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# UNIT 12    ADVANCED FEATURES OF MICROSOFT EXCEL

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## 12.1 INTRODUCTION

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In this unit we will introduce several advanced features of Microsoft Excel. These are related to using formulas, functions and macros, creating headers and footers in the worksheet, protecting data within the worksheet, inserting picture into worksheet etc. One feature which we use quite often in MS Excel is MACRO. Macros automate fragmentally performed tasks by changing them into a set of keystrokes that are stored or recorded and are assigned a control key. Whenever the specified control key is used, the entire operation is performed automatically. You can have macros for formatting worksheet, report generation and so on.

### Objectives

After going through this unit, you will be able to:

- use formula, function within the worksheet,
- edit functions,
- define macros,
- print worksheet data,
- create headers and footers,
- protect data within workbooks, and
- share data with other applications.

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## 12.2 USING FORMULAS, FUNCTIONS AND MACROS

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In this section we will study about how to enter formulas, enter date and time formulas, converting formulas to values, inserting range name in formulas. So let us get started.

### 12.2.1 Entering Formulas

Formulas provide the power while analyzing and creating functioning spreadsheet systems in Excel. Various numeric calculations can be very conveniently accomplished by the use of formulas. You can also manipulate text and lookup values in tables.

Formulas can be created in following ways:

(i) To enter a formula manually into a cell, the steps are:

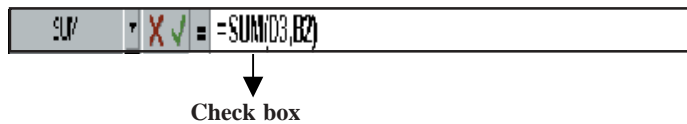
1. Select the cell in which you want to enter the formula.
2. Enter the formula you want preceded by an equal to (=) sign.

When you press the Enter key, the resulting value would be displayed in the specified cell.

(ii) You can point to cells rather than typing cell references in the formula. It hastens the tasks of formula creation as well as reduces the chances of errors. To build a formula by pointing, the steps are:

1. Select the cells in which you want the formula.
2. Type the equal to (=) sign to start the formula.
3. Click on the cells with the reference that is required in the formula.
4. Optionally, enter an arithmetic operator, such as +, -, \*, / or %, or a comparison operator such as <, > = or text operator like the ampersand (&).

- Click on the next cell that you want to include in the formula.



- Click on the check box in the formula entry.

The arithmetic operators used in formulas for addition, subtraction, multiplication, division, +, -, \*, / are used respectively. In addition, exponent (^), percentage (%), text operator (&) and comparison operators like =, <, >, <=, >= are used in formulas.

Most errors occur when the arithmetic operators are not in the proper order of precedence. Negative (-), Percentage (%), Exponential (^), Multiplication and Division (\* and /), Addition and subtraction (+ and -), joining Text (&), Comparison operators (=, <, >, <=, >=, <>)

- Is the order of precedence.

Two examples are discussed hereunder:

$$14+9*5$$

In this example, multiplication would be performed before addition.

$$70/2*5$$

Order of precedence in the example states that multiplication and division operators are at the same level. Since the division operator is prior to multiplication, seventy would first be divided by two and then the result of the division would be multiplied by five.

### 12.2.2 Entering Date and Time Formulas

You can create formulas to calculate values by using dates and time. For excel to recognize date and time that you enter in the formula, you need to specify it in the correct format. You need to enclose the entry in double quotation marks. Excel would then give the required result. To find out the difference of two dates, the format is : = "12/4/"-"4/4". Excel would return the value 244 days. An example to calculate hours difference is = HOUR ("4:30:00- "3:30:00"). This would display the result 1. # VALUE! is an error message displayed by Excel when it cannot recognize a date or time.

### 12.2.3 Converting Formulas to Values

Most of the times when you create a formula, you would only want to view its result and not the formula, which is normally displayed on the formula bar. In such a situation, you can convert the formula to its actual value. To convert a single formula to a value, the steps are:

- Select the cell that contain the formula.
- Double-click on the cell or press the F2 function key.
- Press the F9 function key.

Excel now shows only the result and not the formula.

### Debugging Formulas

While entering formulas, it is possible that you might make errors. In such situations, Excel displays an error value list that enables you to debug your formulas.

### Working with Range Names

Name is an identifier that represents a cell or a range. You can define names to represent data in formulas that are easier to use and understand. For example, =Sum(Marks). To define a name, the steps are:

1. Select the cell or range of cells you want to name.
2. Click on the Name Box located at the left end of the formula bar.
3. Enter the name you want to give to the selected range and press ENTER.

To name a range using the other method, the steps are here under:

1. Select the cell range which has to be named.
2. Select the Name option from Insert menu.
3. Select the Define option from the Name submenu.

The Define name dialog box gets invoked as shown in Figure 12.1.

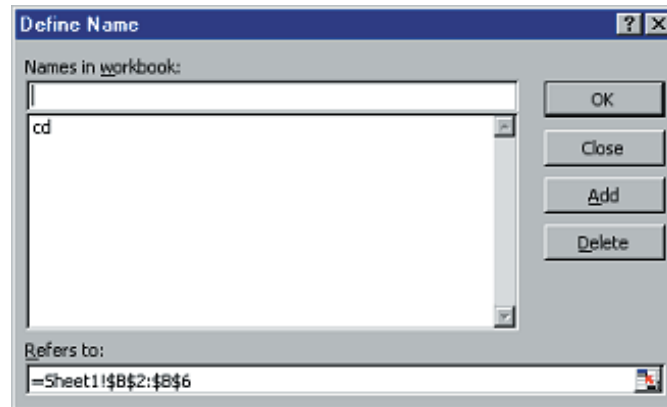


Figure 12.1: Define Name dialog box

4. Type a name in the Name in workbook text box. There should be no space in ranged names. The first character of a range name should be a letter or underline.
5. Click on the OK button.

### 12.2.4 Inserting Range Names in Formulas

You can insert a name into the formula. The steps are:

1. Create a formula that can use the name and type the (=) equal to symbol in a cell.
2. Select the Name option from the Insert menu.
3. Select the Paste option from the Name submenu.

The Paste Name dialog box gets invoked.

1. In the Paste Name drop-down list, select the name you want to insert.
2. Click on the OK button.
3. Enter the rest of the formula and press Enter.

For example, to sum the marks of 25 students, enter the marks of the 25 students in 25 contiguous cells. Give a name to the range of cells namely Marks. Enter the formula =SUM(in a cell. Select the name option from the Insert menu. Select the Paste option from the Name submenu. The formula in the cell now becomes =SUM(Marks). Always complete the formula by adding the closed brackets. Press the Enter key. This shows you the sum of the marks of the 25 students.

### Deleting Range Names

If you change the contents of the range, you may want to change the range name also, or delete the name if it is no longer suitable for the contents that it contains. To delete a name, the steps are:

1. Select the Name option from the Insert menu.
2. Select the Define option from the Name submenu.

3. The Define Name dialog box gets invoked.
4. In the *Name in workbook* drop-down list, select the range name you want to delete.
5. Click on the Delete button.
6. Click on the OK button.

## 12.3 ENTERING FUNCTIONS

Excel functions help in performing simple to complex arithmetic calculations. There are 200 built-in functions or predefined formulas that enable you to create formulas for a wide range of application including business, scientific and engineering applications.

