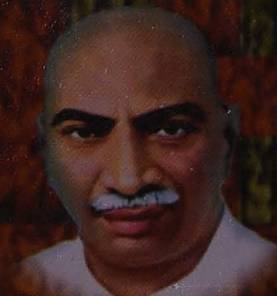




MADURAI KAMARAJ UNIVERSITY

(University with Potential for Excellence)

DISTANCE EDUCATION



B.Sc.,

Mathematics

First Year

Paper - II

(Unit 1 - 10)

**MS OFFICE & DATABASE
MANAGEMENT**

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Welcome

Dear Students,

We welcome you as a student of the First Year B. Sc degree course. This paper deals with the subject "Ms-Office". The learning material for this paper will be supplemented by contact seminars.

Word processing in computer terminology refers to typing, editing and formatting of any kind of document, which could be letter, balance sheet, or something similar. As the term suggests, word processing simply processes words, i.e. textual information

Learning through the distance education mode, as you are all aware, involves, self learning and self assessment and this regard you are expected to put in disciplined and dedicated effort. On our part, we assure of our guidance and support.

B. Sc MATHEMATICS -- MS OFFICE

SYLLABUS

UNIT 1

MS-Word Introduction- Word for Windows. Creating and saving documents- Page setup - Print Preview, Print, Edit-redo, cut, copy, paste, find and replace.

UNIT 2

Views- Normal, Print layout, Ruler, Header and Footer, Insert- Page. no, Picture, Textbox, Word Art. Format fonts (size, color, type), Bulleted numbering, Border and shading, Columns and Change cases.

UNIT 3

Tools- Spelling and Grammar mail merge. Table- draw, insert, delete, select, split columns and rows.

UNIT 4

Explanation for an Excel Page (rows, columns and cells) Entering data. Usage of formulae and functions.

UNIT 5

Creating an Excel chart, Data Manipulation and Type of functions.

Text Book:

1. "M. S. OFFICE" by C.Nellaikannan. Nels Publications. 3rd edition, 2004.
2. "COMPUTER TODAY" by Suresh K. Basandra. Galgotia Publishing Pvt Ltd, 1995, Chapter 9.

B. SC MATHEMATICS – FIRST YEAR

PAPER – II MS – OFFICE

SCHEME OF LESSONS

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1.1 Introduction to Ms-Word

Let us consider an office scene. Many letters are typed in the office. The officer dictates a letter. The typist first types a draft copy of the letter. The officer goes through it to check mistakes regarding spelling errors, missing words, etc. and suggests corrections. The typist changes the letter as suggested by the officer. This is a simple example of word processing.

There are many software packages to do the job of word processing. Some of them work in DOS environment. Examples are WordStar, Word Perfect and Professional Write. But in these days working in WINDOWS is becoming more and more popular. So let us consider software for word processing which works in WINDOWS. Your choice is MS-WORD because it is the most popular software in these days.

MS-WORD is a part of the bigger package called MS OFFICE, which can do much more than word processing. In fact when you open up MS OFFICE you will find four main components in it. They are MS-WORD (for word processing), MS EXCEL (for spreadsheet), MS ACCESS (for database management) and MS POYYOURPOINT (for presentation purposes). However, you will limit yourselves to MS-WORD only in this lesson.

Microsoft word is a word processing program that you can use to compose and update a wide range of business and personal documents. In addition, word offers many **desktop-publishing features** that let you enhance the appearance of documents so that they are appealing and easy to read. Whether you need to create a letter, memo, annual report for various firms and education department, news letters or book word has the power and liveness to produce professional documents quickly and easily.

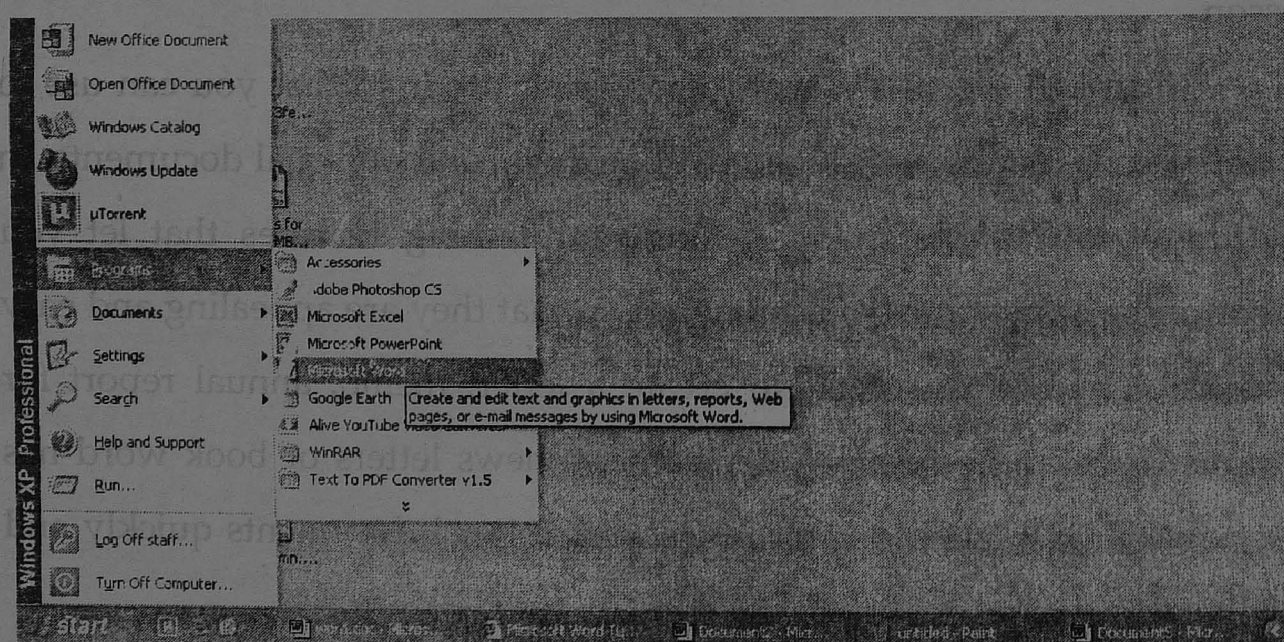
1.1.1 Advantage of Ms-Word

Today's world is very competitive. Particularly in the business world, one likes to receive neatly typed, error-free and easy to read letters and documents. It helps the sender to get more business and improve relations with clients. Ms-Word helps in preparing such documents through its special features, such as bold, underlined, different font size, margins, tabs, spelling and grammar checking and correction and etc. besides these, one can also get different quality of printouts by using different modes.

1.1.2 Starting Ms-Word

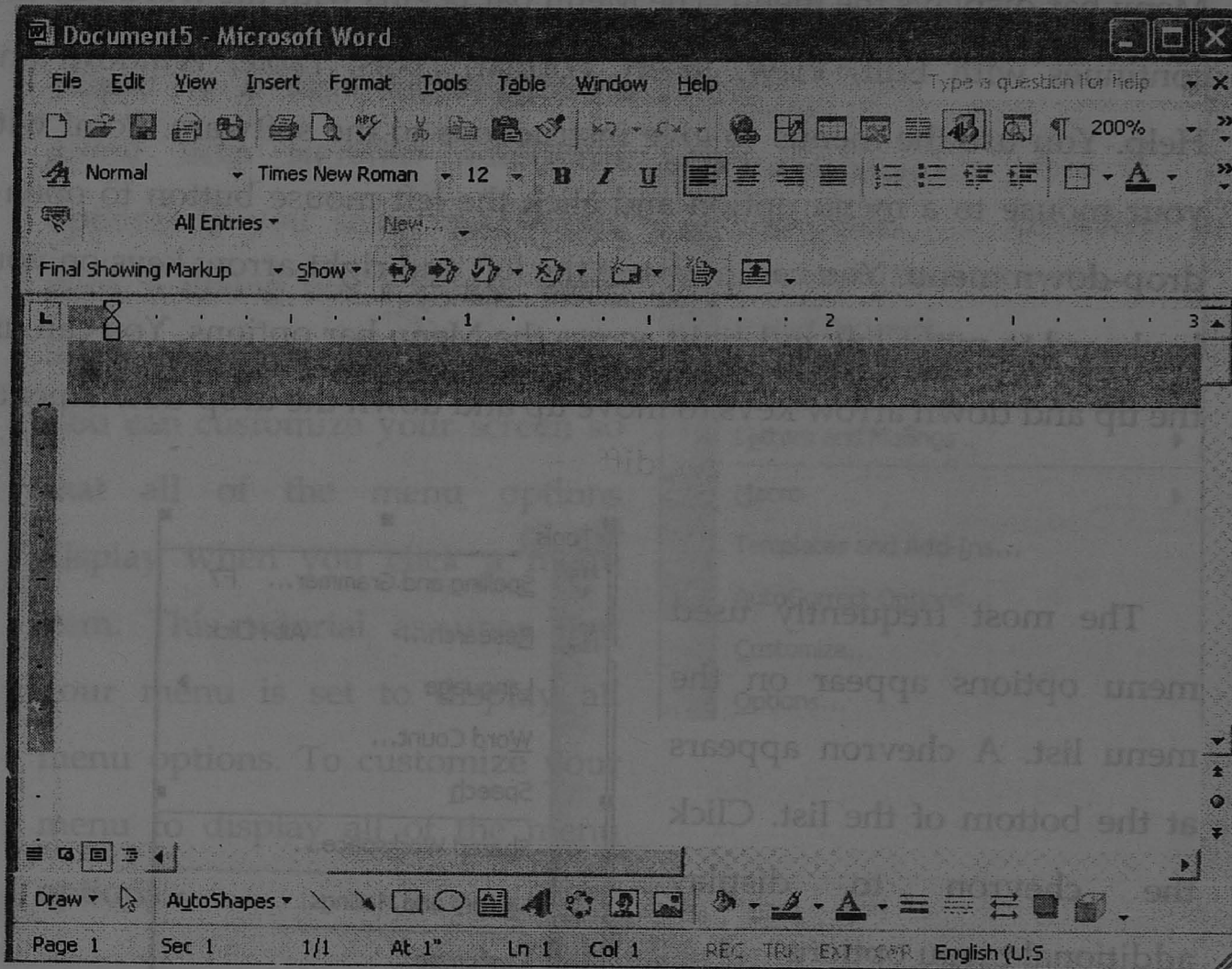
Two Ways

1. Double click on the Microsoft Word icon on the desktop.
2. On the taskbar, click Start, point to Programs, and then click Microsoft Word.



The word window opens with a blank document and the New document task pane in the document window.

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1.2 Ms-Word for Windows

1.2.1 The Title Bar



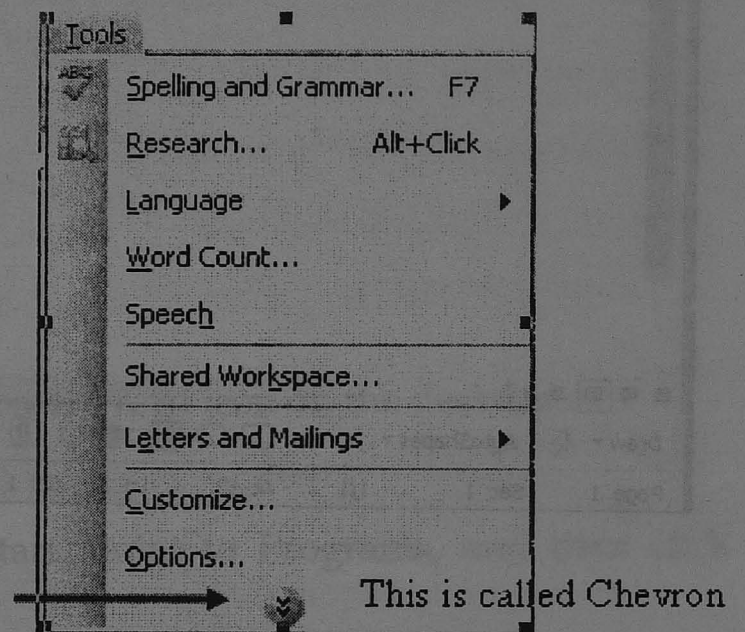
This lesson will familiarize you with the Microsoft Word screen. You will start with the Title bar, which is located at the very top of the screen. On the Title bar, Microsoft Word displays the name of the document on which you are currently working. At the top of your screen, you should see "Microsoft Word - Document1" or a similar name.

1.2.2 The Menu Bar

File Edit View Insert Format Tools Table Window Help Type a question for help

The Menu bar is generally found directly below the Title bar. The Menu bar displays the menu. The Menu bar begins with the word File and continues with Edit, View, Insert, Format, Tools, Table, Window, and Help. You use the menus to give instructions to the software. Point with your mouse to a menu option and click the left mouse button to open a drop-down menu. You can now use the left and right arrow keys on your keyboard to move left and right across the Menu bar options. You can use the up and down arrow keys to move up and down the drop-down menu.

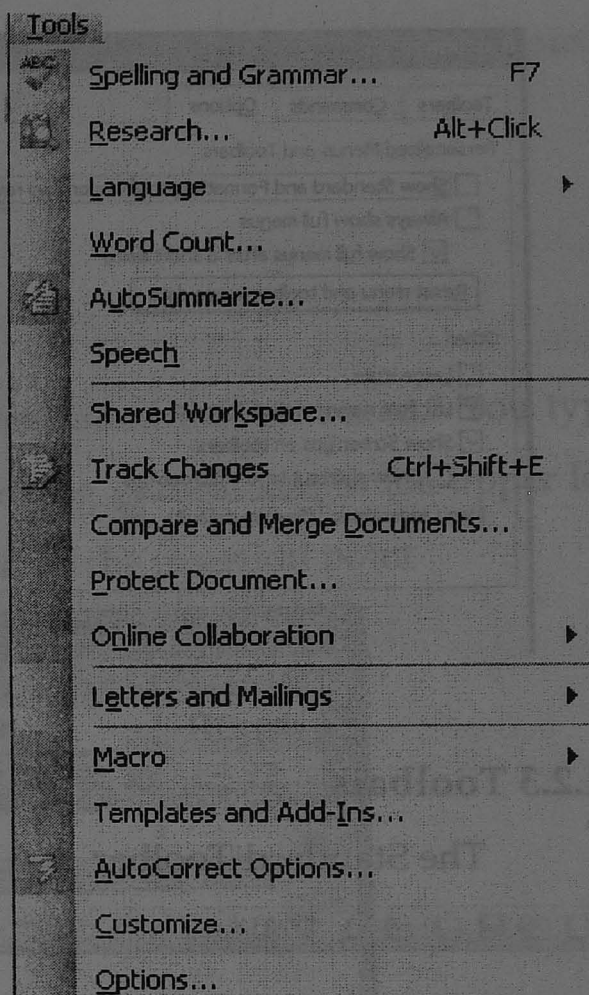
The most frequently used menu options appear on the menu list. A chevron appears at the bottom of the list. Click the chevron to display additional menu options.



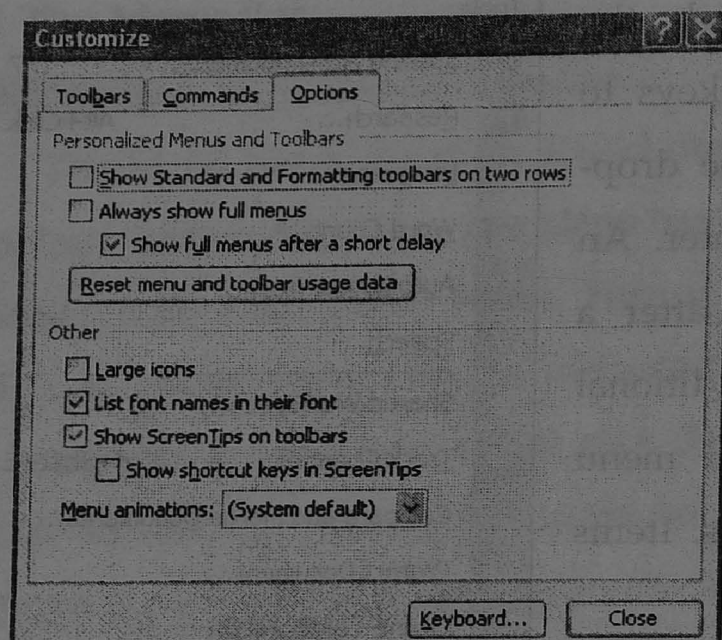
To select an option, click the option or use the arrow keys to move to the option on the drop-down menu and press Enter. An ellipse or a right arrow after a menu item signifies additional options; if you select that menu item, a dialog box appears. Items in gray are not available.

You can customize your screen so that all of the menu options display when you click a menu item. This tutorial assumes that your menu is set to display all menu options. To customize your menu to display all of the menu options:

1. Click Tools on the Menu bar.
2. Click Customize on the drop down menu. The Customize dialog box opens.
3. Click the Options tab.
4. Click in the check box to select Always Show Full Menus.
5. Click Close.



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1.2.3 Toolbars

The Standard Toolbar



The Formatting Toolbar



Toolbars provide shortcuts to menu commands. Toolbars are generally located just below the Menu bar. Before proceeding with this lesson, make sure the toolbars you will use -- Standard and Formatting -- are available.

Follow these steps:

1. Click View on the Menu bar.
2. Highlight Toolbars.
3. Standard and formatting should have check marks next to them. If both Standard and formatting have check marks next to them, press Esc three times to close the menu.
4. If they do not both have check marks, click Customize.
5. Click the Toolbars tab.
6. Point to the box next to the unchecked option and click the left mouse button to make a check mark appear.

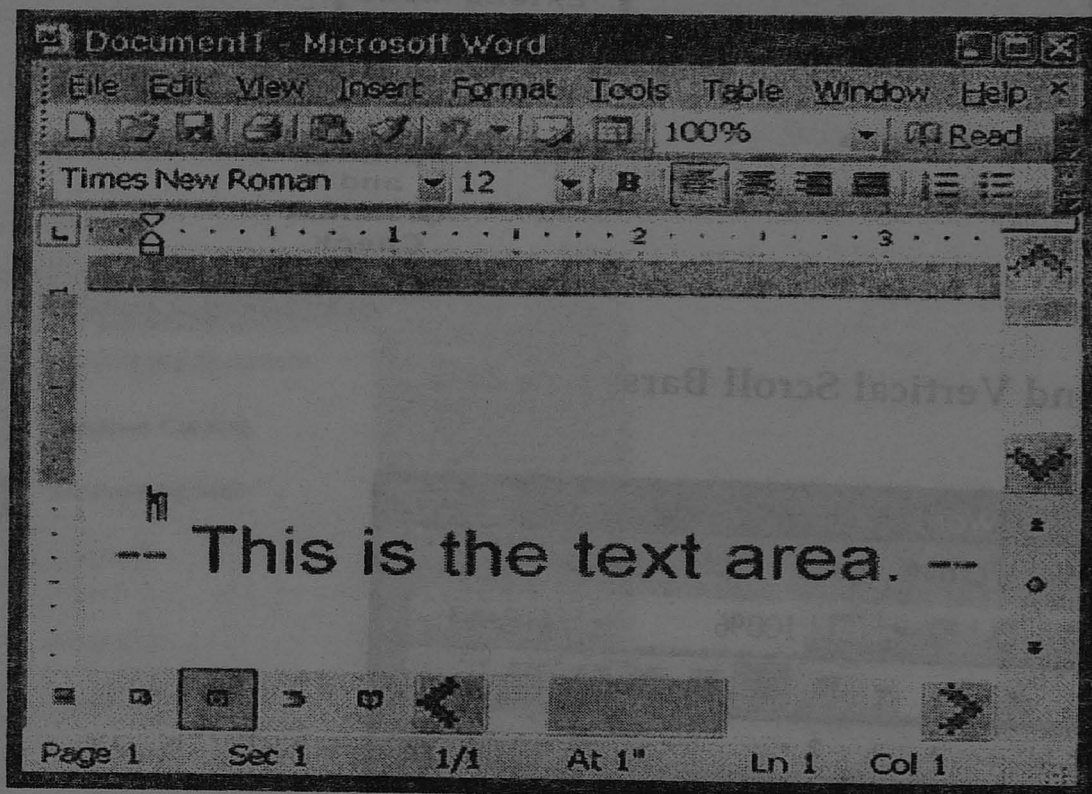
Note: You turn the check mark on and off by clicking the left mouse button.

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7. Click Close to close the dialog box.

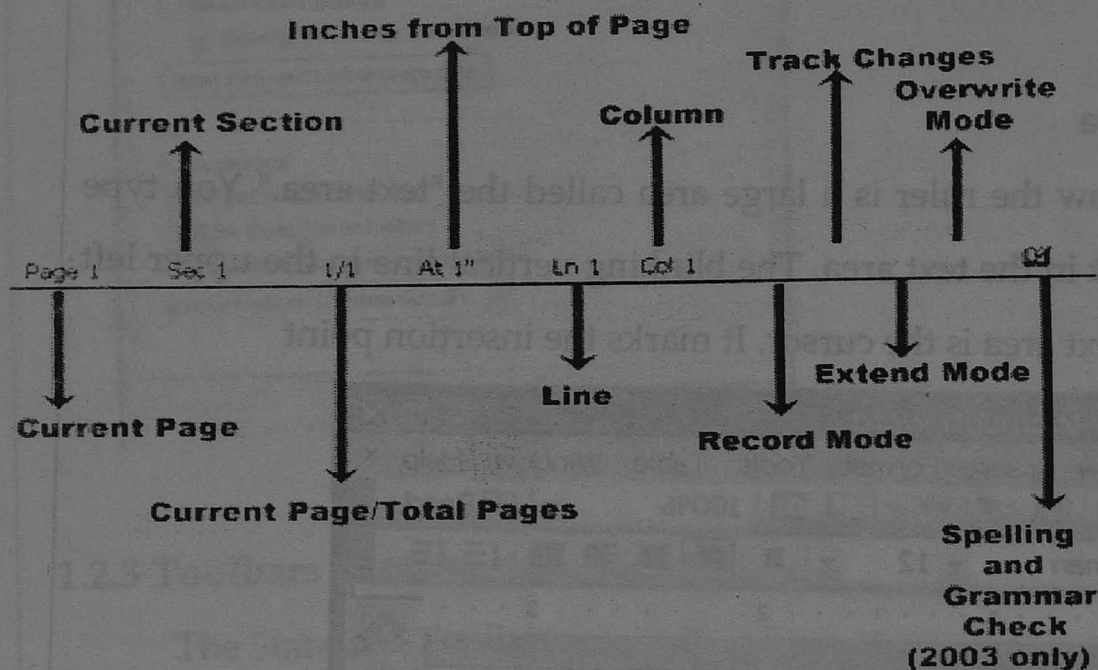
1.2.4 Text Area

Just below the ruler is a large area called the "text area." You type your document in the text area. The blinking vertical line in the upper left corner of the text area is the cursor. It marks the insertion point

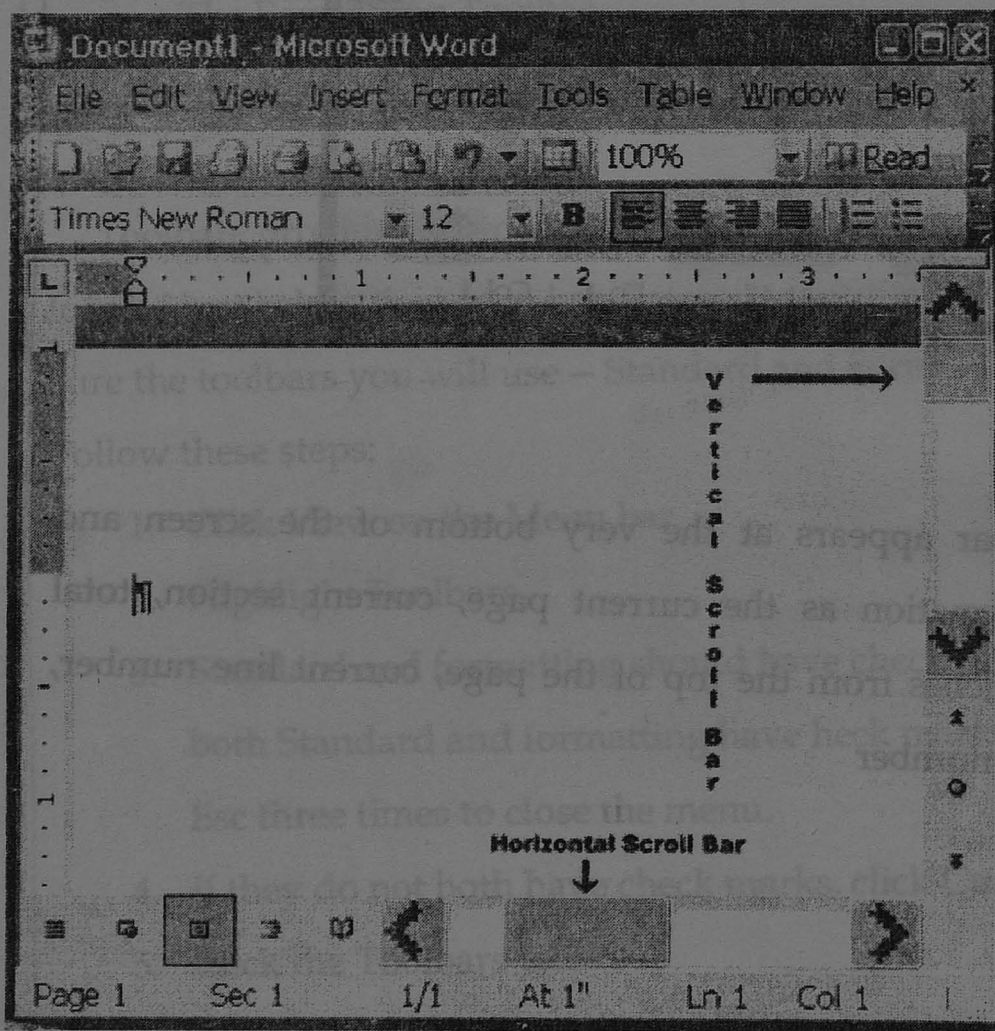


1.2.5 Status Bar

The Status bar appears at the very bottom of the screen and provides such information as the current page, current section, total number of pages, inches from the top of the page, current line number, and current column number



1.2.5 Horizontal and Vertical Scroll Bars



The Horizontal and Vertical scroll bars, if turned on, enable you to move up and down or across the window simply by pressing the icons located on the scroll bars. The Horizontal scroll bar is located above the

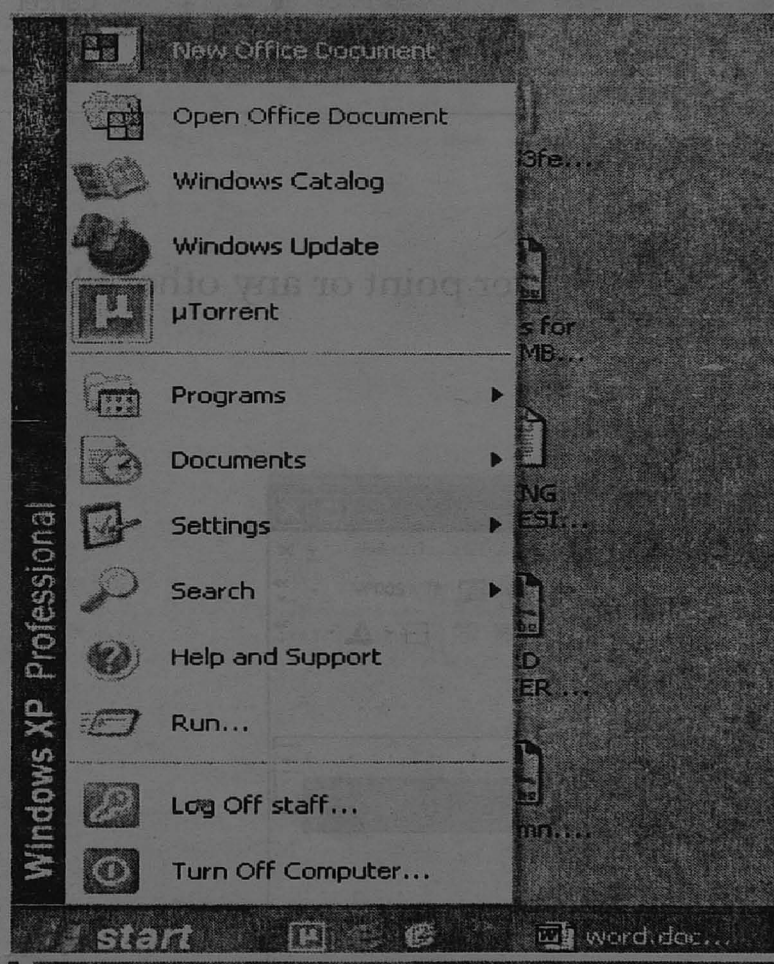
Status bar. The Vertical scroll bar is located along the right side of the screen. To move up and down your document, click and drag the Vertical scroll bar up and down. To move back and forth across your document, click and drag the Horizontal scroll bar.

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1.3 Creating a word document

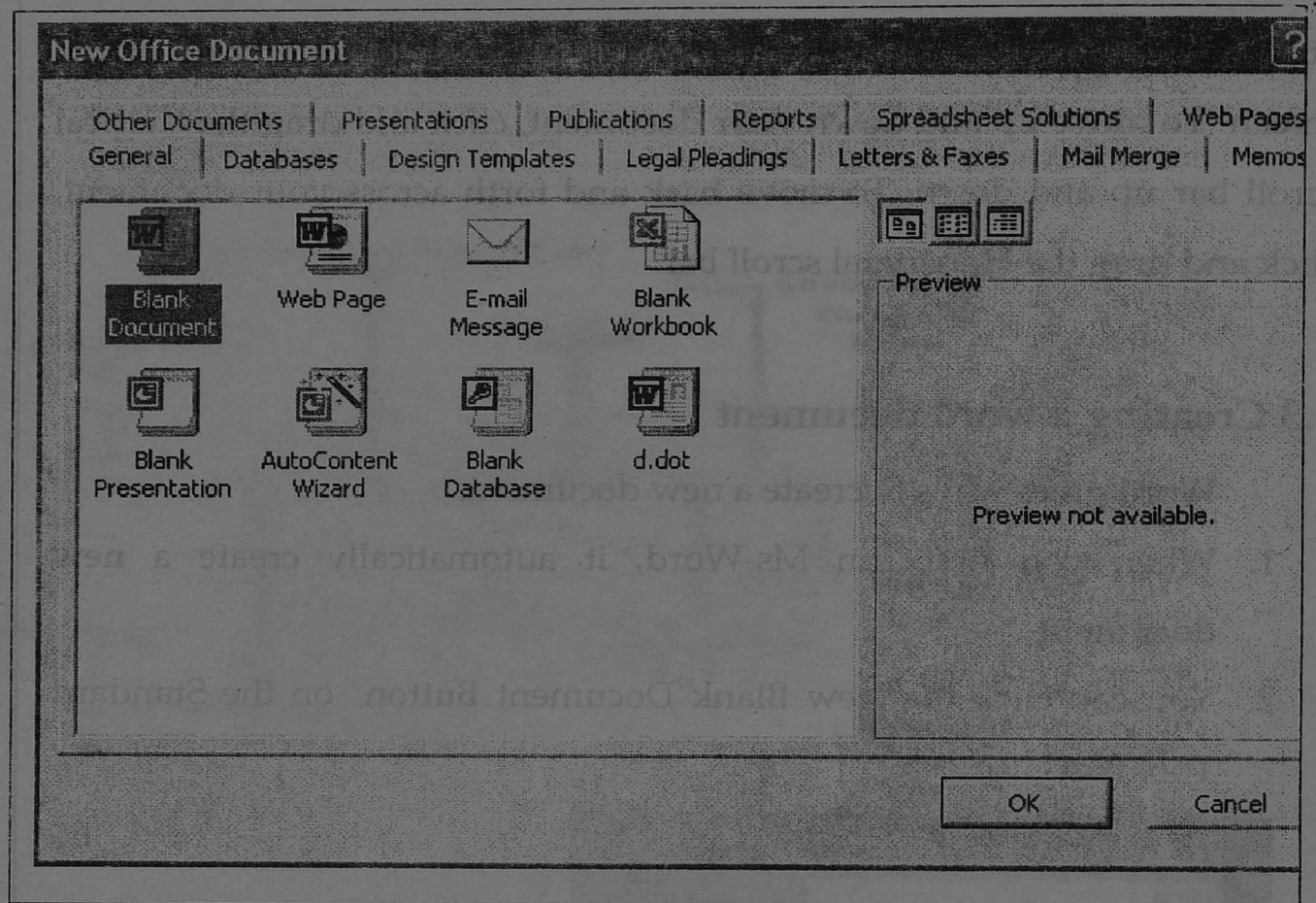
Word gives ways to create a new document:

1. When you first run Ms-Word, it automatically create a **new document**
2. You can click the New Blank Document Button on the Standard Tool Bar



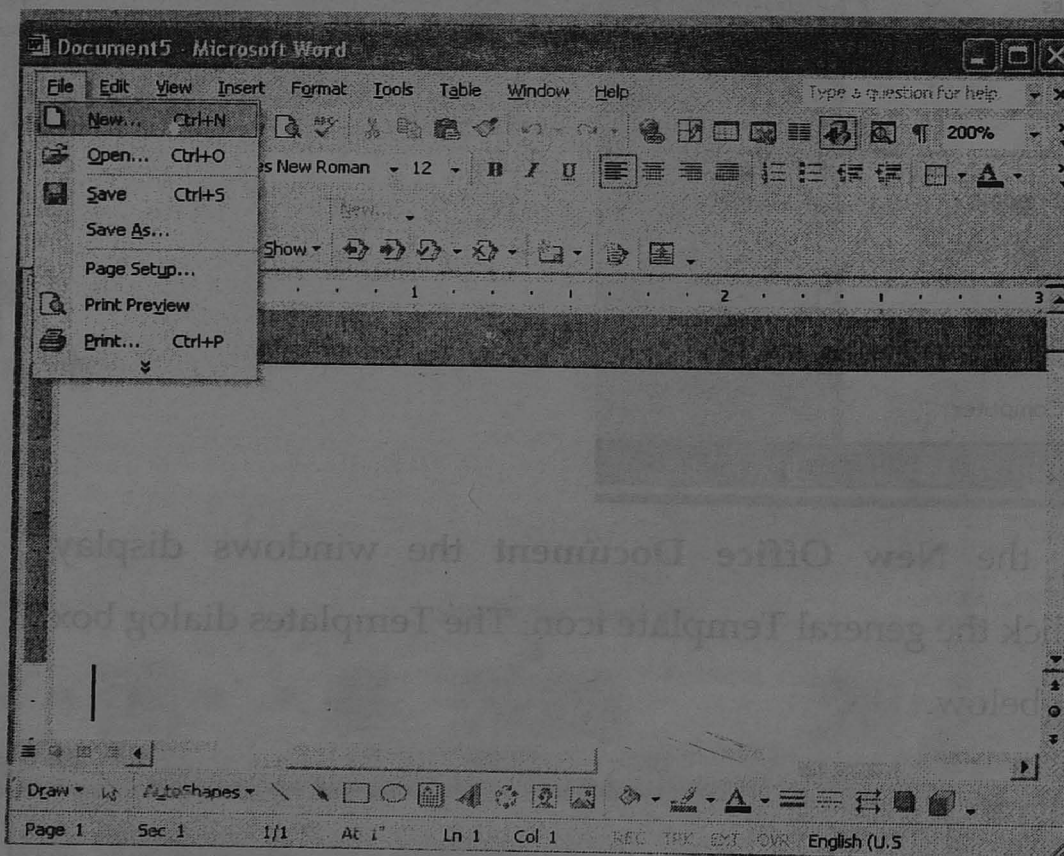
After clicking the New Office Document the windows display following pane. Click the general Template icon. The Templates dialog box appears, as shown below.

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From this you can select Ms-Word/Excel/Power point or any other files.

3. You can choose File → New



1.3.1 Open a Word Document

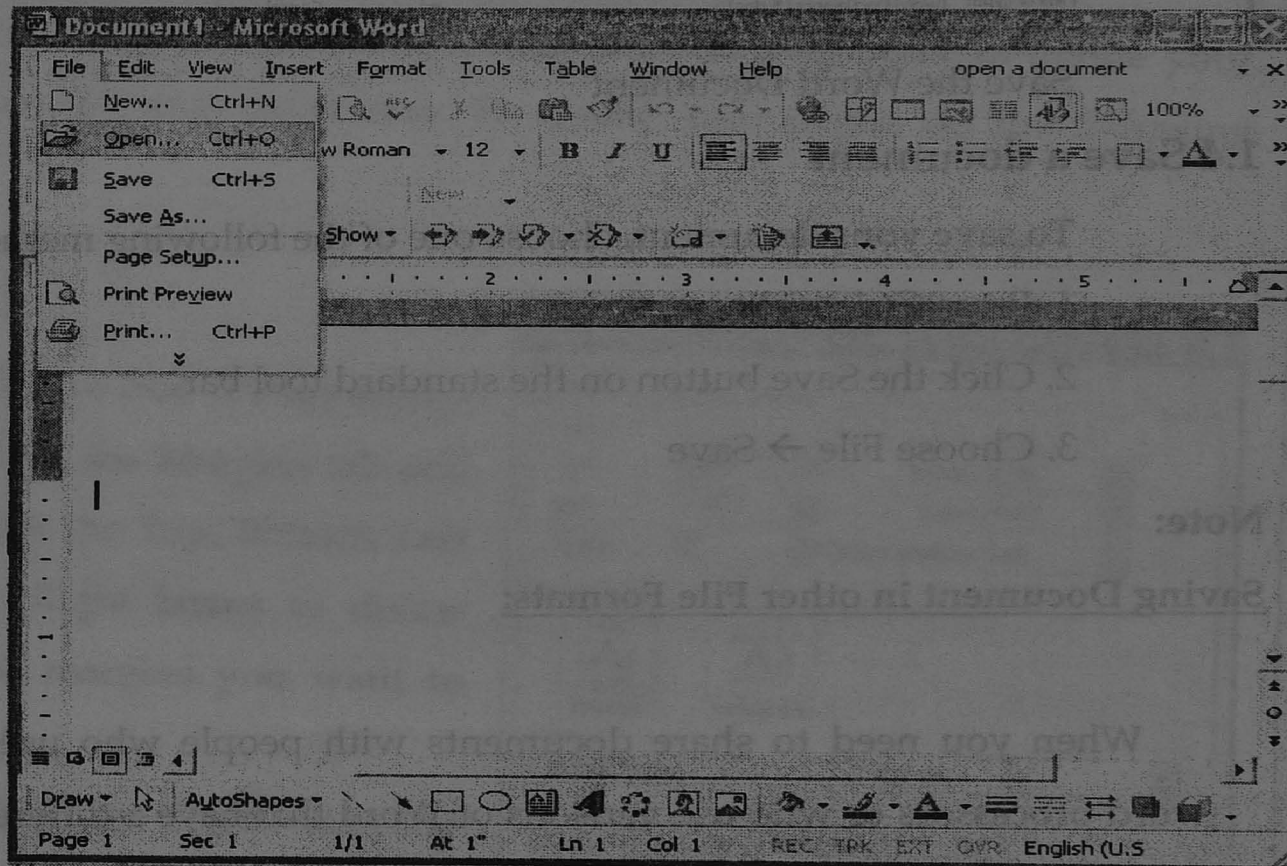
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Instead of creating new documents, you may want to spend more of your time editing documents that you already created. To open a previously saved file, Word gives four ways:

1. Press Ctrl + O
2. Click the Open button on the Standard Tool Bar



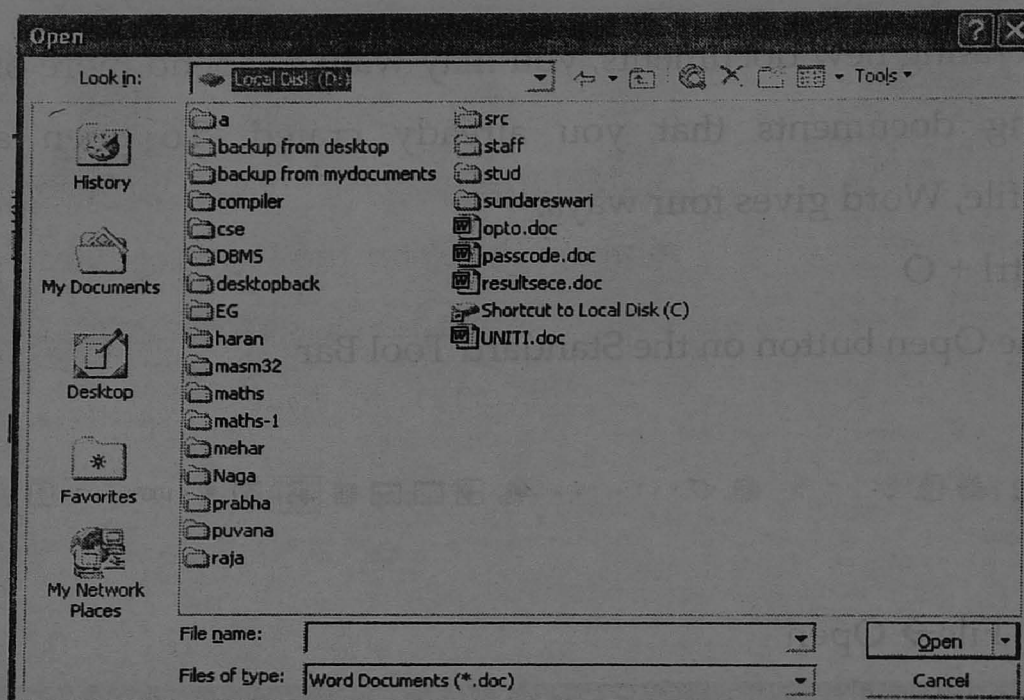
3. Choose File → Open



4. Choose one of the last four files you saved, their names appear at the bottom of the File Menu or Inside the New Document Pane.

