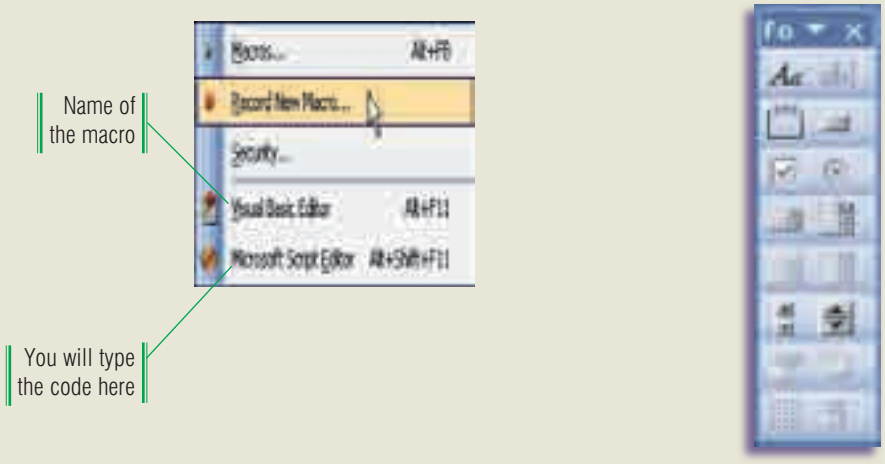
CHAPTER 9
IN BRIEF

SUMMARY

In this chapter, you have learned to automate repeated actions. You can record your doings under a Macro. Anytime you run it, you can repeat your steps with a simple click. You can assign a key combination to your Macro like <Ctrl+shift+4>, and run it via keyboard. Macros can be created using **Record New Macro** from **Macro** on the **Tool** menu. You can also run your the Macro from the same menu. To use macros in your workbooks, the security level **must be** set at medium or low.

You can write your own macros too. All macros are designed in Visual Basic scripting language. After you create the macro, you can see the code of this macro from **Visual Basic Editor**. You also studied how to modify this scripting code. Alternatively, you can manually create your own functions and sub programs by typing directly in this window.

Usually, a Macro starts with "**Sub**" and ends with "**End Sub**". Between these keywords, you type your code. Having finished your code, you can run and see the result.



You can run the Macros assigning it to a button too. You choose the **Forms** from **View**, **Toolbars** menu. You will find the button tool on this toolbar. On the window just choose your macro's name, and you have assigned your macro to the button. From now on, you can use your macro by clicking this button.

In addition, in the Visual Basic window you can create a **User Form**, which combines the power of Visual Basic code in Microsoft Excel environment. You can view it from any Macro by typing {formname}.show.

QUESTIONS

1. Which of the following statements is not true?

   A.Excel can use some Visual Basic language commands.
   B.Macro names can be as long as 32 characters, including letters, numbers and space char.
   C.You can start the 'Macro Recorder' by selecting 'Tools>Macro>Record New Macro'
   D.You can assign a shortcut to your Macro to make it quicker to access

2. How can you Run a macro?

   A.Select Macros from the Tools menu. Then, select your Macro and click the Run button.
   B.Select Tools-Play Macro from the menu and select macro.
   C.Click the Play Macro button on the toolbar and select macro.
   D.Take Music lessons from a professional Macro player.

3. If you perform a task repeatedly in Microsoft Excel, you can automate the task by using a .....

   A.Filtering
   B.Formula
   C.Macro
   D.User Form

4. When using Macro, which formula calculates the sum of cells D1 and D2 onto D3?

   A.D3 = D1+D2
   B.Range ("D3") = Sum (Range ("D1:D2"))
   C.Range ("D3") = Range ("D2") +Range ("D1")
   D.Range ("D3") = Range ("D2:D3").Copy

5. Security level must be set to …….. to run a macro in Excel.

   A.Medium
   B.High
   C.Very high
   D.Ultimate

6. Sub rec()

   Range ("B1:D1").Select
   Selection. Copy
   Range ("D1").Select
   Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlAdd
   End Sub

   If this macro is run, what will the value on cell E1 be?