Functions can be entered in the following ways:

- Entering function Manually
- With the help of the Paste Function

### 12.3.1 Entering Function Manually

- (i) To enter a function in the active cell, type the equal to (=) sign, followed by an open parentheses. You can then specify the cell range you want the function to use and complete the function with closed parentheses; for example, =SUM(A2:A8).
- (ii) You can use the AutoSum button for quick calculations that involves addition of numbers. This button is located on the standard toolbar. To use this feature of Excel, follow these steps:
  1. Select a cell adjacent to the range you want to sum.
  2. Click on the AutoSum button



Excel automatically inserts the SUM function and selects the cells in the column above the selected cell.

3. You can also highlight the cell range (including a blank cell in which you want the total) that you want to sum and then click on the AutoSum button.

Excel automatically calculates the total and displays it.

### 12.3.2 Paste Function

The Paste Function feature is a convenient way of applying functions to the formulas for calculations. To use this feature, the steps are:

1. Select the Paste Function button from on the *standard toolbar* or select the Function option from the Insert menu. The Paste Function window is displayed in Figure 12.2.

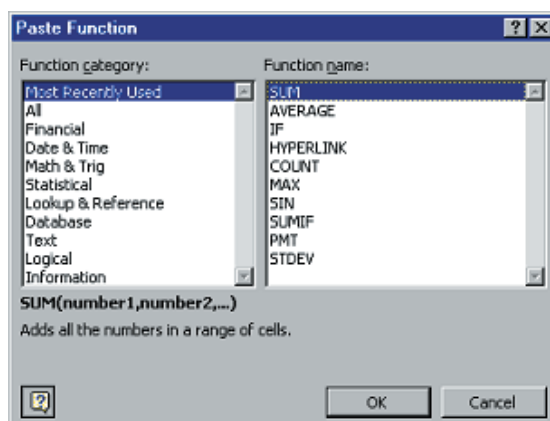


Figure 12.2: Paste Function Window

2. The Function Category list displays the built-in functions of Excel.
3. Select the function that is required by clicking on it and click on the OK button. A formula palette drops down which prompts you to enter the required arguments as shown in Figure in 12.3.

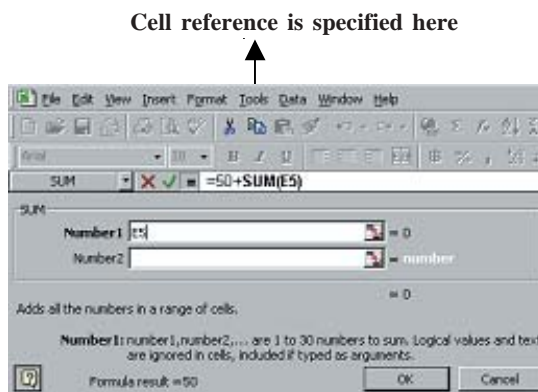


Figure 12.3: Formula Palette

4. Enter the arguments in the display area or click on the cell reference button to go to the worksheet to select the cells.
5. Click again on the cell reference button to come back to the same formula palette.
6. Press Enter or click on the OK button.

### 12.3.3 Editing Functions

Functions also require editing. To modify functions in a formula, the steps are:

1. Select the cell that contains the function which you want to edit.
2. Select the Function option from the Insert menu.

The formula palette is displayed.

1. You can change any of the specified arguments as required.
2. Click on the OK button.

You can even edit a function by changing the formula entry in the cell. To do so, the steps are:

1. Select the cell that contains the formula which has to be edited.
2. Click on the formula bar or double-click on the cell.
3. Change the arguments as required.
4. Press Enter or click on the check mark button on the formula bar.

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## 12.4 MACROS

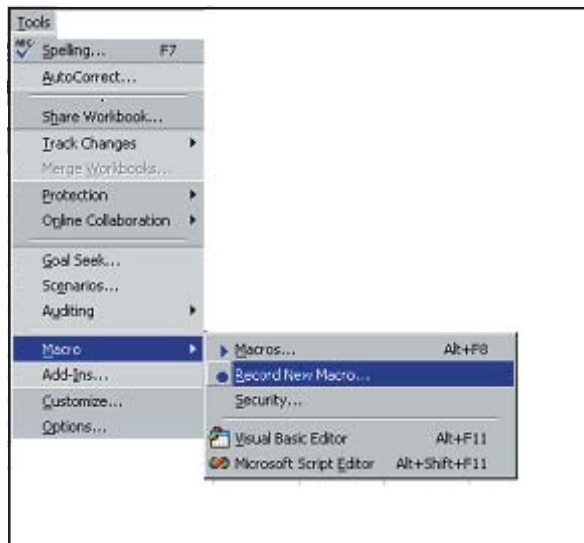
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*Macros* automate frequently performed tasks by changing them into a set of keystrokes that are stored or recorded and are assigned a control key. Whenever the specified control key is used, the entire operation is performed automatically. You can have macros for formatting worksheets, report generations and so on. This feature is time saving, flexible and very powerful.

### 12.4.1 Creating and Storing Macros

You can create a macro in a number of ways. To create a macro, you should have your program in the macro record mode. This can be done by:

1. Selecting the Record New Macro option from the Tools menu as shown in Figure 12.4. A Record Macro dialog box gets invoked.

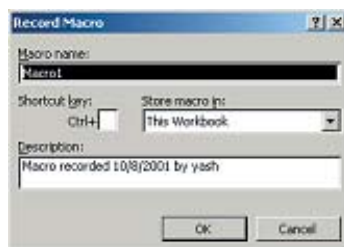


**Figure 12.4: Record Macro Dialog Box**

Macro recorder is a tool that translates your actions in Visual Basic Applications (VBA) macro. It works like a tape recorder – when you turn it on, it records everything you do. Later you can run the macro and all the previously performed actions are repeated.

You can name your macro in the Record macro dialog box as shown below. The name that you specify should not contain spaces or other punctuation marks, but it can contain underscores.

You can assign a shortcut key for the macro that you want to record.



You can specify the letter for your shortcut key and use it in conjunction with Ctrl to run the macro. The latter can be in lower or upper case; for example, you can assign the Ctrl + r shortcut key combinations for a macro that is recorded for generating reports.

You can store macros in the Store macro in text box. The options available are:

- 1 Personal Macro Workbook – which has the name PERSONAL.XLS. This workbook opens and is hidden automatically everytime you start Excel.
  - 1 This Workbook – which stores the macro in the active workbook.
  - 1 The New Workbook – which stores/records the macro in a new workbook that is created.
2. You can click on the OK button and the macro recording processing begins.
  3. You can then perform the actions that you want to record. It is a good practice to save your workbook and the recorded macro that it contains before running the macro.

Once you have completed all the necessary actions for storing/recording macros, you can click on the stop button as shown in Figure below.

You can also select the Stop Recording option from Macro submenu within the Tools menu option.



### 12.4.2 Running a Macro

You can run a macro in different ways. You can select the Run option from the dialog box or use the shortcut key that you have assigned to your macro. Given below is an example to create a macro.

You can record a macro that can create the given worksheet, by following the steps:

1. Select the Macro from the Tools menu.
2. Select the Record New Macro option from the Macro submenu.

The Record Macro dialog box gets invoked as shown in Figure 12.5

	A	B	C	D	E	F
1	<b>Name</b>	<b>Product</b>	<b>Varieties</b>	<b>Total</b>		
2	Sanjay	90	1	90		
3	Yashpal	60	2	120		
4	Chandan	70	3	210		
5				=B5*C5		
6						

Figure 12.5: Record Macro dialog box

3. Give a name to the macro that you want to record and assign *m* as a shortcut key.
4. Click on OK.
5. In the Excel worksheet, type the Name, Product, Varieties, Total.
6. Type in the rest of the data shown in the sample worksheet.
7. Click on the Stop button, to end the recording process.
8. Clear the data that you have copied on your worksheet.
9. Run the macro by pressing *Ctrl+m*.