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If you choose one of the first three opening methods, the Open dialog box appears. Just double-click the file that you want to open.



Save the Word Document

1.4 Save a document

To save your document, choose one of the following methods

1. Press Ctrl + S
2. Click the Save button on the standard tool bar
3. Choose File → Save

Note:

Saving Document in other File Formats:

When you need to share documents with people who use other word processors or who use versions of Word that have a different file format (such as Word 6.0/95 or Word for the Macintosh), you can save documents in other file formats. For example, you can open a document created in WordPerfect, make changes to it in Word, and then save.

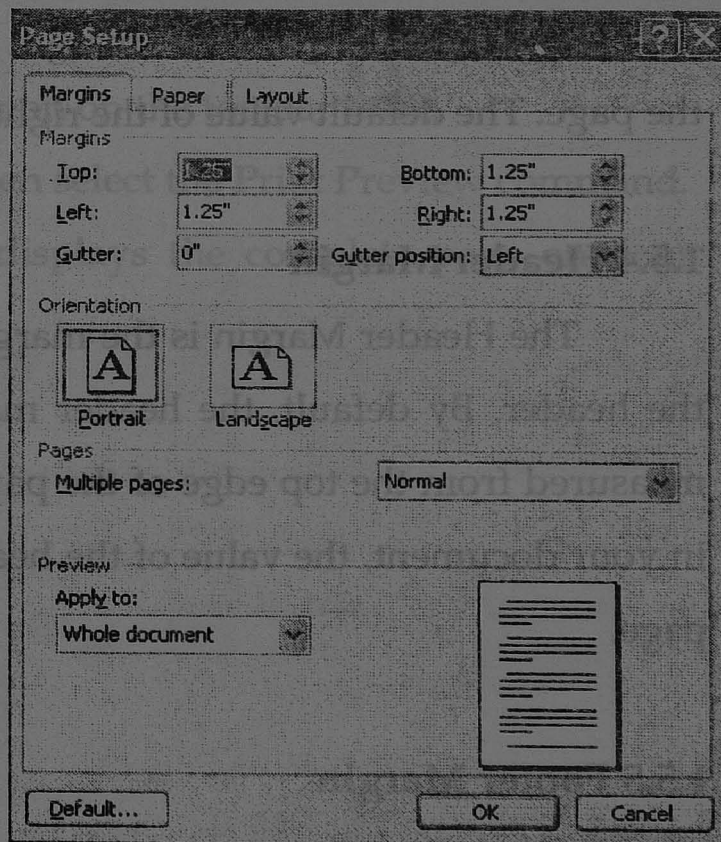
Saving Documents for Internet, Intranet or Web Use

If you use Word to create web pages to display in a web browser, you can save documents in web page format and publish them to a web server. You can also save documents to an FTP site on the Internet (you must have an Internet account through an Internet service provider and permission to save documents on the FTP server) or to your company's intranet.

1.5 Page Setup

Before you print your documents, you may want to define your page margins and paper size. To define your pages, do the following steps.

1. Choose File → Page set up
2. Click the Margins tab and click the Top, Bottom, Left or Right boxes to define the margins you want to set.
3. Click the Paper tab and then click in the paper Size list box to define the paper size.
4. Click the Layout tab.



1.5.1 Top Margin

The top margin is the margin that Word leaves at the top of the page. This margin is specified in inches. By default, Word leaves a margin of 1" at the top of every page. This margin is measured from top edge of

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the paper. If you define any header for your document, that is printed in the top margin.

1.5.2 Bottom Margin

The bottom margin is the margin that Word leaves at the bottom of the page. This margin is specified in inches. By default, Word leaves a margin of 1" at the bottom of every page. This margin is measured from bottom edge of the paper. If you define any footer for your document, that is printed in the bottom margin.

1.5.3 Left Margin

The left margin is the margin that Word leaves at the left side of the page. The default value of the left margin is 1.25".

1.5.4 Right Margin

The right margin is the margin that Word leaves at the right side of the page. The default value of the right margin is 1.25".

1.5.4 Header Margin

The Header Margin is the margin that Word leaves before printing the header. By default, the header margin is 0.5". The header margin is measured from the top edge of the paper. If you are not using any header in your document, the value of the header margin affects the layout of the page.

1.5.5 Footer Margin

The Footer Margin is the margin that Word leaves after printing the footer. By default, the footer margin is 0.5". The footer margin is measured from the bottom edge of the paper.

1.5.6 Paper Size

When you create a new document, Word assigns a default page size based on the Normal Template.

1.5.7 Gutter Margin

The Gutter margin is also called the binding margin. This margin is used only when you want to prepare a document that will be bound and you want to leave a specific margin for binding. The default value of the Gutter margin is zero.

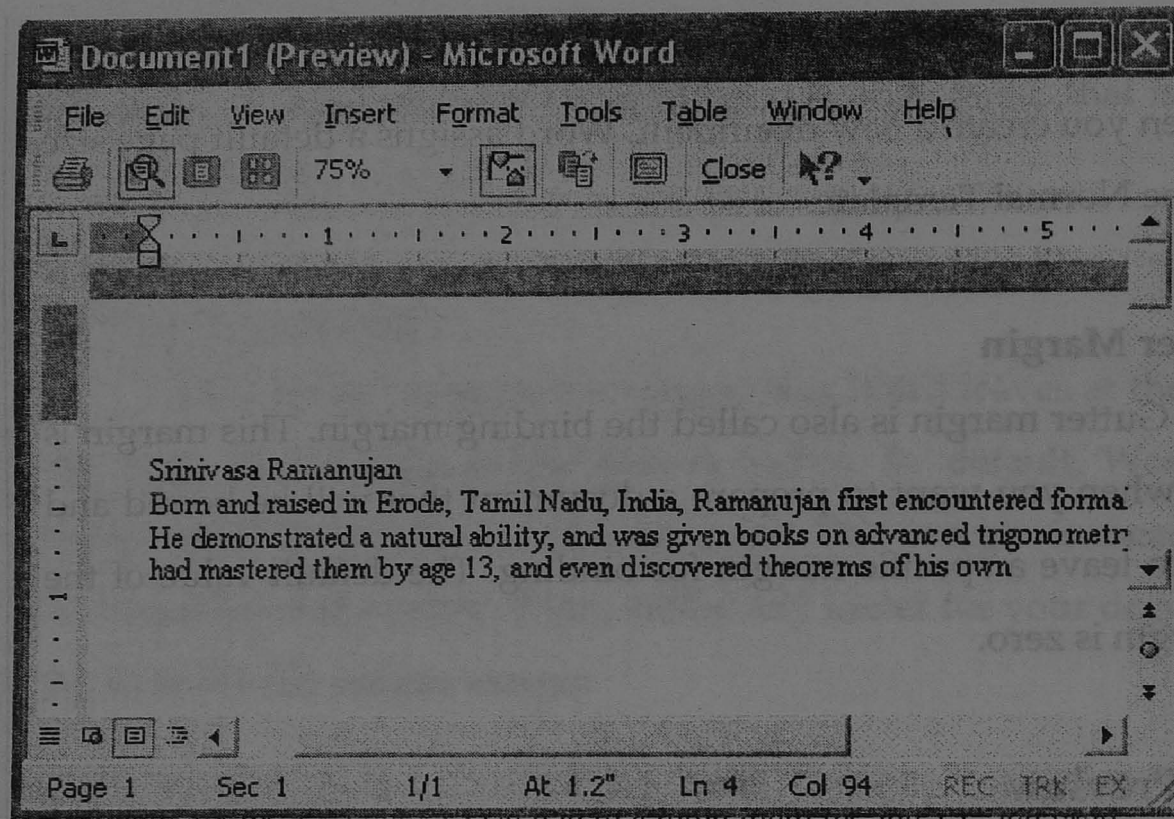
1.6 Print Preview

Print preview helps you to get a good idea about what you would get on printing the current document. It can help you to check if you are too much or too little margins. Basically, Print Preview gives you a bird's eye view of the current document. To print preview your document, do any of the following.

1. Click the print preview button on the toolbar 
2. Open the File menu and then select the Print Preview command.

On selecting Print Preview, Word displays the complete page on your screen.

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1.6.1 Printing

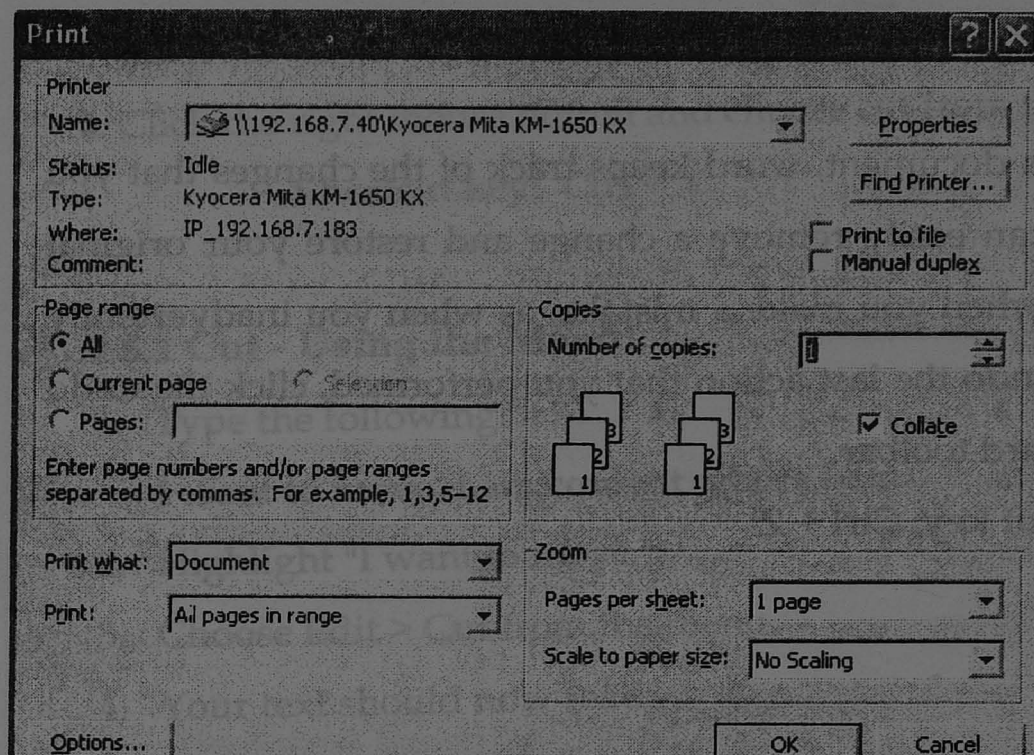
After you have finished typing your document, you will want to print it. While preparing to print, you can specify the number of copies you want and the pages you want to print.

Print Your Document

1. Choose File > Print from the menu.
2. Click OK.

Alternate Method - Printing by Using the Icon

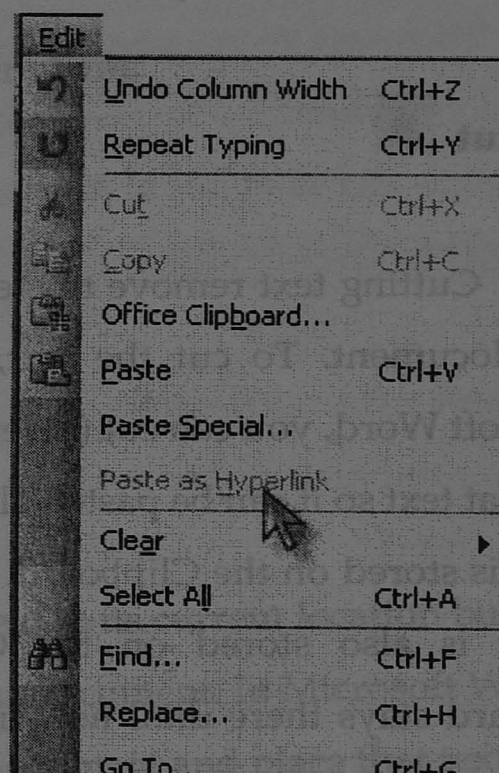
Click the Print icon  on the Standard toolbar



1.6.2 Edit Menu

Editing a Document

Editing encompasses many tasks, such as inserting and deleting words and correcting errors, and moving and copying text to different places in the document. Before edit or work with text, you first need to select it. Selected text appears highlighted on the screen. To select a block of text quickly, you can use the selection area. To deselect text, click anywhere outside of the selected text.



1.6.3 Undo

As you edit a document, word keeps track of the changes that you make so that you can easily remove a change and restore your original text. This is useful when you make a mistake, as when you inadvertently delete a word. To undo the last action that you performed, click the undo button on the standard toolbar.

Short cut key: Ctrl + Z

1.6.4 Redo

If you want undo an action, you can restore, or redo, the action by clicking Redo button.

Shortcut key: Ctrl+ Y

1.6.5 Cut

Cutting text remove the text so you can move it to another part of your document. To cut the text, you can do any of the following. In Microsoft Word, you can cut (delete) text from one area of a document and save that text so it can be pasted elsewhere in the document. When you cut text, it is stored on the Clipboard. You can also copy text. When you copy text, it is also stored on the Clipboard. Information stored on the Clipboard stays there until new information is either cut or copied. Each time you execute Cut or Copy, you replace the old information on the Clipboard with whatever you just cut or copied. You can paste Clipboard information as often as you like.

1. Select the Text that you want to cut
2. Choose Edit → Cut

3. Click the Cut button
4. Click the right mouse button and choose cut from the pop up menu.

Shortcut key: Ctrl + X

1.6.5.1 Cut - Using the Menu

1. Type the following:

I want to move. I am content where I am.

2. Highlight "I want to move."
3. Choose Edit > Cut from the menu.
4. Your text should now read:

"I am content where I am

1.6.5.2 Alternate Method -- Cut by Using the Icon

1. Type the following:

I want to move. I am content where I am.

2. Highlight "I want to move."
3. Click the Cut Icon .
4. Your text should now read:

" I am content where I am."

1.6.6 Copy

Copy text lets you keep the original text in its current location but paste a copy of that text in another part of your document. In Microsoft Word, you can copy text from one area of the document and place that text elsewhere in the document. As with cut data, copied data is stored on the Clipboard.

Shortcut key: Ctrl+ C

1.6.6.1 Copy - Using the Menu

1. Type the following:
You will want to copy me. One of me is all you need.
2. Highlight "You will want to copy me."
3. Choose Edit > Copy from the menu

1.6.6.2 Alternate Method -- Copy by Using the Icon

1. Type the following:
You will want to copy me. One of me is all you need.
2. Highlight "You will want to copy me."
3. Click the Copy Icon .

1.6.7 Paste

In Microsoft Word, you can copy text from one area of the document and place that text elsewhere in the document. As with cut data, copied data is stored on the Clipboard.

Shortcut key: Ctrl + V

1.6.7.1 Paste - Using the Menu

1. Place the cursor after the period in the sentence: "One of me is all you need."
2. Press the spacebar to leave a space.
3. Choose Edit > Paste from the menu.
4. Your text should now read:
"You will want to copy me. One of me is all you need. You will want to copy me."

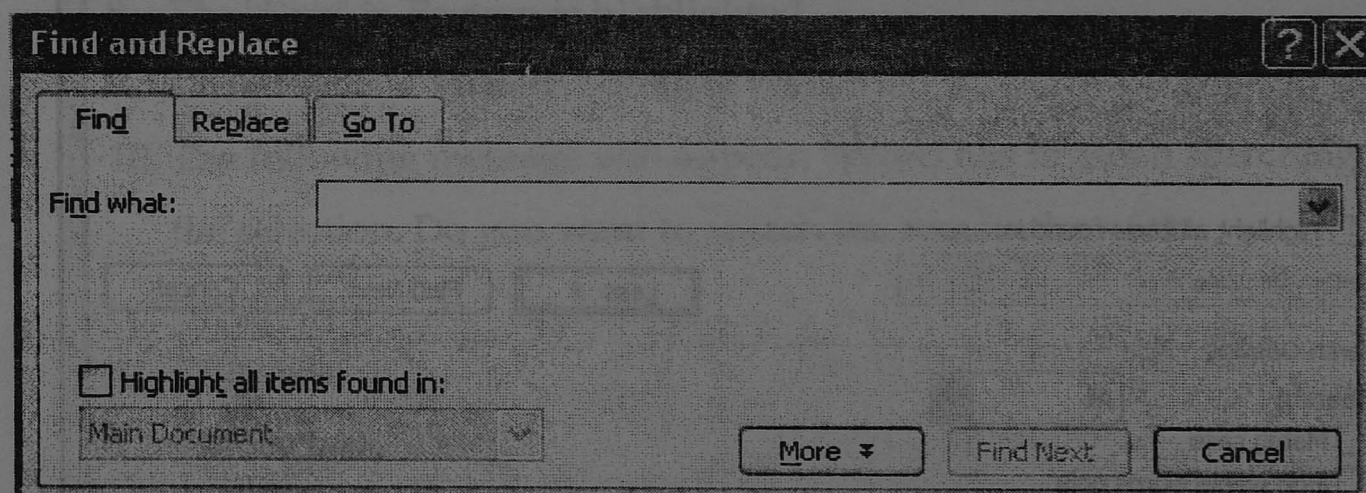
1.6.7.2 Alternate Method -- Paste by Using the Icon

1. Place the cursor after the period in the sentence: "One of me is all you need."
2. Press the spacebar to leave a space.
3. Click the Paste Icon .
4. Your text should now read:
"You will want to copy me. One of me is all you need. You will want to copy me."

1.7 Find and Replace

If you need to find a particular word or piece of text, you can use the Find command. If you want to search the entire document, simply execute the Find command. If you want to limit your search to a selected area, highlight that area and then execute the Find command.

After you have found the word or piece of text you are searching for, you can replace it with new text by executing the Replace command



1.7.1 Find - Using the Menu

1. Type the following:
Monica is from Easton. She lives on the east side of town. Her daughter attends Eastern High School.

2. Highlight: "Monica is from Easton. She lives on the east side of town. Her daughter attends Eastern High School."
3. Choose Edit > Find from the menu.
4. Type **east** in the Find What field.
5. Click Find Next.

Note that the "East" in Easton is highlighted.

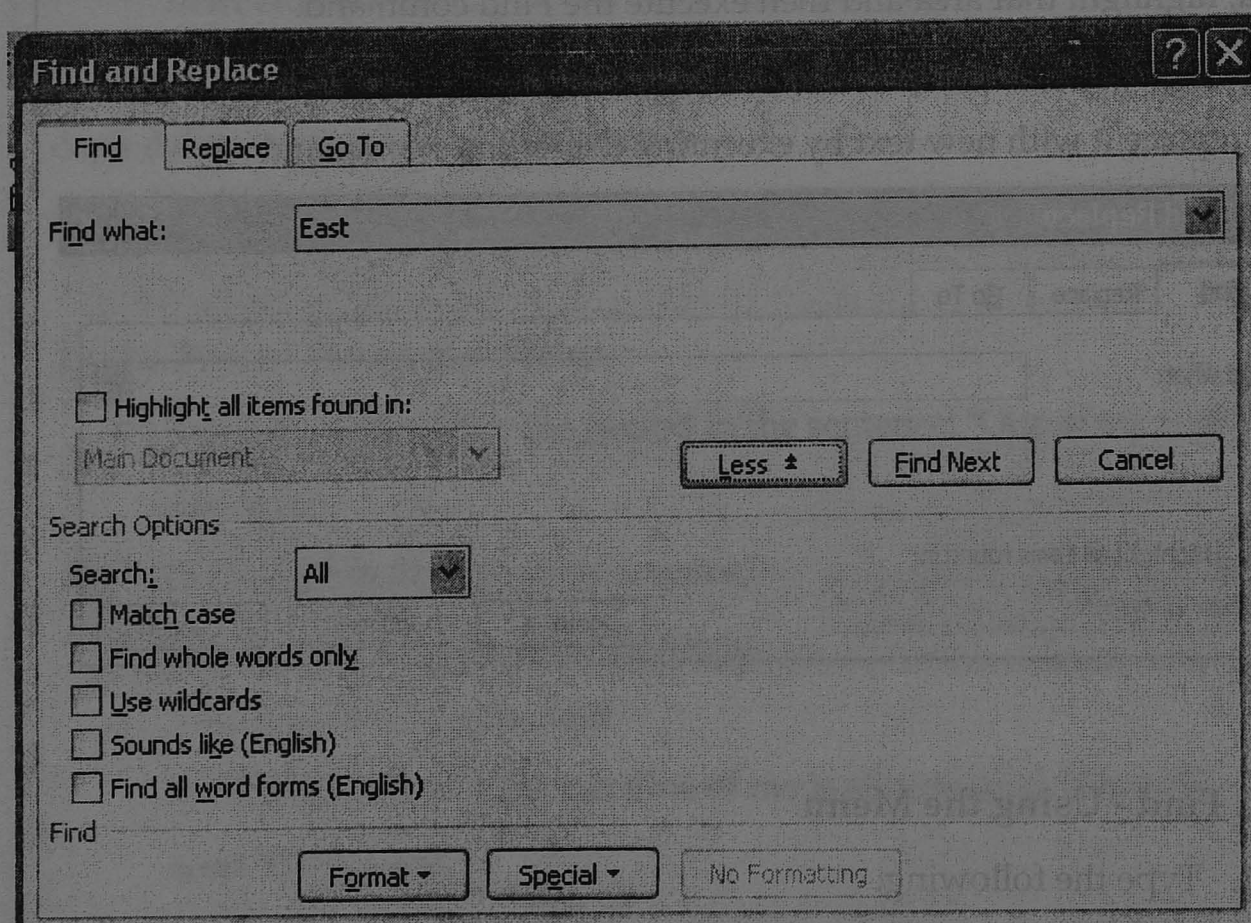
6. Click Find Next.

Note that "east" is highlighted.

7. Click Find Next.

Note that the "East" in Eastern is highlighted.

8. Click Find Next. The following message should appear: "Word has finished searching the selection. Do you want to search the remainder of the document?"
9. Click No.
10. Click Cancel.



1.7.2 Alternate Method -- Find by Using Keys

1. Highlight: "Monica is from Easton. She lives on the east side of town. Her daughter attends Eastern High School."
2. Press Ctrl + F
3. Follow steps 5 through 10 in the preceding section.

1.7.3 Replace - Using the Menu

1. Highlight "Monica is from Easton. She lives on the east side of town. Her daughter attends Eastern High School."
2. Choose Edit > Replace from the menu.
3. Type "east" in the Find What box.
4. Click Find Next. Do not replace the "East" in "Easton."
5. Click Find Next.
6. In the Replace With box, type **west**.
7. Click Replace. Word replaces east with west.
8. The "East" in Eastern is highlighted.
9. Click Replace. Eastern becomes Western.
10. The following message will appear: "Word has finished searching the selection. Do you want to search the remainder of the document?"
11. Click No.
12. Click Close.
13. Your text should now read,
"Monica is from Easton. She lives on the west side of town. Her daughter attends Western High School."

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1.7.4 Alternate Method -- Replace by Using Keys

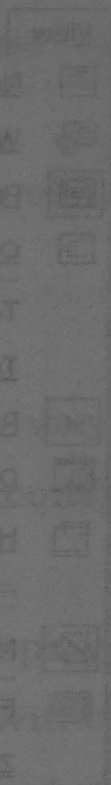
1. Highlight "Monica is from Easton. She lives on the west side of town. Her daughter attends Western High School."
2. Press Ctrl + H
3. Follow steps 4 through 13 in the preceding section, but type **East** in the Replace With box.

Check Your Progress

1. Write the Advantage of Ms-Word.
2. How to start an Ms-Word.
3. How to create an Ms-Word document.
4. How to save an Ms-Word document.
5. Explain different types of Bars in Ms-Word.
6. How to open a Ms-Word document
7. Write detailed notes on Page Setup.
8. How to Print an Ms-Word document.
9. Explain about print preview options in Ms-Word.
10. Write detailed notes on cut, copy and paste command with examples.
11. Write detailed notes on find and replace command with example.

UNIT II

OBJECTIVES



After going through this lesson you would be in a position to

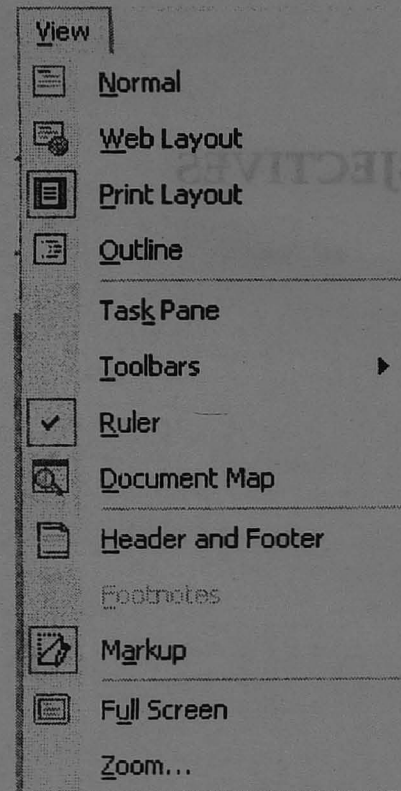
- Using the view menu.
- Creating Header and Footer
- Using Word Art and Format the fonts.
- How to set a bullets and numbering

2.1 Views

View Menu

Word provides many different ways to view your documents. Word can make your text easier to read by displaying it in different views, enlarging the text or revealing spaces and paragraph marks-so you can see exactly how your writing will look when printed.

2.1.1 Choosing a different view of a document:



Word lets you see your document from four different perspectives, each showing a different amount of text and graphics on screen. To change the view of your document, choose View from the menu bar and then choose one of the following

In Word, you can display your document in one of five views: Normal, Web Layout, Print Layout, Reading Layout, or Online Layout.

Normal View

Normal view is the most often used and shows formatting such as line spacing, font, point size, and italics. Word displays multiple-column text in one continuous column. It is the default editing view, while you use to write and edit your documents.

Web Layout

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Web layout view enables you to view your document as it would appear in a browser such as Internet Explorer.

Print Layout

The Print Layout view shows the document as it will look when it is printed.

Reading Layout

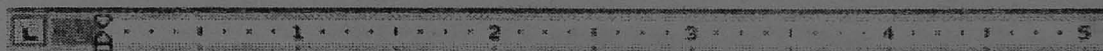
Reading Layout view formats your screen to make reading your document more comfortable.

Outline view

Outline view displays the document in outline form. Headings can be displayed without the text. If you move a heading, the accompanying text moves with it.

2.1.2 Ruler

It displays or hides the horizontal ruler, which you can use to position objects, change paragraph indents, page margins and other spacing settings.



The ruler is generally found below the main toolbars. The ruler is used to change the format of your document quickly. The Ruler Bar allows you to format the vertical alignment of text in a document. To display the ruler:

1. Click View on the Menu bar.
2. The option Ruler should have a check mark next to it. If it has a check mark next to it, press Esc to close the menu. If it does not have a check mark next to it, continue to the next step.

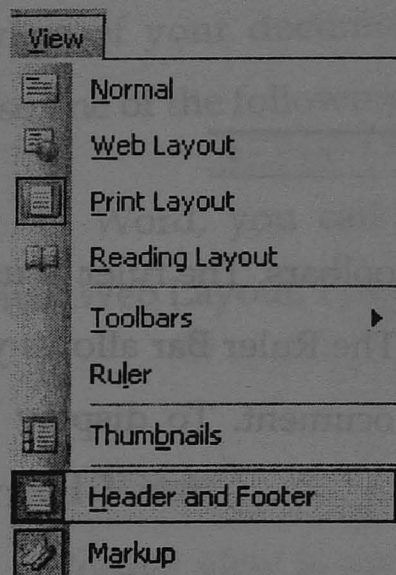
2.2 Header and Footer

The Header is a special text that is printed at the top of the each page. Headers and footers are used in printed documents. You can create headers and footers that include text or graphics – for example, page number, the date, a company logo, the document's title or author's name – that are usually printed at the top or bottom for each page in your document.

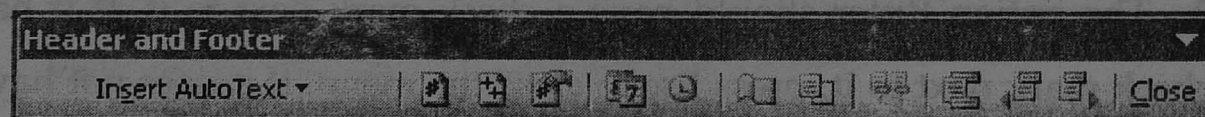
A header is printed in the top margin and footer is printed in bottom margin. You can use the same header and footer throughout the document or change the header and footer for part of the document. For example, use a unique header or footer on the first page, or leave the header or footer off the first page. You can also use different headers and footers on odd and even pages or for part of a document.

2.2.1 Create a Header or Footer.

1. From the **View** menu, click Header and Footer.



The Word displays the following Header and Footer Toolbar.



2. To create a header, enter text or graphics in the header area. Or click a button on the Header and Footer Toolbar

If you want to insert page number then click



If you want to insert date then click

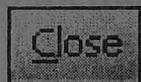


If you want to insert time then click



3. To create footer, click Switch between Header and Footer  to move to the footer area. Then repeat the step 2.

4. Click Close



2.2.2 Create a unique Header or Footer for all pages

1. If your document divided into sections, click in a section or select multiple sections you want to change.
2. On the **View** menu, Click **Header and Footer**.
3. On the **Header and Footer** toolbar, click **Page Setup**.
4. Click the **Layout** tab.
5. Select the **Different first page** check box, and then click **OK**.
6. If necessary, move to the **First Page Header** area or **First Page Footer** area.
7. Create the header or footer for the first page of the document or section.
8. To move to the header or footer for the rest of the document or section, click **Show Next** on the **Header and Footer** toolbar.

2.2.3 Create different Headers or Footers for Odd and Even pages.

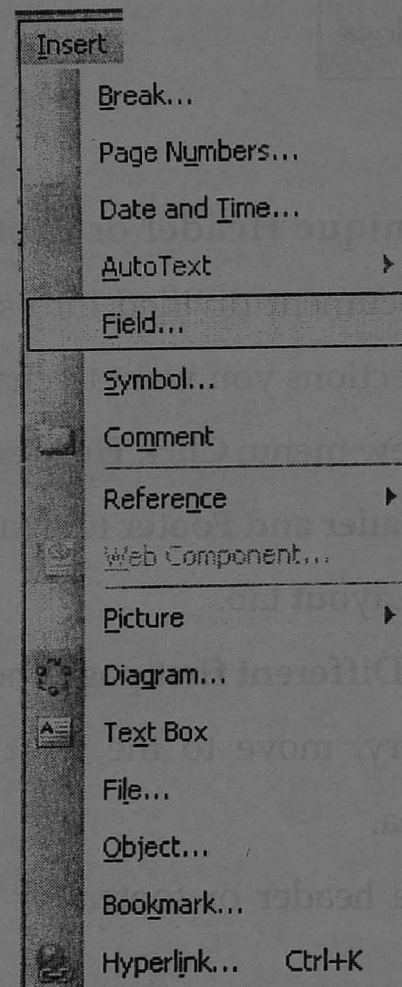
1. On the **View** menu, click **Header and Footer**
2. On the **Header and Footer** toolbar, click **Page Setup**.
3. Click the **Layout** tab.

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4. Select the **Different odd and even** check box, and then click **OK**.
5. If necessary, move to the **Even Page Header** area or **Even Page Footer** area.
6. Create the header or footer for each even numbered page of the document or section.
7. To move to the header or footer for the rest of the document or section, click **Show Next** on the **Header and Footer** toolbar.

2.3 Insert Menu.

Word provides lot of options in Insert Menu like insert a page number, page breaks, word art, date and time, special symbols like $\neq$, $\cap$, θ , .. etc .



2.3.1 Page Numbers

Word provides the following two ways to add page numbers. In either case, the page number appears in the header or footer at the top or bottom of the every page.

Method I

Use the **Page Numbers** command on the **Insert** menu. Choose this method if you want to add just page numbers to headers or footers.

Method II

Use the **Header and Footer** on the command on the **View** menu. Choose this method if you want to add a variety of information to headers or footers- for example, chapter titles, dates or page numbers.

2.3.1.1 Inserting and Customizing Page Numbers.

Ms- Word Provides lot of options for inserting and customizing page numbers.

Insert and position Page Numbers.

Insert page Numbers.

Insert Running-total Page Numbers.

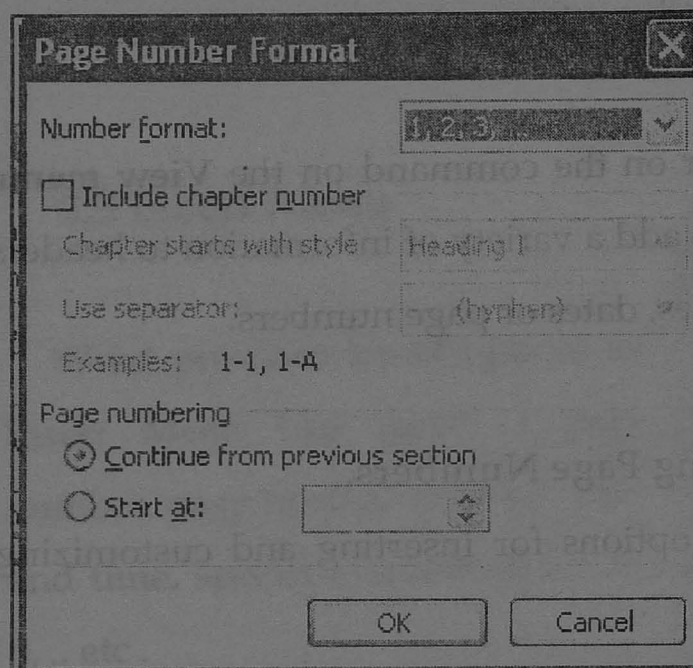
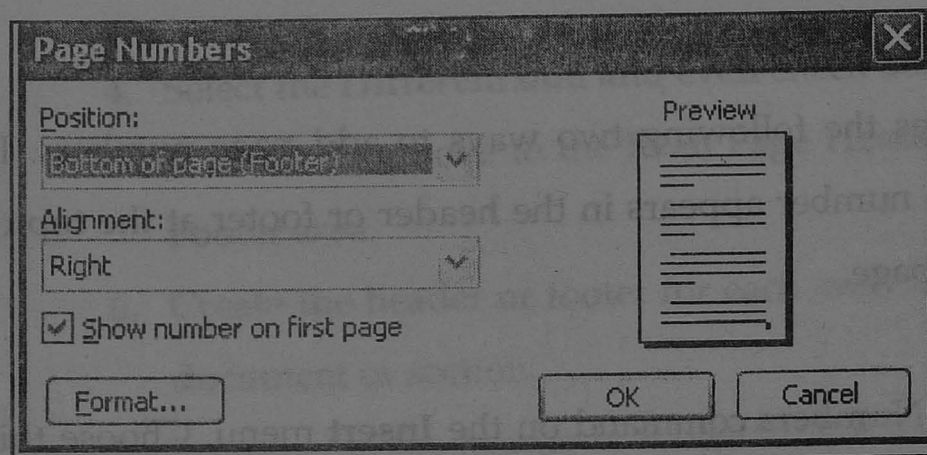
You can include the total number of pages along with the page number, such as "Page 5 of 33".

Format Page Numbers.

You can change the font or size of Page Numbers, or switch to roman numerals.

2.3.1.2 Change the Page Numbers in different parts of the document.

When you first insert page numbers, Word numbers the entire document-even if the document is divided into sections. Thereafter, you can change the format of page numbers in individual sections. For example, use roman numerals for the table of contents and Arabic numerals for the rest of pages. Change the page numbers in different parts of a document.



2.3.1.3 Insert Page Numbers

1. On the Insert menu, click Page Numbers.
2. In the Position box, specify whether to print page numbers in the header at the top of the page or in the footer at the bottom of the page.

2.3.1.4 Change the Page Number Format

1. If your document is divided into sections, click in a section or select multiple sections in which you want to change the page number format.
2. On the Insert menu, click Page Numbers
3. Click Format.
4. In the Number Format box, click the format you want.

2.3.1.5 Change the font type and font size of Page Numbers.

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On the **Format** Menu, Click **Style**.

1. In the **List** box, click **All styles**.
2. In the **Styles** box, click **Page Number**.
3. Click **Modify**
4. Click **Format**, and then Click **Font** tab.
5. From the **Font** tab, Select the font size, and other formats you want for the page numbers.

2.3.1.6 Remove Page Numbers

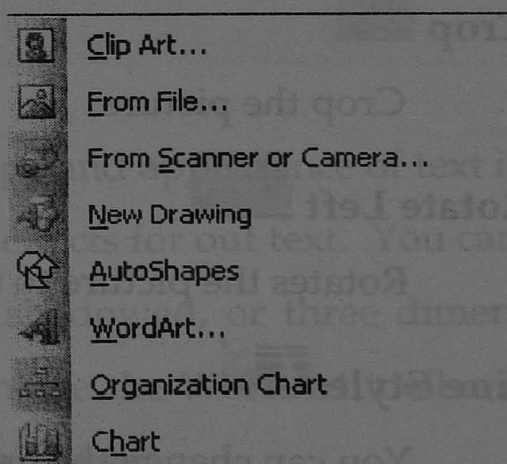
1. From the **View** Menu, Click **Header and Footer**.
2. If you positioned the page numbers at the bottom of the page, click **Switch Between Header and Footer** on the **Header and Footer** toolbar.
3. Select a page number.
4. Press **DELETE**.