   A.3 B.4 C.6 D.9

7. For the same values in the table in question 6 what will be the value of F1 if you run the macro below?

   Sub rec1()
   If Range("C1") > 5 Then
   Range("F1") = Range("B1") + Range("D1")
   Else
   Range("F1") = Range("C1") + Range("D1")
   End If
   End Sub

   A.6 B.7 C.8 D.10

8. What does the following command do?

   Range("C4:F4"=" "

   A.Assigns 0 value to the range
   B.Copies '' characters onto the range
   C.Clears the contents in specified range
   D.Selects the range

9. From the forms toolbar which option is preferred when you need to use a true/false question?

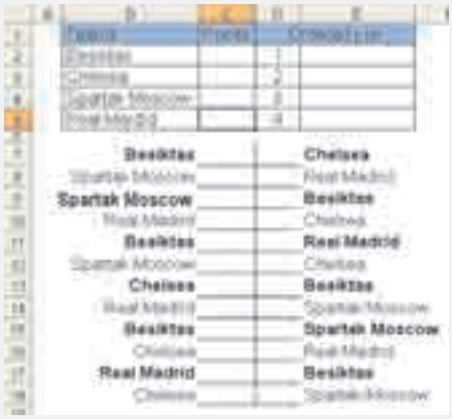
   A.Button
   B.Check box
   C.Option button
   D.Label

QUESTIONS

PRACTICE

1- Mr. John Liar, Accountant of MyCowSoft Company, is having difficulty with lots of calculations. He asked for some help from the boss. And the boss has selected you for the job. To help you, Mr. John numbered the expenses. So, in a data board, he keeps the list starting from the 11th row. Time to time, he wants to calculate the sum of each expense type to be written to the summary list at the top.

2- Champions League Matches: UEFA have fired their computer programmer, because of some disagreements. Now they need someone who can solve their programming problems.
Basically, they have difficulty with their current pointing system and they want to calculate points of each team directly from the score-board. In a data board, in an Excel sheet, they store the scores of each match. They want you to write a macro program that will take the data from the board, calculate the points and sort the teams.



3-Now, you are ready to write the previous project that you prepared for your science teachers. This time they ask for some combo boxes to simplify the selections.

Your teachers will keep the class names in a separate range of cells. There will be two separate combo boxes; one for class names and another for students in the selected class. Any time they select a class from the combo box, the second combo box items will be updated and will have the student list in the new class. When they select any student from the student combo box, it will show the information on the selected student and averages for the selected class.

4- Prepare a calculator in Excel.

As a second project, you can also upgrade this calculator to make complex calculations using parenthesis.

Note: Use Macros, do not use the easier method in which you calculate the results without programming.

PROJECT

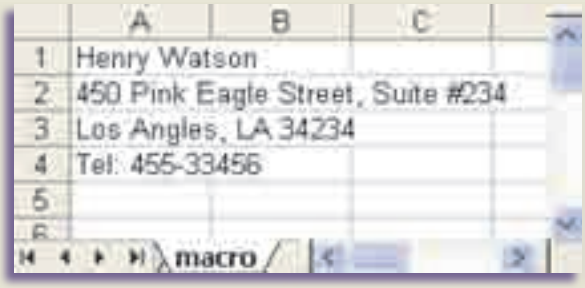
1. Create a new workbook and save it as "Macro-1.xls"