The entire worksheet would be created again for you.

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## 12.5 PRINTING WORKSHEET DATA

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Excel offers you various printing options for your worksheets. It enables you to have a preview of worksheet data with the aid of the *Print Preview* option. You can set margins, fonts, headers and footers to enhance your worksheets.

### 12.5.1 Printing an Area

By default, Excel prints the current worksheet when the Print command is selected from the File menu. However, if you require a particular area of the worksheet to be printed, then you are offered this facility also. To do so, you can follow these steps:

1. Select the range that you want to print.
2. Select the Print option from the File menu.

The Print dialog box gets invoked as shown in Figure 12.6.

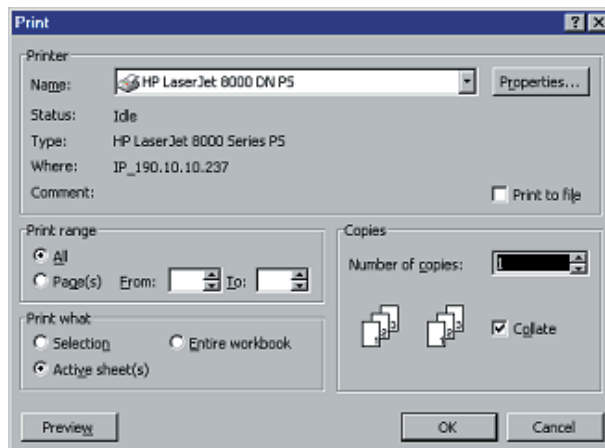


Figure 12.6: Print Dialog Box

3. In the *Print What* section of the dialog box, choose the *Selection* option.
4. Select the OK option to complete the procedure.

### 12.5.2 Defining and Deleting a Print Area

There may be situations where you need to print the same range repeatedly. To avoid the tedium of specifying the same range for printing several times, you can conveniently define range as the print area.

To define the print area, you can follow these steps:

1. Select the area you want to specify.
2. Select the Print Area option from the File menu.
3. Select the Set Print Area from the Print Area submenu as shown in Figure 12.7.

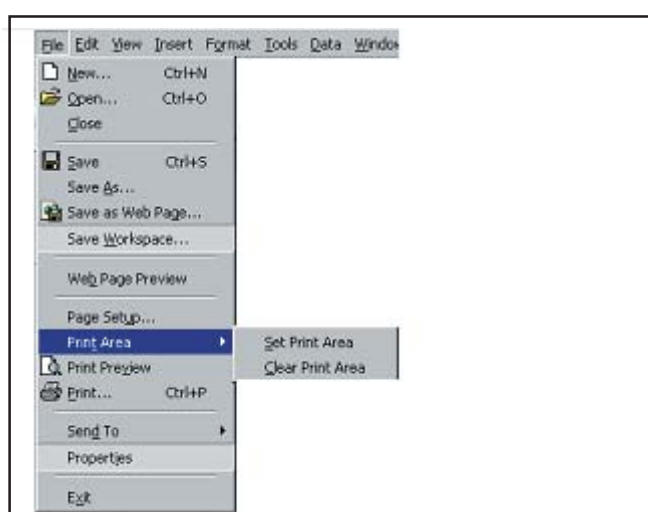


Figure 12.7: Print Area Window

4. Select the Print option from the File menu.
5. Click on the OK button.
6. You can select Clear Print Area when you want to remove the defined Print Area.

### 12.5.3 Printing Worksheets

Worksheets can be very conveniently printed by the use of the Print command that sends your worksheet pages to the printer immediately.

To print worksheets, the steps are:

1. Select the Print option from the File menu. This invokes the Print dialog box.

This dialog box is very similar as you used in the MS-Word Print dialog box. The only difference is the three extra – buttons which are given below:

*Selection* – prints selected cells.

*Active sheet(s)* – prints only selected worksheets.

*Entire Workbook* – prints open workbook.

**Device Options** : controls the print quality and allows you to adjust Printer memory tracking (this affects how the driver tracks printer memory usage).

### 12.5.4 Inserting and Removing Page Break

Whenever a print area is defined, Excel automatically inserts page break into the worksheet. Page break gets displayed in the form of dashed lines. If the page breaks are not according to your choice, you can insert the page breaks yourself. There are two types of page breaks that you can insert:

- Vertical page breaks, and
- Horizontal page breaks.

#### Inserting Vertical Page break

To insert a vertical page break, the steps are:

1. Click on the heading of the column to the right of text where you want your page break. The column gets highlighted.
2. Select the Page Break option from the Insert menu.

#### Inserting a Horizontal Page Break

To insert a horizontal page break, the steps are:

1. Click on the heading of the row below where you want your page break to be inserted.
2. Select the Page Break option from the Insert menu.
3. You can select the Remove Page Break option from the Insert menu to remove all page breaks.

You can also select the Page Break Preview from View menu. Page breaks are displayed on the screen in thick blue lines while page numbers are displayed in large grey text. To make changes in page breaks, place your mouse pointer on the page break and, when it turns into a double-headed arrow, drag the line to the new position. To get back to the normal view, select the normal option from the view menu.

### 12.5.5 Modifying Page Setup

The Page settings can be setup by using the Page Setup command. This help you to control the basic layout of the printed pages, change the margins, text alignment and set the print titles.

## Setting Print Titles

You can set *print titles* so that information about column, row headings get displayed on each page in the printout.

To create print titles, the steps are:

1. Select the Page Setup option from File menu. The Page Setup dialog box will open as shown in Figure 12.8.
2. Select the Sheet tab from the Page Setup dialog box.

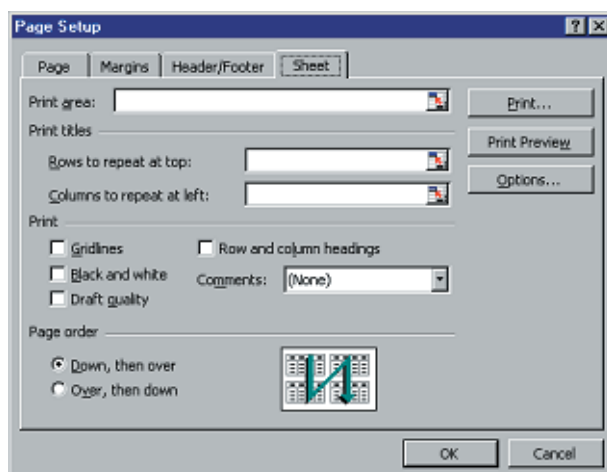


Figure 12.8: Page Setup Dialog Box

3. If you want to define titles across the top of each page, select the Rows to repeat at top box. If you want to define titles down the left side of each page, select the column to repeat at left box.
4. Click on the OK button.

## Removing Print Titles

You can remove the print titles by following the steps here under:

1. Select the Page Setup option from the File menu.
2. Select the Header/Footer tab as shown in Figure 12.9.
3. Click on the arrow next to the *Header* box.
4. Select a header from the drop-down list.
5. Select the data that you want to use as footer from the list.
6. Click on the OK button.

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## 12.6 CREATING HEADERS AND FOOTERS

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You can format headers and footers by selecting the Header/Footer tab available on the Page Setup dialog box. Headers are printed at the top of every page and they are commonly used for report titles, chapter names, company names, and so on. Footers are mainly used for specifying page numbers, or total number of pages, and are printed at the bottom of each page. There are a variety of built-in headers and footers from which you can select or define your own headers and footers.