2.3.1.7 Change Page Numbers to a right-to-left format

1. On the **Insert** menu, click **Page Numbers**, and then Click **Format**.
2. Click the arrow to right of the **Number Format** box, and choose one of the right-to-left formats.

2.3.2 Pictures

You can insert pictures, photos or any other art into a Word document. When you use the **Picture** submenu on the **Insert** menu. To insert a picture from the clip art collection that comes with Word, you click the **Clip Art** command on the picture submenu or click the **Insert Clip**



Art button on the Drawing toolbar, which opens the Insert Clip Art Task Pane. Once you insert clip art or any picture into your document, you can modify it by using the picture toolbar.

2.3.2.1 Picture Toolbar



Insert Picture



You can insert a picture using above button.

Color



You can able to change the coloring of the picture.

More Contrast



You can apply the contrast to selected picture for the document.

Less Contrast



Reduces the contrast for the picture

More Brightness



You can able to increase the brightness for the picture.

Less Brightness



You can able to decreases the brightness for the picture.

Crop



Crop the picture.

Rotate Left



Rotates the picture to the left.

Line Style



You can change the line style.

Compress Pictures



You can reduce the size of the pictures.

Text Wrapping



You can able to wrap text around a picture.

Format Picture



You can able to format a picture such as color, size and lines.

2.3.3 Text Box



You can use text boxes to manipulate text and take advantage of new graphical effects. Text boxes provide early all the advantages of frames, plus they provide many additional advantages that frames don't. However, you must use a frame instead of a text box when you want to position text or graphics that contain certain items.

Create a watermark containing text that appears on the printed pages of a document. Format the text container by using the options on the **Drawing** toolbar. You can apply 3-D effects, shadows, colors, files and border styles.

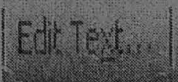
2.3.3.1 Insert a text box

1. On the **Drawing** toolbar, click **Text Box**.
2. Click or drag in your document where you want to insert the text box.

2.3.4 Word Art

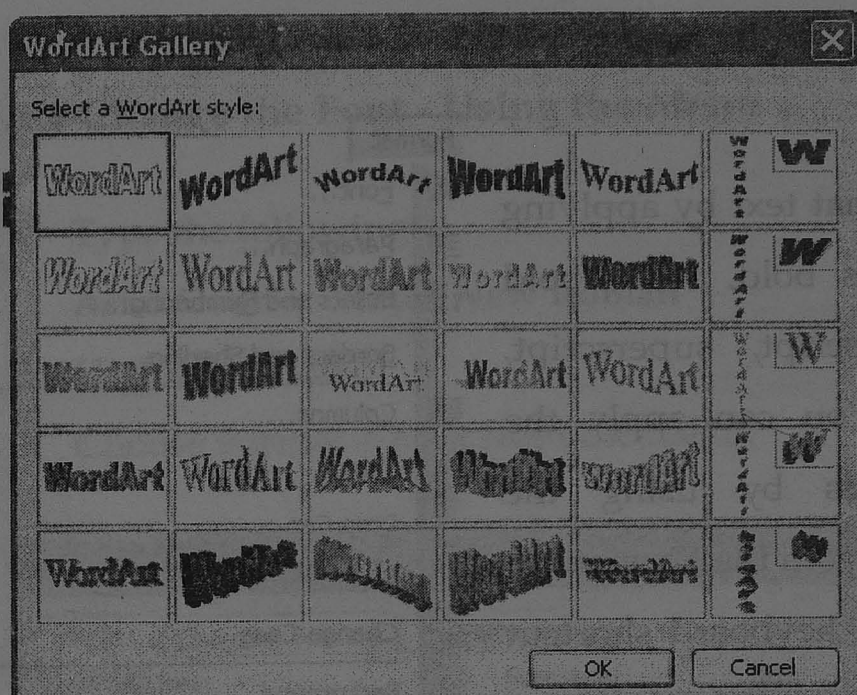
WordArt allows changing the shape and appearance of text in your document. Use WordArt to crate special effects for out text. You can make WordArt text appear curved, outlined, shadowed, or three dimensional. When you work with WordArt, you can use the WordArt toolbar, which opens when you insert or select a WordArt object.

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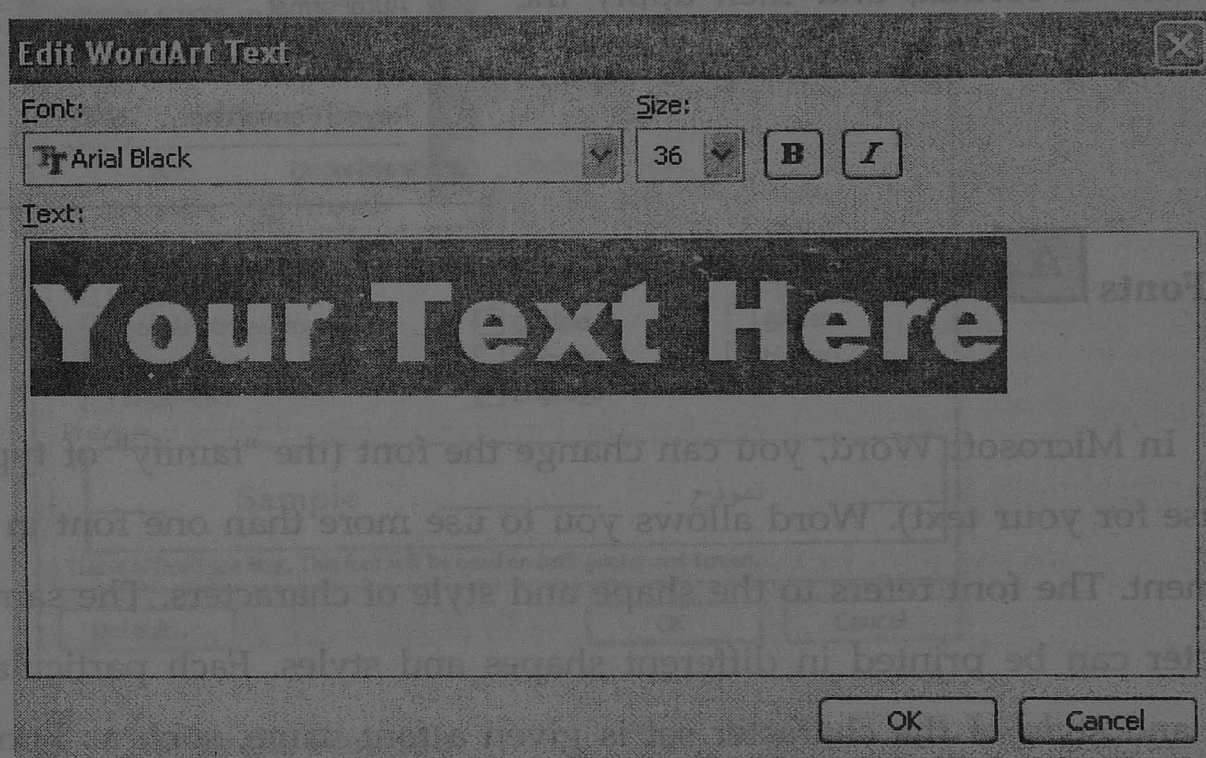
Button	Button Name	Description
	Word Art	Insert WordArt
	Edit Text	Edit text within WordArt
	Gallery	It provides graphical options for your WordArt
	Format Word Art	It allows to change the color, size and layout of the WordArt
	Text Wrap	You can changes the text wrapping around your WordArt
	WordArt Letter Heights	It makes the letters in the WordArt the same Height.
	Alignment	It changes the alignment of the WordArt.
	Character Spacing	It changes the space between characters in the WordArt.

Example:

1. Click the **Insert** Menu.
2. From the **Insert** Menu, select **Picture**.
3. From the **Picture**, select **WordArt....** Then the following tab appears.



- From the WordArt Gallery, select anyone Style. Then the following tab appears.

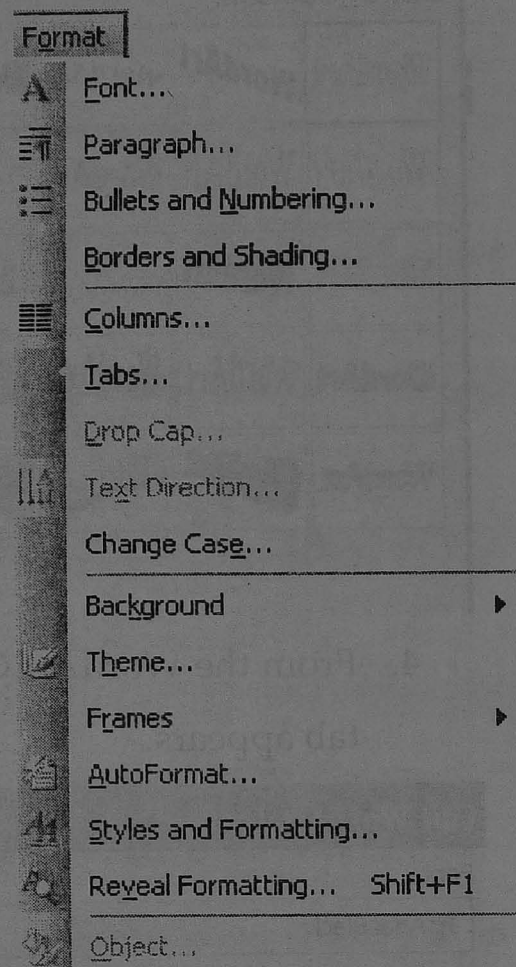


- In the Text Area type "Math Quiz" and then click OK.
- Then Word displays the text with the corresponding style.

Math Quiz

2.4 Format Menu

Word allows to format text by applying various styles, such as bold, italic, bold italic, underline, subscript, superscript, strike-through, etc. You can apply the commonly used styles by using the corresponding buttons from the Formatting toolbar or by using the keyboard shortcut commands. For applying other styles on selected text in a document. Select the field you want to format, and then apply the formatting by using the Formatting toolbar



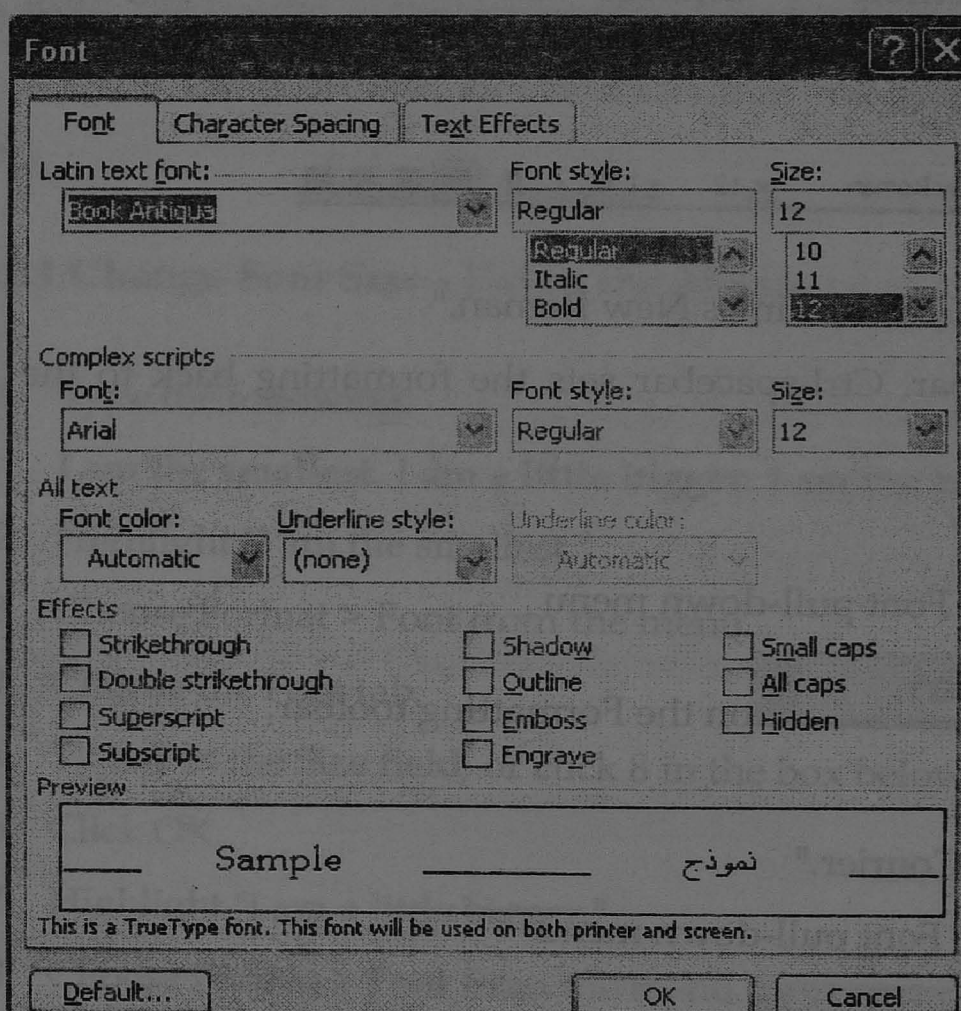
2.4.1 Fonts



In Microsoft Word, you can change the font (the "family" of type you use for your text). Word allows you to use more than one font in a document. The font refers to the shape and style of characters. The same character can be printed in different shapes and styles. Each particular shape and style of the character set is given a font name, such as Book Antiqua, Times New Roman, Arial Narrow, Bookman Old Style, Century, Georgia, High Tower Text, Imprint MT Shadow, etc. Usually, Word selects the Times New Roman font by default. However, you can apply another font to any selected text, or even to the entire document. Word displays the name of the current font in the Font name box. This box is located on the left side of the font size box. This feature is illustrated in the following exercise:

2.4.1.1 Change the Font - Using the Menu

1. Type the following:
Arial Courier Times New Roman
2. Highlight "Arial."
3. Choose Format > Font from the menu.



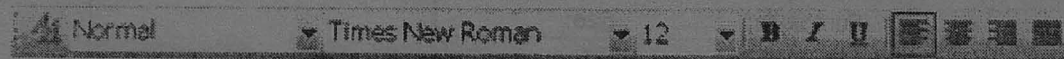
4. Choose the Font tab.
5. In the box below the Font field, click "Arial."
6. Click OK.
7. Highlight "Courier."
8. Choose Format > Font from the menu.
9. Choose the Font tab.
10. In the box below the Font field, click "Courier New."
11. Click OK.
12. Highlight "Times New Roman."
13. Choose Format > Font from the menu.

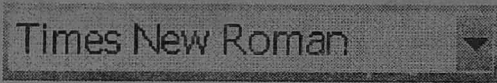
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14. Choose the Font tab.
15. In the box below the Font field, click "Times New Roman."
16. Click OK.
17. Your text should now look similar to the following:

"Arial Courier Times New Roman"

2.4.1.2 Alternate Method -- Change the Font by Using the Formatting Toolbar



1. Highlight "Arial Courier Times New Roman."
2. Press Ctrl-spacebar. Ctrl-spacebar sets the formatting back to the default.
3. Highlight "Arial."
4. Click to open the Font pull-down menu
on the Formatting toolbar.
5. Click "Arial."
6. Next, highlight "Courier."
7. Click to open the Font pull-down menu
on the Formatting toolbar.
8. Click "Courier."
9. Next, highlight "Times New Roman."
10. Click to open the Font pull-down menu
on the Formatting toolbar.
11. Click "Times New Roman."
12. Your text should now look similar to the following:
"Arial Courier Times New Roman"

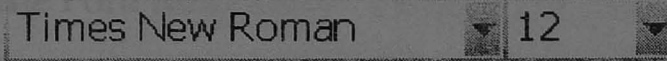
2.4.2 Font Size

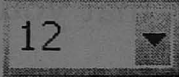
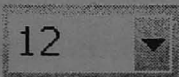
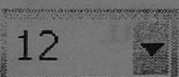
In Microsoft Word, you can change the size of your font (text). The following exercise illustrates changing the font size. When you type text in a document, all characters are of a 'pre-defined' size. In Word, the character size (in fact height) is specified in points. 72 points are equal to one inch. The typical point size used in Word is from 10 to 12. If you do not select a new point size, all characters that you type are of the default size.

2.4.2.1 Change Font Size - Using the Menu

1. Type the following:
I am the smallest. I am a little bigger. I am the biggest.
2. Highlight "I am the smallest."
3. Choose Format > Font from the menu.
4. Choose the Font tab.
5. Type 8 in the Size field, or click 8 in the box below the Size field.
6. Click OK.
7. Highlight "I am a little bigger."
8. Choose Format > Font from the menu.
9. Choose the Font tab.
10. Type 14 in the Size field, or click 14 in the box below the Size field.
11. Click OK.
12. Highlight "I am the biggest."
13. Choose Format > Font from the menu.
14. Choose the Font tab.
15. Type 24 in the Size field, or click 24 in the box below the Size field.
16. Click OK.
17. Your text should now look similar to the following:
"I am the smallest. I am a little bigger. I am the biggest."

2.4.2.2 Alternate Method -- Change Font Size by Using the Toolbar



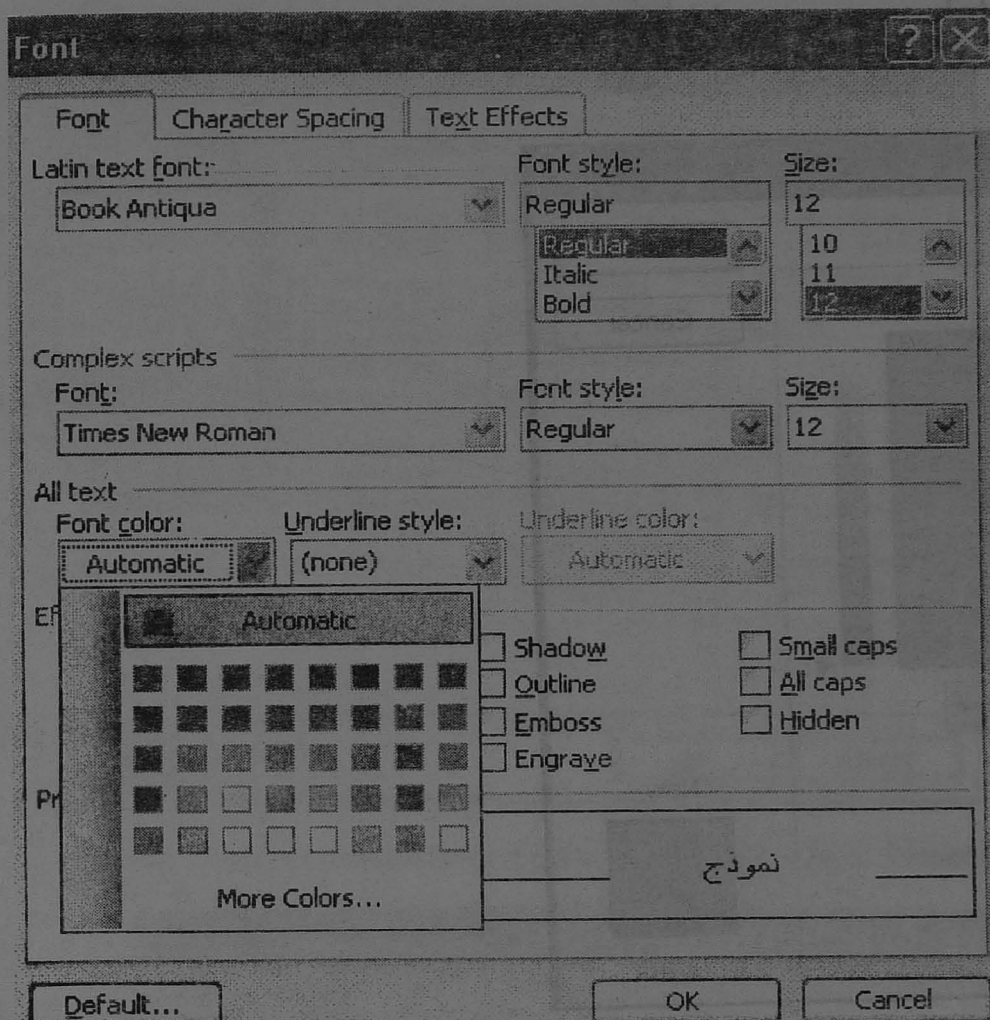
1. Highlight:
"I am the smallest. I am a little bigger. I am the biggest."
2. Press Ctrl-spacebar to set the formatting back to the default.
3. Highlight "I am the smallest."
4. In the Font Size box  on the toolbar, type 8.
5. Press Enter.
6. Highlight "I am a little bigger."
7. In the Font Size box  on the toolbar, type 14.
8. Press Enter.
9. Highlight "I am the biggest."
10. In the Font Size box  on the toolbar, type 24.
11. Press Enter.

2.4.3 Change the Font Color

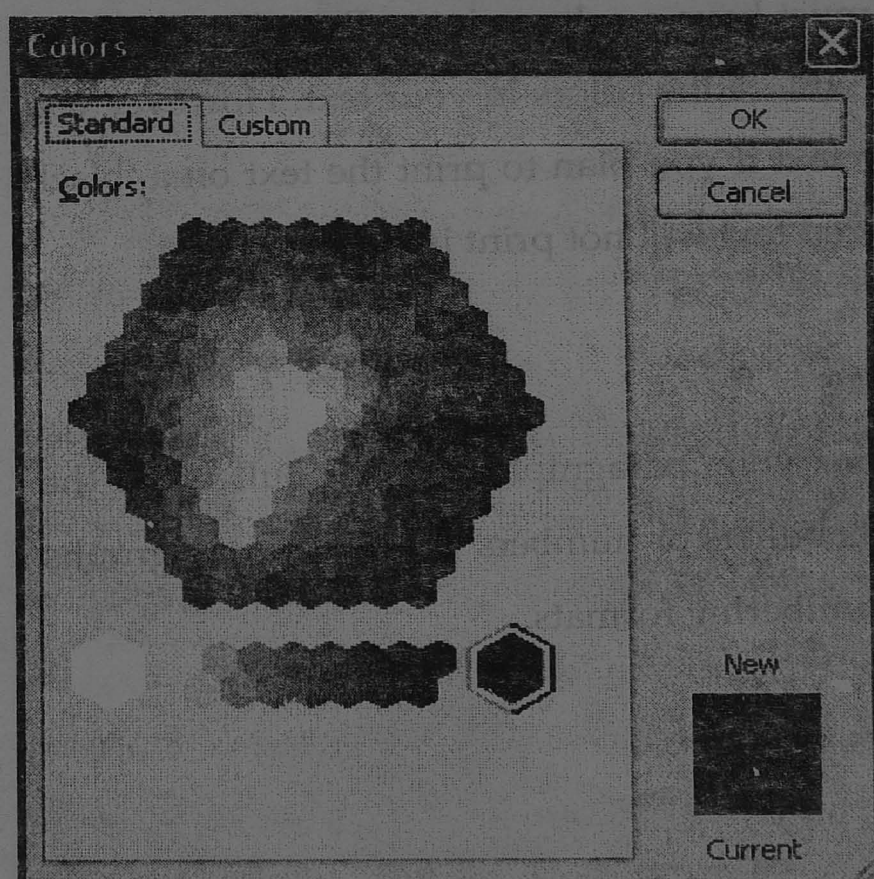
To apply the color most recently used for text, click **Font Color** on the **Formatting** toolbar. To apply a different color, click the arrow next to the **Font Color** button, and then select the color you want.

Example:

1. Select the text you want to change the color.
2. From the **Format** menu, click **Font**, and then click **Font Color**.

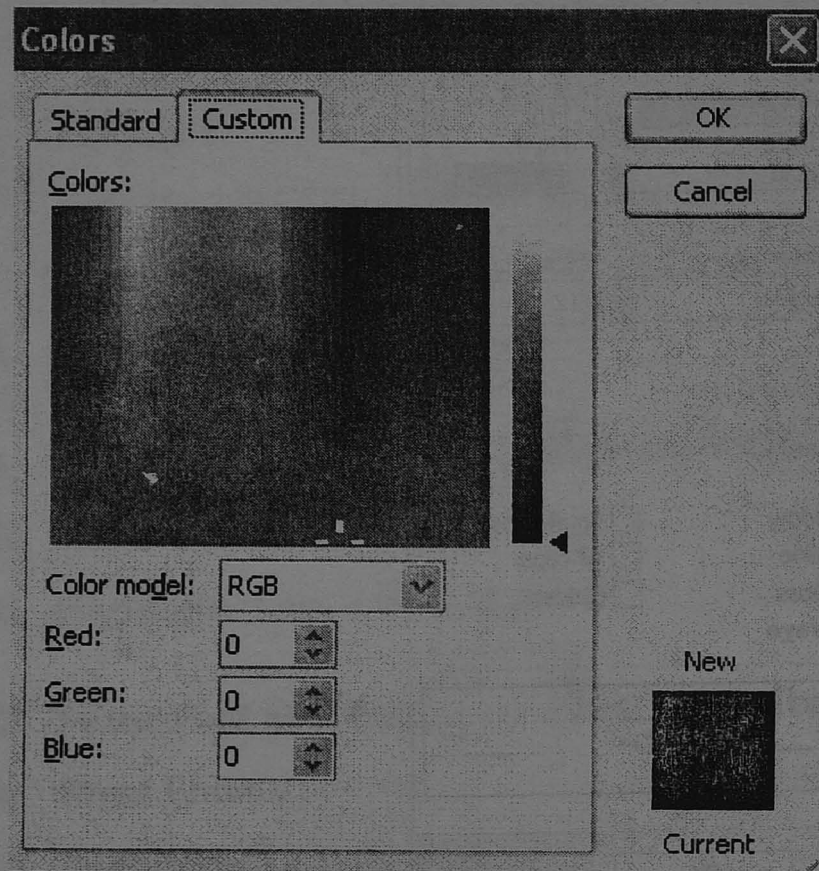


3. From the small tab select any one color otherwise click **More Colors..** Then the following tab appears.



From the tab select **Standard**. Under the **Standard** tab lot of colors displayed. If you want to set the RGB frequency select **Custom** tab.

Under the **Custom** tab you can able to set the Red, Green and Blue frequency.



Note:

To display color, you must have a color printer. Even if you do not have a color printer, you can still define colors in your text. However you should not use colors in your text if you plan to print the text on a 'black and white' printer, as the colored text will not print in good contrast.

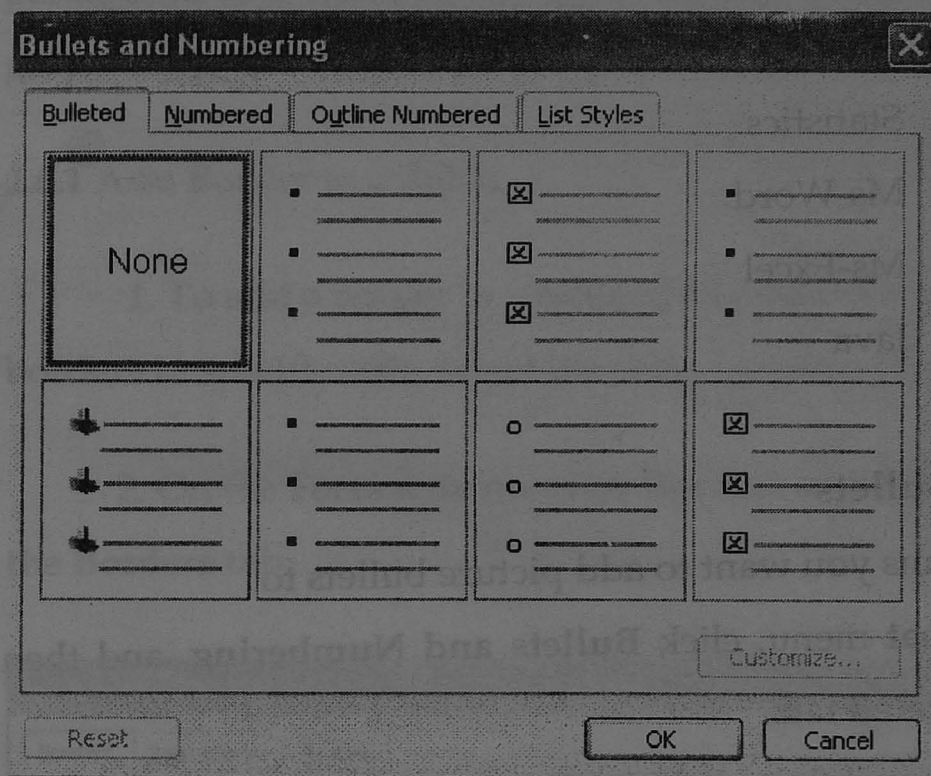
2.5 Bullets and Numbering

Word can easily number your paragraphs or put 'Bullets' at the beginning of paragraphs. Adds bullets or numbers to selected paragraphs and modifies the bullets and numbering formats.

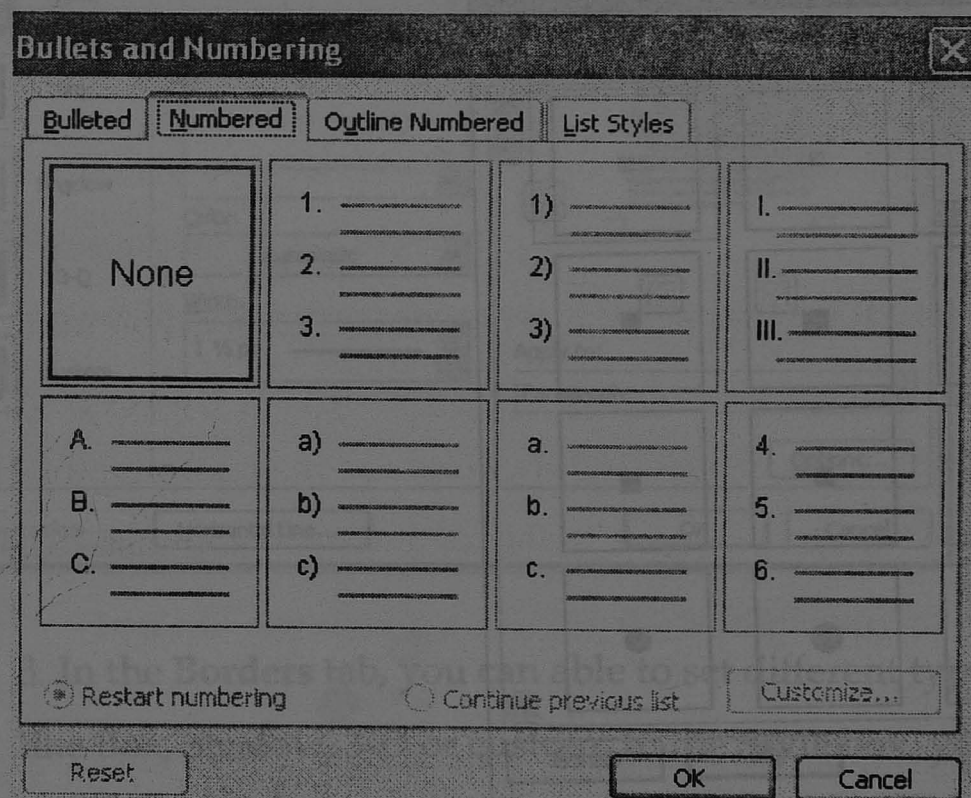
2.5.1 Bullets

1. Select the items you want to add bullets or numbering to.
2. On the **Formatting** toolbar, do one of the following:

To add Bullets, Click **Bullets**.



3. If you want to add numbering, click Numbering tab..



Example for Bullets:

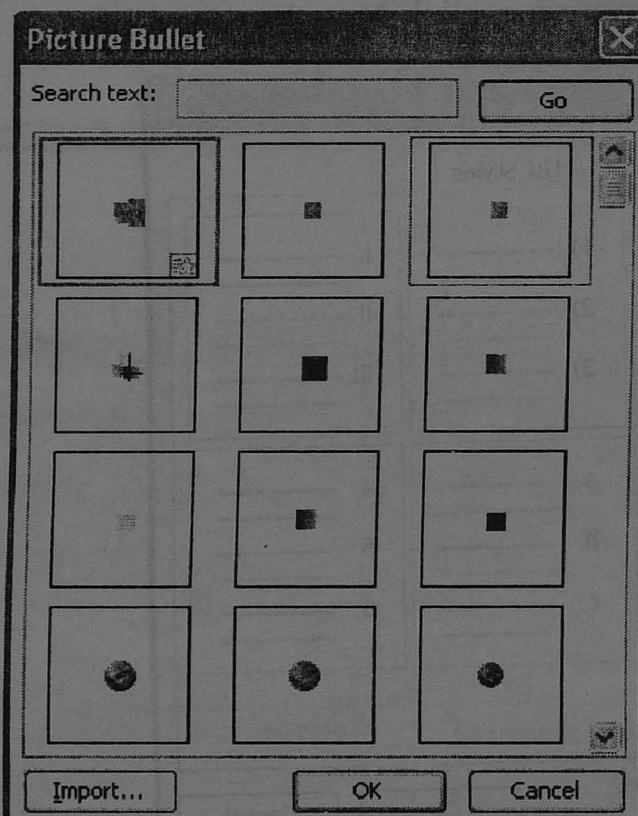
- ❖ Algebra
- ❖ Statistics
- ❖ Ms-Word
- ❖ Ms-Excel
- ❖ Java

Examples for Numbering

- i. Algebra
- ii. Statistics
- iii. Ms-Word
- iv. Ms-Excel
- v. Java

2.5.1.1 Add Picture Bullets

1. Select the items you want to add picture bullets to.
2. On the **Format** menu, click **Bullets and Numbering**, and then click the **Bulleted** tab.
3. Click **Picture**, and then click the **Pictures** tab.



4. In the **Picture Bullet** select any one Picture style, and then click **OK**.

2.6 Borders and Shading

Borders and shading fills can add interest and emphasis to various parts of your document. You can add borders to pages, text, tables and table cells, graphic objects, pictures, and Web frames. You can shade

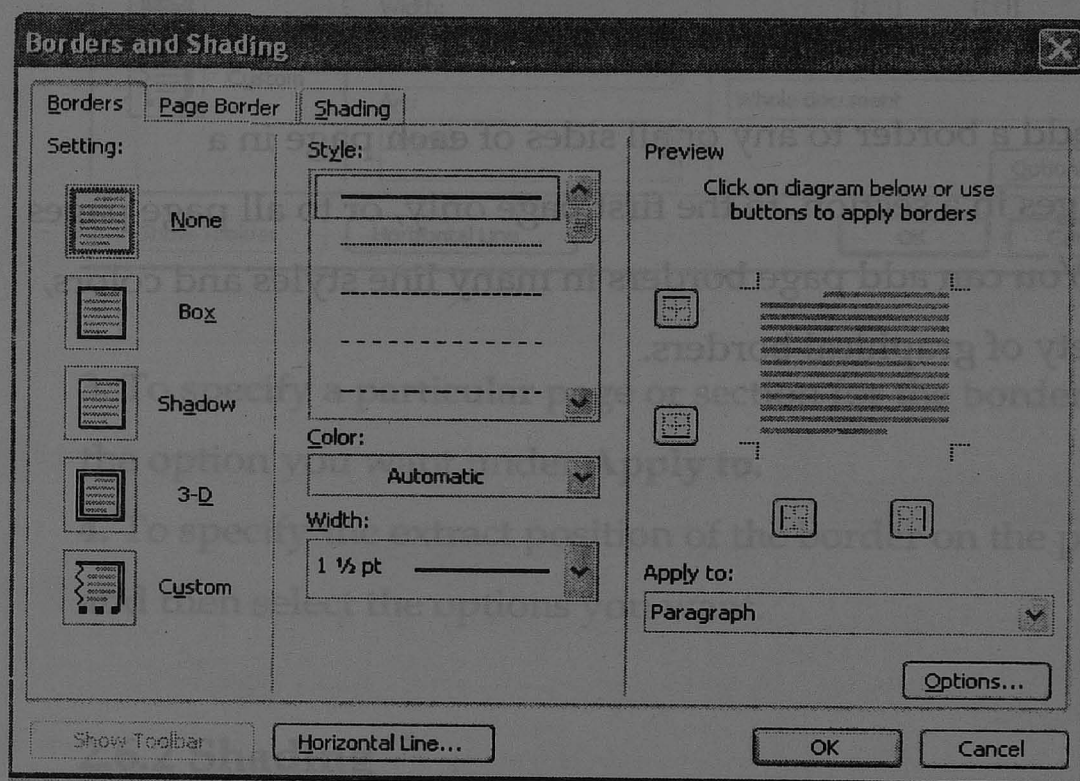
paragraphs and text. You can apply colored or textured fills to your graphic objects.

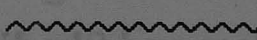
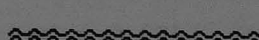
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2.6.1 Add Border to a Table

1. To add a border to a table, click anywhere in the table or To add borders to specific cells, select the cells, including the end of cell mark.

2. On the **Format** menu, click **Borders and Shading**, and then click the **Borders** tab.



3. In the **Borders** tab, you can able to set different types of borders like Box, Shadow, 3-D or custom. In the **Style** box, you can set different types of Borders style like , , , , , etc.

4. In the **Color** box, you can apply different types of colors to the borders.

5. In the **Width** box, you can able to increase the Borders Width.

6. Make sure the correct option **Table** or **Cell** is selected under **Apply to**.

7. Under **Preview**, Click the diagrams sides, or use the buttons to apply and remove borders.

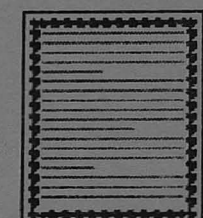
Example:

Name	Network	Post/pre paid
Sweatha	AirTel	Prepaid
Anitha	Reliance	Postpaid
Tessy	Aircell	Prepaid
Sruthi	AirTel	Prepaid

2.6.1.2 Page Borders

You can add a border to any or all sides of each page in a document, to pages in a section, to the first page only, or to all page pages except the first. You can add page borders in many line styles and colors, as well as a variety of graphical borders.