2. Select 'Tools > Macro > Record New Macro from the menu.

3. In the Macro name box type "Enter_Address,"

4. Click OK to start recording.

5. Type your name, address, and phone number in the following format:



6. Click the cell that contains your name and make it bold.

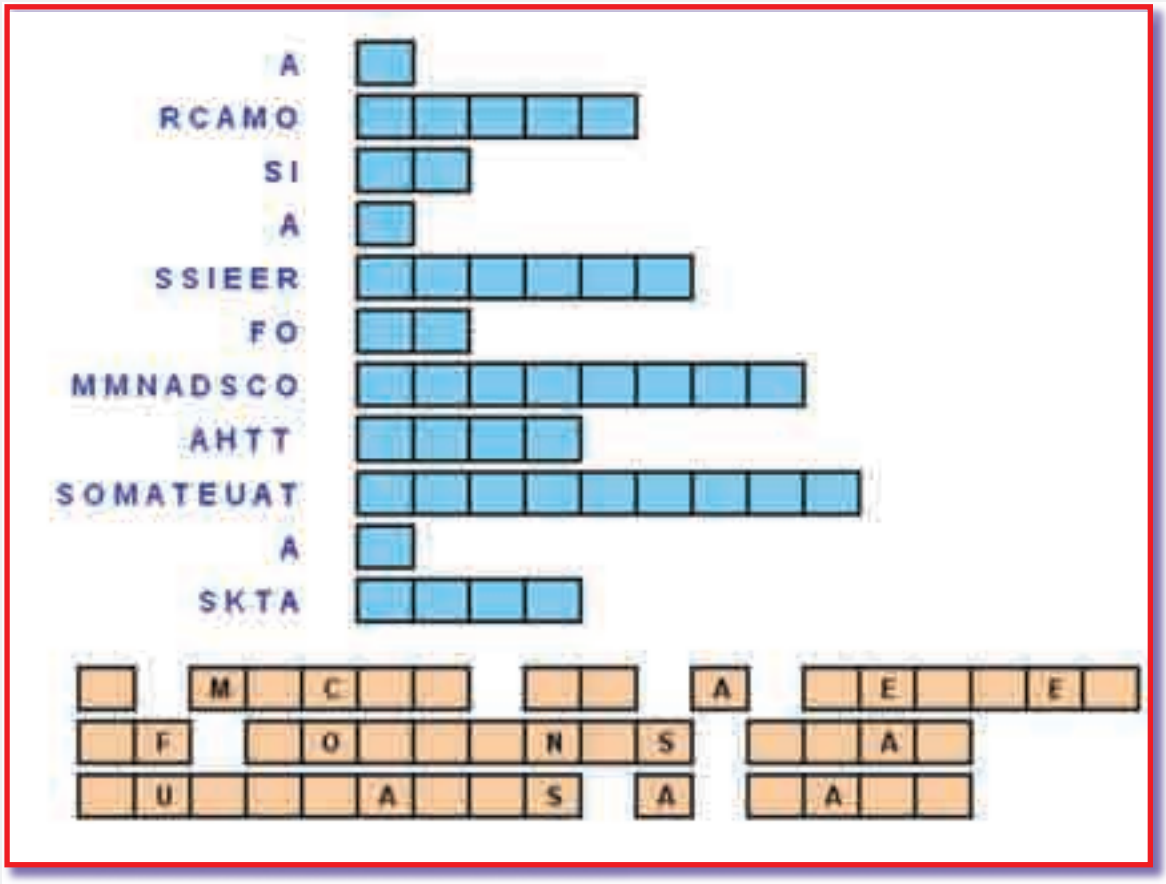
7. Click the Stop button.

8. Clear the address information you just entered and try running your macro. You can modify this Macro to put your signature at the end of your documents.

PROJECT

WORD SEARCH PUZZLE

Find the phrase by filling in the blanks below.