### 12.6.1 Using Built-in Headers and Footers

To use the built-in headers and footers, the steps are:

1. Select the Page Setup option from File menu.
2. Select the *Header/Footer* tab as shown in Figure 12.9.

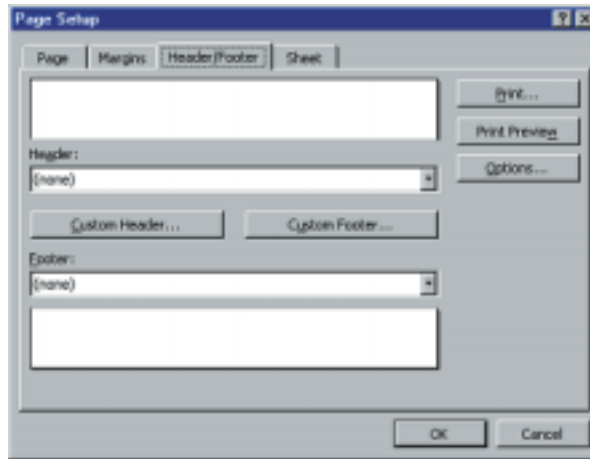


Figure 12.9: Page Setup Dialog Box

3. Click on the arrow next to the *Header* box.
4. Select a header from the drop-down list.
5. Select the data that you want to use as footer from the list.
6. Click on the OK button.

### 12.6.2 Custom Headers and Footers

To define your own headers and footers, the steps are:

1. Select the Page Setup option from the File menu.
2. Select the *Header/Footer* tab.
3. Select the *Custom Header* option to display the Header dialog box as shown in Figure 12.10.

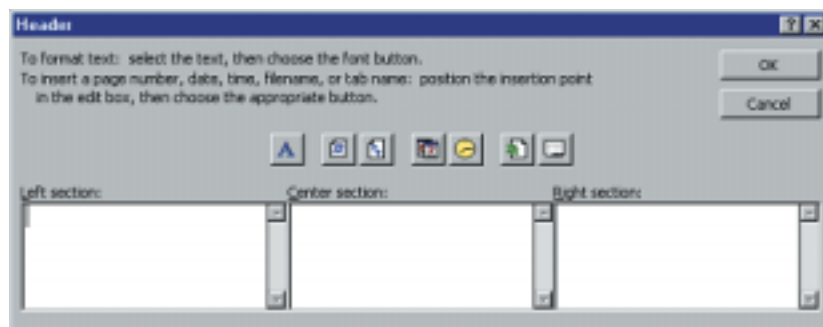


Figure 12.10: Changing column width

This dialog box has three text boxes – left section, center section and right section. These text boxes allow you to justify the text of your headers and footers. Data can be left-aligned, centered or right-aligned. The buttons that are displayed above the text boxes are used to insert the codes. The Date code, for example, inserts the current date. To apply text formatting to the header or footer information, click on the Font button to display the Font dialog box. The buttons on the Custom headers and their functions are listed in the table which is given below:

Button	Function
Font Format	Invokes the font dialog box
Page Number	Inserts the page number
Total pages	Inserts the total number of pages
Current date	Inserts the current date
Current time	Inserts the current time
Worksheet name	Inserts the name of the active sheet

## 12.7 PROTECTING DATA WITHIN WORKBOOKS

Protection against loss or corruption of worksheet data has always been a matter of great concern. This important issue has been dexterously dealt by Excel. There are several levels of protection that can be applied to a workbook.

### 12.7.1 Password to Open a File

The top-most level of protection is set at the file level, which offers several protection options. In this level of protecting data:

- User needs to enter a password to open the file.
- You can make your files read-only so that the data is not deleted or altered by accident or intention.

To apply a password for protecting files, the steps are:

1. Select the Save As option from the File menu. The Save As dialog box gets invoked as shown in Figure 12.11 (a):

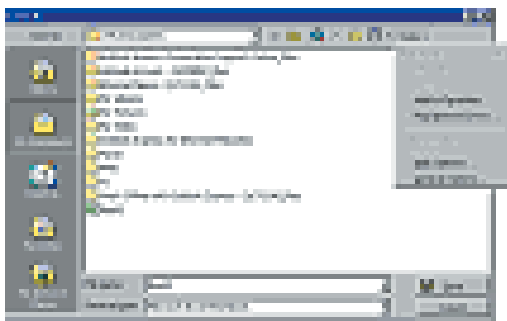


Figure 12.11 (a) : Save As Option in File Menu

2. Click on the Options button. The Save Option dialog box gets invoked as shown in Figure 12.11 (b).

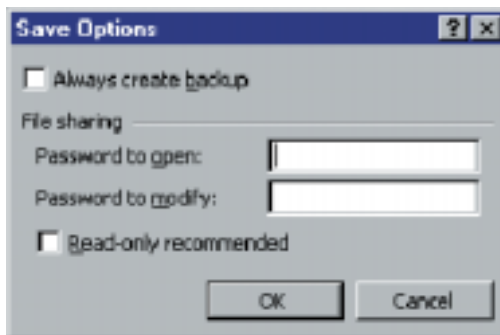


Figure 12.11 (b) : Save Option Dialog Box

3. Enter the password you want to use for the file in the *Password* to open area of the Save Options dialog box. This invokes the Confirm Password dialog box displayed in Figure 12.11 (c).

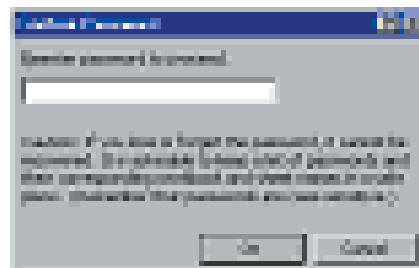


Figure 12.11 (C) : Confirm Password Dialog Box

4. Re-enter the password to proceed in the Confirm Password dialog box and click on the OK button. The Save As dialog box is displayed again.

5. Click on the Save button in the Save AS dialog box.
6. If the Replace Existing File dialog box gets invoked, then click on Yes to implement password protection.

### 12.7.2 Password to Modify a File

The password that is set is to open or access the workbook. This password is used on workbooks that contain vital information that needs to be kept confidential and protected from getting corrupted. This option only allows a user to open the file. To save modifications to a file, you can set a password that a user can enter to save the changes.

Entering a password in the password to modify text box in the Save Options dialog box permits a user to open a workbook in the read-only mode. The user can view and manipulate data but cannot save the changes made to the workbook without the knowledge of the password.

#### Setting the Read-Only Option

The Save Options dialog box contains a read-only recommendation option which you can activate so as to make your workbooks read-only.

### 12.7.3 Creating the Backup Option

The Save Options dialog box has an option for creating backups.

When activated, it creates backups because the *Always create backup* setting has been applied. Every time the file is saved, Excel creates a backup. You can open this backup file when the original file is corrupted. Backup files are saved as backups of the filename. They have an extension .XLS and reside in the same folder as the original file.

### 12.7.4 Removing Protection and Modification Passwords

To remove the password protection from a file, the steps are:

1. Open the workbook that has the password for itself.
2. Select the Save As option from the File menu.
3. Click on the *Options* button.

Clear the password(s)

Asterisks will get displayed when there is a password.

4. Click on the OK button. The Save Options dialog box closes.
5. Now click on the *save* option to save the file.
6. Click on Yes when the Replace Existing File dialog box gets invoked.

There are three other levels of protection with workbooks that maintain data security at the

- Workbook level.
- Worksheet level.
- Object (cells and graphical objects) level.

### 12.7.5 Workbook Level Protection

A user can be restricted to use or change the workbook data even when the user has the access to it. To implement security at the workbook level, the steps are:

1. Select the Protection option from the Tools menu.
2. Select the Protect Workbook option from the Protection submenu.

The Protect Workbook dialog box is involved as shown in Figure 12.12.