Example:

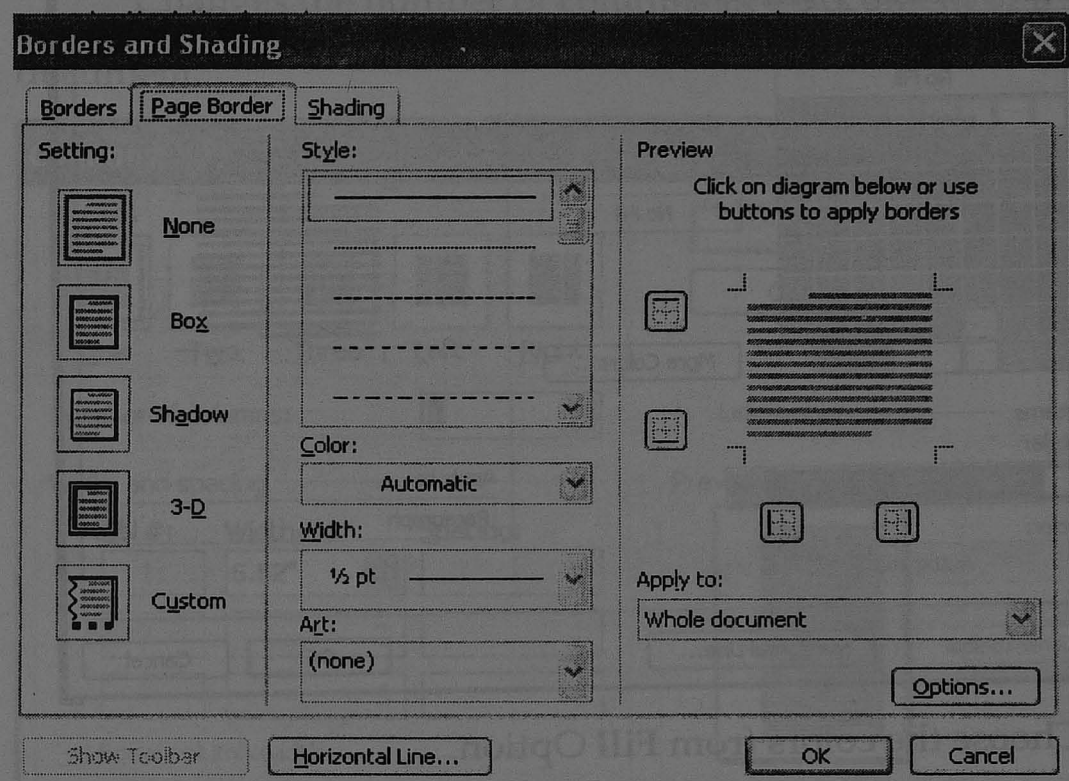


2.6.1.3 Add a Border from a page in a document

On the **Format** menu, click **Borders and Shading**, and then click **Page Border** tab.

1. Select the options you want to apply.

2. To specify that the border appears on a particular side of a page, such as only at the top, click **Custom** under **Setting**. Under **Preview**, click where you want the border to appear.



3. To specify a particular page or section for the border to appear in, click the option you want under **Apply to**.

4. To specify the exact position of the border on the page, click **options**, and then select the options you want.

2.6.2 Shading

You can use shading to fill in the background of a table, a paragraph, or selected text.

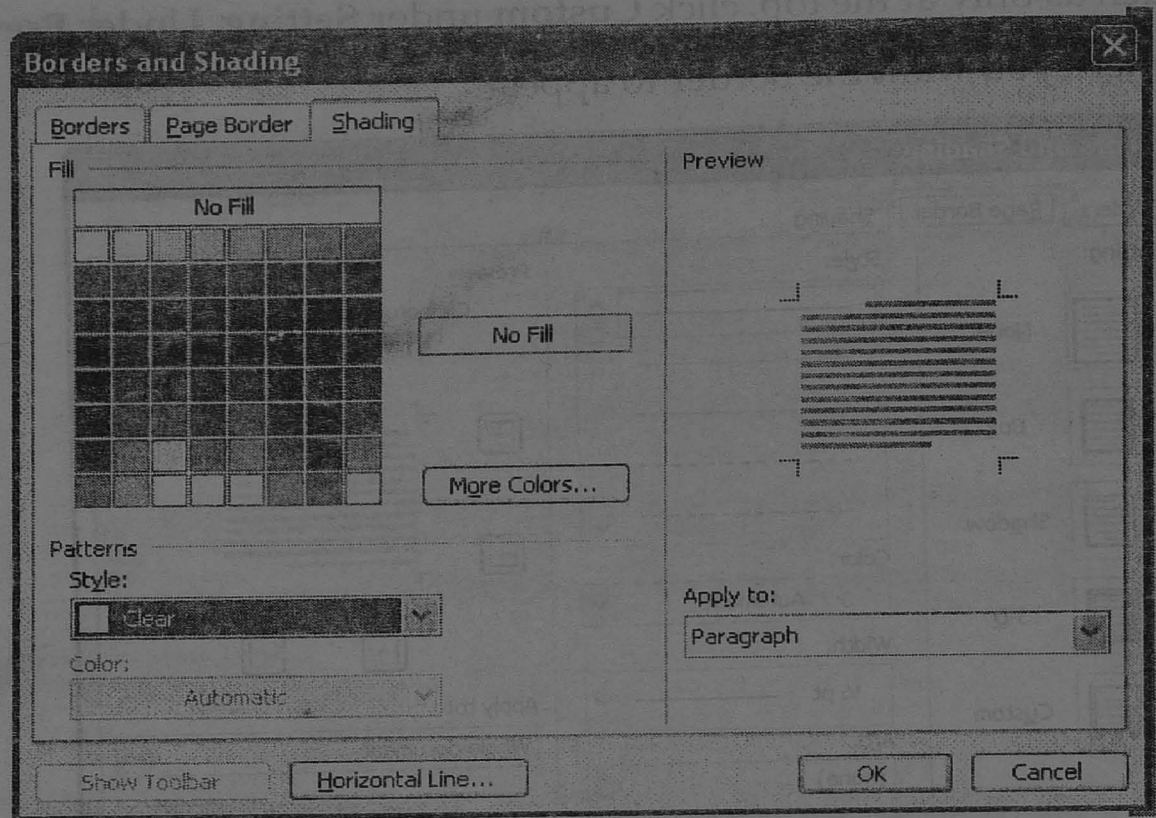
2.6.2.1 Add Shading to a Table, Selected Text or Paragraph

1. To add shading to a table, click anywhere in the table. To add shading to specific cells, select the cells, including the end-of-cell marks. Suppose to add shading to a paragraph, click anywhere in the paragraph. To add shading to specific text, such as a word, select the text.

2. On the **Format** menu, Click **Borders and Shading**.

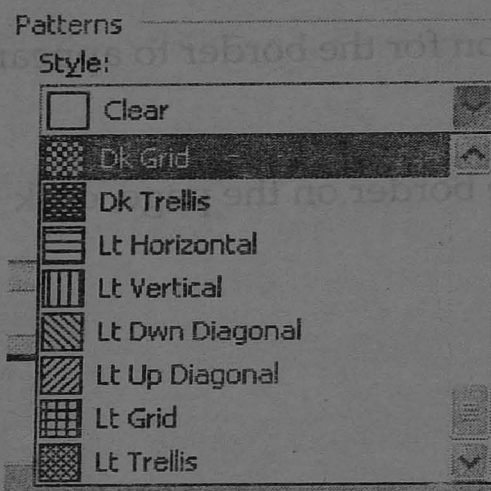
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3. From the Borders and Shading tab click the **Shading** tab.



4. Choose the colors from **Fill** Option.

5. Choose **Style** from **Style** option



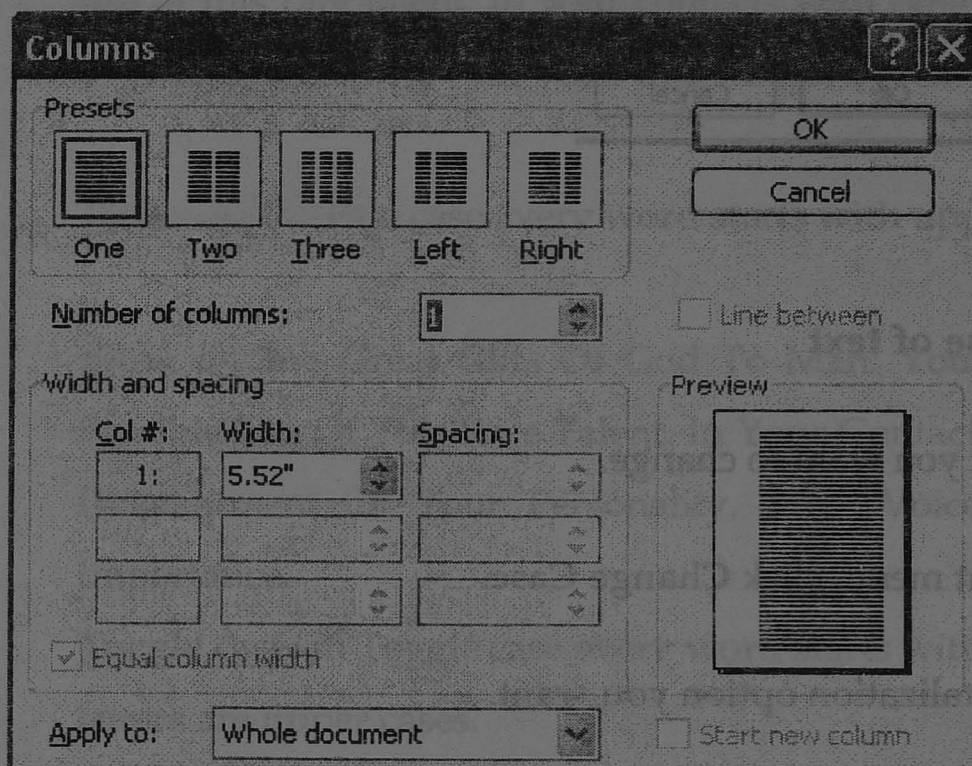
6. Under **Apply to**, click the part of the document you want to apply shading to.

Example:

Name	Network	Post/pre paid
Sweatha	AirTel	Prepaid
Anitha	Reliance	Postpaid
Tessy	Aircell	Prepaid
Sruthi	AirTel	Prepaid

2.7 Columns

Changes the number of columns in a document or a section of document.

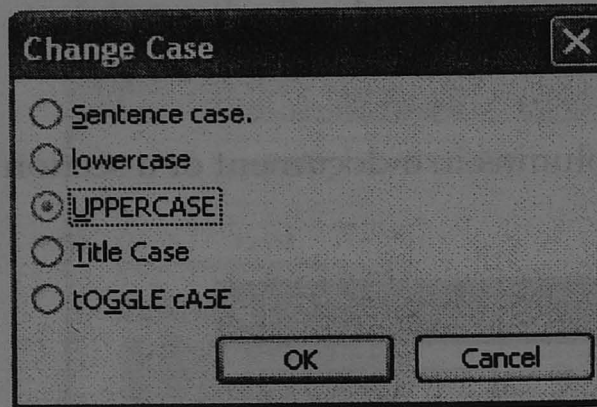


2.7.1 Create Newspaper columns:

1. Switch to print layout view.
2. To format the entire document in columns, click **Select All** on the **Edit** menu. To format part of the document in columns, select the text. To format existing sections in columns, click in a section or select multiple sections.
3. On the **Standard** toolbar, click **Columns**.
4. Drag to select the number of columns you want.
5. If you want to adjust the column widths and spacing, drag the column markers on the horizontal ruler.

2.8 Change case

You can change the capitalization of text like uppercase, lower case, title case, toggle case and sentence case.



2.8.1 Vary the case of text

1. Select the text you want to change.
2. On the **Format** menu, click **Change Case**.
3. Click the capitalization option you want.

Example:

Upper case: In Upper case all the letters in uppercase.

VOICE IS ONE GREAT GIFTS OF GOD TO MAN. YOU SHOULD MAKE THE BEST POSSIBLE USE OF THIS RARE TALENT. IN YOUR CONTACTS WITH OTHERS OR IN THE DEVELOPMENT OF YOUR PERSONALITY, YOUR VOICE AND TONE ARE GREAT IMPORTANCE.

Lower case: In Lower cases all the letters in lower case.

voice is one great gifts of god to man. you should make the best possible use of this rare talent. in your contacts with others or in the development of your personality, your voice and tone are great importance.

Sentence case: In sentence case every sentence starts with uppercase.

Voice is one great gifts of god to man. You should make the best possible use of this rare talent. In your contacts with others or in the development of your personality, your voice and tone are great importance.

Title case: In Title case every word starts with uppercase.

Voice Is One Great Gifts Of God To Man. You Should Make The Best Possible Use Of This Rare Talent. In Your Contacts With Others Or In The Development Of Your Personality, Your Voice And Tone Are Great Importance.

Toggle case: In Toggle case every word starts with lower case and other letters are upper cases.

vOICE IS ONE GREAT GIFTS OF GOD TO MAN. yOU SHOULD MAKE THE BEST POSSIBLE USE OF THIS RARE TALENT. iN YOUR CONTACTS WITH OTHERS OR IN THE DEVELOPMENT OF YOUR PERSONALITY, YOUR VOICE AND TONE ARE GREAT IMPORTANCE

Check Your Progress

1. Write a shorts note about view menu.
2. Explain different types of views in Ms-Word.
3. What is mean by Ruler?
4. Write a detailed notes on Header
5. Write a detailed notes on Footer
6. How to create a Header and Footer
7. How to insert a Page Numbers in our Ms-Word document. Explain how to customize page numbers.
8. Explain about Picture toolbar.
9. Explain about Word Art.
10. How to change the font size in Ms-Word, and give an example.
11. How to change the font type in Ms-Word.
12. Write detailed notes about bullets and numbering.
13. Write detailed notes about shading.
14. How to change the case and give the example.

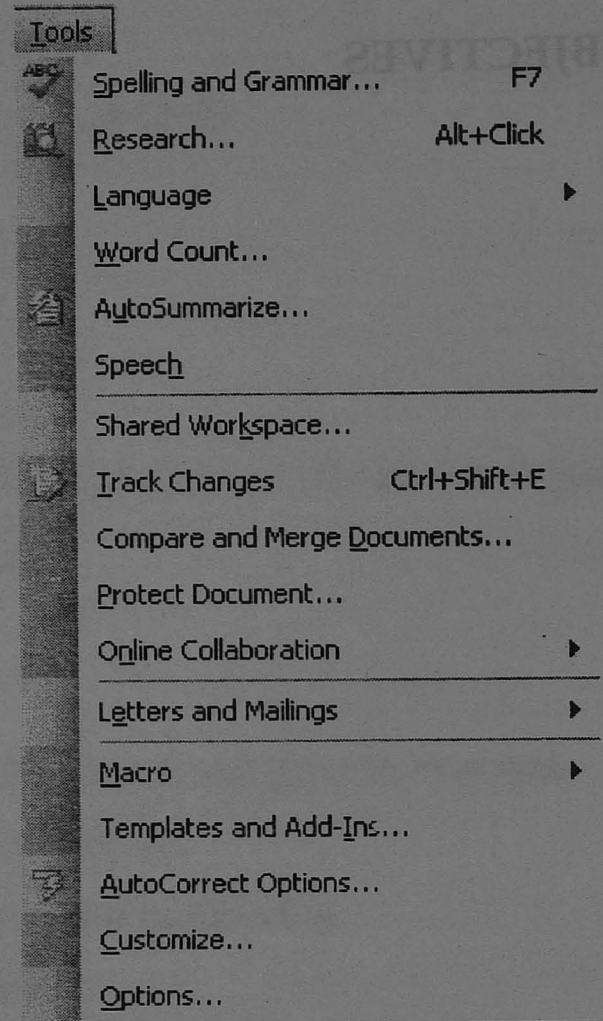
OBJECTIVES

After going through this lesson you would be in a position to

- How to check a spelling
- Creating Tables in Documents
- Using Multiple Columns
- What is Mail Merge?
- Viewing and Printing Merged Letters

3.1 Tools Menu - Spelling and Grammar

Proofreading a document involves checking the spelling of words, correcting grammatical errors, and choosing language that best conveys your message to your audience. You should always proofread a document before you print and share it with others. Sending a document that is filled with spelling and grammatical errors creates a poor impression. You can use Word's spelling and Grammar. As you type the text of your documents, by default Word underlines spelling and grammar errors with Red and Green wavy lines.



A Red wavy line indicates that Word does not recognize the spelling of the word; that is, the word is not included in Word's online dictionary. A green line indicates a possible grammar error. To fix individual spelling and grammar errors quickly, you can right-click a word underlined with a red or green wavy line to display a list of corrections from which you can choose.

In addition to correcting individual errors, you can check the entire document for spelling and grammar button on the standard toolbar. When you start checking spelling and grammar, Word compares each word in the document with the words in its dictionary (like English, French, Spanish etc). Word stops at each red and green wavy line and displays the possible reason for the error. For example, if a word is misspelled, the spelling and grammar dialog box. Identifies the misspelled word and

provides a list of possible replacements. If Word finds a potential grammar error, the spelling and grammar dialog box identifies the problem and provides suggestions for correcting the error.

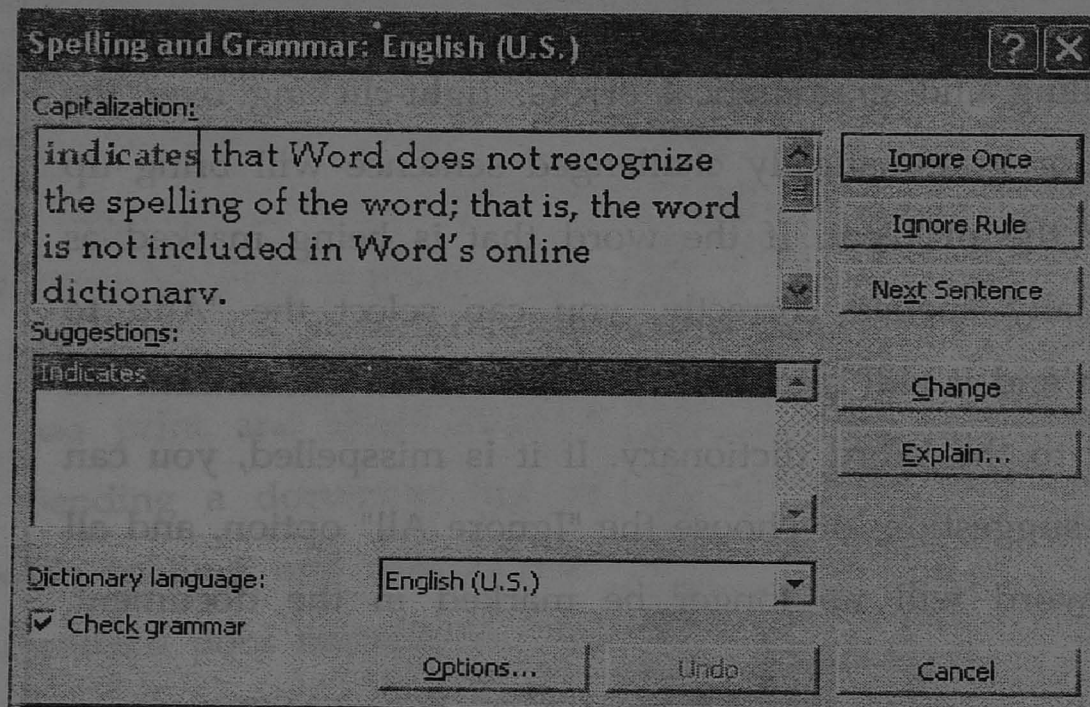
For both the spelling and grammatical errors, right-clicking over the misspelled words or grammatically challenged sentence will bring up suggestions to fix the problem. If the word that is being marked as misspelled is actually spelled correctly, you can select the "Add to Dictionary" option and it will remove the red line from underneath the word, and save it to the Word dictionary. If it is misspelled, you can always accept the suggestion, or choose the "Ignore All" option, and all instances of the word will no longer be marked in the document.

For grammatical errors, right-clicking will give you a brief description of what is potentially wrong with the sentence grammar, and in some instances, make a suggestion on how to fix it. You have the option of accepting the suggestion, or telling Word to "Ignore once" to remove the green line.

Of course, if you want to just have Word ignore all of your spelling and grammatical errors and not make any suggestions, you can do this as well by following these steps:

1. Go the **Tools** menu and select **Options**. When the **Options** window appears, click on the **Spelling & Grammar** tab.
2. To remove the spelling check (red lines), uncheck the "Check Spelling as You Type" option in the Spelling section. To remove the grammar check (green lines), uncheck the "Check Grammar as You Type" option in the Grammar section.
3. Click the **OK** button to close out of the **Options** window.

The following table describes the options in the spelling and grammar dialog box:



Example:

3.1.1 Spell Check

Word checks your spelling and grammar as you type. Spelling errors display with a red wavy line under the word. Grammar errors display with a green wavy line under the error. If you want to spell check your entire document, press F7 and click the spelling icon , or choose **Tools** > **Spelling and Grammar** from the menu. If you want to spell check part of your document, highlight the area you want to spell check. Then press F7 and click the spelling icon , or choose **Tools** > **Spelling and Grammar** from the menu.

1. Type the following exactly as shown. Include all errors.

Open thr door for Sumathi. She is a teacher from the town of Madurai.

2. Highlight: "Open thr door for Sumathi. She is a teacher from the town of Madurai."

3. Press F7 or click the Spelling icon  on the Standard toolbar.

4. "The" is misspelled, so it is highlighted on the screen and noted in the Not in Dictionary box.

5. Word suggests correct spellings. These suggestions are found in the Suggestions box.

6. To change the word to the correct spelling, make sure "the" is highlighted in the Suggestions box. Click Change.
Note: If the word is misspelled in several places in the document, click Change All to correct all misspellings.

7. The name "Sumathi" is not in the dictionary, but it is correct. Click Ignore Once to leave "Sumathi" in the document with its current spelling.

Note: If a word appears in several places in the document, click Ignore All so you are not prompted to correct the spelling for each occurrence.

8. "Madurai" is not found in the dictionary. If you frequently use a word not found in the dictionary, you should add that word to the dictionary by pressing the Add to Dictionary button. Word will then recognize the word the next time it encounters it. Click Add to Dictionary.

9. The following should appear on your screen: "Word finished checking the selection. Do you want to continue checking the remainder of the document?"

10. Click No. If you wanted Word to spell-check the entire document, you would have clicked on Yes.

Space for
Hint

Button	Function
Ignore Once	Leaves the highlighted error unchanged and finds the next spelling or grammar error.
Ignore All	Leaves all occurrence of the highlighted spelling or grammar error unchanged throughout the Word Document.
Next Sentence	Accept manual changes in a document and continues to check the document.
Add to dictionary	Adds the selected word in the Not in dictionary box to the custom dictionary contains your own word.
Change	Changes the highlighted error to the word that you select in the suggestions box.
Change All	Changes all occurrence of the highlighted error to the word that you select in the suggestions box and then continues to check the reset of the document.
Explain	Provides more information about the grammar error.
Auto correct	Adds the spelling error and its correction to the AutoCorrect list so that Word corrects it automatically as you type.
Undo	Undoes the last spelling or grammar action
Options	Opens the Spelling and Grammar options dialog box. Use this dialog box to open a different custom dictionary or to change the rules that Word uses to check spelling and grammar

3.2 Mail merge basics

This article will step you through the basics of creating a mail merge and contains links to some of the more advanced features. The Mail Merge feature has been described here. In Ms-Word Mail Merge option is an important and every way for office set up. Many times you required sending the same content of a letter to different individuals. By using Mail Merge you can send the same letter to a number of persons without typing the content of the letter again and again

Sometimes the term "mail merge" can be a little misleading. You assume from the title that the intent of mail merge is to produce letters for mass mailing purposes. That's not necessarily the case.

Mail merge is for simplifying repetitive documents and tasks. Mail merge can be used for creating many documents at once that contain identical formatting, layout, text, graphics, etc., and where only certain portions of each document varies. Mail merge is also used for generating mailing labels, envelopes, address lists, personalized training handouts, etc. As well as hard copy mail shots, it can be used to generate multiple emails and electronic faxes. And it can even be used to create a "friendly" front-end to spreadsheet or database information.

Whenever you need to assemble similar data, mail merge is the answer!

Mail merge primarily consists of two files, the **Main Document** and the **Data Source**. The Main Document contains the information that will remain the same in each record, and the Data Source contains all the variable information, in the form of fields. This is the information that will change in the Main Document when the merge is completed. Along with the information that remains the same, the Main Document also contains merge fields, which are references to the fields in the Data Source.

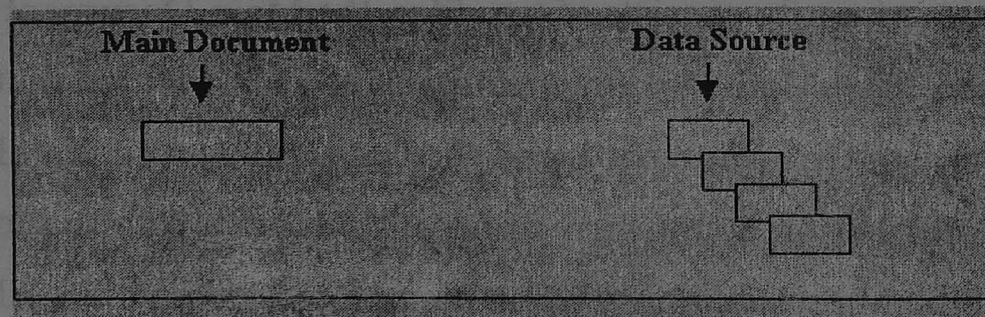
When the Main Document and Data Source are merged, Microsoft Word replaces each merge field in the Main Document with the data from the respective field contained in the Data Source. The end result is a third document, a combination of the Main Document and Data Source – although you can also mail merge directly to the printer; (or fax or email) – you don't need to create a merged document on screen; and you can also “preview” the mail merge without actually merging (using the **ViewMergedData** button).

3.2.1 Concept of Mail Merging and its Components

- Mail Merge is the facility which requires the following three information
- General body of the letter called main document
- Header Row, the record structure or the name of the fields, which will identify the data

Data for all the individuals, for whom the letters are to be generated also called data source

Mail Merge option of Word reads this data and physically merges it with Main document to generate letters for all the persons or for all records in the data file.



3.2.2 Steps to create a mail Merge

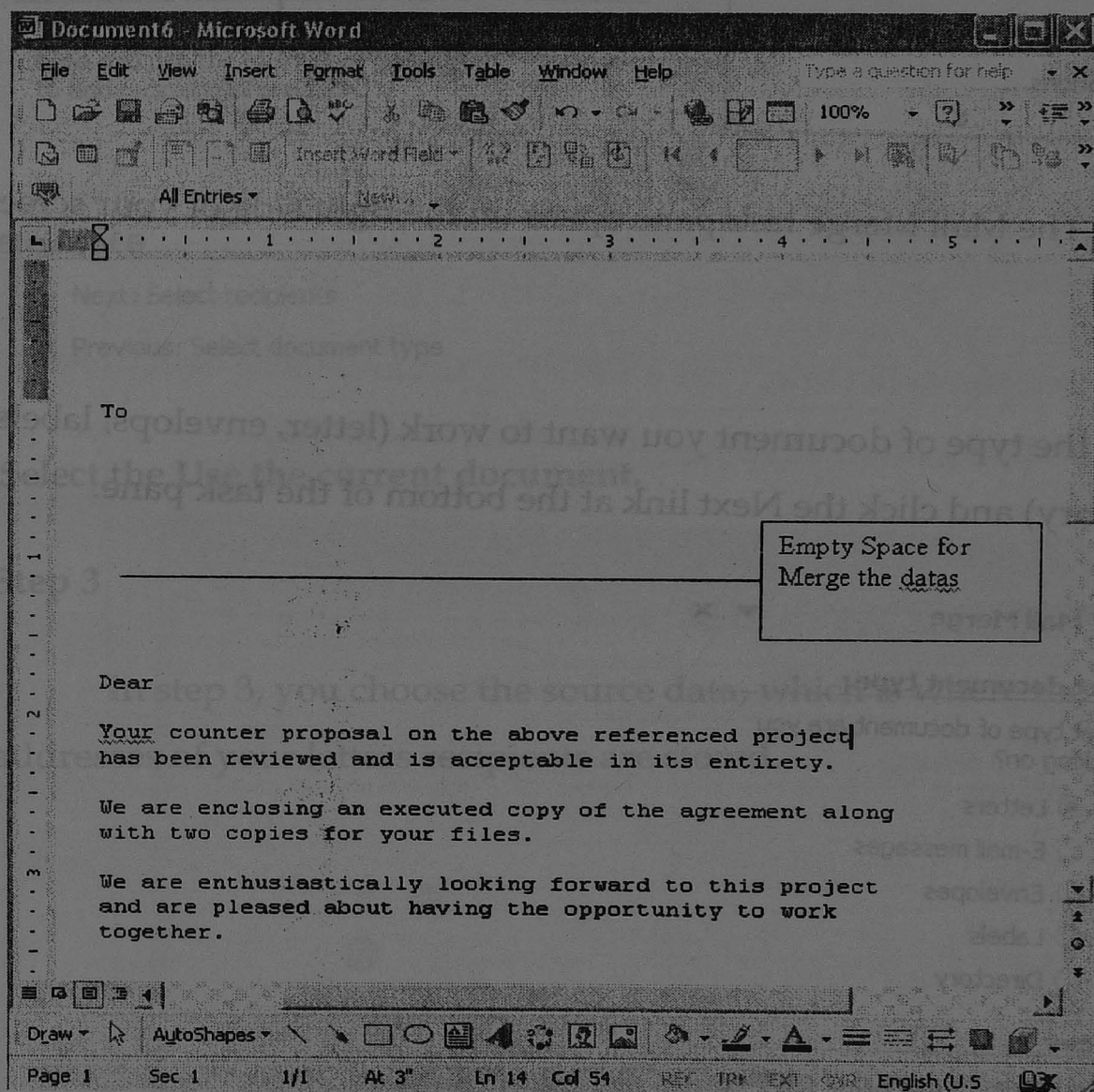
1. Open or create a document
2. Choose or crate a data source

3. Insert the data fields

4. Run the Merge

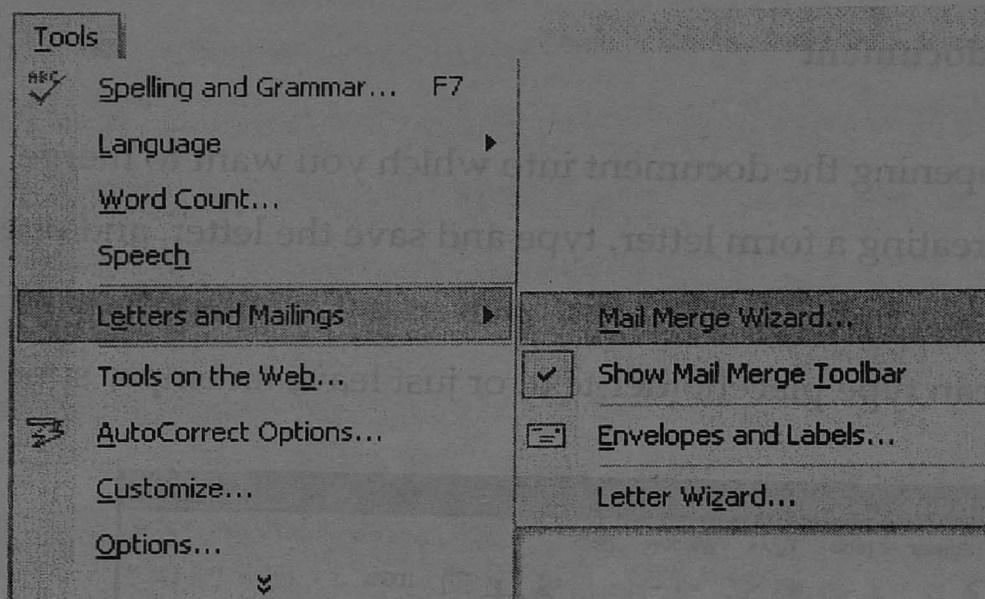
Open or Create a document

Starts by opening the document into which you want to merge data. If you are creating a form letter, type and save the letter, and open it in word. If you are creating mailing list, open a new, blank document. In a form letter, you can type placeholder text, or just leave an empty spot.



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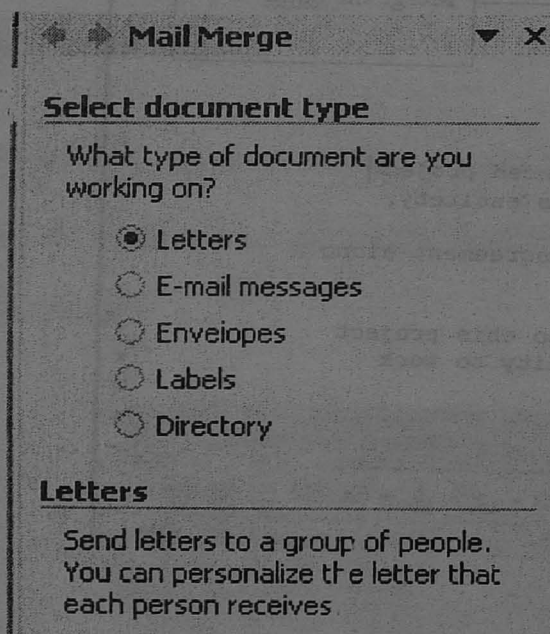
Choose Tools → Letters And Mailings → Mail Merge Wizard.



The Mail Merge task pane opens on the right side of your screen.

Step 1

Select the type of document you want to work (letter, envelopes, labels, directory) and click the Next link at the bottom of the task pane.



Click Next to continue.

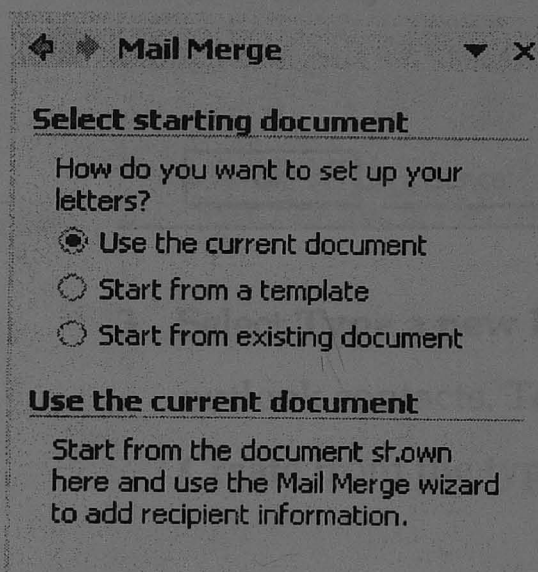
Step 1 of 6

➡ Next: Starting document

Step 2

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Select the document you want to set up your letters.



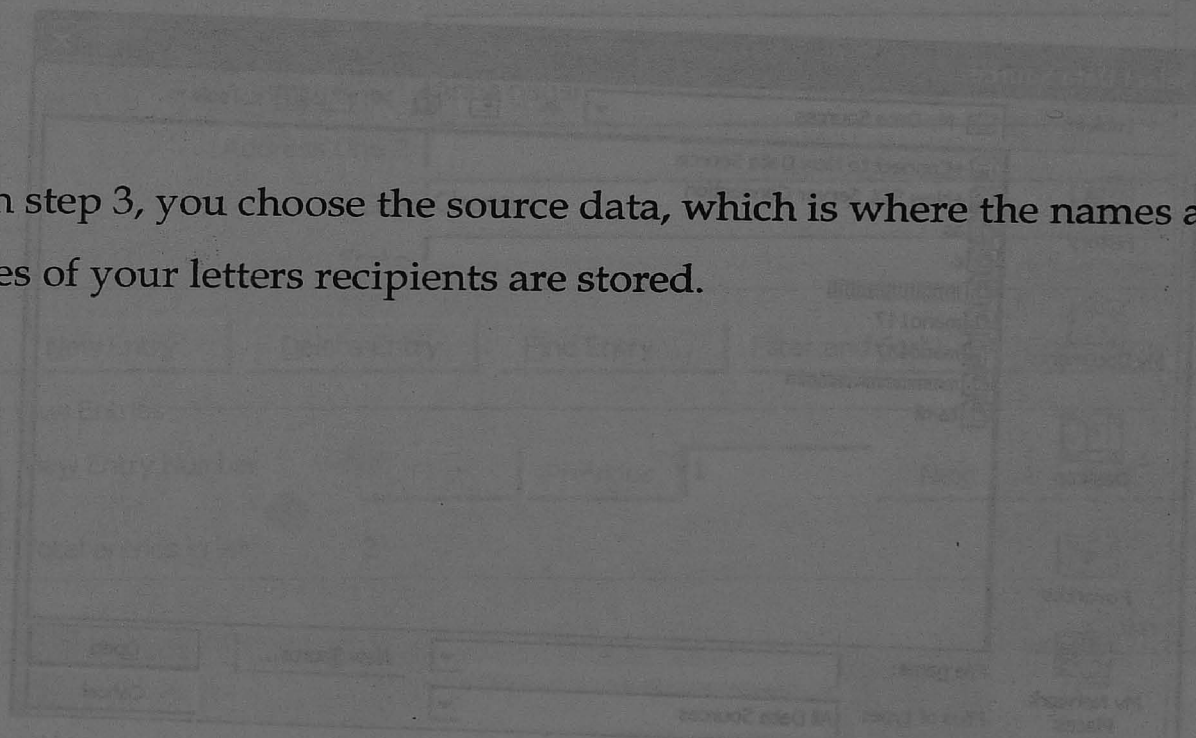
Step 2 of 6

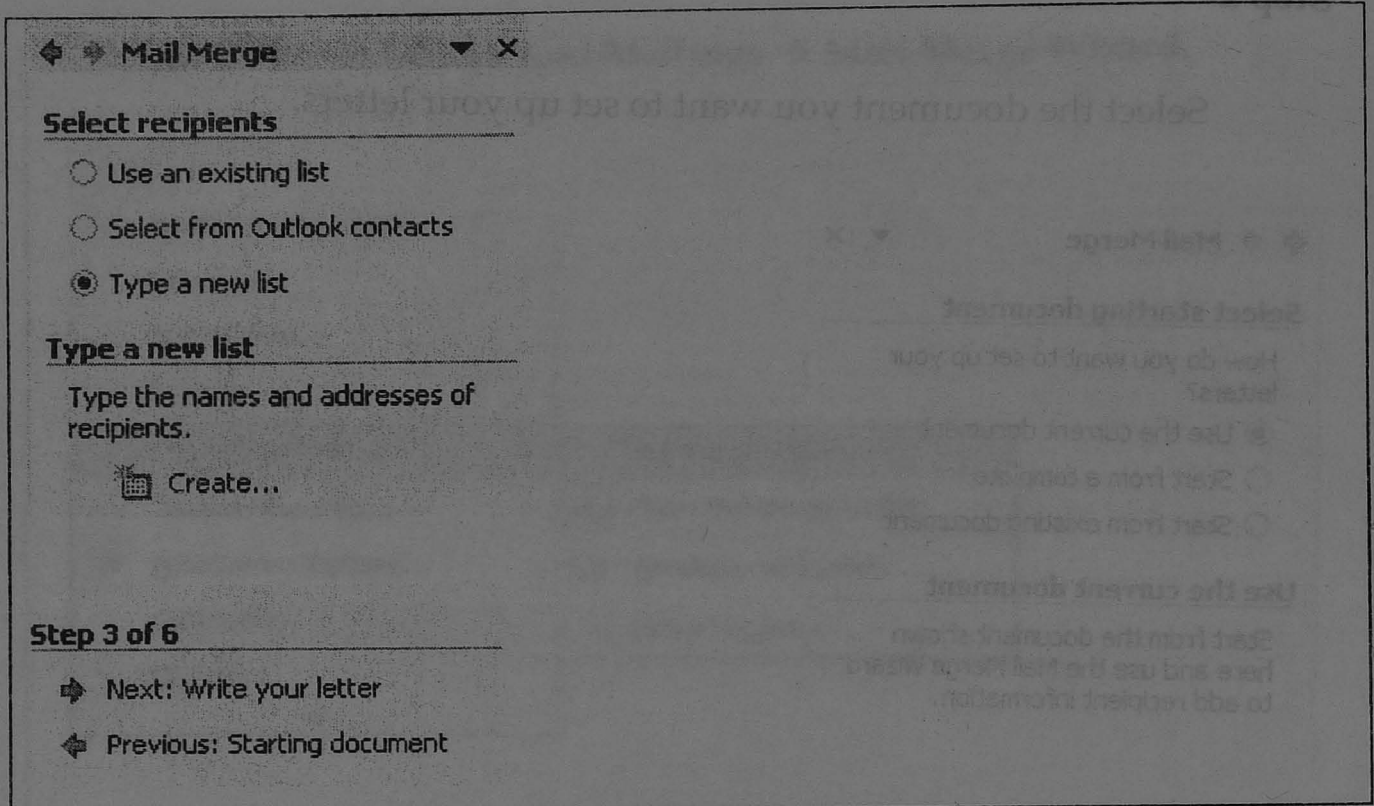
- ➡ Next: Select recipients
- ⬅ Previous: Select document type

Select the **Use the current document**.