ANSWERS

Answer Key

CHAPTER 1

1- D
2- C
3- B
4- B
5- A
6- C
7- C
8- A
9- D
10- A

CHAPTER 2

1- C
2- B
3- D
4- B
5- B
6- C
7- A
8- D
9- C
10- FALSE
11- D
12- D
13- B
14- A

CHAPTER 3

1-B
2-D
3-A
4-B
5-D
6-C
7-B
8-A
9-C
10-D
11-C
12-C
13-B
14-C
15-D
16-D
17-A

CHAPTER 4

1- D
2- A
3- D
4- B
5- B
6- C
7- D
8- A
9- A
10- C

CHAPTER 5

1-B
2-D
3-A
4-B
5-C
6-D
7-D
8-D
9-D
10-C
11-C
12-T
13-C
14-D
15-D
16-C

CHAPTER 6

1-A
2-D
3-C
4-A
5-D
6-C
7-B
8-D
9-D
10-B

CHAPTER 7

1- C
2-D
3-A
4-B
5-A
6-A
7-D
8-TRUE
9-A
10-B

CHAPTER 8

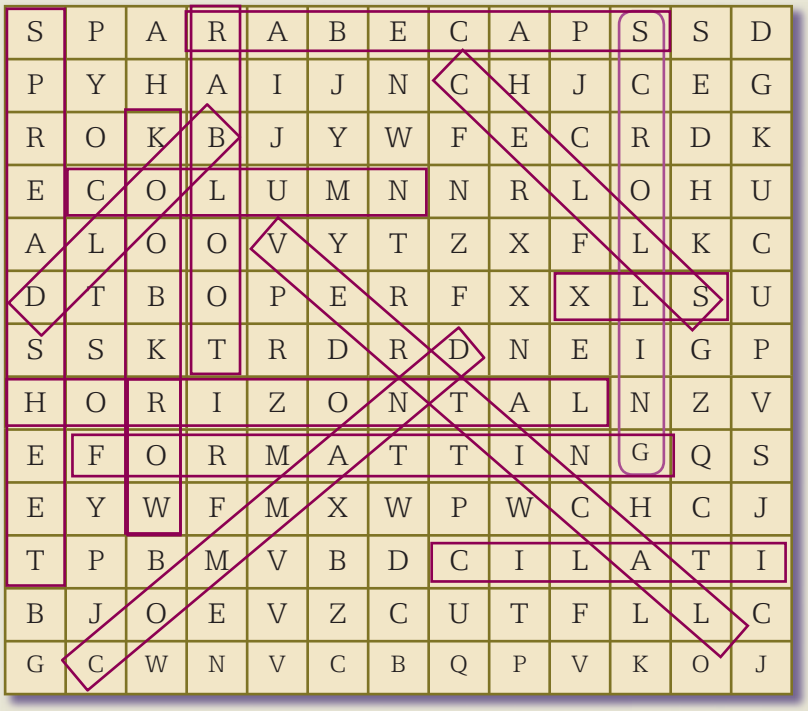
1-B
2-B
3-A
4-D
5-B
6-A
7-TRUE
8-TRUE
9-FALSE
10-FALSE
11-Not D.