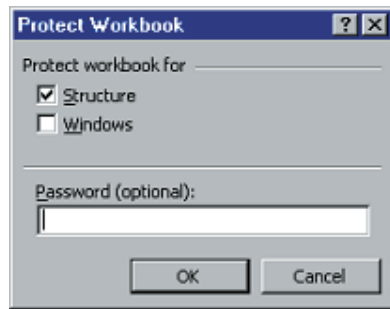


Figure 12.12 : Protect Workbook Dialog Box

The Protect Workbook dialog box enlists certain options. These are:

- *Structure* - prevents changes made to worksheet structure. Deleting, inserting, renaming, copying, moving, hiding or unhiding sheet is prevented.
- *Windows* – checks changes made to workbook windows. Windows control button is hidden and its window functions are deactivated.
- *Password (optional)* – is for optional passwords which can be upto 255 characters, including special characters, and is case-sensitive.

### 12.7.6 Protection and Security at Worksheet Level

You may want to prevent users from changing the contents of a particular worksheet, which is to say, you may want a user to make changes to one worksheet but not to the others. You can follow these steps to do so:

1. Select the Protection option from the Tools menu.
2. Select the Protect Sheet option from the Protection submenu. The Protect Sheet dialog box gets invoked as shown in figure 12.13.

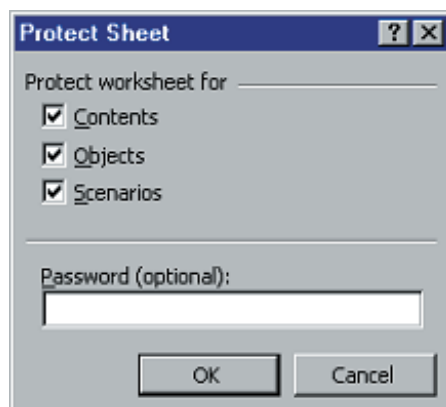


Figure 12.13: Protect Sheet Dialog Box

The dialog box offers several options. These options allows a user to protect a sheet at various levels.

- *Contents* - protects cells and chart items in a worksheet.
- *Objects* – protects graphic objects on a worksheet.
- *Scenarios* – prevents changes to scenario definition.
- *Password (Optional)* – is case-sensitive and can contain 255 characters, which can include special characters.

**HIDING SHEET:** You can also hide all or part of the sheet. For this, you can select the Format, Sheet and Hide options to a hide a worksheet. Unhide the worksheet by selecting Format, Sheet and Unhide. If the workbook structure is protected, then the Hide and the Unhide options fail to work. To overcome this, you should first hide the sheets and then protect the workbook structure. Then unprotect the workbook to unhide the screen.

You can hide rows and columns by selecting the Tools, Row Hide and Format, Column Hide options, respectively. If you choose Tools, Protection, Protect Sheet command, then it becomes all the more difficult for the user to unhide the rows and columns.

### 12.7.7 Cell Protection

Cell protection is sometimes required to keep data in cells secure even when the entire worksheet in which it resides has been worked on by other users.

You can protect the cells by following the steps:

1. Select the Cells options from the Format menu. The Format Cells dialog box gets invoked as shown in Figure 12.14.
2. Select the Protection tab.

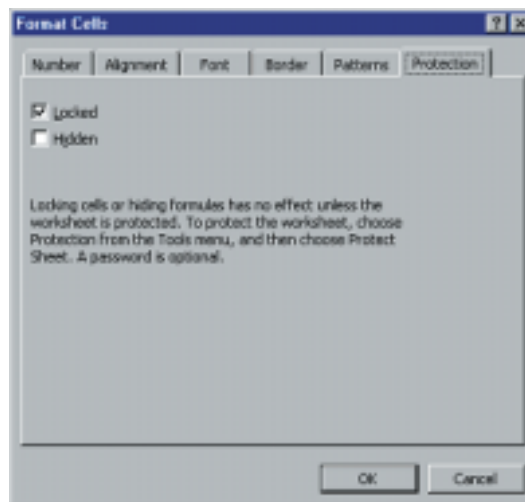


Figure 12.14 : Format Calls Dialog Box

There are two options available in the dialog box. These are:

*Locked* – this option does not allow the cells to be changed once the sheet is protected.

*Hidden* – this option hides the formulas once the sheet is protected.

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## 12.8 SHARING DATA WITH OTHER APPLICATIONS

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Excel allows you to link worksheets to a non-Excel document. This is facilitated by using the Dynamic Data Exchange (DDE) and Object Linking and Embedding (OLE) utilities, which are a part a Windows application. Using this feature, you can embed in MS PowerPoint as MS Word document, an Excel worksheet, chart and so on. This capability also exists in other applications, such as Access, Word and Excel.

Using OLE, you can embed or link documents.

- You can embed a document from another application into an Excel worksheet. The embedded application appears as an object which can be moved and resized. Editing the contents of the object is possible by double-clicking on it.
- In a link between two files, the information from the source document is inserted into the destination document. As a result of the link, whenever there is a change in the source document, the data in the destination document is automatically updated.

## 12.8.1 Inserting Pictures into Worksheets

You can insert pictures, like those created in Paintbrush, into your worksheet to enhance its appearance. To do so, follow these steps:

1. Select the Picture option from the Insert menu.
2. Select the Clip Art option from the Picture submenu. The Microsoft Clip Gallery dialog box gets invoked as shown in Figure 12.15 (a).

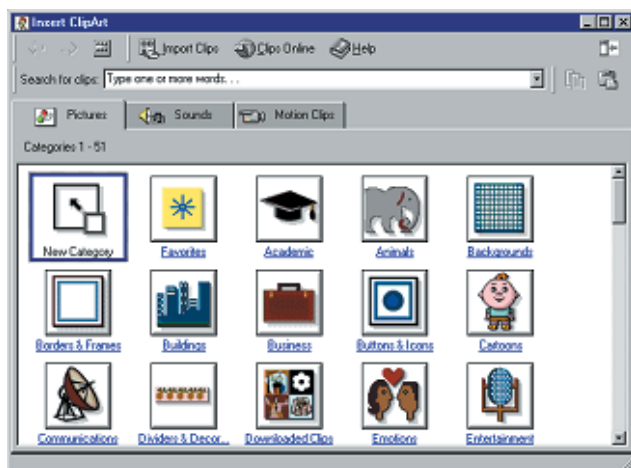


Figure 12.15(a): Insert Clip Art Dialog Box

3. Click on the picture which you want to import.
4. Click on the Insert button to complete the process.

The picture will be inserted into the worksheet as shown in Figure 12.15 (b).

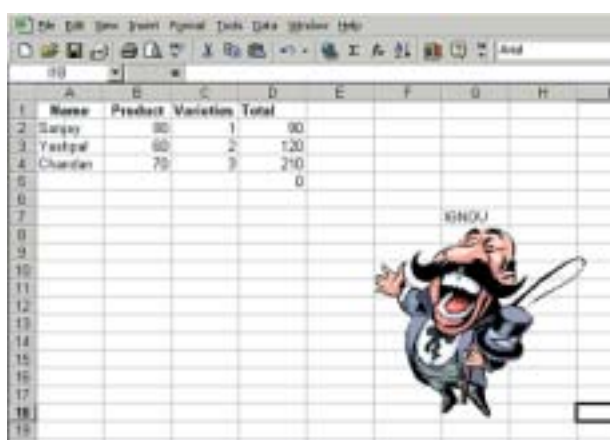


Figure 12.15 (b): Inserting Picture into Worksheet

## 12.8.2 Inserting or Linking to a Worksheet

You can link documents by following the steps listed here under:

1. Activate the sheet where you want to link the document.
2. Select the Objects option from the Insert menu and then click on the *Create From File* tab.
3. Type the name of the document file that you want to link. Alternatively, use the *Browse* button to search for the file.
4. To establish a link to the source file, activate the *Link to file* option.
5. Click on the OK button.