Step 3

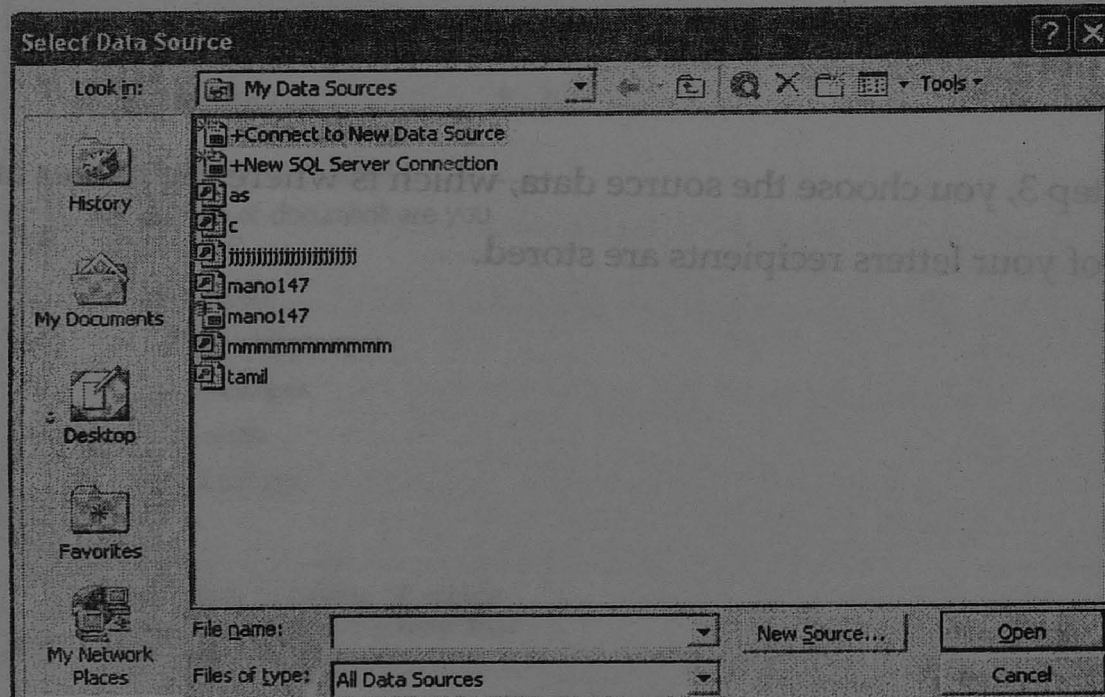
In step 3, you choose the source data, which is where the names and addresses of your letters recipients are stored.



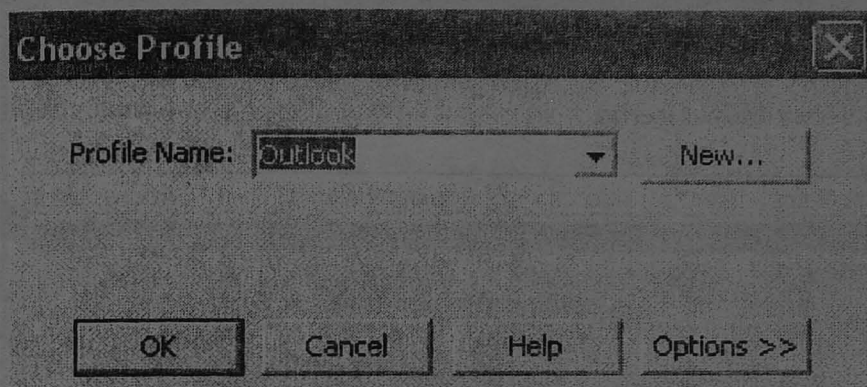


1. Use an existing list

From the recipients list select use an existing list and then select browse to select the existing file which contains the names and addresses to merge.



2. From the recipients list select from Outlook contacts and then choose contacts folder that contains the names and addresses to merge.



3. Select **Type a new list** if you don't want to use an existing list or outlook contacts. To type the names and addresses of recipients select **Create from the type a new list**.

New Address List

Enter Address Information

Title b

First Name Bala

Last Name Selvam

Company Name Evita

Address Line 1 Anna nagar

Address Line 2

City Chennai

State

New Entry Delete Entry Find Entry ... Filter and Sort... Customize...

View Entries

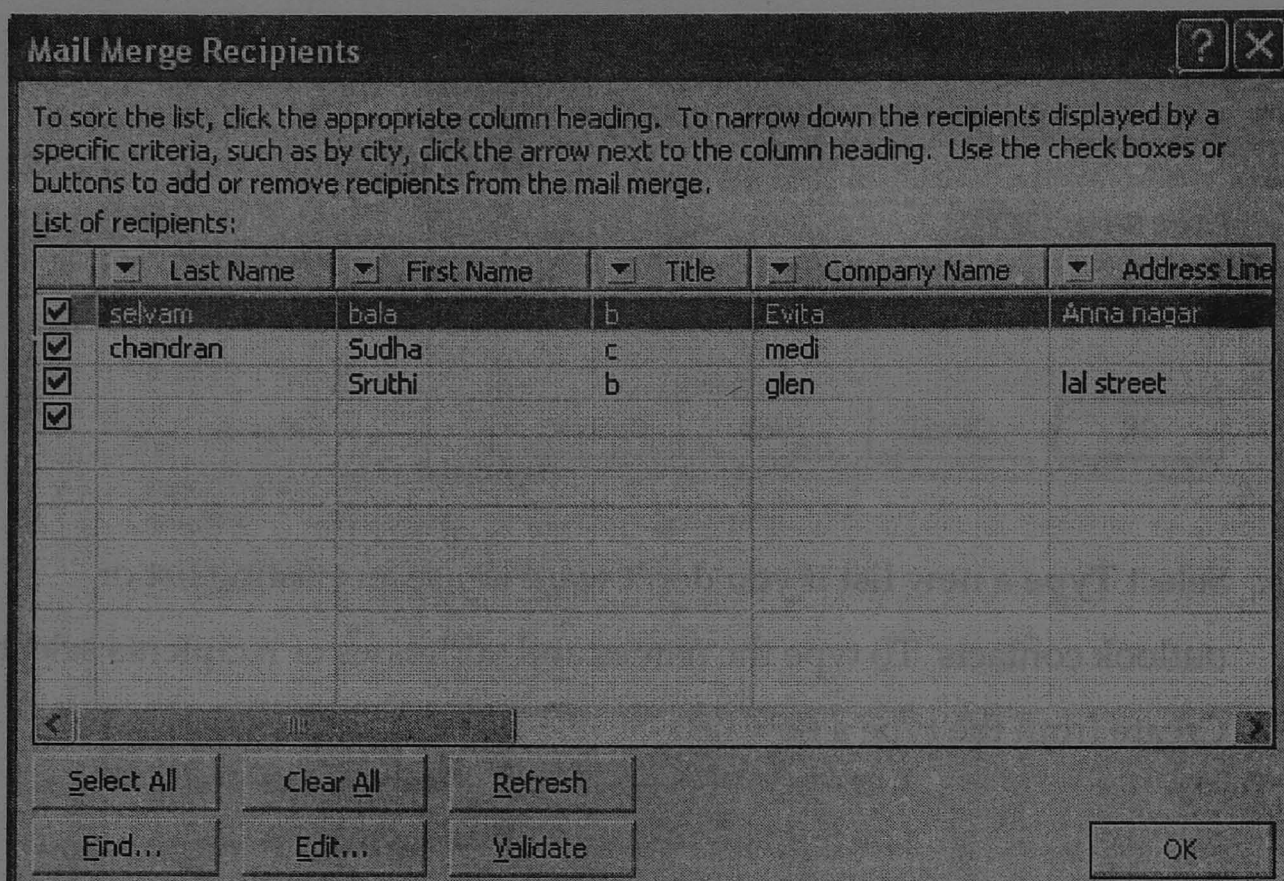
View Entry Number First Previous 1 Next Last

Total entries in list 2

Close

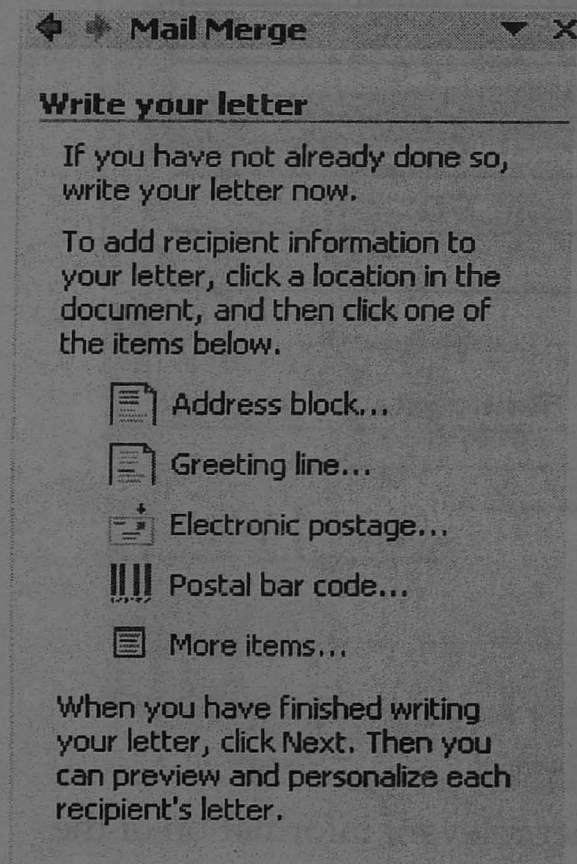
After adding the names, address and other relevant information of the recipients choose close to save the data.

Space for Hint



Step 4

Insert the Data Fields



To add recipient's information to your letter, click a location in the document, and then click on the items below.

1. Address Block

Choose the address block to insert the recipients address.

Insert Address Block

Specify address elements

☒ Insert recipient's name in this format:

Josh Randall Jr. and Cynthia Smith
Joshua Randall Jr. and Cynthia Smith
Joshua and Cynthia Randall
Mr. and Mrs. Josh Randall
Mr. and Mrs. Joshua Randall
Joshua Q. and Cynthia Randall

☒ Insert company name

☒ Insert postal address:

☒ Never include the country/region in the address
☐ Always include the country/region in the address
☐ Only include the country/region if different than:

Preview

Joshua Randall Jr. and Cynthia Smith
Blue Sky Airlines
1 Airport Way
Kitty Hawk, NC 27700

Match Fields... OK Cancel

Here you can choose the recipients address format and that can be previewed in the preview window.

2. Greeting Line

Choose the Greeting line field to insert the greeting message of your letter like Respected Mr. Bala

Greeting Line

Greeting line format:

Dear Joshua Randall Jr.,

Greeting line for invalid recipient names:

To Whom It May Concern:

Preview

Dear Joshua Randall Jr.,

Match Fields... OK Cancel

3. Postal Bar code

Insert the postal bar Code field to insert a barcode at the insertion point.

Insert Postal Bar Code

Select the appropriate address fields below and click OK to insert a barcode at the insertion point.

Merge field with ZIP code:

City

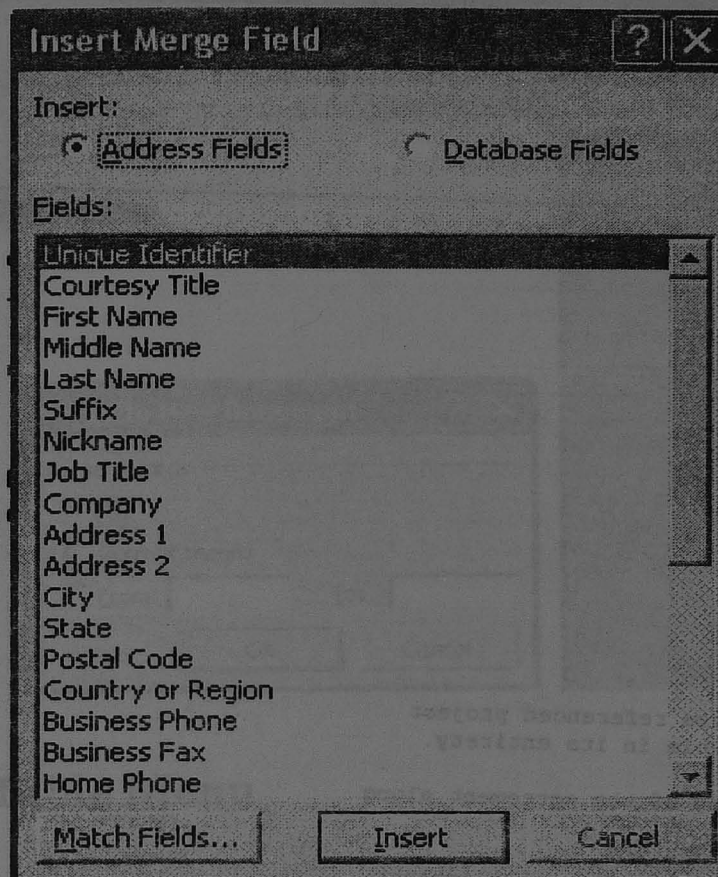
Merge field with street address:

First Name

OK Cancel

4. More Items

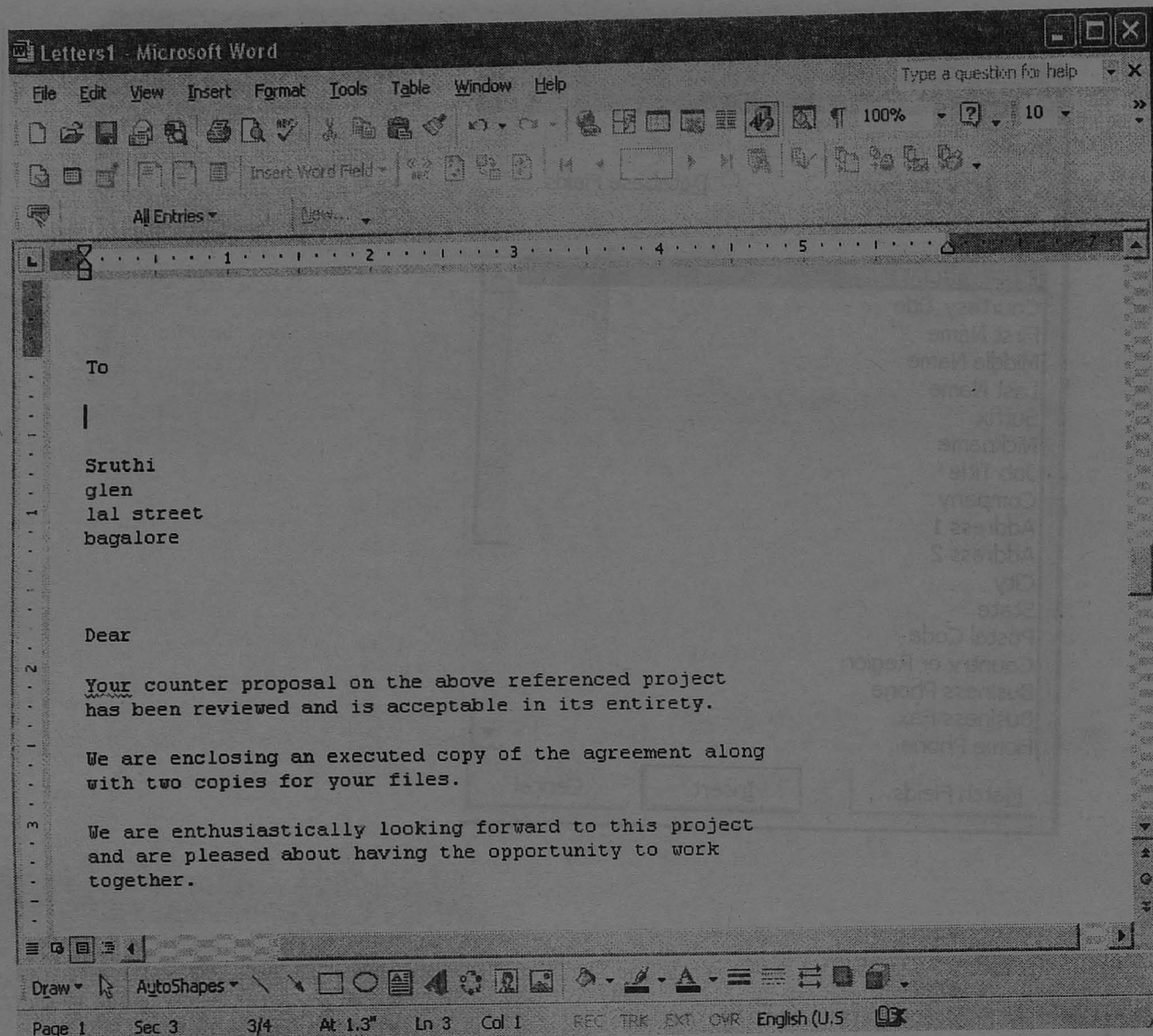
From the more items field you can choose a specify field from the database to insert into the document.



Step 5

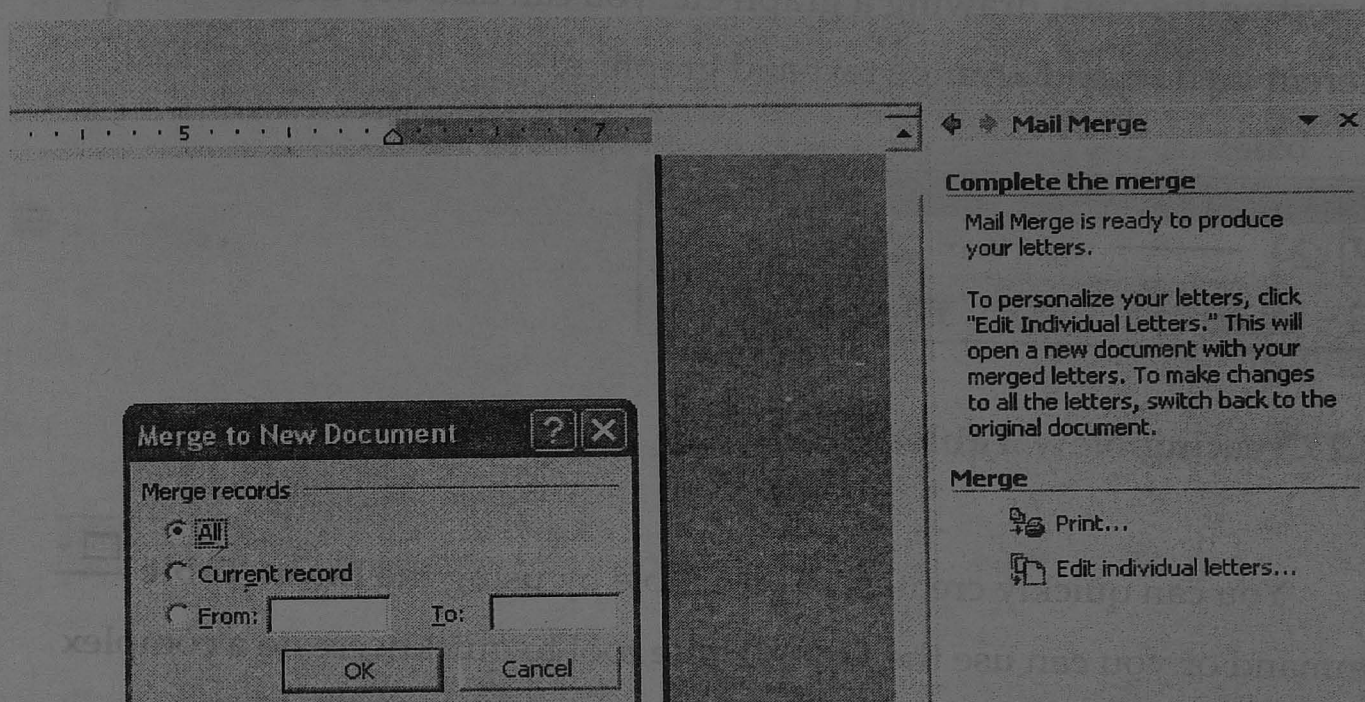
Preview Your Letters

At this point, Word has created a sample merge that you can check by previewing each of the letters. You can preview each of the letters. You can preview each merged letter by clicking the double-arrow boxes under preview your letters in the task pane.

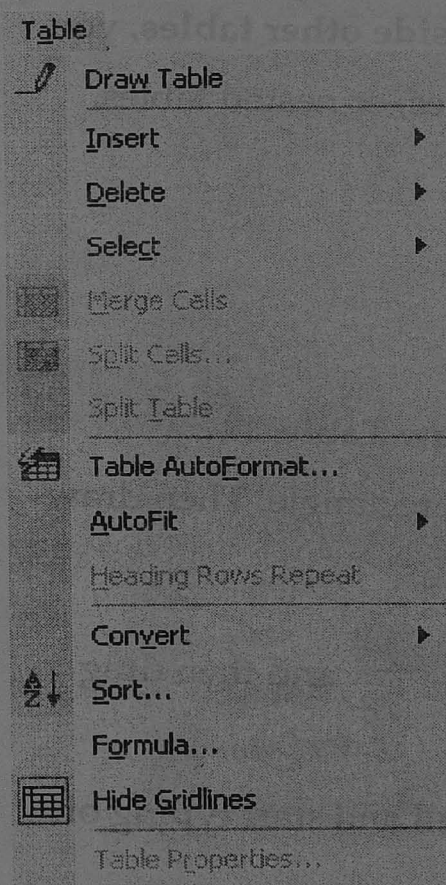


Step 6

This is the last step in the merge process. The advantage of creating a new document with all the individual letters is that you can personalize letter. If you click Edit individual Letters in the task pane, the mail merge To New document dialog box appears. You can choose to crate a new document with all of the letters in it.



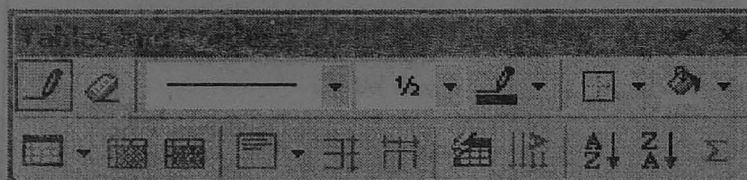
3.3 Table Menu



3.3.1 Draw table

A table is made up of rows and columns of cells that you can fill with text and graphics. Tables are often used to organize and present information. You can use tables to perform calculations and other works

like sorting the data, drawing a graph etc. you can also use tables to create different layouts and arrange text and graphics.



3.3.2 Creating New Tables

You can quickly create a simple table by using the **Insert Table**  command or you can use the **Draw Table** tool to quickly create a complex table. Using **Draw table** is similar to drawing a rectangle on graph paper—first, draw a line from one corner of the table to the corner diagonally opposite in order to define the boundary of the entire table, and then draw the column and row lines inside. **Creating tables inside other tables**, you can use **Draw table** to create tables inside other tables, or nested tables.

3.3.2.1 Create a Complex Table

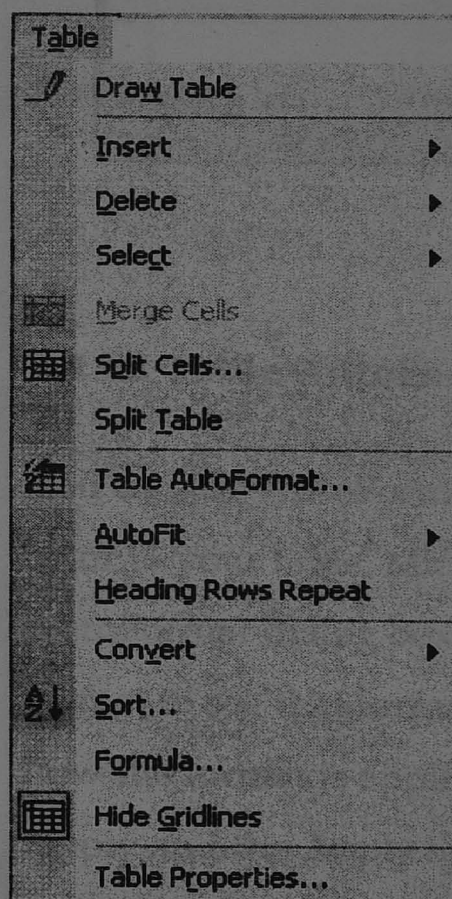
1. click where you want to create the table
2. On the **Tables and Borders** toolbar, click **Draw Table** 
3. To define the outer table boundaries, draw a rectangle. Then draw the column and row lines inside the rectangle.
4. To create a line or block of lines, click **Eraser**  and then drag over the line.
5. When you finish creating the table, click a cell and start typing or insert a graphic.

3.3.2.2 Create a table inside another table

Space for
Hint

1. On the **Tables and Borders** toolbar, click **Draw Table** 
2. Position the pencil in the cell where you want to draw a nested table
3. Draw the new table. To define the table boundaries, draw a rectangle. Then draw the column and row lines inside the rectangle.
4. When you finish creating the nested table, click a cell, and start typing or insert a graphic.

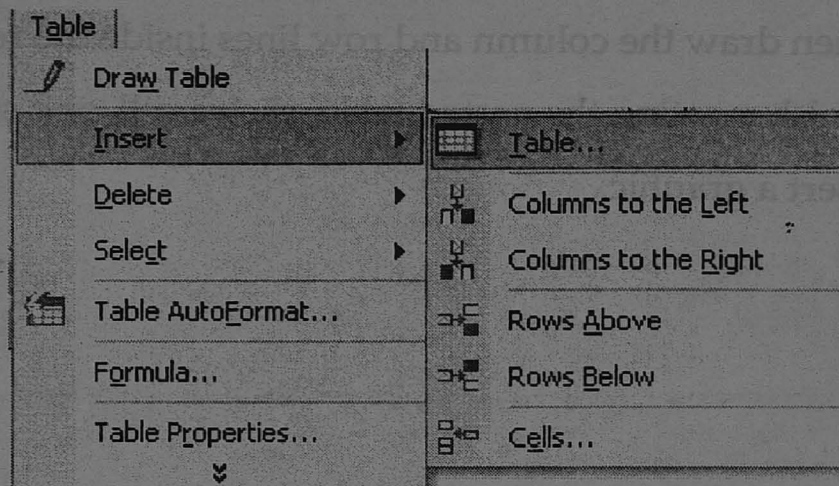
3.3.3 Insert



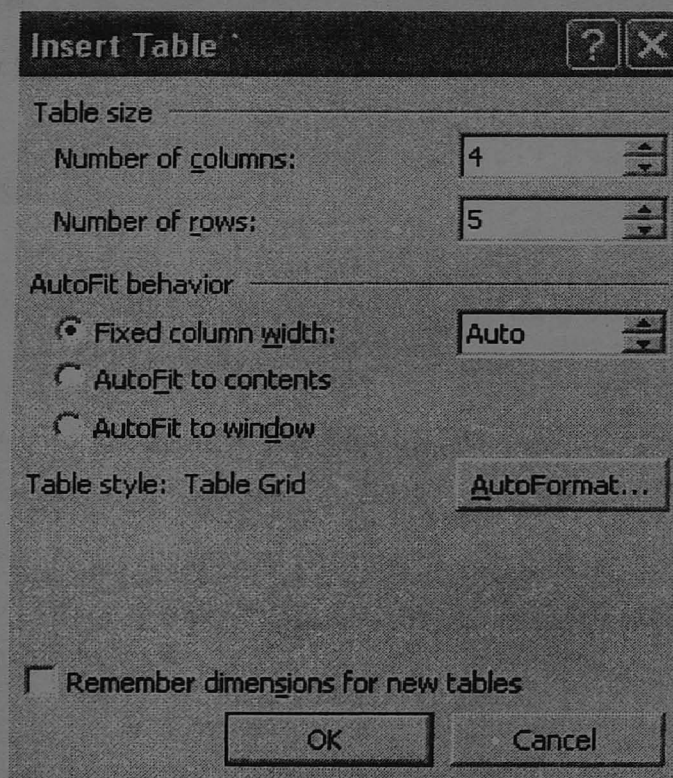
3.3.3.1 Creating a Table

To create a four-column, five-row table:

1. Choose Table > Insert > Table from the menu.



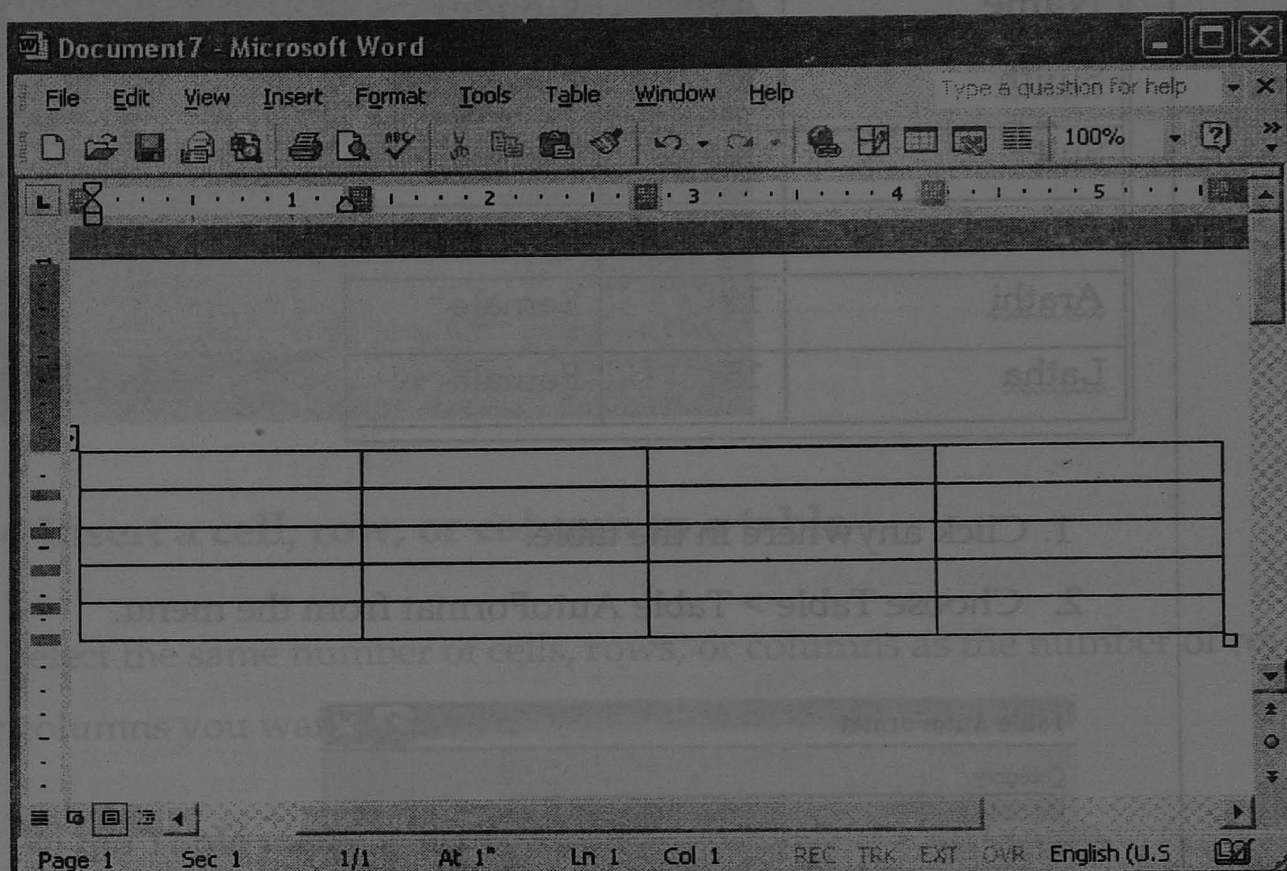
2. The Insert Table dialog box opens.



3. Type 4 in the Number of Columns field.
4. Type 5 in the Number of Rows field.
5. Select Auto in the Column Width field. Selecting Auto allows Microsoft Word to determine the size of your column widths. Alternatively, you can enter the column width you desire.

6. Click OK. Your table should look like the one shown here, with four columns and five rows.

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3.3.3.2 Table AutoFormat

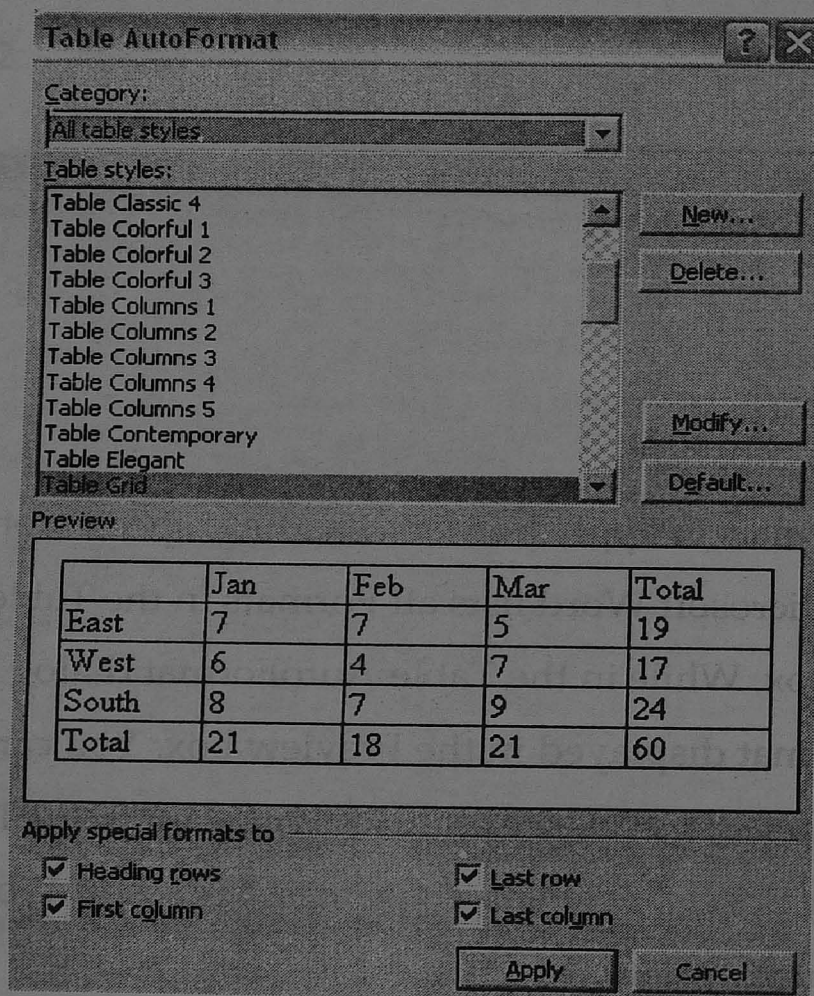
You can use AutoFormats to apply borders, shading, special fonts, and color to your table. Microsoft Word lists all Formats in the Table AutoFormat dialog box. While in the Table AutoFormat dialog box, click a format to see that format displayed in the Preview box. You can customize how the format is applied. Check the features you want in the Formats to Apply and the Apply Special Formats To frames. Microsoft Word comes with a long list of AutoFormats.

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To apply an AutoFormat to your Name, Age, and Gender table:

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

1. Click anywhere in the table.
2. Choose Table > Table AutoFormat from the menu.



3. Click Table Colorful 1 in the Table Styles box.
4. Select Heading Rows and First Column in the Apply Special Formats To frame. Do not select Last Row and Last Column.
5. Click Apply.

Your table should look like the one shown here

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

3.4 Insert a cell, row, or column to a table

1. Select the same number of cells, rows, or columns as the number of rows or columns you want to insert.
2. On the Table menu, point to **Insert**, and then click an option.

Example 1: - Insert a Row

Consider the Table

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

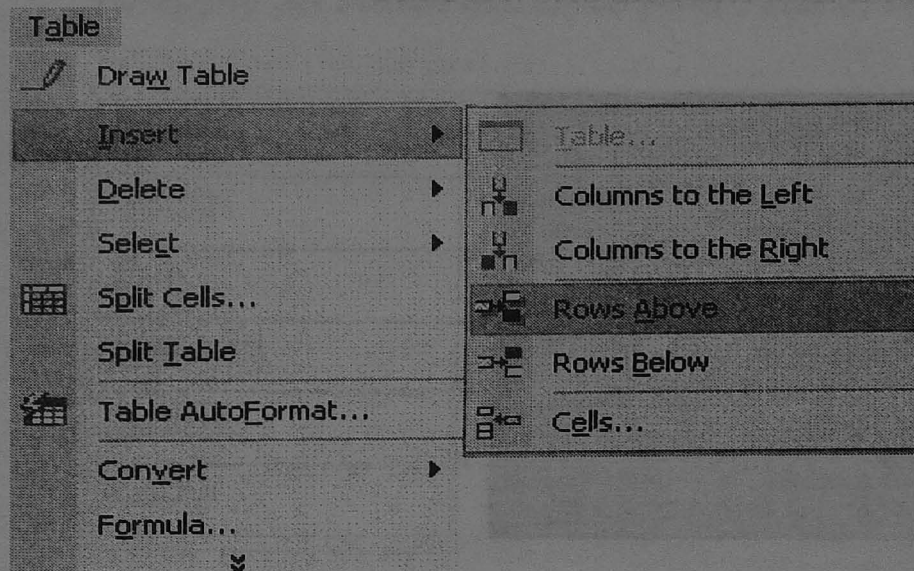
Step 1:

Select the Third Row

Step 2:

From the Table menu select **Insert → Rows Above**

Space for
Hint



Step 3:

After the insertion of the row the table becomes

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Example 2: -- Insert a Column

Consider the Table

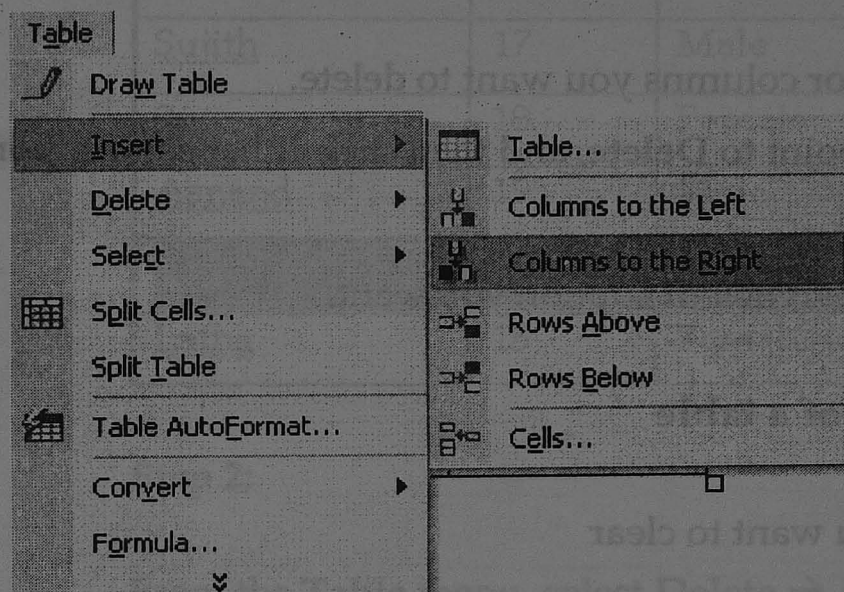
Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 1:

Select the Third column

Step 2:

From the Table menu select **Insert → Columns Right**



Step 3:

After the insertion of the Column the table becomes

Name	Age	Gender	
Sujith	17	Male	
Suji	18	Female	
Aanand	19	Male	
Arathi	19	Female	
Latha	15	Female	

3.5 Delete a Table or Delete items from Table

You can delete an entire table. You can also clear the contents of cells without deleting the cells themselves.