CHAPTER 9

1-B
2-A
3-C
4-C
5-A
6-D
7-B
8-C
9-B

ANSWERS

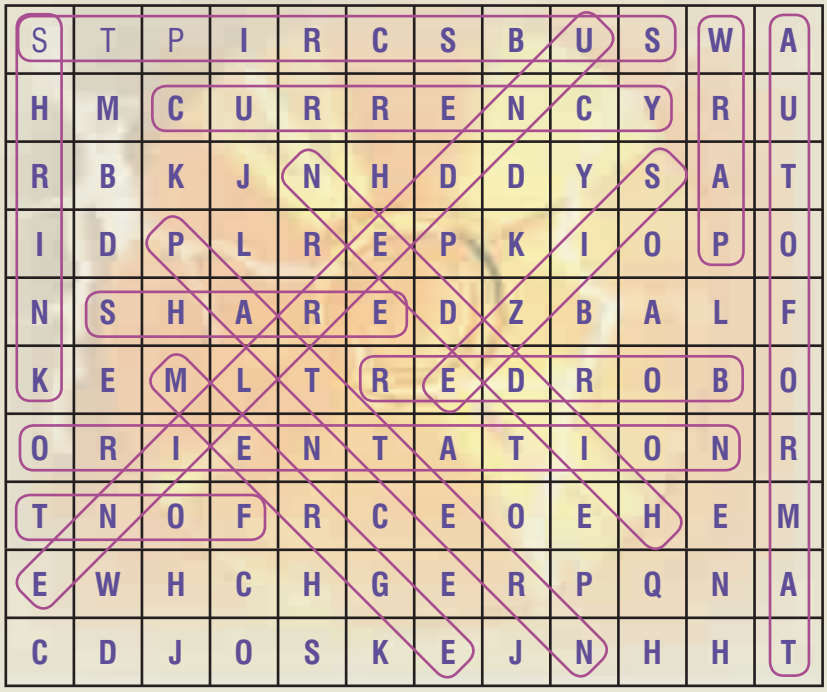
WORD SEARCH PUZZLE



WORDS	CLUES
SCROLLING	Move on-screen text or images horizontally or vertically so new information appears on one side of the screen as older information disappears from the other side.
SPACEBAR	The longest key on the keyboard.
TOOLBAR	Can contain buttons, menus, or a combination of both.
BOLD	A font style.
CELLS	The basic unit of a worksheet into in which you enter data.
ROW	It's named with numbers and contains 256 cells.
COMMAND	Insturction.
FORMATTING	A toolbar.
HORIZONTAL	Something arranged across.
ITALIC	A font style.
COLUMN	It is named with letters and contains 65536 cells.
SPREADSHEET	A program which allows you to enter formulas in table format and then perform calculations or create graphs.
VERTICAL	Perpendicular to the horizon. Up and down.
WORKBOOK	Made up of sheets.
XLS	Default extension of an Excel document.

ANSWERS

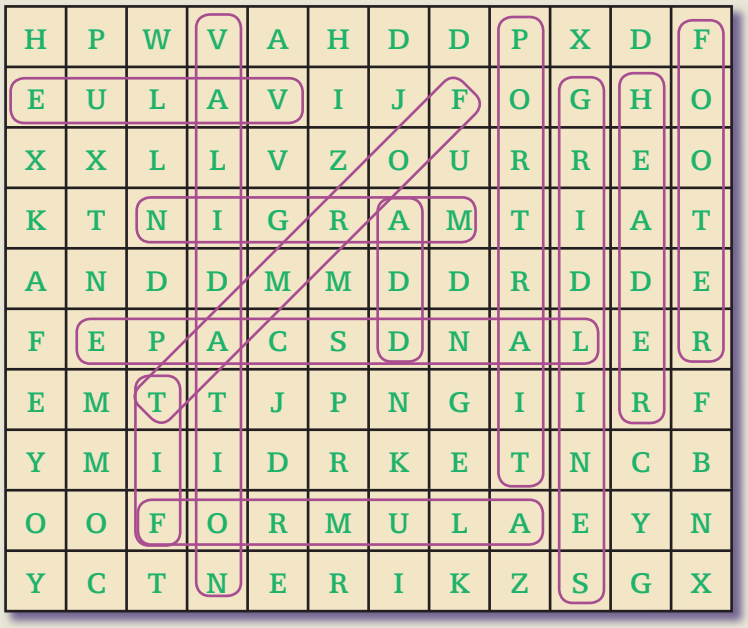
WORD SEARCH PUZZLE



CLUES	WORDS
AUTOFORMAT	Applies a set of predefined formatting choices to worksheets and tables.
CURRENCY	Money that is used by a country.
FONT	A set of letters, numerals, and shapes, which conform to a specific set of design criteria.
BORDER	The edge or margin of a range of cells.
MERGE	Combining two or more cells.
HIDDEN	Invisible.
ORIENTATION	The alignment of an object in relation to the cardinal directions.
WRAP	Automatic moving of text to the subsequent line after completion of the previous one.
PATTERN	An artistic or decorative design created by the regular repetition of shapes.
SUBSCRIPT	A character or symbol printed partly below the base line of the text.
SHRINK	Reducing the size of an content to fit it in a cell.
UNDERLINE	Horizontal line underneath something written.
SIZE	The physical magnitude of the font.
SHARE	A network resource exported by a server or workstation.