## 12.8.3 Embedding an Excel Object in Another Application

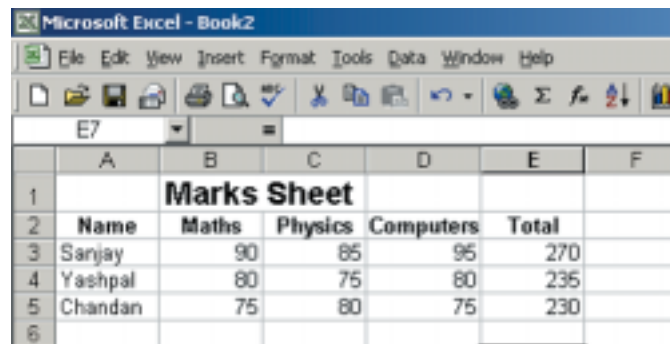
To embed the Excel object in other applications, you can :

1. Select the worksheet range or the chart that you want to embed.

2. Select the Copy option from the Edit menu.
3. Start the other application.
4. Open the document in which you want to embed the Excel object.
5. Select the Paste Special option from the Edit menu. Select the *Paste Link* from the Paste Special dialog box and then click on the OK button.

## 12.9 WORKING WITH DATA FORMS USING LISTS

A list is data stored in worksheet cells. *Columns* in a list represent a category and determine the type of information required for each entry in the list. Each row in the list is a *record*. *Records* is a list that can be entered and edited by a user with the aid of the *data forms* that Excel provides. A data form is a dialog box that is used to simplify the tasks of entering data, deleting entries and finding specific cell entries. A sample list created in *Excel* worksheet is shown in Figure 12.16. The columns in this list are considered as *Fields* and the rows are treated as *Records*.



	A	B	C	D	E	F
1		<b>Marks Sheet</b>				
2	<b>Name</b>	<b>Maths</b>	<b>Physics</b>	<b>Computers</b>	<b>Total</b>	
3	Sanjay	90	85	95	270	
4	Yashpal	80	75	80	235	
5	Chandan	75	80	75	230	
6						

Figure 12.16 : Sample Excel worksheet

### 12.9.1 Adding Records with Data Forms

To add new records to the list, using the data forms, the steps are:

1. Select the Form option from the Data menu.

At the left side of the form are labels of the fields in the list and the text boxes that shows the entries for the records. At the right side of the form are buttons that help to perform specific operation in the list as shown in Figure 12.17.

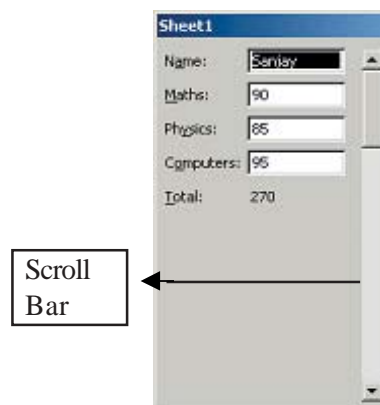


Figure 12.17 : Adding Records With Data Forms

### 12.9.2 Deleting Records With Data Forms

Records can also be deleted from the list with the help of the data forms. When you use the data forms to delete records, you are able to delete only one record at a time.

To delete the records, the steps are:

1. Select the Form option from the Data menu. This opens up the data form for the current list.

2. Scroll to the record that you want to delete.
3. Click on the *delete* button. A message box gets invoked which prompts you to confirm the deletion.
4. Confirm the record from the list, or click on Cancel to cancel the deletion.

The records below the deleted records gets renumbered automatically.

### 12.9.3 Finding Records with Data Form

You can use the data form to find particular records in a list. You can view only one record at a time when you use the data form. To search for records, the steps are:

1. Select the Form option from the Data menu.

This opens the data form for the current list.

2. Click on the *Criteria* button. The window displayed is illustrated in Figure 12.18.



Figure 12.18 : Finding Records with data form

3. Select a text box and enter the criteria that you want to search. For example, marks in Maths.
4. Select the *Find Next* button after you have entered the criteria. If no matches are found, Excel beeps. Select the *Find Previous* button if you want to search backwards in the list to find a match.
5. Select the Close button to clear the dialog box.

### 12.9.4 Sorting Data in a List

Sorting helps to arrange the data entries in a systematic order. You can sort a data base or a list by a single or multiple fields in ascending or descending order.

#### Sorting by a Single Field

To sort a list or a database by a single field, you can:

1. Select any one cell within the database range.
2. Select the sort option from the Data menu. The Sort dialog box gets invoked as show in Figure 12.19.



Figure 12.19 : Sort Dialog Box

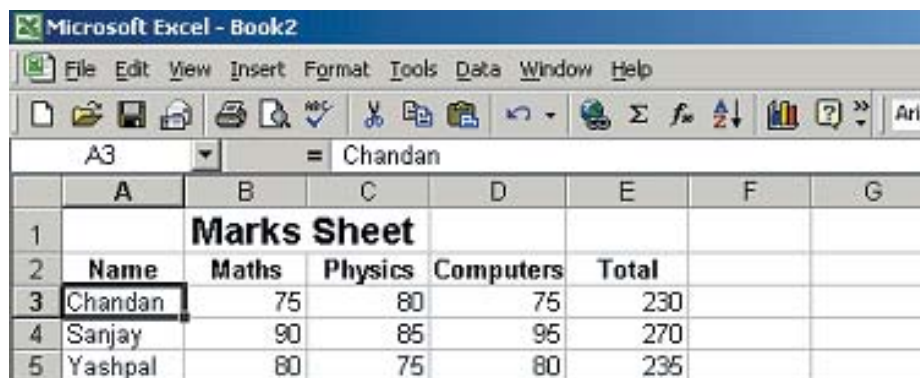
3. Select the field you want to sort from the *Sort by drop-down list*.
4. Use the *Options* buttons to specify the ascending or descending order, or use the buttons available on the *standard toolbar*.
5. Excel tries to determine if the database has a header row (field names), and sets the *Header row or No Header row setting* accordingly in the *My list has area*. Override this setting, if necessary.
6. Click on the OK button to sort the list.

### Sorting by Multiple Fields

There may be situations where you need to sort a database by multiple fields. For example, in students records list of database, you need to sort the records by the *Name*, and then by the *Total* from the highest to the lowest. To do so, the steps are:

1. Select a cell inside the database.
2. Select the Sort option from the Data menu.
3. Select the Product field from the Sort by drop-down list, and select the *Ascending* order option and specify the *Amount* field in the *Then* by drop-down list in the *Descending* order.
4. Click on the OK button.

Your data would be sorted accordingly (refer to Figure 12.20).



	A	B	C	D	E	F	G
1		<b>Marks Sheet</b>					
2	<b>Name</b>	<b>Maths</b>	<b>Physics</b>	<b>Computers</b>	<b>Total</b>		
3	Chandan	75	80	75	230		
4	Sanjay	90	85	95	270		
5	Yashpal	80	75	80	235		

Figure 12.20 : Sorting by Multiple Field

### 12.9.5 Filtering Data in a List

Filters allow you to work with selected rows of information in any list, including a list that you have organized as the database. This implies that you can display only those database records that meet your criteria. For example:

You want to send out certificates to academic proficiency to all those students who have acquired more than 75% marks in their annual examinations. For this, you can filter the data base so that only the records with more than 75% and above marks are displayed.