3.5.1 Delete a table and its contents

1. Click the table.
2. On the Table menu, point to **Delete**, and then click **Table**

Space for
Hint

3.5.2 Delete cells, rows or columns from table

1. Select the cells, rows, or columns you want to delete.
2. On the **Table** menu, point to **Delete**, and then click either columns or rows or cells.
3. If you are deleting cells, click the option you want.

3.5.3 Clear the contents of a table

1. Select the items you want to clear
2. Press **Delete**

Example

Deletion of Rows

Consider the table

Name	Age	Gender
Sujiith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

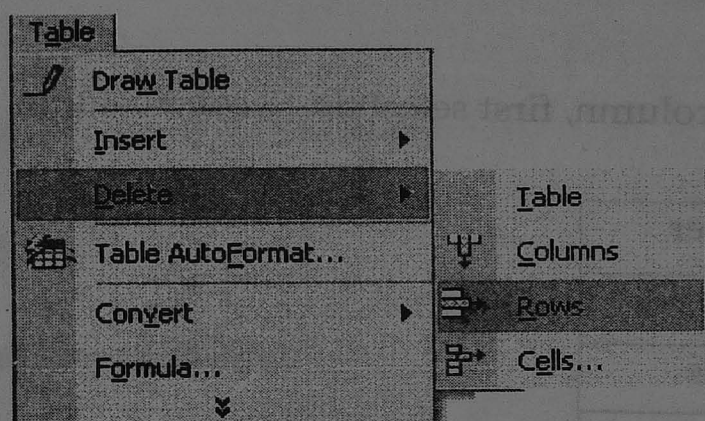
Step 1:

Now you want to delete a Forth Row, first select the fourth row

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 2:

From the **Table** menu, select **Delete** → **Rows**



After the deletion of Fourth row, the table becomes

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Latha	15	Female

3.5.4 Deletion of Columns

Consider the table

Name	Age	Gender
<u>Sujith</u>	17	Male
<u>Suji</u>	18	Female
<u>Aanand</u>	19	Male
<u>Arathi</u>	19	Female
<u>Latha</u>	15	Female

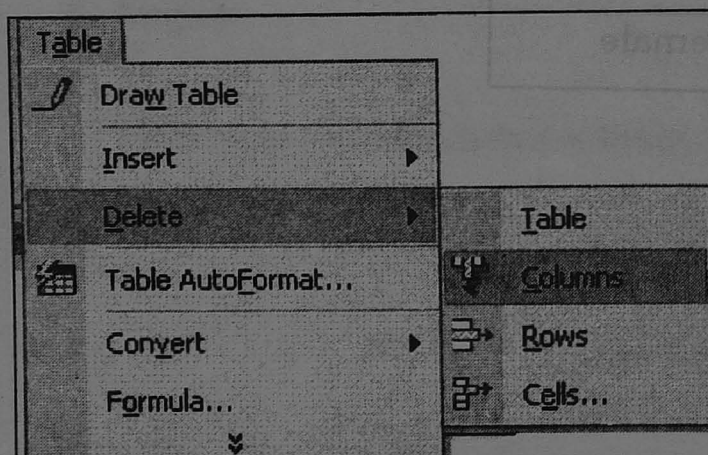
Step 1:

Now you want to delete a Second column, first select the Second column

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 2:

From the Table menu, select Delete → Columns



After the deletion of Second column the table becomes

Name	Gender
<u>Sujith</u>	Male
<u>Suji</u>	Female
<u>Aanand</u>	Male
<u>Arathi</u>	Female
<u>Latha</u>	Female

Example 3 -- Delete a items

Step 1

Consider the table

Name	Age	Gender
<u>Sujith</u>	17	Male
<u>Suji</u>	18	Female
<u>Aanand</u>	19	Male
<u>Arathi</u>	19	Female
<u>Latha</u>	15	Female

Step 2

You want to delete fourth row items, first you have to select the fourth row.

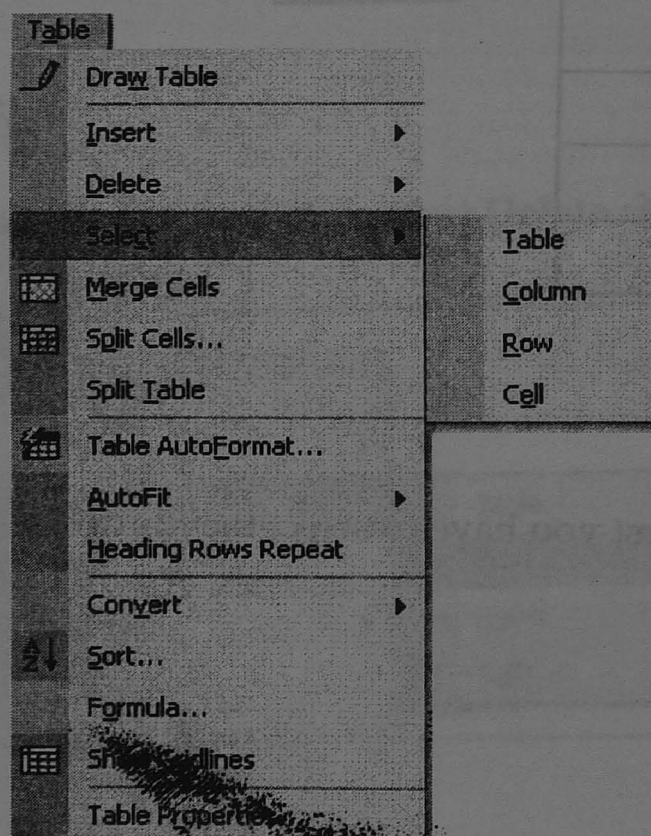
Space for
Hint

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Now press the **Delete** button from the keyboard. After the deletion of fourth row items the table becomes

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female

3.6 Select



Table

Select the table that contains the insertion point

Column

Selects the Column that contains the insertion point.

Row

Selects the Row that contains the insertion point.

Cell

Selects the Cell that contains the insertion point.

3.6.1 Selecting Table

1. Click the table
2. On the Table menu, point to **Select**, and then Click **Table**

3.6.2 Select Cells, Rows, or Columns from a Table

1. Select the cells, rows, or columns
2. On the Table menu, point to **Select**, and then click either **Columns** or **Rows** or **Cells**.

3.7 Split a Table

1. To split a table in two, click the row that you want to be the first row of the second table
2. On the Table menu, click **Split Table**.

Space for
Hint

Example

Consider the table

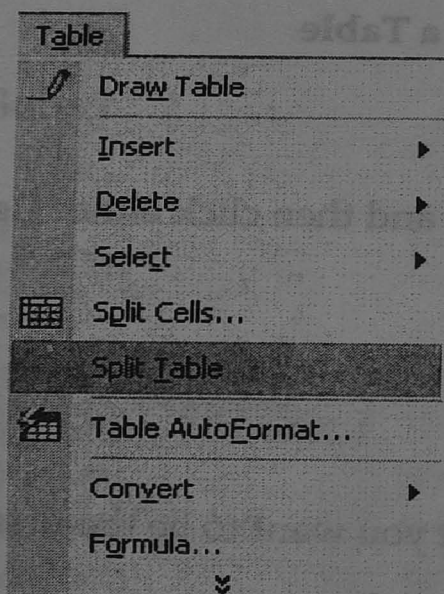
Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 1:

Click the Third Row

Step 2:

From **Table** menu, select **Split Table**



Step 3:

After the splitting of the table, the table becomes

Name	Age	Gender
Sujith	17	Male
Suji	18	Female

Aanand	19	Male
Arathi	19	Female
Latha	15	Female

3.7.1 Split a cell into multiple cells in a table

1. Click in a cell, or select multiple cells that you want to split.
2. On the **Table** menu, click **Split Cells**.

Select the number of columns or rows you want to split the selected cells into.

Example

Consider the Table

Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 1:

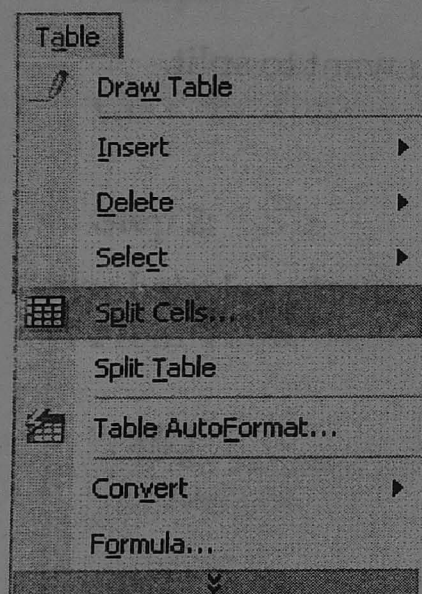
Space for
Hint

Select any one cell

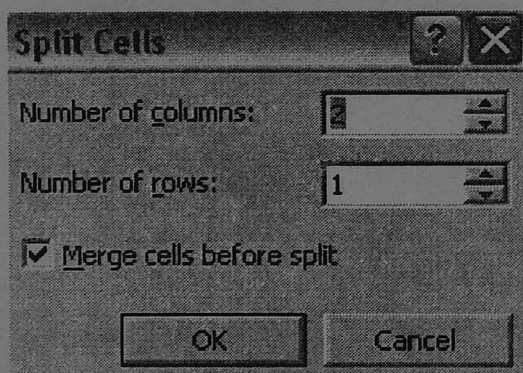
Name	Age	Gender
Sujith	17	Male
Suji	18	Female
Aanand	19	Male
Arathi	19	Female
Latha	15	Female

Step 2:

From the Table menu, select Split Cells



Step 3: The following menu appears.



In the Number of Columns select 1, and in the Number of rows select 2.

Step 4:

After the splitting the cells, the table becomes

Name	Age	Gender
<u>Sujith</u>	17	Male
<u>Suji</u>	18	Female
<u>Aanand</u>	19	Male
<u>Arathi</u>	19	Female
<u>Latha</u>	15	Female

Check Your Progress

1. Write a advantage of using spelling and grammar Ms-Word with detailed examples
2. What is mean by Mail Merge?
3. Write the concept of Mail Merge components.
4. Write a detailed notes about Mail Merge
5. How to create a table.
6. Explain Table menu
7. What is mean by Table AutoFormat?
8. How to split the columns in tables.
9. How to delete and insert a data and cell in tables.

UNIT IV

OBJECTIVES

Name	Age	Gender
John	17	Male
Sun	18	Female
Amend	19	Male
Austin	19	Female
Laura	15	Female

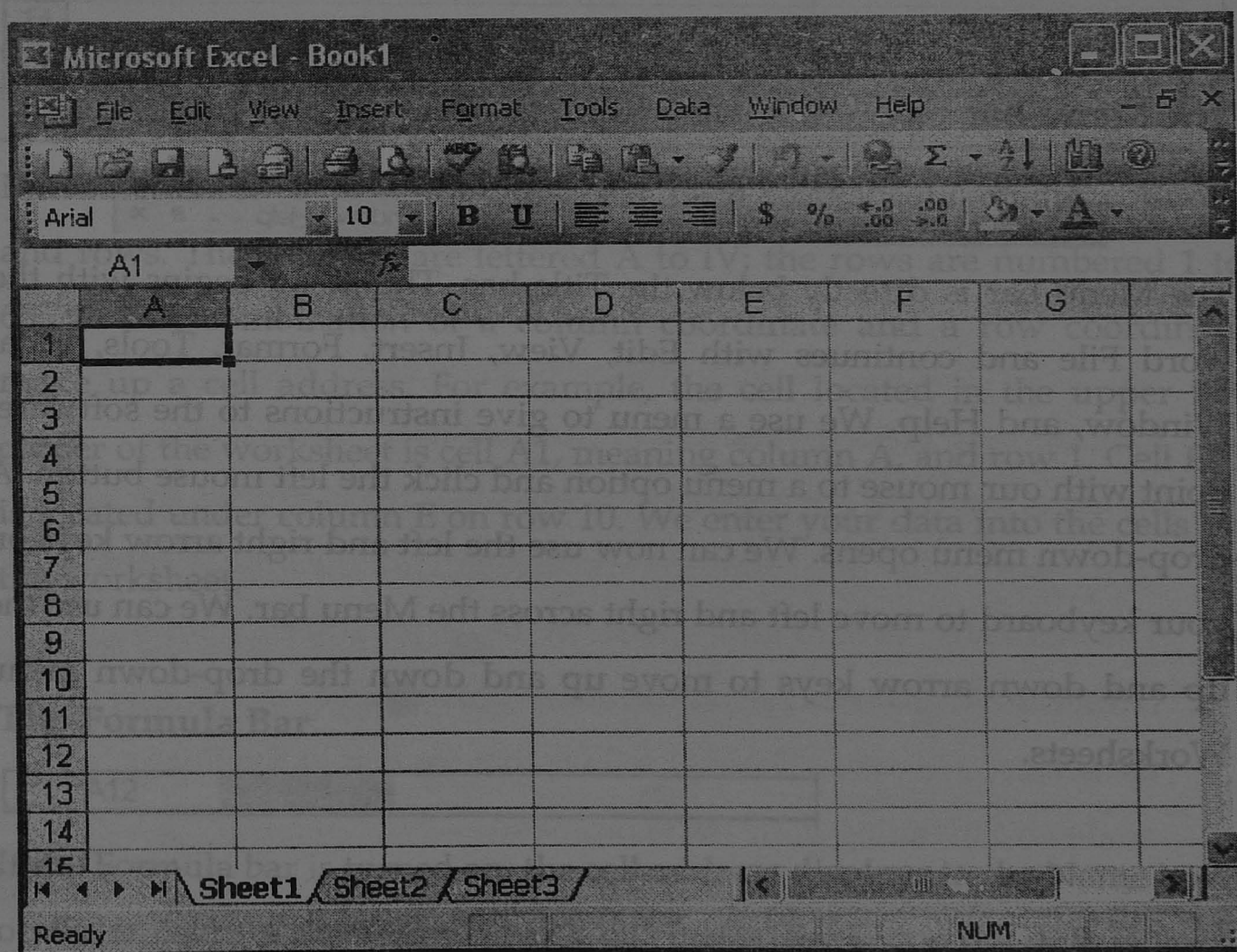
After going through this lesson you would be in a position to

- Usage of Excel page
- Explanation of Excel Page
- Entering the data in Excel
- Excel formulae
- Excel functions

4.1 Introduction for an Excel page

Ms Excel is a spreadsheet program that lets us organize our data into lists and then summarize, compare and present our data graphically. For example, we can have Excel find the sum, average, standard deviation, maximum for sales on a given day; create a graph showing what percentage of sales were in a particular range; and show how the total sales compared with the total sales of other days in the same week.

When we start Excel, a blank document appears. From this point, we can add data, change how the data looks, and have Excel summarize data.



4.1.1 Cell, Row & Column

The most basic part of an Excel document is the box that holds an element of data in Excel, that box is called a cell. Each cell is at the

intersection of a row (a sequence of cells along a horizontal line) and a column (a sequence of cells along a vertical line); rows are identified by a number and columns by a letter. The row number and column letter that designate a specific cell are called a cell reference.

The Title Bar

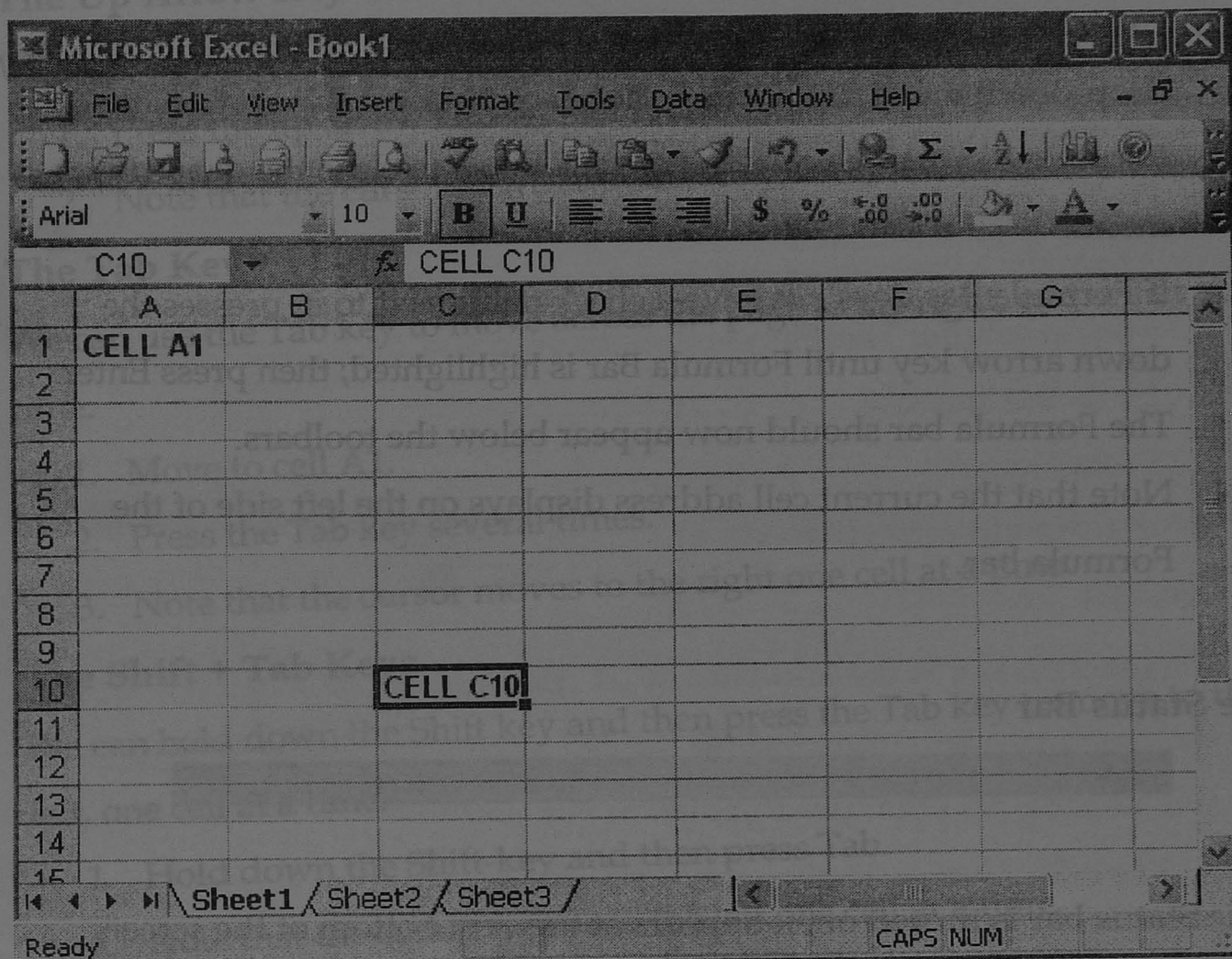


We will start with the Title bar, which is located at the very top of the screen. On the Title bar, Microsoft Excel displays the name of the workbook we are currently using. At the top of our screen, we should see "Microsoft Excel - Book1" or a similar name.

The Menu Bar



The Menu bar is directly below the Title bar. The menu begins with the word File and continues with Edit, View, Insert, Format, Tools, Data, Window, and Help. We use a menu to give instructions to the software. Point with our mouse to a menu option and click the left mouse button. A drop-down menu opens. We can now use the left and right arrow keys on your keyboard to move left and right across the Menu bar. We can use the up and down arrow keys to move up and down the drop-down menu Worksheets.



Microsoft Excel consists of worksheets. Each worksheet contains columns and rows. The columns are lettered A to IV; the rows are numbered 1 to 65536. The combination of a column coordinate and a row coordinate make up a cell address. For example, the cell located in the upper left corner of the worksheet is cell A1, meaning column A, and row 1. Cell E10 is located under column E on row 10. We enter your data into the cells on the worksheet.

The Formula Bar



If the Formula bar is turned on, the cell address displays in the Name box on the left side of the Formula bar. Cell entries display on the right side of the Formula bar. Before proceeding, make sure the Formula bar is turned on.

1. Point to View, which is located on the Menu bar.

2. Click the left mouse button. A drop-down menu opens. On the drop-down menu, if Formula Bar has a check mark next to it, the Formula bar is turned on. Press the Esc key to close the drop-down menu.
3. If Formula Bar does not have a check mark next to it, presses the down arrow key until Formula Bar is highlighted; then press Enter. The Formula bar should now appear below the toolbars.
4. Note that the current cell address displays on the left side of the Formula bar.

The Status Bar



If the Status bar is turned on, it appears at the very bottom of the screen.

Before proceeding, make sure the Status bar is turned on.

1. Point to View, which is located on the Menu bar.
2. Click the left mouse button. A drop-down menu opens.
3. On the drop-down menu, if Status Bar has a check mark next to it, it is turned on. Press the Esc key to close the drop-down menu.
4. If Status Bar does not have a check mark next to it, presses the down arrow key until Status Bar is highlighted; then press Enter. The Status bar should now appear at the bottom of the screen.
5. Notice the word "Ready" on the Status bar at the lower left side of the screen. The word "Ready" tell we that Excel is in the Ready mode and awaiting your next command.

The Down Arrow Key

We can use the down arrow key to move downward one cell at a time.

1. Press the down arrow key several times.
2. Note that the cursor moves downward one cell at a time.

The Up Arrow Key

We can use the Up Arrow key to move upward one cell at a time.

1. Press the up arrow key several times.
2. Note that the cursor moves upward one cell at a time.

The Tab Key

We can use the Tab key to move across the page to the right, one cell at a time.

1. Move to cell A1.
2. Press the Tab key several times.
3. Note that the cursor moves to the right one cell at a time.

The Shift + Tab Keys

We can hold down the Shift key and then press the Tab key to move to the left, one cell at a time.

1. Hold down the Shift-key and then press Tab.
2. Note that the cursor moves to the left one cell at a time.

The Right and Left Arrow Keys

You can use the right and left arrow keys to move right or left one cell at a time.

1. Press the right arrow key several times.
2. Note that the cursor moves to the right.
3. Press the left arrow key several times.
4. Note that the cursor moves to the left.

Page Up and Page Down

The Page Up and Page Down keys move the cursor up and down one page at a time.

1. Press the Page Down key.
2. Note that the cursor moves down one page.
3. Press the Page Up key.
4. Note that the cursor moves up one page.

Space for Hint

The Home Key

The Home key, used in conjunction with the End key, moves you to cell A1 -- or to the beginning of the data area if you have entered data.

1. Move the cursor to column J.
2. Stay in column J and move the cursor to row 20.
3. Press the End key.
4. Press Home.
5. You should now be in cell A1.

Go to -- F5

The F5 function key is the "Go To" key. If you press the F5 key while in the Ready mode, you are prompted for the cell to which you wish to go. Enter the cell address, and the cursor jumps to that cell.

1. Press F5. The Go To dialog box opens.
2. Type J3.
3. Press Enter. The cursor should move to cell J3.

Go to -- Ctrl-G

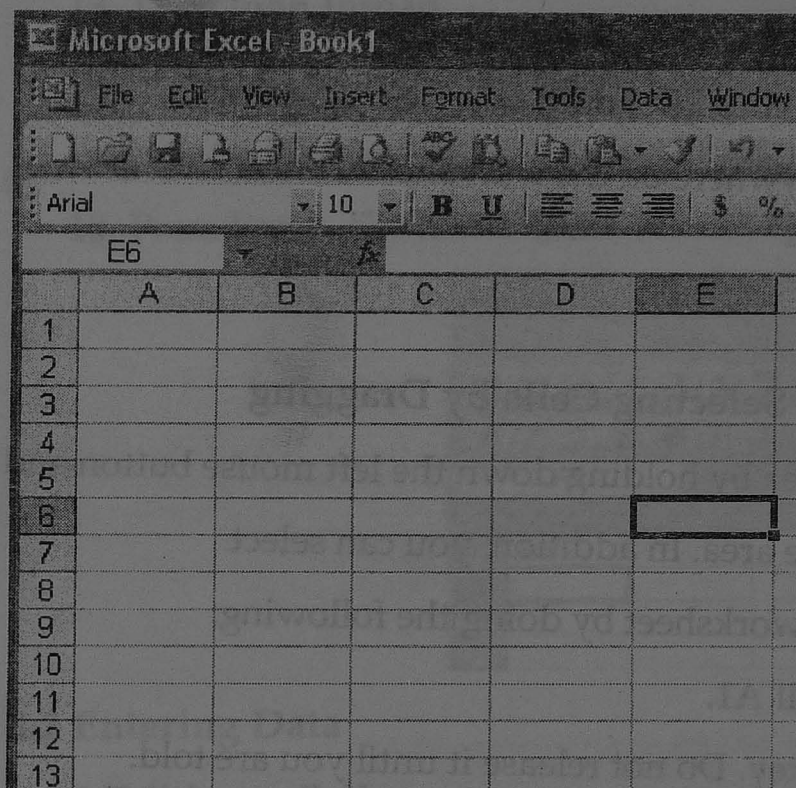
You can also use Ctrl-G to go to a specific cell.

1. Hold down the Ctrl key while you press "g" (Ctrl-g). The Go To dialog box opens.
2. Type C4.
3. Press Enter. You should now be in cell C4.

Name Box

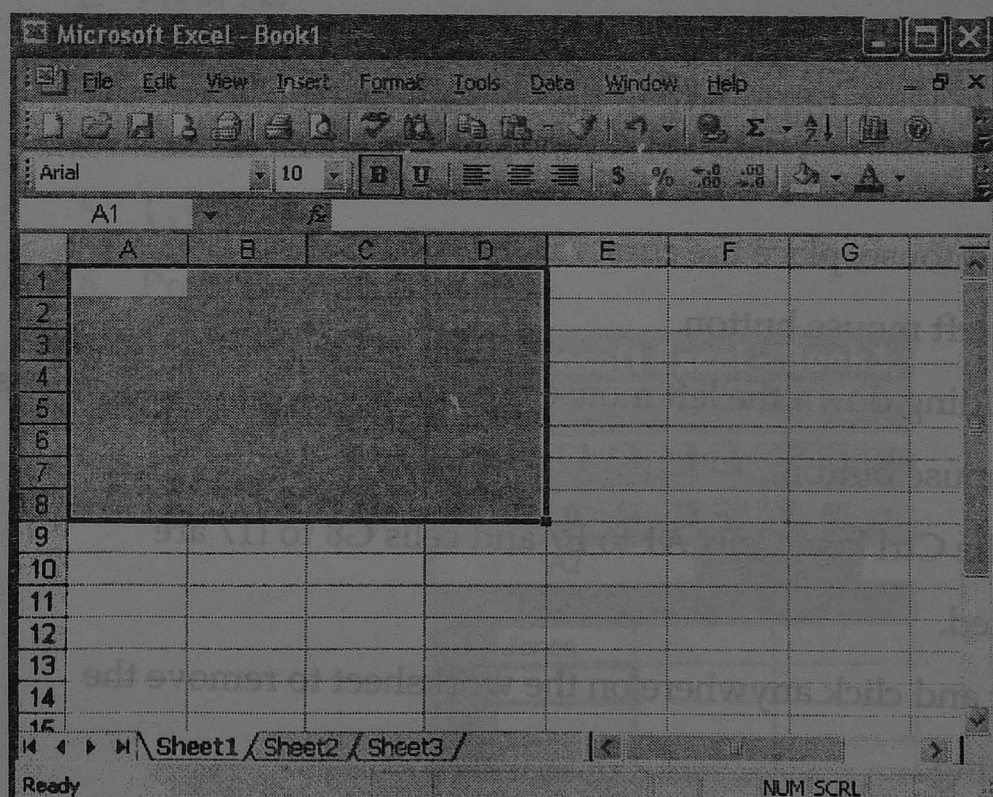
You can also use the Name box to go to a specific cell.

Space for
Hint



1. Type E6 in the Name box
2. Press Enter. Excel moves to cell E6.

4.1.2 Selecting Cells



If you wish to perform a function on a group of cells, you must first select those cells by highlighting them. To highlight cells A1 to E1:

1. Place the cursor in cell A1.
2. Press the F8 key. This anchors the cursor.

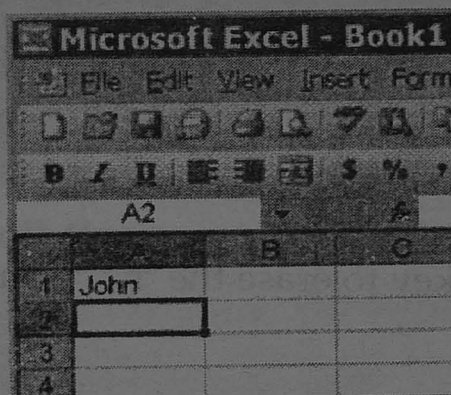
3. Note that "EXT" appears on the Status bar in the lower right corner of the screen. You are in the Extend mode.
4. Click in cell E7. Cells A1 to E7 should now be highlighted.
5. Press Esc and click anywhere on the worksheet to clear the highlighting.

4.1.3 Alternative Method: Selecting Cells by Dragging

You can also highlight an area by holding down the left mouse button and dragging the mouse over the area. In addition, you can select noncontiguous areas of the worksheet by doing the following:

1. Place the cursor in cell A1.
2. Hold down the Ctrl key. Do not release it until you are told.
Holding down the Ctrl key enables you to select noncontiguous areas of the worksheet.
3. Press the left mouse button.
4. While holding down the left mouse button, use the mouse to move from cell A1 to E7.
5. Continue to hold down the Ctrl key, but release the left mouse button.
6. Using the mouse, place the cursor in cell G8.
7. Press the left mouse button.
8. While holding down the left mouse button, move to cell I17. Release the left mouse button.
9. Release the Ctrl key. Cells A1 to E7 and cells G8 to I17 are highlighted.
10. Press Esc and click anywhere on the worksheet to remove the highlighting.
11. In this lesson, you are going to learn how to enter data into your worksheet. First, you place the cursor in the cell in which you would like to enter data. Then you type the data and press Enter.
12. Place the cursor in cell A1.

13. Type **John Jordan**.
14. The Backspace key erases one character at a time. Erase "Jordan" by pressing the backspace key until Jordan is erased.
15. Press Enter. The name "John" should appear in cell A1.

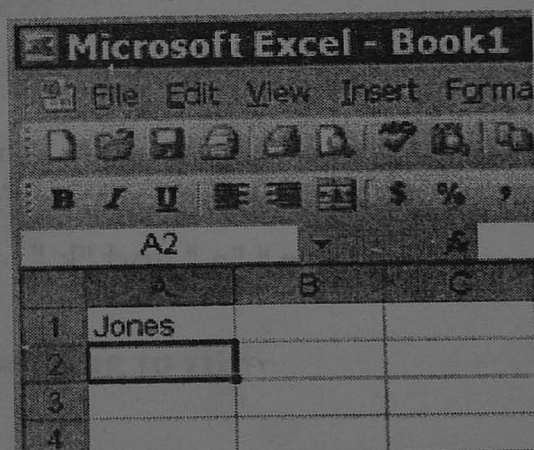


4.2 Entering Data

4.2.1 Editing a Cell

After you enter data into a cell, you can edit it by pressing F2 while you are in the cell you wish to edit.

1. Move the cursor to cell A1.
2. Press F2.
3. Change "John" to "Jones."
4. Use the backspace key to delete the "n" and the "h."
5. Type nes.
6. Press Enter.

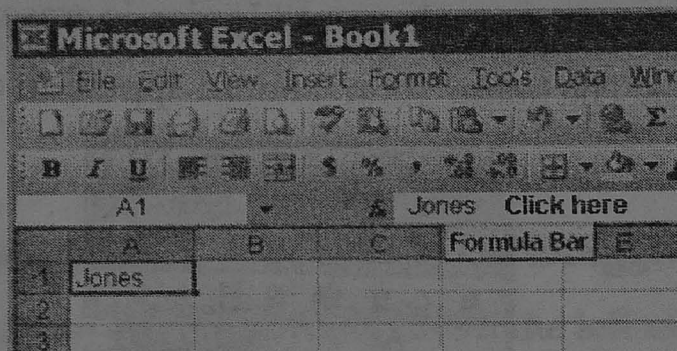


4.2.2 Alternate Method: Editing a Cell by Using the Formula Bar

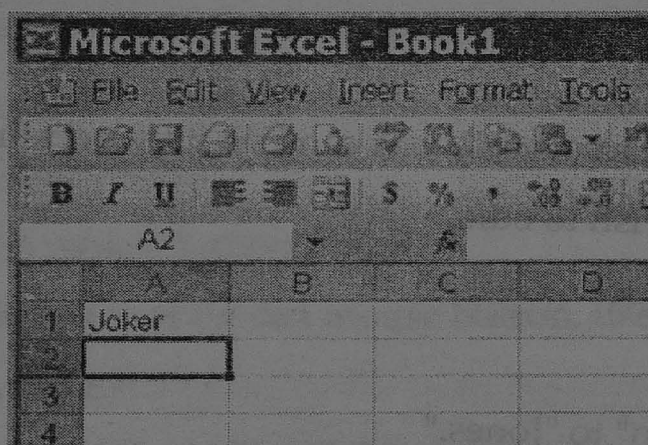
You can also edit the cell by using the Formula bar. You can change "Jones" to "Joker" as follows:

Space for
Hint

1. Move the cursor to cell A1.
2. Click in the formula area of the Formula bar.



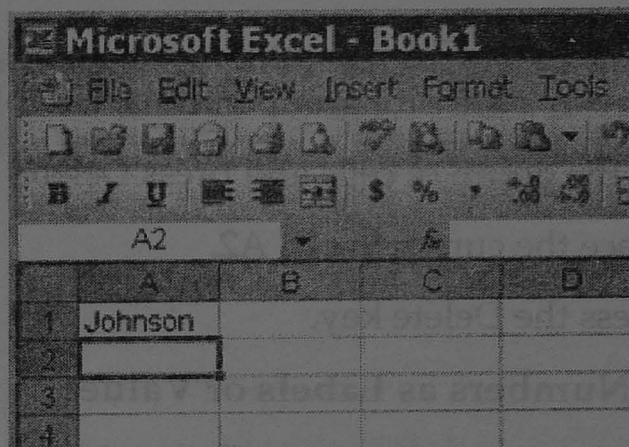
3. Use the backspace key to erase the "s," "e," and "n."
4. Type ker.
5. Press Enter.



4.2.3 Alternate Method: Editing a Cell by Double-Clicking in the Cell

You can change "Joker" to "Johnson" as follows:

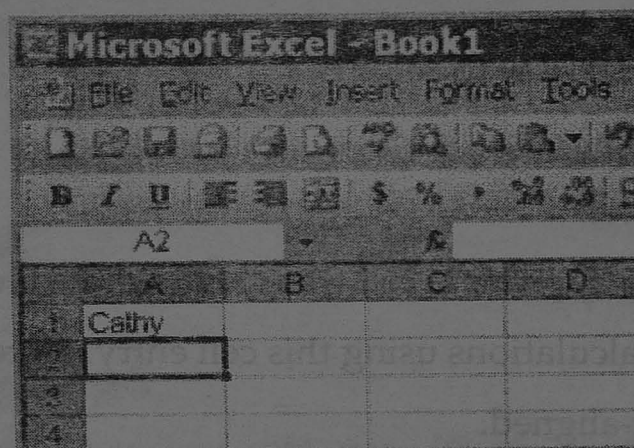
1. Move the cursor to cell A1.
2. Double-click in cell A1.
3. Press the End key. Your cursor is now at the end of your text.
4. Use the backspace to erase "r," "e," and "k."
5. Type hnson.
6. Press Enter.



4.2.4 Changing a Cell Entry

Typing in a cell while you are in the Ready mode replaces the old cell entry with the new information you type.

1. Move the cursor to cell A1.
2. Type **Cathy**.
3. Press Enter. The name "Cathy" should replace "Johnson."



4.2.5 Wrapping Text

When you enter text that is too long to fit in a cell into a cell, it overlaps the next cell. If you do not want it to overlap the next cell you can wrap the text.

1. Move to cell A2.
2. Type **Text too long to fit.**
3. Press Enter.
4. Return to cell A2.
5. Choose Format > Cells from the menu.
6. Choose the Alignment tab.
7. Click Wrap Text.
8. Click OK. The text wraps.

4.2.6 Deleting a Cell Entry

To delete an entry in a cell or a group of cells, you place the cursor in the cell or highlight the group of cells and press Delete.

1. Place the cursor in cell A2.
2. Press the Delete key.

4.2.7 Entering Numbers as Labels or Values

In Microsoft Excel, you can enter numbers as labels or as values. Labels are alphabetic, alphanumeric, or numeric text on which you do not perform mathematical calculations. Values are numeric text on which you perform mathematical calculations. If you have a numeric entry, such as an employee number, on which you do not perform mathematical calculations, enter it as a label by typing a single quotation mark first.

Enter a number:

1. Move the cursor to cell B1.
2. Type 100.
3. Press Enter.

The number 100 appears in cell B1 as a numeric value. You can perform mathematical calculations using this cell entry. Note that by default the number is right-aligned.

Enter a value:

1. Move the cursor to cell C1.
2. Type '100.
3. Press Enter.

The number 100 appears in cell C1 as a label. Note that by default the cell entry is left-aligned and a green triangle appears in the upper left corner of the cell.

4.2.8 Usage of formulae

Making Numeric Entries

In Microsoft Excel, you can enter numbers and mathematical formulas into cells. When a number is entered into a cell, you can perform mathematical calculations such as addition, subtraction, multiplication, and division.

When entering a mathematical formula, precede the formula with an equal sign. Use the following to indicate the type of calculation you wish to perform:

+ Addition

- Subtraction

* Multiplication

/ Division

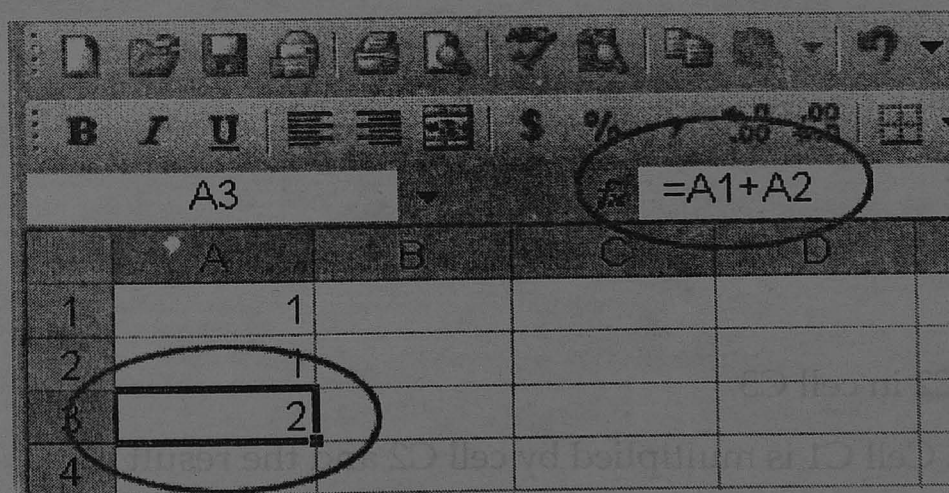
^ Exponential

4.2.9 Performing Mathematical Calculations

The following exercises demonstrate how to perform mathematical calculations.