ANSWERS

WORD SEARCH PUZZLE



WORDS	CLUES
LANDSCAPE	Page orientation in which the page width exceeds the page length.
ADD	A function that allows you to add the numbers in multiple cells.
FIT	To be the right size or shape.
FORMULA	Starts with "=" signs and represents what the calculations for each cell.
FOOTER	One or more lines of text that appear at the bottom of every page of a document.
FORMAT	The size, style, type page, margins, printing requirements, etc.
GRIDLINES	The horizontal and vertical lines on the spreadsheet.
HEADER	Text that appears at the top of every page of a document when it is printed.
MARGIN	Area between the edge of a page and the written or printed text.
PORTRAIT	The orientation of a page in which the longer dimension is vertical.
VALIDATION	Comparing data with known information (patterns, ranges, check digits) to verify that the data is correct.
VALUE	A number that can be entered into a cell.

ANSWERS

WORD SEARCH PUZZLE

1. Match

abs	and	count
pi	if	int
left	len	lower
max	mid	not
now	or	hlookup
right	rank	round
today	upper	vlookup
weekday		

CATEGORIES					
Date & Time	Logical	Lookup & Reference	Math & Trig	Statistical	Text
now	not	hlookup	abs	count	right
today	and	vlookup	pi	max	left
weekday	or		int	min	len
	if		round		lower
	rank				upper
					mid

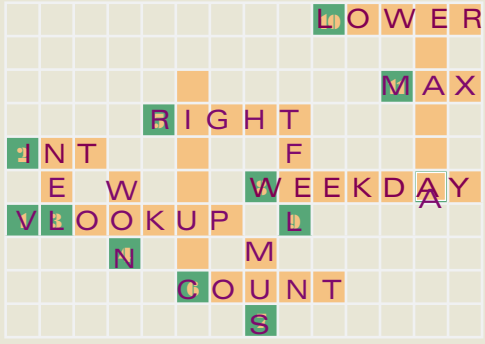
2. Puzzle

Across

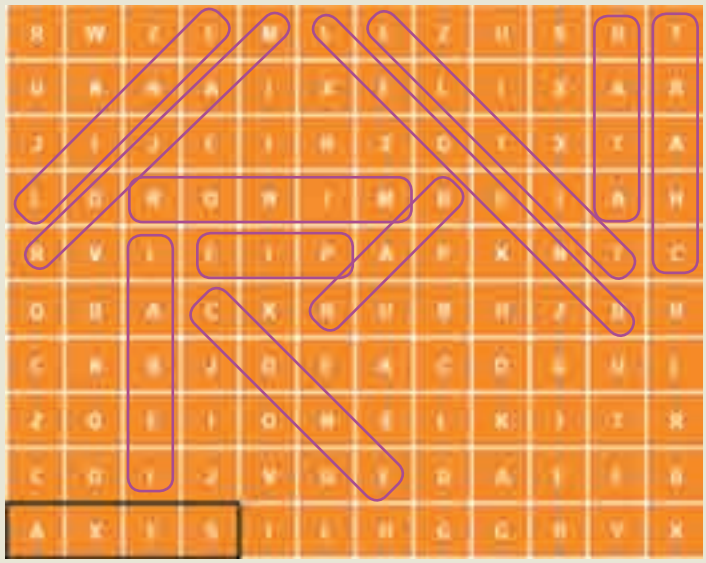
1. Searches for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify in the table.
2. Rounds a number down to the nearest integer.
5. Returns the last character or characters in a text string, based on the number of characters you specify.
6. Counts the number of cells that contain numbers, and also numbers within the list of arguments.
8. Returns the day of the week corresponding to a date. The day is given as an integer, ranging from 1 (Sunday) to 7 (Saturday), by default.
10. Converts all uppercase letters in a text string to lowercase.
11. Returns the largest value in a set of values.