### 12.9.6 Using the Autofilter

AutoFilter is a special filter that filters records from the worksheet databases with the help of a single command. It makes the filtering task very easy and quick. With AutoFilter, you can also specify complex filtering criteria. To filter records by using the AutoFilter, the steps are:

1. Select any cell in the database.
2. Select the Filter option from the Data menu.
3. Select the AutoFilter option from the Filter submenu.

Drop-down controls are placed on the top of each field name as shown in figure below.

1		<b>Marks Sheet</b>			
2	<b>Name</b> ▼	<b>Maths</b> ▼	<b>Physic</b> ▼	<b>Compute</b> ▼	<b>Total</b> ▼

4. Click on a drop-down control to apply a filter to the field.

The resultant list shows all the unique data entries in the column along with several other options as shown in Figure 12.21 (a).

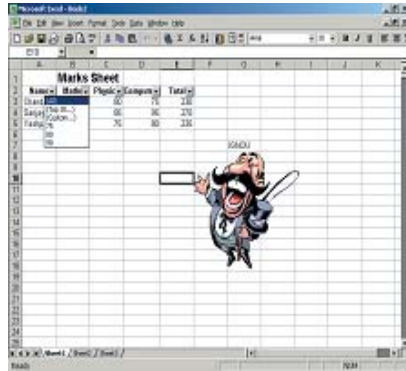


Figure 12.21 (a) : Using theAutofiller

You can use the drop-down menu lists for other fields to apply additional filters to your database. A record must match all the selections that you make in the drop-down list. Excel immediately hides all those records that do not match the criteria. There are three options that you can use for special purposes:

- *Choose (All)* – to cancel the filter defined for the current column (filters in other columns remain in effect).
- *Choose (Top 10)* – to apply criteria based on the values in the cells of the current columns; for example, you can display the top ten records based on their cell values.
- *Choose (Custom)* – this is to apply complex criteria to your database.

If you select the Top 10 AutoFilter option from the drop-down list, as shown in Figure 12.21 (b) then the Top 10 AutoFilter dialog box gets displayed.

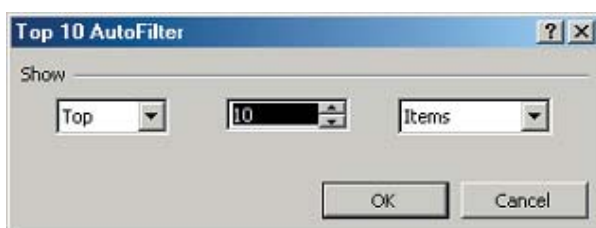


Figure 12.21 (b) : Top 10 Auto Filter Dialog Box

Once you apply the option to your data, then the data gets filtered and gets displayed in the required format as shown in Figure 12.21 (c)



Figure 12.21 : Data Display Using Auto Filter

### 12.9.7 Setting Custom Categories

You can define a Custom AutoFilter when the data you want to filter meets the specified criteria. To apply a customized criteria to a database, the steps are:

1. Select a cell in the database.
2. Select the Filter option from the Data menu.
3. Select the AutoFilter option from the Filter submenu. Drop-down arrows gets displayed on the top of each field in the database.
4. Click on the arrow next to any field name and select the custom entry.

The Custom AutoFilter dialog box gets invoked as shown in Figure 12.22 (a). It has four boxes in which you can specify one or two criteria to apply to the current column. Each criteria consists of a condition and data item.

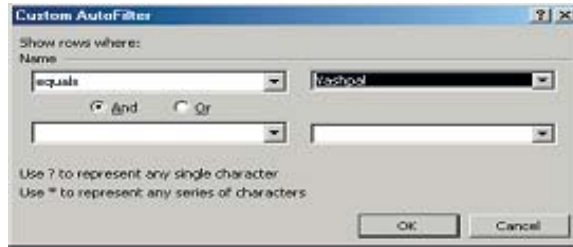


Figure 12.22 (a) : Custom Auto Filter Dialog Box

5. Click on the arrow next to the first box. Select one of the operators from the resulting list. These include conditions such as *Equals*, *Does not equal*, *Is greater than*, *Is less than*, and so on.
6. Click on the arrow of the next box. A drop-down list is displayed. In this list there are all unique data entries in the current column.
7. Select an entry (to complete the criteria) which you want to compare or enter the data yourself in the text box.
8. You can repeat the last three steps to specify another criteria in the second row of the text boxes.

If you specify another criteria, then select either the *And* or the *Or* option button to connect the two criteria.

1. Click on the OK button to apply the custom criteria.

Excel hides all records that do not match the criteria. For example, if you want the record for which the Name is Yashpal, then you can specify the conditions accordingly in the custom AutoFilter as shown in Figure 12.22 (b).

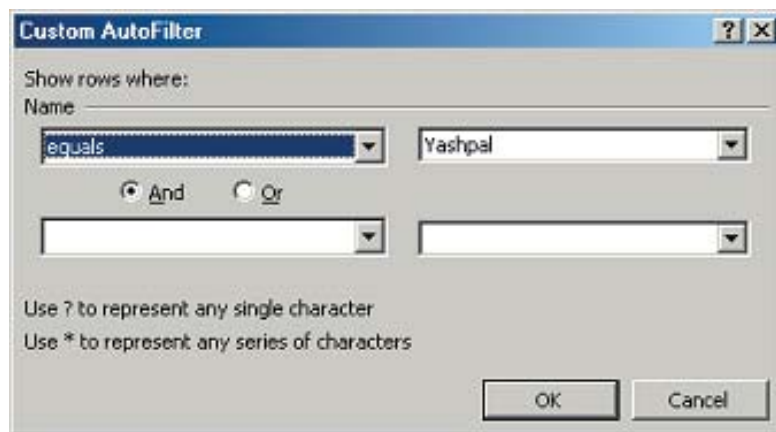


Figure 12.22 (b) : Custom Auto Filter—Specifying Conditions

The result of this condition is displayed by Excel which hides all those records that do not match the criteria.

## 12.10 PIVOT TABLES

Pivot tables enable you to easily summarize and compare data in a list.

They are called pivot tables because you can change their layout by rearranging or pivoting the row and column headings quickly and conveniently. You can use pivot tables to create summaries of large amounts of data. You can summarize and rearrange data specifically for charts with the help of pivot tables. Whenever the pivot tables change, the chart based on those pivot tables also change. You can also use them for in-depth data analysis or creating reports.

### Using the Pivot Table Wizard

A pivot table can be created with the aid of the *Pivot Table Wizard*. To use the wizard, the steps are:

1. Select the Pivot table Report option from the Data menu.

Step 1 of the Pivot Table Wizard dialog box gets invoked as shown in Figure 12.23 (a).

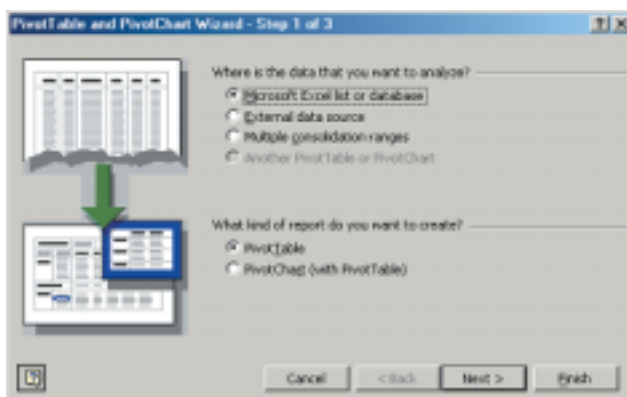


Figure 12.23 (a) : Pivot Table Wizard Dialog Box

1. Enter the data that you want to use in the pivot table.
2. Select the *Microsoft Excel list or database* when using worksheet data.