4.2.9.1 Addition

1. Move your cursor to cell A1.
2. Type 1.
3. Press Enter.
4. Type 1 in cell A2.
5. Press Enter.
6. Type `=A1+A2` in cell A3.
7. Press Enter. Cell A1 has been added to cell A2, and the result is shown in cell A3.



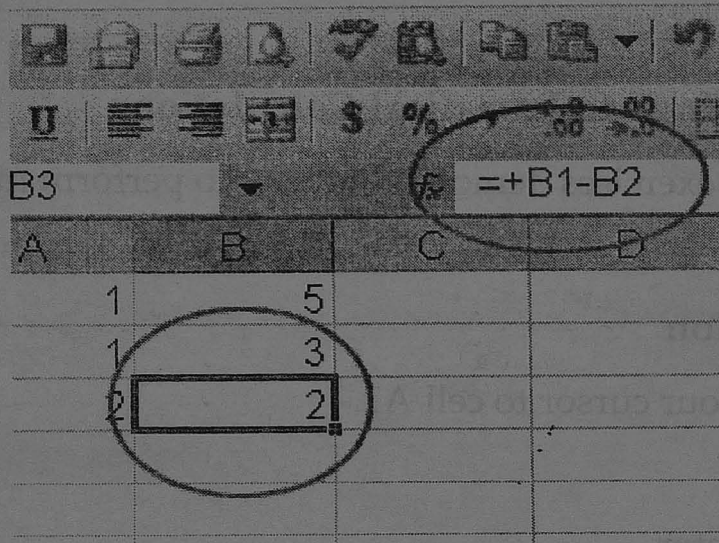
[Place the cursor in cell A3 and look at the Formula bar.]

4.2.9.2 Subtraction

1. Press F5. The Go To dialog box opens.
2. Type B1 in the Reference field.

Space for
Hint

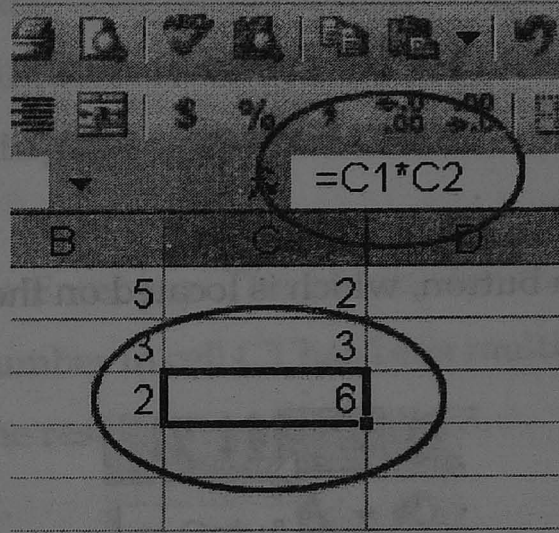
3. Press Enter. The cursor should move to cell B1.
4. Type 5 in cell B1.
5. Press Enter.
6. Type 3 in cell B2.
7. Press Enter.
8. Type **=+B1- B2** in cell B3.
9. Press Enter. Cell B1 has been subtracted from B2, and the result is shown in cell B3.



Place the cursor in cell B3 and look at the Formula bar.

4.2.9.3 Multiplication

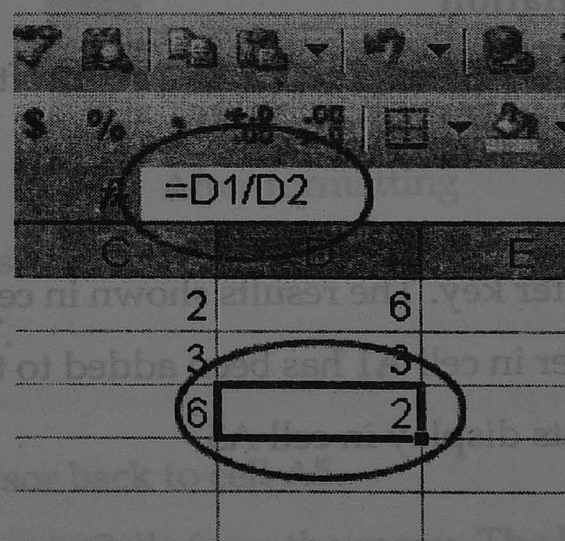
1. Hold down the Ctrl key while you press "g" (Ctrl-g). The Go To dialog box opens.
2. Type **C1** in the Reference field.
3. Press Enter. You should now be in cell C1.
4. Type 2 in cell C1.
5. Press Enter.
6. Type 3 in cell C2.
7. Press Enter.
8. Type **=C1*C2** in cell C3.
9. Press Enter. Cell C1 is multiplied by cell C2 and the result is displayed in cell C3.



Place the cursor in cell C3 and look at the Formula bar.

4.2.9.4 Division

1. Press F5.
2. Type D1 in the Reference field.
3. Press Enter. You should now be in cell D1.
4. Type 6 in cell D1.
5. Press Enter.
6. Type 3 in cell D2.
7. Press Enter.
8. Type =D1/D2 in cell D3.
9. Press Enter. Cell D1 is divided by cell D2 and the result is displayed in cell D3.



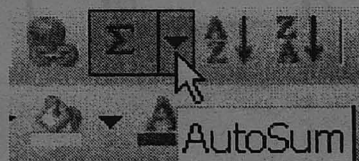
Place the cursor in cell D3 and look at the Formula bar.

4.2.9.5 The AutoSum Icon

The AutoSum icon on the Standard toolbar automatically adds a column of numbers. The following illustrates the SUM function:

Space for
Hint

1. Go to cell F1.
2. Type 3. Press Enter.
3. Type 3. Press Enter.
4. Type 3. Press Enter.
5. Click the AutoSum button, which is located on the Standard toolbar.



6. F1 to F3 should now be highlighted.
7. F1 to F3 should now be highlighted.
8. Press Enter. Cells F1 through F3 are added.

4.2.9.6 Automatic Calculation

If you have automatic calculation turned on, Microsoft Excel recalculates the worksheet as you change cell entries. You can check to make sure automatic calculation is turned on.

Setting Automatic Calculation

1. Choose Tools > Options from the menu.
2. Choose the Calculation tab.
3. Select Automatic if it is not already selected.
4. Click OK.

Trying Automatic Calculation

Make the changes outlined below and note how Microsoft Excel automatically recalculates.

1. Move to cell A1.
2. Type 2. Press the Enter key. The results shown in cell A3 have changed. The number in cell A1 has been added to the number in cell A2 and the results display in cell A3.
3. Move to cell B1.
4. Type 6.

5. Press the Enter key. The results shown in cell B3 have changed. The number in cell B1 has been subtracted from the number in cell B2 and the results display in cell B3.
6. Move to cell C1.
7. Type 4. Press the Enter key. The results shown in cell C3 have changed. The number in cell C1 has been multiplied by the number in cell C2 and the results display in cell C3.
8. Move to cell D1.
9. Type 12. Press the Enter key. The results shown in cell D3 have changed. The number in cell D1 has been divided by the number in cell D2 and the results display in cell D3.

4.2.9.7 Formatting Numbers

You can format the numbers you enter into Microsoft Excel. You can add commas to separate thousands, specify the number of decimal places, place a dollar sign in front of the number, or display the number as a percent in addition to several other options.

4		
5	1234567	
6		

Before formatting

4		
5	1,234,567.00	
6		

After formatting

1. Move the cursor to cell A5.
2. Type **1234567**.
3. Press Enter.
4. Move the cursor back to cell A5.
5. Choose Format > Cells from the menu. The Format Cells dialog box will open.
6. Choose the Number tab.
7. Click Number in the Category box.

Space for
Hint

8. Type 2 in the Decimal Places box.
9. Place a check mark in the Use 1000 Separator box.
10. Click OK. The number should now display with two decimal places. The thousands should now be separated by commas.

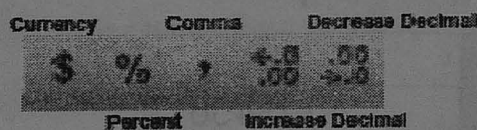
Adding a Dollar Sign to a Numeric Entry

1. Move the cursor to cell A5.
2. Choose Format > Cells from the menu. The Format Cells dialog box opens.
3. Choose the Number tab.
4. Click Currency in the Category box.
5. Make sure there is a "\$" in the Symbol box.
6. Click OK. The number displays with a dollar sign.

7.

4	
5	\$1,234,567.00
6	

Alternate Method: Formatting Numbers by Using the Toolbar



1. Move the cursor to cell A6.
2. Type 1234567.
3. Press Enter.
4. Move the cursor back to cell A6.
5. Click twice on the Increase Decimal icon to change the number format to two decimal places. Clicking on the Decrease Decimal icon decreases the decimal places.
6. Click once on the Comma Style icon to add commas to the number.
7. To change the number to a currency format, click Currency Style format.
8. Move the cursor to cell A7.
9. Type .35 (note the decimal point).

6	0.35
---	------

10. Press Enter.
11. Move the cursor back to cell A7.
12. Click the Percent Style icon to turn .35 to a percent.

6	35%
---	-----

4.2.9.8 More Advanced Mathematical Calculations

When you perform mathematical calculations in Microsoft Excel, be careful of precedence. Calculations are performed from left to right, with multiplication and division performed before addition and subtraction.

1. Move to a new worksheet by clicking on Sheet3 in the lower left corner of the screen.
2. Go to cell A1.
3. Type = 3+3+12/2*4.
4. Press Enter.

Note: Microsoft Excel divided 12 by 2, multiplied the answer by 4, added 3, and then added another 3. The answer, 30, displays in cell A1.

To change the order of calculation, use parentheses. Microsoft Excel calculates the information in parentheses first.

1. Double-click in cell A1.
2. Edit the cell to read = (3+3+12)/2*4.
3. Press Enter.

Note: Microsoft Excel added 3 plus 3 plus 12, divided the answer by 2, and multiplied the result by 4. The answer, 36, displays in cell A1.

4.2.9.9 Filling Cells Automatically

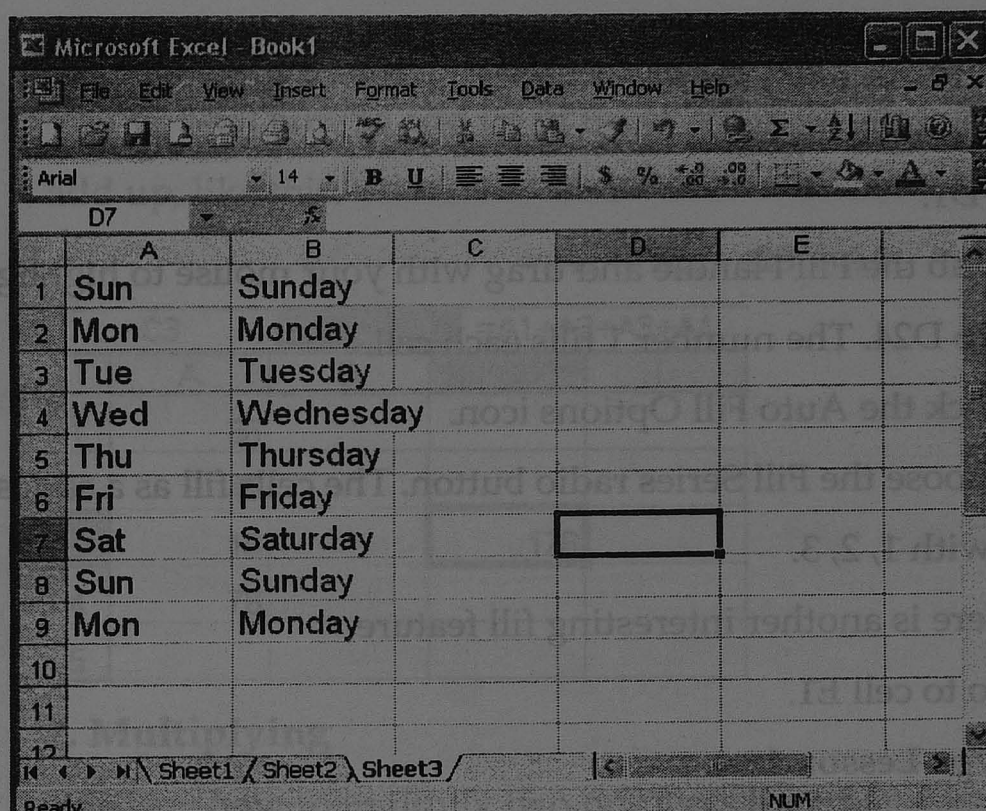
You can use Microsoft Excel to fill cells automatically with a series. For example, you can have Excel automatically fill in times, the days of the week or months of the year, years, and other types of series. Days of the week and months of the year fill in a similar fashion. The following demonstrates filling the days of the week:

1. Move to Sheet2.
2. Move to cell A1.
3. Type **Sun**.
4. Move to cell B1.
5. Type **Sunday**.
6. Highlight cells A1 to B1.
7. Bold cells A1 to B1.
8. Find the small black square in the lower right corner of the highlighted area. This is called the Fill Handle.
9. Grab the Fill Handle and drag with your mouse to fill cell A1 to B24. Note how the days of the week fill the cells in a series. Also, note that the Auto Fill Options icon appears.

10.

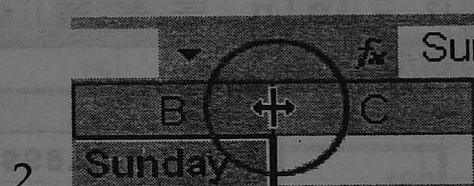
	A	B	C
1	Sun	Sunday	
2			
3			

11. Click the Auto Fill Options icon.
12. Choose the Copy Cells radio button. The entry in cells A1 and B1 are copied to all the cells highlighted.
13. Click the Auto Fill Options icon again.
14. Choose the Fill Series radio button. The cells fill as a series from Sunday to Saturday again.
15. Click the Auto Fill Options icon again.
16. Choose the Fill without Formatting radio button. The cells fill as a series from Sunday to Saturday, but the entries are not bolded.
17. Click the Auto Fill Options icon again.
18. Choose the Fill Weekdays radio button. The cells fill as a series from Monday to Friday.



Some of the entries in column B are too long to fit in the column. You can quickly adjust the column width to fit the longest entry.

1. Move your cursor over the line that separates column B and C. The Width Indicator appears.



3. Double-click. The Column adjusts to fit the longest entry.

The following demonstrates filling time:

1. Type 1:00 into cell C1.
2. Grab the Fill Handle and drag with your mouse to highlight cells A1 to A24. Note that each cell fills using military time.
3. Press Esc and then click anywhere on the worksheet to remove the highlighting.

To change the format of the time:

1. Select cells C1 to C24.
2. Choose Format > Cells from the menu.
3. Choose the Number tab.
4. In the Category box, choose Time.
5. In the Type box, choose 1:30 PM.

6. Click OK. The time is no longer in military time.

You can also fill numbers.

Type a 1 in cell D1.

1. Grab the Fill Handle and drag with your mouse to highlight cells D1 to D24. The number 1 fills each cell.
2. Click the Auto Fill Options icon.
3. Choose the Fill Series radio button. The cells fill as a series starting with 1, 2, 3.
3. Here is another interesting fill feature.
1. Go to cell E1.
2. Type Lesson 1.
3. Grab the Fill Handle and drag with your mouse to highlight cells E1 to E24.
4. The cells fill in as a series: Lesson 1, Lesson 2, Lesson 3, and so on.

Arial 12 B U 18						
	A	B	C	D	E	F
1					Lesson1	
2					Lesson2	
3					Lesson3	
4					Lesson4	
5					Lesson5	
6					Lesson6	
7					Lesson7	
8					Lesson8	
9					Lesson9	
10					Lesson10	
11					Lesson11	
12					Lesson12	
13					Lesson13	

4.3 Usage of Formulae & Functions

Formulas are equations that perform calculations on values in your worksheet. A formula starts with an equal sign (=). Formulas are at the heart of spreadsheet

1. Addition

You've seen how to add up in Excel. You either used individual cells to add up, like this:

$$= A1 + A2 + A3 + A4$$

	C3		A	=A1+A2+A3+A4
	A	B	C	D
1	36			
2	45			
3	19		176	
4	76			
5				

2. Multiplying

You saw how to multiply two numbers together. Just use the asterisk symbol with the cell references. Like this:

$$= A1 * A2$$

	C4		A	=A1*A2
	A	B	C	D
1	12			
2	15			
3				
4			180	
5				

3. Subtraction

To subtract one value from another, you just use the minus sign in between your cell references. Like this:

$$= A1 - C1$$

Below is an image from a spreadsheet showing a subtraction formula:

	A3		A	=A1-C1
	A	B	C	D
1	35		27	
2				
3	8			
4				
5				

Cell A3 is where the answer is displayed, and where we entered the formula.

If you want to subtract more than two cells you can do it like this:

$$= A1 - B1 - C1$$

4. Division

If you want to divide one number by another the symbol to use is this one:

/

That's the forward slash, and can be found just to the right of the full stop on your keyboard. You use it like this:

$$= A1 / C1$$

Below is an image from a spreadsheet showing a division formula:

	B4	=A1/C1		
	A	B	C	D
1	48		16	
2				
3				
4		3		
5				

5. Power

If you want to find the power for the particular number, you have to use the symbol

^

You use it like this:

$$= A1 ^ D1$$

Below is an image from a spreadsheet showing a Power formula

B4		=A1^C1		
	A	B	C	D
1	2		5	
2				
3				
4		32		
5				

6. Combined arithmetic operators

There are times when you will want to combine the arithmetic operators in your calculations. Here are a few examples of combining the operators

- Enter the number 25 in cell A1
- Enter the number 50 in cell A2
- Enter the number 2 in cell A3
- In cell A5 enter the following formula

$$=(A1 + A2) * A3$$

D4				
	A	B	C	D
1	25			
2	50			
3	2			
4				150
5				

The answer you should have got was 150. Notice the brackets in the formula. The brackets group part of your sum together. Without them, Excel will normally calculate from left to right

4.3.1 Functions

Microsoft Excel has a set of prewritten formulas called functions.

Functions differ from regular formulas in that you supply the value but not the operators, such as +, -, *, or /. For example, you can use the SUM function to add. When using a function, remember the following:

Use an equal sign to begin a formula.

Specify the function name.

Enclose arguments within parentheses.

Use a comma to separate arguments.

Here is an example of a function:

`=SUM(2,13,A1,B27)`

In this function:

The equal sign begins the function.

SUM is the name of the function.

2, 13, A1, and B27 are the arguments.

Parentheses enclose the arguments.

A comma separates the arguments.

The SUM function adds the arguments together. In the exercises that follow, we will look at various functions.

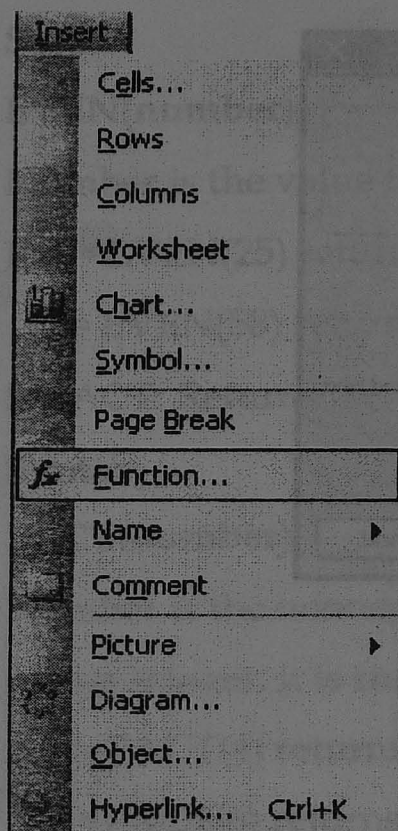
Method I

1. Type **12** in cell B1.
2. Press Enter.
3. Type **27** in cell B2.
4. Press Enter.
5. Type **24** in cell B3.
6. Press Enter.
7. Type **=SUM(B1:B3)** in cell A4.
8. Press Enter. Microsoft Excel sums cells B1 to B3.

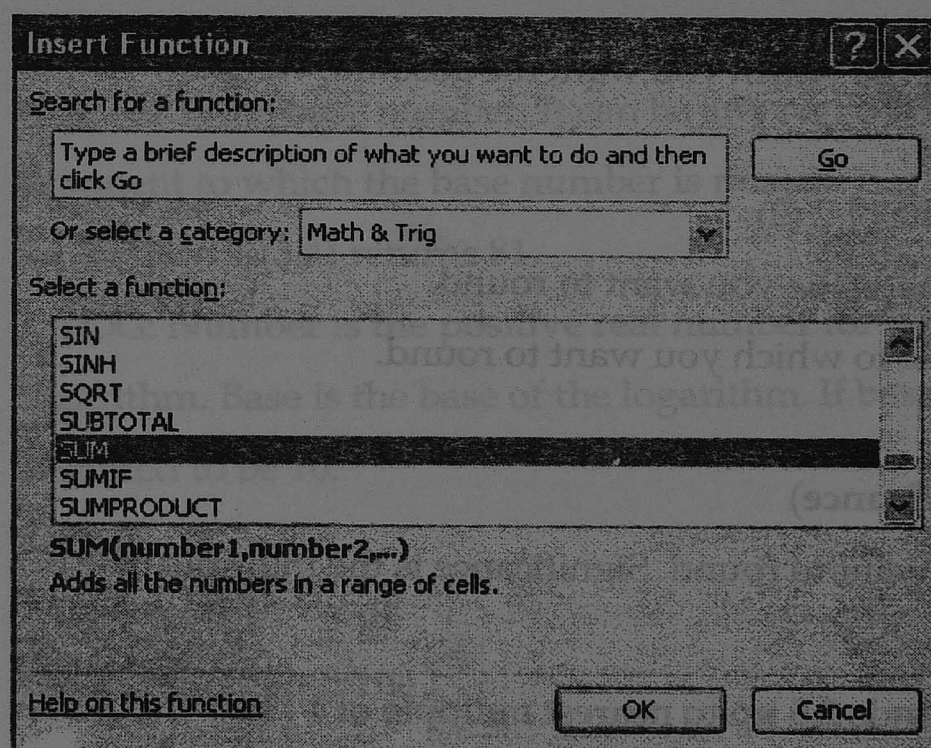
A5		=SUM(B1:B3)		
	A	B	C	D
1		12		
2		27		
3		24		
4				
5	63			

Method II

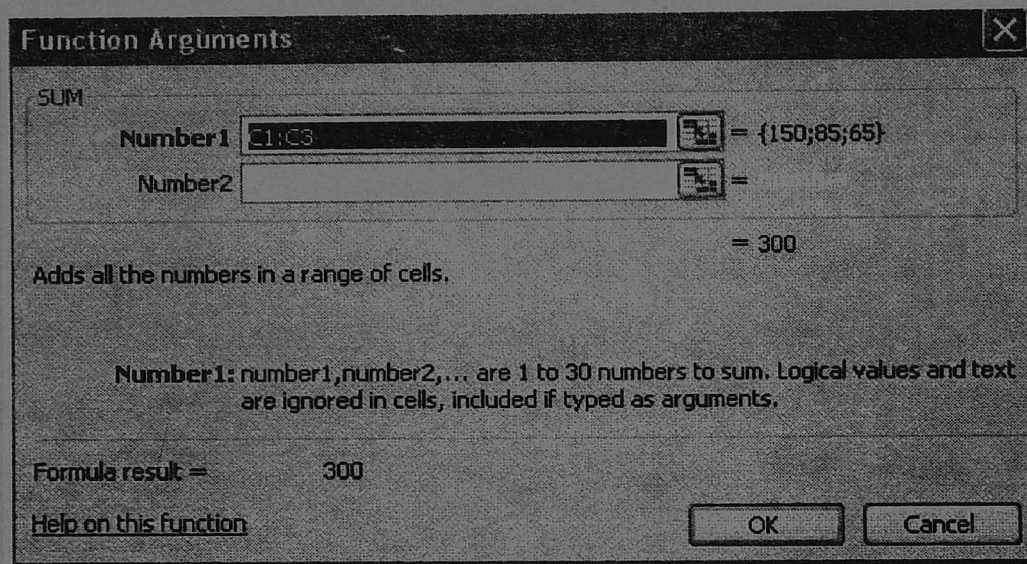
1. Type **150** in cell C1.
2. Press Enter.
3. Type **85** in cell C2.
4. Press Enter.
5. Type **65** in cell C3.
6. Press Enter. Your cursor should be in cell C4.
7. Choose Insert > Function from the menu.



8. Choose Math & Trig in the Or Select A Category box.
9. Click Sum in the Select A Function box.



10. Click OK. The Functions Arguments dialog box opens.
11. Type C1:C3 in the Number1 field, if it does not automatically appear.



12. Click OK. Microsoft Excel sums cells C1 to C3.

4.3.2 Math & Trig Functions

1. ABS: Returns the absolute value of a number, a number without its sign.

Syntax

ABS(number)

Number is the real number of which you want the absolute value.

Ex: =ABS(- 34) returns 34.

=ABS(2) Absolute value of 2 (2)

2. CEILING: Number is the value you want to round.

Significance is the multiple to which you want to round.

Syntax

CEILING(number, significance)

Number is the value you want to round. Significance is the multiple to which you want to round.

Ex: =CEILING(2.5, 1) Rounds 2.5 up to nearest multiple of 1 (3)

=CEILING(-2.5, -2) Rounds -2.5 up to nearest multiple of -2 (-4)

3. COS: Returns the cosine of an angle.

Syntax

COS(number)

Number is the angle in radians for which you want the cosine.

Ex: =COS(0) returns 1

4. EVEN: Rounds a number up to a nearest even integer.

Syntax**EVEN(number)**

Number is the value to round.

Ex: =EVEN(25) returns 26.

=EVEN(58) returns 58.

5. FACT: Returns factorial value of a given number.

Syntax**FACT(number)**

Number is the nonnegative number you want the factorial of. If number is not an integer, it is truncated.

Ex: =FACT(4) returns 24.

=FACT(6) returns 720.

6. POWER: Returns the result of a number raised to a power.

Syntax**POWER(number, power)**

Number is the base number. It can be any real number. Power is the exponent to which the base number is raised.

Ex: =POWER(3,4) returns 81.

7. LOG: Number is the positive real number for which you want the logarithm. Base is the base of the logarithm. If base is omitted, it is assumed to be 10.

Syntax**LOG(number, base)**

Ex: =LOG(10) returns 1

=LOG(8,2) returns 3.

8. ROMAN: Converts an Arabic number to Roman.

Syntax

ROMAN(number, form). Form is a number specifying the type of roman numeral you want

Ex: =ROMAN(67) returns LXVII

9. ROUND: Rounds a number to a specified number of digits.

Syntax

ROUND(number, num_digits). Num_digits specifies the number of digits to which you want to round number.

Ex: =ROUND(300.455, 2) returns 300.46

=ROUND(400.56, 0) returns 401

10. **SQRT:** Returns the square root of a number.

Syntax

SQRT(number)

Ex: =SQRT(5) returns 2.236068

=SQRT(16) returns 4.

4.3.3 Text Functions

1. **CHAR:** Returns the character specified by the code number from the character set for our computer.

CHAR(number)

Number is a number between 1 and 255 specifying which character you want

Ex: =CHAR(71) returns G

2. **CODE:** Returns a numeric code for the first character in a text string, in the character set used by our computer.

Syntax

CODE(text)

Text is the text for which you want the code of the first character.

Ex: =CODE("G") returns 71

3. **CONCATENATE (text1,text2,...):** Text1, text2, ... are 1 to 30 text items to be joined into a single text item. The text items can be text strings, numbers, or single-cell references.

Syntax

CONCATENATE (text1,text2,...)

Text1, text2, ... are 1 to 30 text items to be joined into a single text item

Ex: =CONCATENATE("mean","mode") returns meanmode.

4. **EXACT**: Compares two text strings and returns TRUE if they are exactly the same, FALSE otherwise. EXACT is case-sensitive but ignores formatting differences. Use EXACT to test text being entered into a document.

Syntax

EXACT(text1,text2)

Text1 is the first text string.

Text is the second text string.

Ex: **Exact("BOX", "box")** returns False.

5. **LEN**: LEN returns the number of characters in a text string

Syntax

LEN(text)

Ex: **=LEN("GEETHA")** returns 6.

6. **PROPER**: Capitalizes the first letter in a text string and any other letters in text that follow any character other than a letter. Converts all other letters to lowercase letters.

Syntax

PROPER(text)

Text is text enclosed in quotation marks, a formula that returns text, or a reference to a cell containing the text you want to partially capitalize.

Ex: **=PROPER("I love india")** returns I Love India

7. **LOWER**: Converts all uppercase letters in a text string to lowercase.

Syntax

LOWER(text)

Text is the text you want to convert to lowercase. LOWER does not change characters in text that are not letters

Ex: **=LOWER("TREE")** returns tree.

8. **UPPER**: Converts text to uppercase.

Syntax

UPPER(text)

Text is the text you want converted to uppercase. Text can be a reference or text string

Ex: =UPPER("bLuE") returns BLUE.

9.REPT: Repeats text a given number of times

Syntax

REPT(text, number_times)

Text is the text you want to repeat.

Number_times is a positive number specifying the number of times to repeat text.

Ex: =REPT("@",7) returns @@@@ @@@.

10. TRIM: Removes all spaces from text except for single spaces between words.

Syntax

TRIM(text)

Text is the text from which you want spaces removed.

Ex: =TRIM("I LOVE INDIA") returns I LOVE INDIA.

4.3.4 Statistical Functions

1. AVERAGE: To calculate the average of a series of numbers.

Syntax

AVERAGE(number1,number2,...)

Number1, number2, ... are 1 to 30 numeric arguments for which you want the average

Ex: =AVERAGE(18,24,81) returns 41.

2.COUNT: Counts the number of cells that contain numbers and also numbers within the list of arguments

Syntax:

COUNT(value1,value2,...)

Value1, value2, ... are 1 to 30 arguments that can contain or refer to a variety of different types of data, but only numbers are counted.

Ex: =COUNT(55,"sujith",777) returns 2.

3. **LARGE** : Returns the k-th largest value in a data set. You can use this function to select a value based on its relative standing.

Syntax

LARGE(array,k)

Array is the array or range of data for which you want to determine the k-th largest value. **K** is the position (from the largest) in the array or cell range of data to return.

Ex: The cell A1 to A4 contains 45, 67, 23 and 77. The function
=LARGE(A1:A4,2) returns 67.

C4		=LARGE(A1:A4,2)	
	A	B	C
1	45		
2	67		
3	23		
4	77		67
5			

4. **MAX**: Returns the largest value in a set of values.

Syntax

MAX(number1,number2,...)

Number1, number2, ... are 1 to 30 numbers for which you want to find the maximum value.

Ex: =MAX(45,97,77,67) returns 97.

5. **MIN**: Returns the smallest number in a set of values.

Syntax

MIN(number1,number2,...)

Number1, number2, ... are 1 to 30 numbers for which you want to find the minimum value.

Ex: The cell A1 to A4 contains 55, 66, 23 and 77. The function

=MIN(A1:A4) returns 23.

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C2 =MIN(A1:A4)			
	A	B	C
1	55		
2	66		23
3	23		
4	77		
5			

6. **SMALL**: Returns the k-th smallest value in a data set. Use this function to return values with a particular relative standing in a data set.

Syntax

SMALL(array,k)

Array is an array or range of numerical data for which you want to determine the k-th smallest value.

K is the position (from the smallest) in the array or range of data to return

Ex: The cell A1 to A4 contains 77, 53, 87 and 12. The function

=SMALL(A1:A4,3) returns 77.

7. **STDEV**: Estimates standard deviation based on a sample. The standard deviation is a measure of how widely values are dispersed from the average value.

Syntax

STDEV(number1,number2,...)

Number1, number2, ... are 1 to 30 number arguments corresponding to a sample of a population.

STDEV uses the following formula:
$$\sqrt{\frac{\sum (X - \bar{X})^2}{n}}$$

Ex: =STDEV(12,10,26) returns 8.717797887

8. **MODE**: Returns the most frequently occurring, or repetitive, value in an array or range of data.

Syntax

MODE(number1,number2,...)

Number1, number2, ... are 1 to 30 arguments for which you want to calculate the mode

Ex: =MODE(3,4,4,1,5) returns 4.

Check Your Progress

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1. Write a short note on Excel
2. Define cell and row and column.
3. Explain Formula Bar
4. What is mean by worksheet
5. Explain the Excel page.
6. How to Enter a data in excel?
7. Explain the mathematic calculations with detailed example.
8. Explain auto sum calculation
9. How to format a numbers.
10. Explain Math and Trig Functions with examples.
11. Explain Text functions with examples.
12. Explain Statistical functions with examples.

5.1.1 Type of Charts

1. Column Chart
2. Bar Chart
3. Line Chart
4. Pie Chart
5. XY Chart
6. Area Chart
7. Doughnut Chart
8. Radar Chart
9. Surface Chart
10. Bubble Chart
11. Stock Chart
12. Cylinder Chart
13. Cone Chart
14. Pyramid Chart

5.1.2 Column Chart

Column chart is nothing but a clustered column. It compares the values across categories.

OBJECTIVES

After going through this lesson you would be in a position to

- Usage of Charts
- Types of Charts
- Data Manipulation
- Types of functions

5.1 Creating an Excel Chart

Chart:

Often a worksheet contains so much numeric data that it becomes difficult to accurately analyse it and to take a correct decision. In such cases, the facility to represent data in the form of charts (Graphs). Because charts convey message clearly and quickly, they play a very important role in the business world. Excel allows you to view graphs on the screen as well as to print them. To create a chart, all you need to do is to select the range that you want to include in the chart and use the wizard called Chart Wizard.

5.1.1 Type of Charts.

1. Column Chart
2. Bar Chart
3. Line Chart
4. Pie Chart
5. XY Chart
6. Area Chart
7. Doughnut Chart
8. Radar Chart
9. Surface Chart
10. Bubble Chart
11. Stock Chart
12. Cylinder Chart
13. Cone Chart
14. Pyramid Chart

5.1.2 Column Chart:

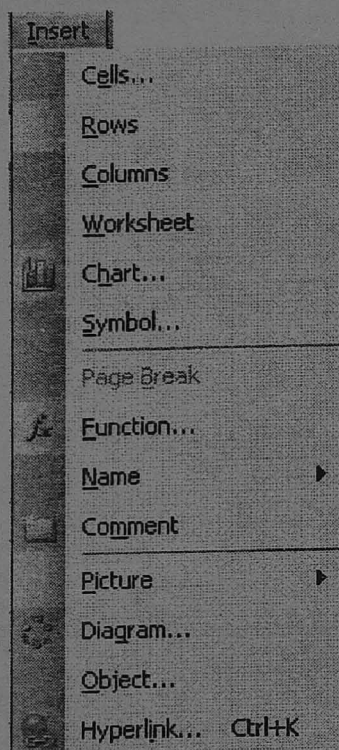
Column chart is nothing but a clustered column. It compares the values across categories.

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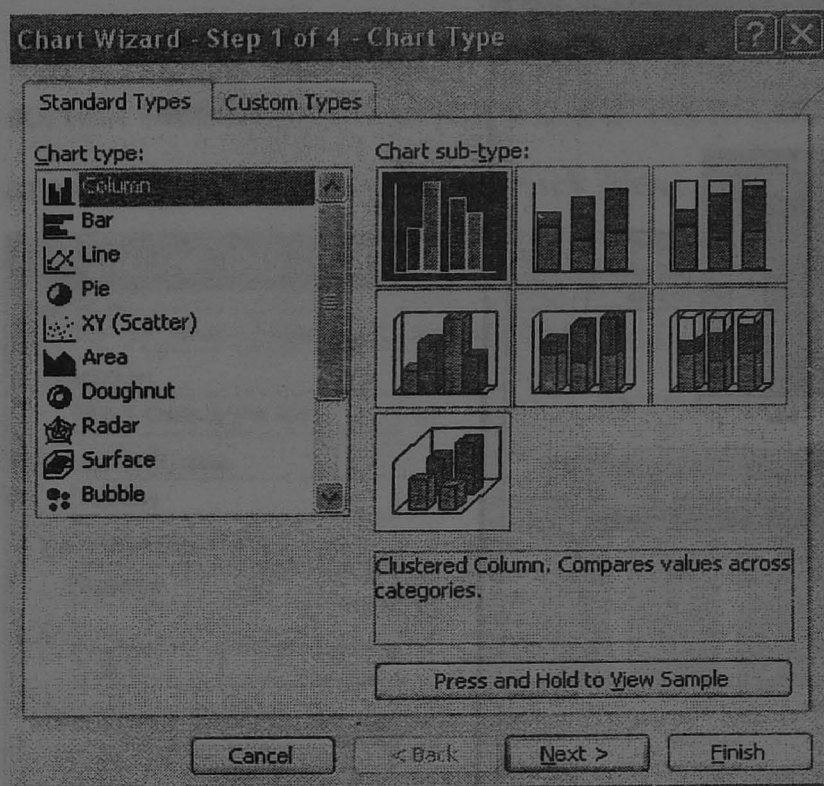
Enter a data in the work sheet and select all the cell values.

	A	B	C	D
1		Jan	Feb	Mar
2	Cost	1200	2450	3510
3	Overheads	2600	3500	4050
4	Sales	4250	4600	3500

From the Insert menu select Chart



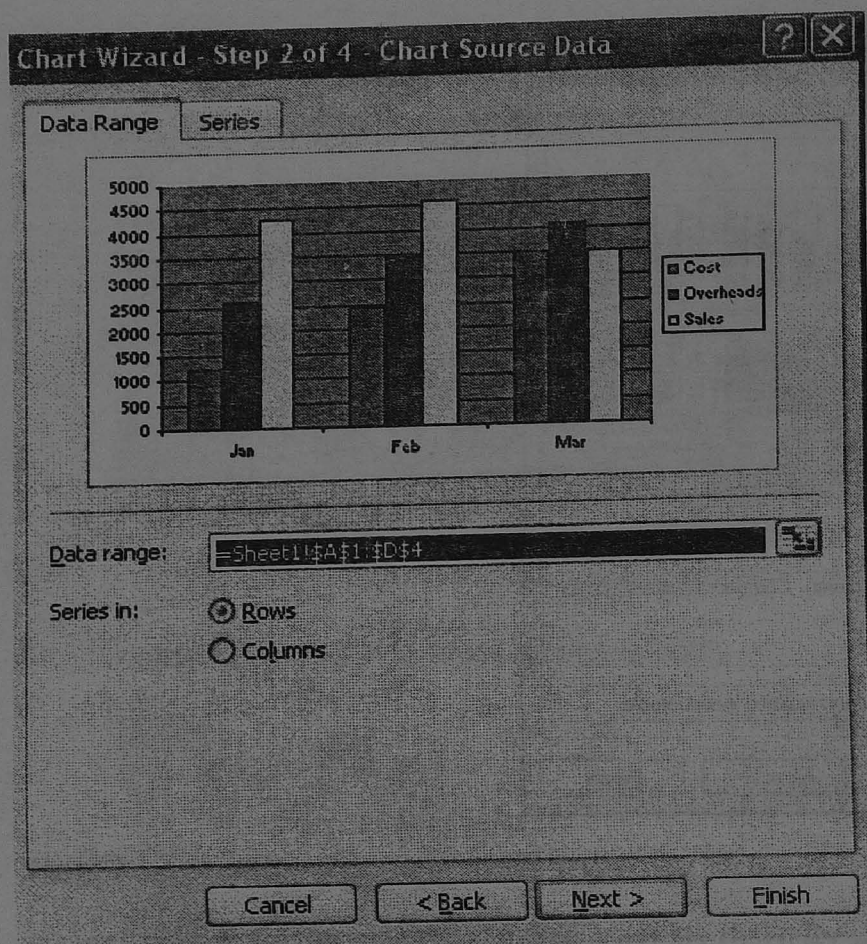
The following chart wizard appears. Under the Chart Type select Column.