Down

3. Returns the number of characters in a text string.
4. Returns of the current local date and time.
6. Counts the number of cells within a range that meet the given criteria.
7. Adds up all the numbers in a range of cells.
9. Returns the first character or characters in a text string, based on the number of characters you specify.



WORD SEARCH PUZZLE



WORDS	CLUES
AXES	Pulural form of a straight line around which an object rotates.
BAR	A chart type.
CHART	Visual display of information.
CONE	A chart type.
DATA	Information.
LABEL	Brief description which appears on a computerized note.
LEGEND	Used to identify each bar in a 3-D column chart.
LINE	A chart type.
MINOR	The secondary gridlines on the background of a chart.
TITLE	General or descriptive heading for a chart.
PIE	A chart type used especially on limited data.
MAJOR	The main gridlines on the background of a chart.

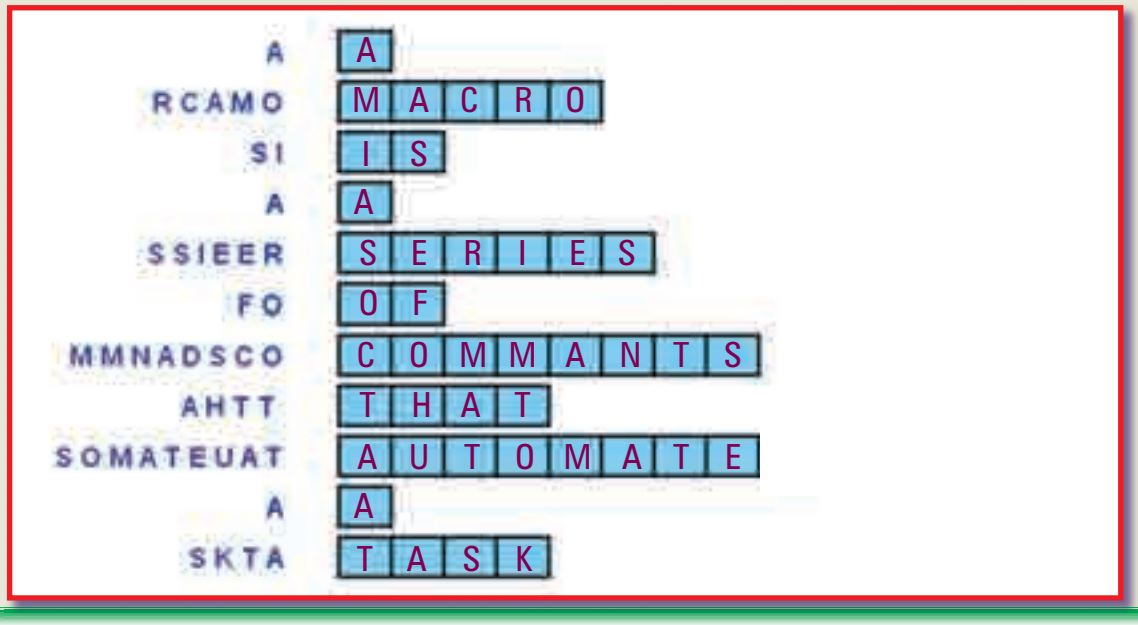
ANSWERS

PUT THE WORDS IN GROUPS

Standard color
Disable AutoRecover
Show formula
Password to modify
Show insert option button
Copy colors from
Show gridlines
Show values on chart
AutoCorrect options
Show paste option button
Standard colors
Show status bar
Password to open
Dictionary language

Tab	Color	Save	View	Chart	Security	Spelling	Edit
Commands	Standart color	Disable AutoRecover	Show gridlines	Show values on chart	Password to open	Dictionary language	Show insert option button
	Copy colors from		Show formula		Password to modify	AutoCorrect options	Show paste option button
	Standard colors		Show Status Bar				

WORD SEARCH PUZZLE



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