You can create a pivot table from other sources of data, from another pivot table, database from other applications.

1. Click on the *Next* button.

Step 2 of the Pivot Table Wizard gets invoked as shown in Figure 12.23 (b):

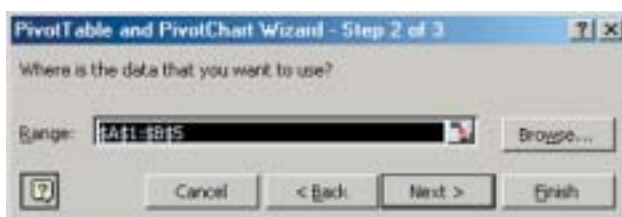


Figure 12.23 (b) : Step 2 Pivot Table Wizard Dialog Box

2. Type the range address that is to be specified in the range text box.
3. Click on the Next button.

Step 3 of the Pivot Table Wizard gets invoked as shown in Figure 12.23 (c):



Figure 12.23 (c) : Step 3 Pivot Table Wizard Dialog Box

4. Click on the Next button.
5. Indicate whether you want to place the pivot table in a *New worksheet* or an *Existing Worksheet*.
6. Select the Options button for more options.
7. You can enter *Format* and *Data* options according to your requirements.
8. Click on the *Finish* button.

The Pivot Table Wizard displays the results in a table on the worksheet [refer to Figure 12.23 (d)].



Figure 12.23 (d) : Pivot Table Options Dialog Box

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## 12.11 LET US SUM UP

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In this Unit, we learnt about various advanced features of Microsoft Excel. You would recall, we read that:

- a list is a table of data stored in a worksheet. The top row of the list contains labels identifying the contents of each column, and the rest of the rows under these headings or labels contains data. It can also be thought of as a database table.
- databases are modified and maintained by typing directly in to a worksheet. When you require a more structured way of performing data entry, you can use Excel's built-in forms. A data form shows one record at a time. It can be used to add new records and edit existing records.
- sorting arranges data in a list or database in ascending or descending order.
- filtering helps you to extract all those records that match your criteria.

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## 12.12 CHECK YOUR PROGRESS EXERCISE

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1. Create a custom number format to display the cell values in thousands.
2. Create a list with column headings as *Names*, *Class*, *Marks*, *Percentage* and *Grade* and add some records to it.

Add some more records to it using the data forms.

Sort the list on *Name* and then by *Marks*.

Use the AutoFilter to get the top ten marks of the students.

Summarize the worksheet list by using the pivot table, and create subtotals and grand total.

3. Copy and paste a range of cells using the AutoFill handle. Find out the difference in the results when the mouse pointer is positioned at the edge of the block of cells and dragged, and when the lower right corner is dragged.
4. Create a worksheet in which column A has the label Roll-no, column B has the label Names, Column C has the label Marks and Column D has the label percentage.

Put in the required data for the respective columns in twenty rows for all columns except for the roll number.

Enter the roll numbers for all twenty students in the format r1, r2, r3,...r20 by using the Fill, Series command from the Edit menu.

Enter the marks of every student in the Marks column.

Calculate the percentage of each student, presuming that the marks are given out of a total of 500. Complete the task by entering the percentage formula manually for the first five students and then use the Edit formula feature for the next fifteen students.

Calculate the Grand Total.

Calculate the Average

Rename the sheet as RESULT

Cut and Paste the students name, marks in another sheet which should be named as REPORT.

5. Create a table with Column A labeled as Item Name, Column B as Item No., Column C as Price and Column D as Comments. Fill in the rows with appropriate cell entries. Now do the following:

Customize the price field to display the amount in thousands 2,233 format.

Increase the column width by using the menu bar.

Increase the row height by using the mouse.

Align the data vertically to position the contents on top.

Fill in cell D1 with an entry "This product is not available and the supplier should be informed about it".

Rotate the item names.

Change the font of Cell A1 to make it bold and underlined.

Add to your worksheet graphic objects and fill it with a title *Sales Report*.

Now create a chart by using the Chart Wizard (use a pie chart) and use the Column A and C as its axis.

6. Create a range of 15 values and name it as *Test*. Find out the maximum value from the text range, by using the range name in the formula.
7. Create a worksheet with column B containing 20 numeric values under the heading Price. Column A

Should have 20 item numbers in the format 101, 102 till 120.

Now create a formula to add all the values by specifying the cell references through pointing.

Perform the same operation by using the AutoSum button.

Use the Paste Function feature and determine:

The number of entries

The maximum value

The minimum value

The average of all the twenty values

Search the cell value for item number 119 by using the Natural Language formula.

Create a bar chart using the values in the in column A as x-axis and use the values of column B as y-axis. Give a title name to the chart as Rate Chart.

Record a macro to copy the contents of column A to column C (after recording the macro remove the contents of column C and then run the macro).

8.
  - i) Create a worksheet with a bar chart showing Book # against No. available. Add headings as bar chart showing Book # against number of books issued showing Books in Demand.  
  
A Sample worksheet is given below:
  - ii) Previous this worksheet.
  - iii) Adjust the margins (on the Print Preview screen) to centralize the chartsheet vertically.
  - iv) Copy a part of your worksheet data to MS Word in a document named *combination*.
  - v) Create this Word document called Combination and save it in Excel worksheet as an icon.
  - vi) Select an area of the Libmast worksheet data area and set it as a print area. Print two copies of it.
9. Create your own page footers which should specify the page numbers in the format A.1, A.2, and so on.
10. What option would you use to align the text both left and right? Which option would be suitable to center text across multiple lines?
11. Create a worksheet with data in four pages and send only the first two pages for printing.

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## 12.13 ANSWERS TO CHECK YOUR PROGRESS EXERCISE

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- 1) Select a cell and make a numeric entry. Select the Cells option from the Format menu. Select the Numbers tab from the Format Cell dialog box. Select the custom Category and enter #,### in the type box. Click on the OK button. Now your cell values would appear as 3,456.
- 2) No model answer. Do it yourself. This is practice exercise.

- 3) Dragging the edge of the block moves the block of data to another location while the lower right corner has the AutoFill handle (a solid cross) which copies data to an adjacent cell.
- 4) No model answer. This is practice exercise.
- 5) No model answer. This is a practice exercise.
- 6) Enter the 15 values in the First 15 rows of column A. Select the cell range. Select the name option from the Insert menu. Select the Define option from the Name submenu. In the Define Name dialog box enter the name you want to give to the range in the Name in Workbook text box. Select a cell in which you want the formula. Type =MAX (in the cell). Select the name option from the Insert menu. Select the Paste option from the Name submenu. In the Paste Name dialog box select the name Test that gets displayed in the past name text box. Click on the OK button. The formula now contains the range name. Complete the formula by typing the closed brackets. Press Enter and the result will be shown in the cell.
- 7) No model answer. This is a practice exercise.
- 8) No model answer. This is a practice exercise.
- 9) Select the Page Setup option from the File menu. Click on the Custom footer. Click on the Center section on the Footer dialog box. Type A, and click on the Page number button. Click on the OK button.
- 10) Use the justify option of the horizontal alignment. Use the option Center Across Selection for centering text across multiple columns.

There are various options available for vertical alignment also. These are:

*Top:* Position contents at the top of the cell.

*Center:* Centers contents vertically within a cell.

*Bottom:* Position contents at the bottom of the cell.

*Justify:* Justifies lines vertically from top to bottom and automatically wraps the text.

To position contents at the bottom of the cell, which option would you select from the vertical alignment options?

- 11) Select the print option from the file menu. In the print dialog box, specify pages 1 to 2 in the print range section.