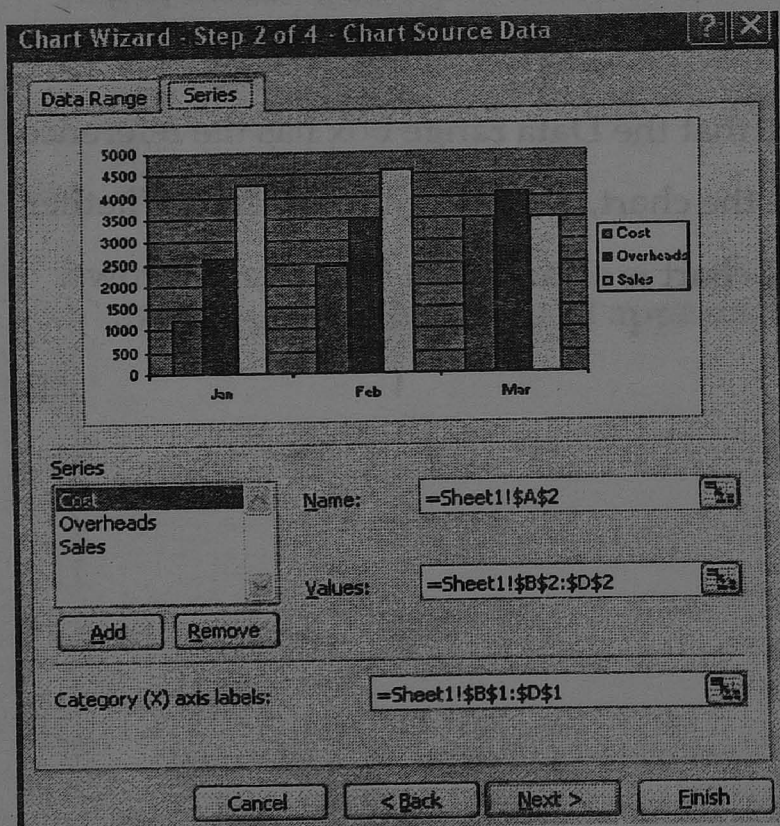
When we click a chart type, the subtypes for that type appear in the **Chart sub-type** section, and a description of the default subtype for that type appears in the descriptions and gets a preview of how our data would appear in a specific chart subtype by selecting the subtype and using the **Press and Hold View Sample** button. When we have selected the type and subtype for our chart, click **Next** to move to the next wizard page.

On this wizard page, we ensure that the **Data range** box has the reference for the cells to be used to create the chart, and we tell the wizard whether the data to be used to create the chart is arranged in columns and rows.

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Once we have ensured that the correct cells and their arrangement have been selected, we can click the **Series** tab to name the data series, or set of values used to define the contents of the chart.



The cell range used to create this chart has the data labels included, so the correct labels appear in the wizard. We should verify that the series labels are indeed correct and then click Next.

Chart Wizard - Step 3 of 4 - Chart Options

Titles Axes Gridlines Legend Data Labels Data Table

Chart title:
B & T Compay Pvt Ltd

Category (X) axis:
Months

Value (Y) axis:
Rupees

Second category (X) axis:

Second value (Y) axis:

Cancel < Back Next > Finish

This wizard page lets us set the appearance of our chart, such as by adding a chart title and labels for both the horizontal axes and vertical axes. After we type a label or a title in a box, the preview of the chart will change to reflect that addition. The other tab pages available on this wizard screen lets us change the appearance of the chart, such as by adding gridlines to reflect changes the appearance of the chart, such as by adding gridlines to reflect changes in value. Changing the position of or hiding the legend, or labeling the columns, or points on our chart. When we are satisfied with the charts appearance, click Next to move to the final Chart Wizard page.

Chart Wizard - Step 4 of 4 - Chart Location

Place chart:

☒ As new sheet: Chart1

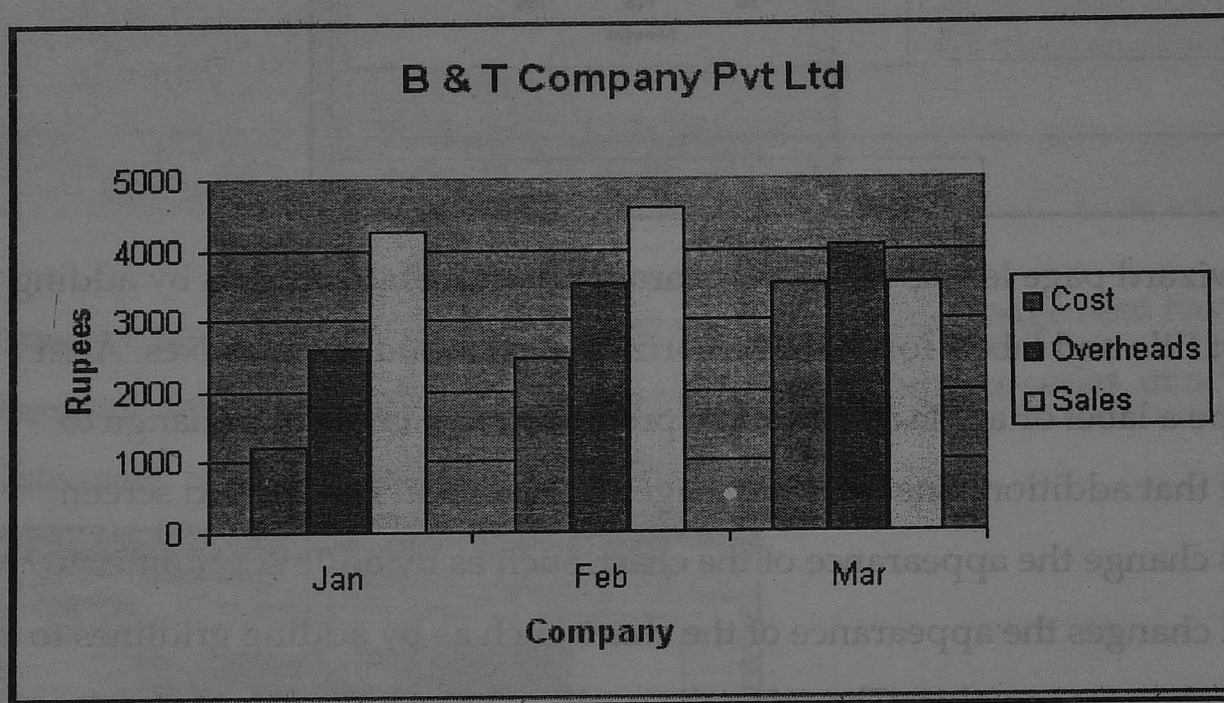
☐ As object in: Sheet1

Cancel < Back Next > Finish

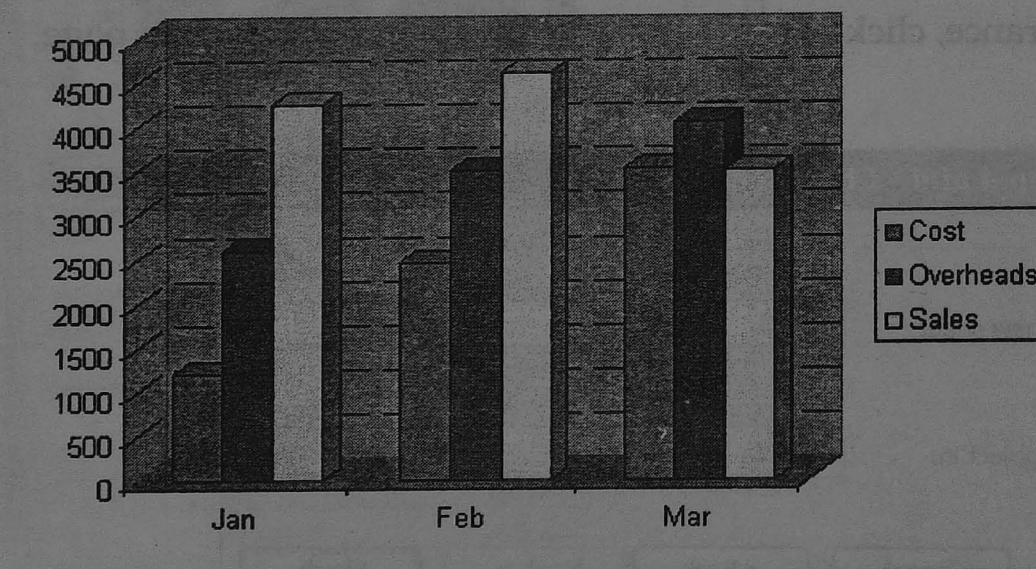
On this wizard page, we can choose to create our chart on a new page by selecting the **As new sheet** option button or as part of an existing worksheet. The name of the worksheet with the data used to create the chart appears in the **As object in** box, but we can choose another worksheet by clicking the down arrow at the right edge of the **As object in** box and clicking the name of another worksheet from the list that appears.

When we click **Finish**, the chart appears in the selected worksheet.

Example of 2-D Column Chart



Example of 3-D Column Chart



We can also change the chart's fill effect, or background, by opening the **Format Chart Area** dialog box. To open that dialog box, we right-click the chart's Chart Area and then choose **Format Chart Area** from the shortcut menu that appears.

We can change the charts background color by clicking any of the color squares on the palette in the **Area** section of the dialog box. To change the chart's fill effect, click the **Fill Effects** button.

We can use the controls in the **Fill Effects** dialog box to choose the color scheme, texture, pattern, or picture to serve as the background for the active chart.

Change fills and lines in charts

Use this procedure to change colors, apply a texture or pattern, or change the line width or border style for data markers, the chart area, the plot area, gridlines, axes, and tick marks in 2-D and 3-D charts, trend lines and error bars in 2-D charts, and the walls and floor in 3-D charts.

1. Double-click the chart item you want to change.
2. If necessary, click the **Patterns** tab, and then select the options you want.

To specify a fill effect, click **Fill Effects**, and then select the options you want on the **Gradient**, **Texture**, or **Pattern** tabs.

Make chart data easier to read by adding bars or lines

You can add series lines to connect data series in 2-D stacked bar and column charts. Drop lines are available in 2-D and 3-D area and line charts. High-low lines and up-down bars are available in 2-D line charts. Stock charts already have high-low lines and up-down bars.

1. Click a data series in the chart that you want to add bars or lines to.
2. On the **Format** menu, click **Selected Data Series**, and then click the **Options** tab.
3. Select the option for the type of lines or bars you want.

5.1.3 Select a different chart type

For most 2-D charts, you can change the chart type of either a data series or the entire chart. For bubble charts, you can change only the type of the entire chart. For most 3-D charts, changing the chart type affects the entire chart. For 3-D bar and column charts, you can change a data series to the cone, cylinder, or pyramid chart type.

1. To change the chart type, do one of the following:

- For the entire chart, click the chart.
- For a data series, click the data series.

2. On the **Chart** menu, click **Chart Type**.

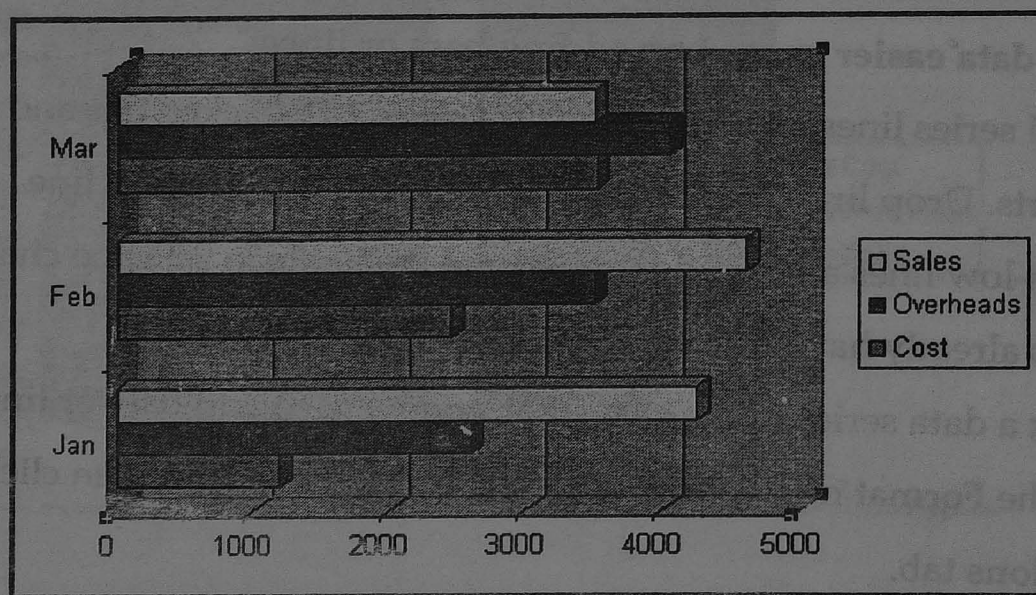
3. On the **Standard Types** tab, click the chart type you want.

If you are changing the chart type for one data series and not the entire chart, be sure the **Apply to selection** check box is selected.

To apply the cone, cylinder, or pyramid chart type to a 3-D bar or column data series, click **Cylinder**, **Cone**, or **Pyramid** in the **Chart type** box on the **Standard Types** tab, and then select the **Apply to selection** check box.

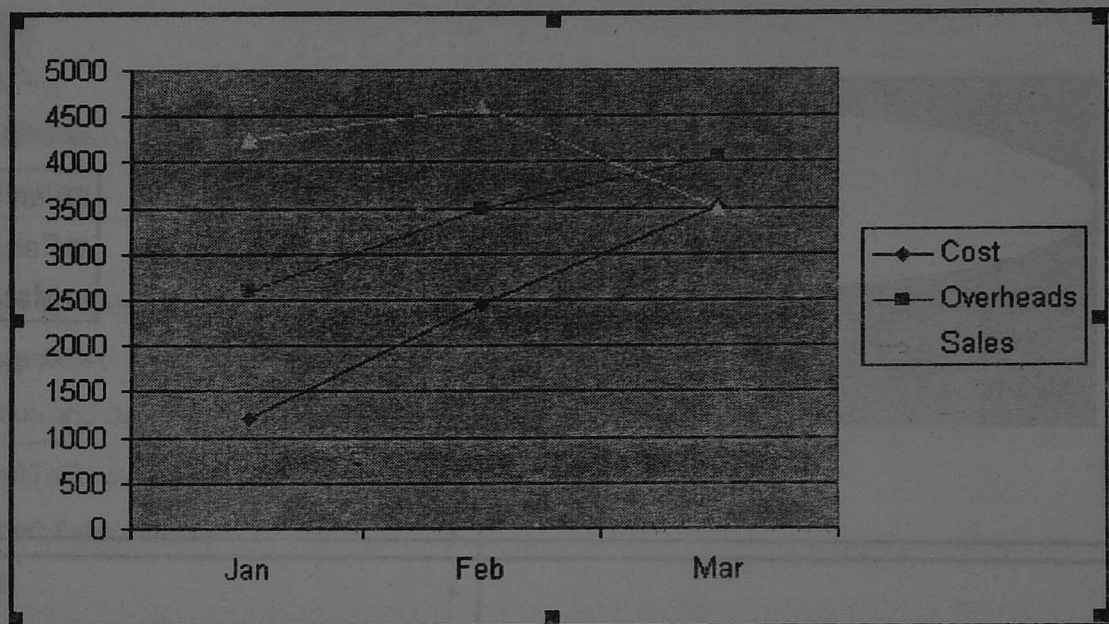
5.1.4 Bar Chart

It is nothing but clustered Bar. It compares the values across the categories.



5.1.5 Line chart

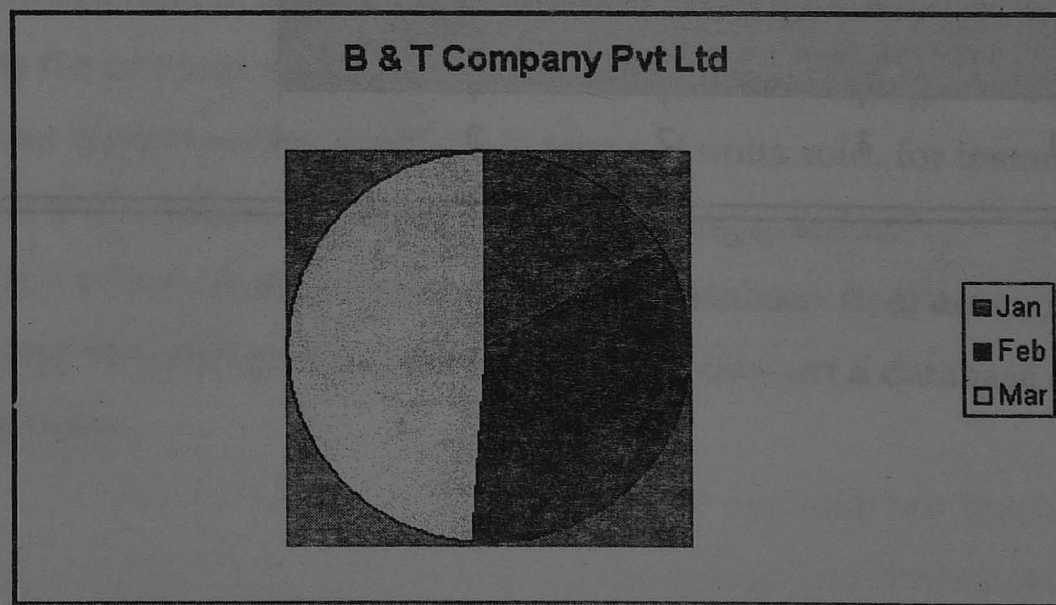
Line chart displays the data as lines. Lines with markers displayed at each data value.



5.1.5 Pie Chart

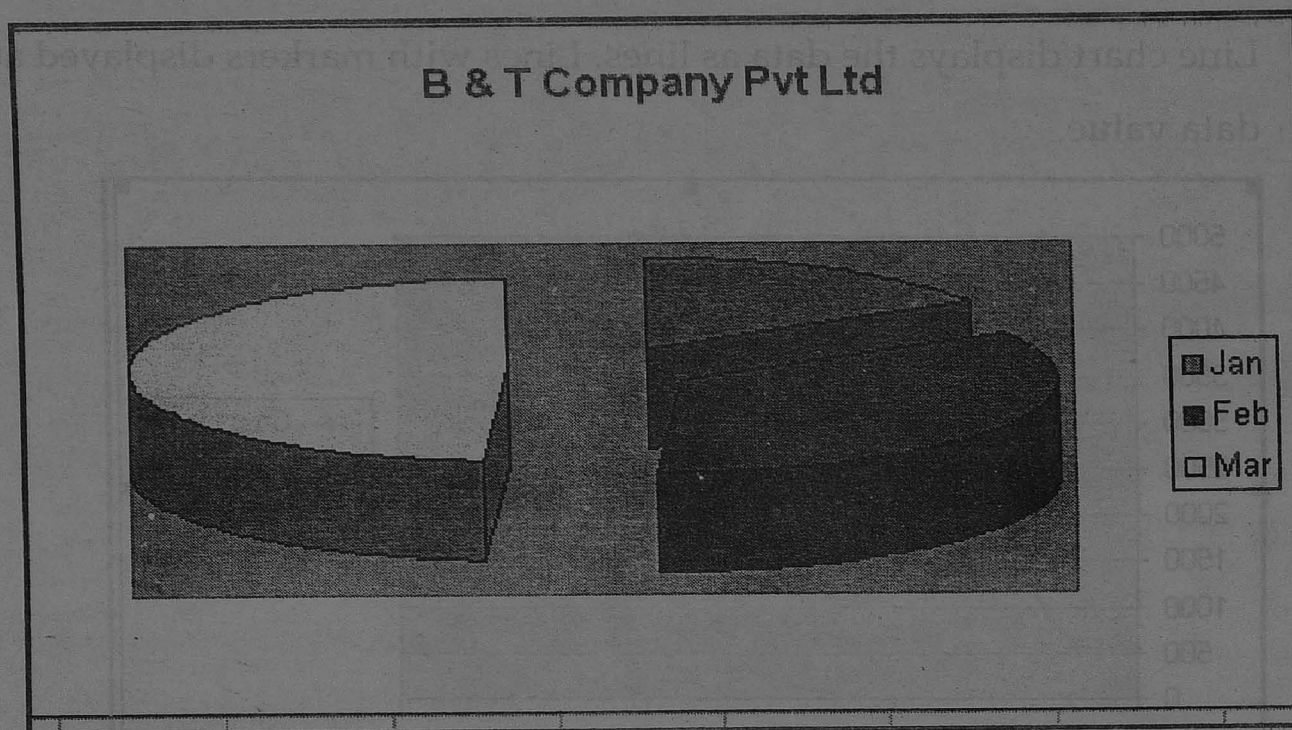
A pie chart presents the various data values of a range as wedge-shaped sections of a circle. It displays the percentage of each part of the total of all values in the range. The total or the circle represents 100 percent. This chart is suitable to display the budget allocation to different departments, to compare the profit for the different divisions of a company.

Example of 2-D Pie Chart



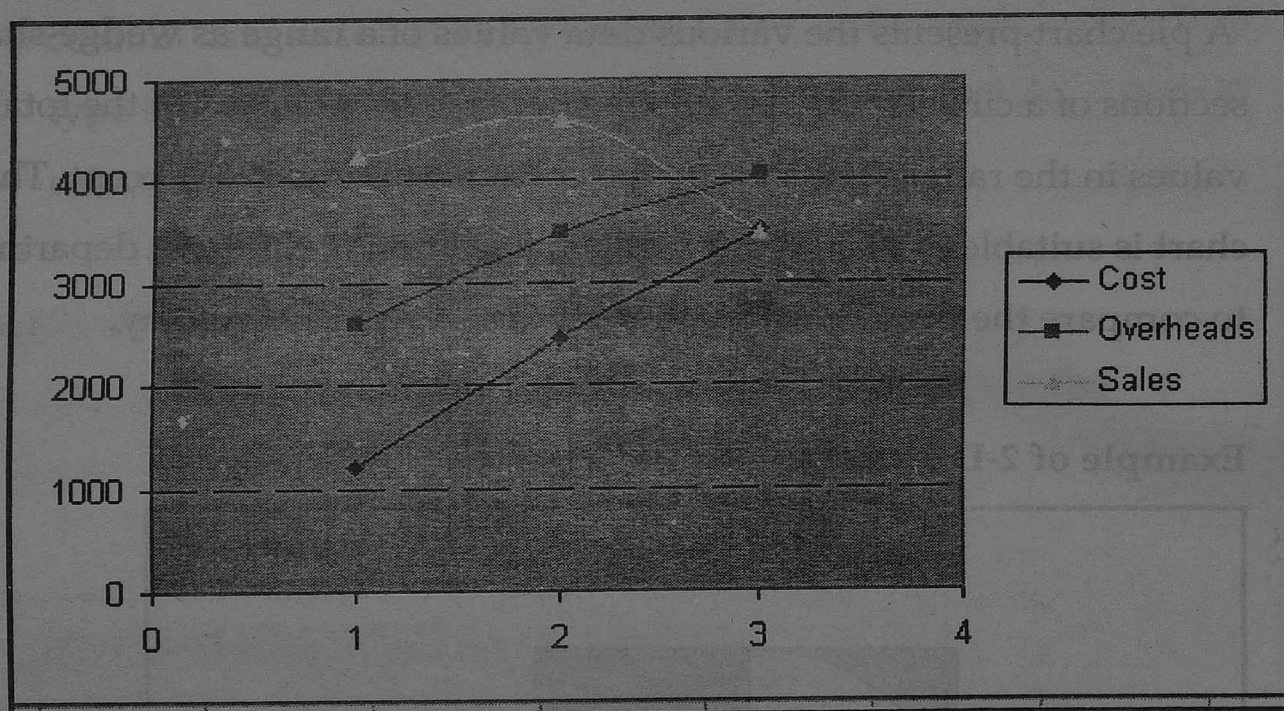
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Example of 3-D Pie Chart



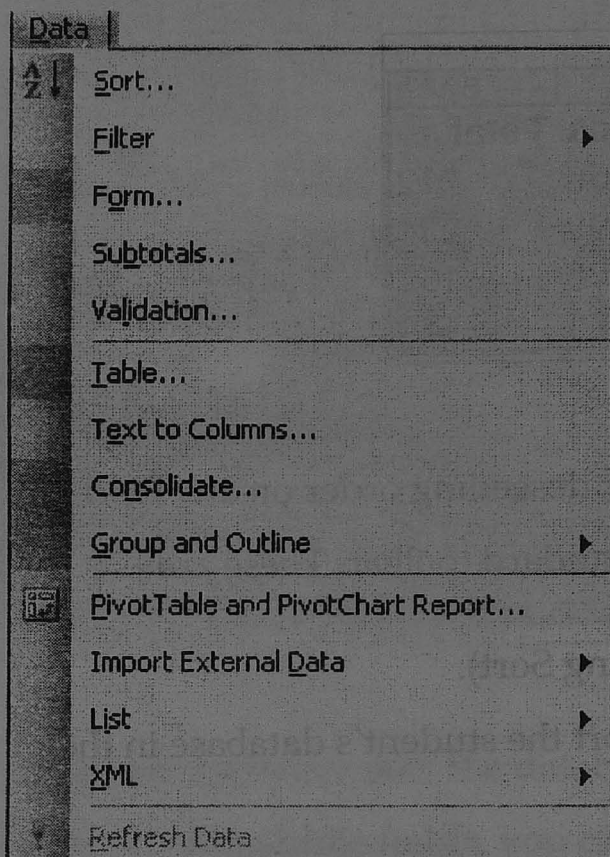
5.1.6 XY(Scatter) Chart

It compares the pairs of values. Example of XY chart is given below.



5.2 Data Manipulation and Type of functions

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5.2.1 Sort

While Excel makes it easy to enter our business data and to manage it after we have saved it in a worksheet, it in a worksheet, it's rare that our data will answer every question we want to ask it. For example, we might want to discover which of our products has the highest total sales, which product has the next highest, and so on. We can discover that information by sorting our data.

When we sort data in a worksheet, we rearrange the worksheet rows based on the contents of cells in a particular column. Sorting a worksheet to find our highest selling products in terms of units sold, for instance, might show the results displayed in the following graphic.

- Sorting is a very powerful command sort the database. (i. e) arrange the information stored in it in a desired order. You can sort a database on multiple fields.

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Consider the following table.

A1		Name			
	A	B	C	D	E
1	Name	Algebra	Calculus	Physics	Total
2	Vani	85	71	56	212
3	Karthick	66	70	98	234
4	Banu	46	79	36	161
5	Aravind	26	48	75	149

Using Sort Buttons

To quickly sort a database in ascending or descending order on any field sort, Excel provides two buttons on the Standard toolbar. These are



(Sort Ascending) and



(Descending Sort).

Let us use the Sort Ascending button to sort the student's database in the ascending order of names.

- Move the cell pointer to anywhere in column A (the column on which you want to sort the database) in the database range, e.g. cell A3.
- Click  (Sort Ascending) on the standard toolbar.

Excel automatically determines the database range and sorts in the ascending order of names. After the ascending order of names the database look like this

A1		Name			
	A	B	C	D	E
1	Name	Algebra	Calculus	Physics	Total
2	Aravind	26	48	75	149
3	Banu	46	79	36	161
4	Karthick	66	70	98	234
5	Vani	85	71	56	212

- To sort the database in the descending order of names, make sure that the cell pointer is positioned anywhere in column A in the database range and click .

Next, let us sort our database in the descending order of the Total field.

Move the cell pointer anywhere in the Total field column (e.g cell E2) and

then click 

Excel sorts the student's database in the descending order like this.

A1		A Name			
	A	B	C	D	E
1	Name	Algebra	Calculus	Physics	Total
2	Karthick	66	70	98	234
3	Vani	85	71	56	212
4	Banu	46	79	36	161
5	Aravind	26	48	75	149

The sort buttons can sort the database only on a single field. To sort the database on multiple fields, you can use the Data, Sort command. This command can be used to sort a database on a single or multiple fields.

5.2.2 Using the Data, Sort Command

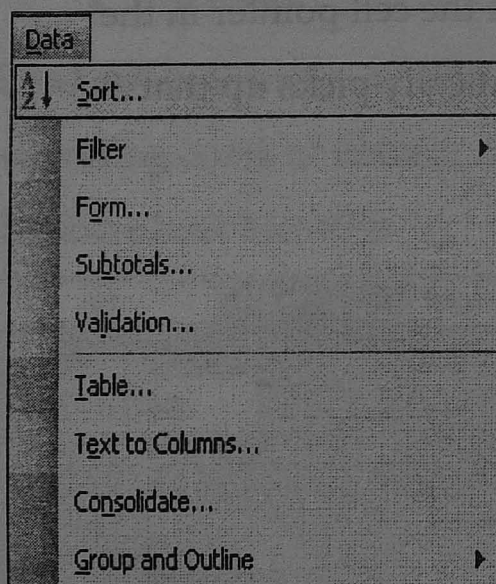
To use the Data, Sort command, you have to position the cell pointer anywhere in the database. However, if you move the cell pointer in the column on which you want to sort, Excel automatically picks up that column as the sort order.

Consider the following database

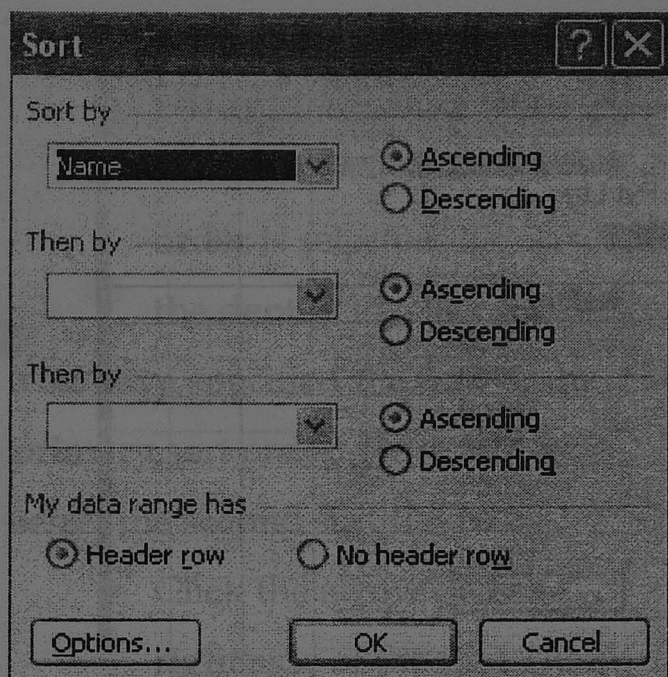
Space for Hint

Name	Dept	Designation	Salary
Sruthi	Sales	Assistant	5000
Vinay	Sales	Manager	13600
Anu	personnel	Assistant	5000
Mani	Prdoduction	Engineer	8560
Sudha	Prdoduction	Manager	15000
Arathi	Prdoduction	Engineer	9500
Sreejith	personnel	Assistant	6000
Anand	personnel	Assistant	6000

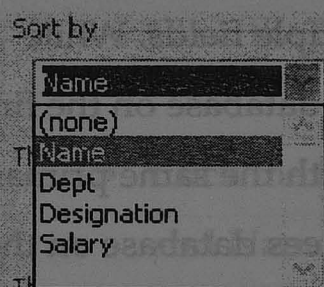
- Since we want to sort the database on the Name field, move in anywhere in column A in the database range. For instance, you can select cell A8.
- Open the **Data** menu and then choose the **Sort** command from the **Data** menu.



Excel automatically selects the database range and opens the Sort dialog box.



The sort dialog box allows you to sort the selected database. If your database is sorted on some field, Excel displays the corresponding fieldname in the **Sort by** box.



If the database is not sorted, it displays Name, which is the fieldname of the column where the cursor is positioned. It can sort the database in ascending or descending order. By default, it selects the Ascending radio button in the **Sort by** box.

The “**My data range has**” box at bottom of the Sort dialog box has two radio buttons – **Header row** and **No header row**. Excel has selected the **Header row** button in the sort dialog box. Header row is the row containing fieldnames. In case your database does not have the header row, ensure that the No header row radio button is checked.

- Ensure that ‘Name’ is selected in the **Sort by** box and **Header row** radio button is selected in the “**My data range has**” box. Then click the **OK** button or Press the **Enter** key.

Excel sorts the employee’s database as below

Balaji Industries Pvt Ltd Employees Database			
Name	Dept	Designation	Salary
Anand	personnel	Assistant	6000
Anu	personnel	Assistant	5000
Arathi	Prdoduction	Engineer	9500
Mani	Prdoduction	Engineer	8560
Sreejith	personnel	Assistant	6000
Sruthi	Sales	Assistant	5000
Sudha	Prdoduction	Manager	15000
Vinay	Sales	Manager	13600

5.2.3 Sorting Database on Multiple Fields

Sometimes you may want to sort a database on multiple fields. While sorting a database on two fields, Excel first sorts the database on the first field (also primary key) and then sorts all records with the same primary key value on the second field. If you sort the employees database on the Dept and Name fields, it will place all records with the same Dept together, and then Re-sorts those records on the Name field.

Sort

Sort by: Dept ☒ Ascending ☐ Descending

Then by: Name ☒ Ascending ☐ Descending

Then by: ☒ Ascending ☐ Descending

My data range has: ☒ Header row ☐ No header row

Options... OK Cancel

- Make sure that the cell pointer is positioned anywhere in the database. Then use the Data, Sort command from the menu.

- If the Sort by box is not displaying 'Dept', click the drop-down arrow on the right side of the Sort by box and choose 'Dept' from the field list displayed by Excel. By default, the Ascending sort order is selected. If you want to use the descending sort order for the dept field, click the Descending radio button.

You have specified the first or the primary sort order. Next, let us select the second sort field.

- Click the arrow on the right side of the first Then by box in sort dialog box. Excel displays the list of fields in your database.
- Click the Name field

Sort

Sort by: Dept ☒ Ascending ☐ Descending

Then by: Name ☒ Ascending ☐ Descending

Then by: ☒ Ascending ☐ Descending

My data range has: ☒ Header row ☐ No header row

Options... OK Cancel

- Click the OK button or Press **Enter** it sorts your database on Dept and Name Field.

Microsoft Excel - Book3

Type a question for help

100%

M15

	A	B	C	D	E	F	G	H	I
1			Balaji Industries Pvt Ltd						
2			Employees Database						
3									
4	Name	Dept	Designation	Salary					
5	Anand	personnel	Assistant	6000					
6	Anu	personnel	Assistant	5000					
7	Sreejith	personnel	Assistant	6000					
8	Arathi	Prdoduction	Engineer	9500					
9	Mani	Prdoduction	Engineer	8560					
10	Sudha	Prdoduction	Manager	15000					
11	Sruthi	Sales	Assistant	5000					
12	Vinay	Sales	Manager	13600					
13									
14									
15									
16									

Sheet1 / Sheet2 / Sheet3 /

Ready NUM SCRL

5.2.4 Database functions

Let us more database to calculate the minimum and average salary for the employees working in the production department. We shall also calculate the number of employees who work in the production department.

Database functions are

- DMAX
- DMIN
- DAVEARGE
- DCOUNT
- DSTDEV
- DVAR

Consider the database.

Balaji Industries Pvt Ltd Employees Database			
Name	Dept	Designation	Salary
Sruthi	Sales	Assistant	5000
Vinay	Sales	Manager	13600
Anu	personnel	Assistant	5000
Mani	Prdoduction	Engineer	8560
Sudha	Prdoduction	Manager	15000
Arathi	Prdoduction	Engineer	9500
Sreejith	personnel	Assistant	6000
Anand	personnel	Assistant	6000

1. DMAX:

Returns the largest number in a column of a list or database that matches conditions you specify.

Syntax

DMAX(database, field, criteria)

Database is the range of cells that makes up the list or database

Field indicates which column is used in the function. Field can be given as text with the column label enclosed between double quotation marks, such as "Age" or "Yield,".

Criteria is the range of cells that contains the conditions you specify

Example:

- Move the cell pointer to cell D15.
- In cell D15, enter =DMAX(A4:D12,"salary",D4:D12).

Excel displays 15000 as a maximum salary.

2. DMIN

Returns the smallest number in a column of a list or database that matches conditions you specify.

Syntax

DMIN(database, field, criteria)

Example:

- Move the cell pointer to cell D15.
- In cell D15, enter =DMIN(A4:D12,"salary",D4:D12).

Excel displays 5000 as a minimum salary.

3. DAVERAGE

Averages the values in a column of a list or database that match conditions you specify.

Syntax

DAVERAGE(database, field, criteria)

Example:

- Move the cell pointer to cell C16.
- In cell C16, enter =DAVERAGE(A4:D12,"salary",D4:D12)

Excel displays 8582.5 as a Average salary.

4. DCOUNT

Counts the cells that contain numbers in a column of a list or database that match conditions you specify.

The field argument is optional. If field is omitted, DCOUNT counts all records in the database that match the criteria.

Syntax

DCOUNT(database, field, criteria)

Example:

=DCOUNT(A4:D12,"salary",D4:D12) returns 8.

5. DSTDEV

Estimates the standard deviation of a population based on a sample by using the numbers in a column of a list or database that match conditions you specify.

Syntax

DSTDEV(database, field, criteria)

6. DVAR

Estimates the variance of a population based on a sample by using the numbers in a column of a list or database that match conditions you specify.

Syntax

DVAR(database, field, criteria)

Check Your Progress

1. Write the usage of charts
2. Write down the types of charts
3. Write a detailed notes about all types of charts
4. Write a short note about pie chart
5. What is mean by sorting
6. Write detailed notes about sorting with example.
7. Write notes on database functions.

Welcome

Dear Students,

We welcome you as a student of the First Year B. Sc degree course. This paper deals with the subject "Data Base". The learning material for this paper will be supplemented by contact seminars.

Database management systems have become ubiquitous as a fundamental tool for managing information, and a course on the principles and practice of database systems is now an integral part of computer science curricula. This book covers the fundamentals of database management systems. It is intended as a text for an introductory database course for undergraduates, and we have attempted to present the material in a clear, simple style

Learning through the distance education mode, as you are all aware, involves, self learning and self assessment and this regard you are expected to put in disciplined and dedicated effort. On our part, we assure of our guidance and support.

B. Sc MATHEMATICS -- DATABASE

SYLLABUS

UNIT 6

Database definition – Use of a Database – Data Definition language – Data Manipulation Language

UNIT 7

Database Models – Relational, Hierarchical, Network and its Applications

UNIT 8

Building a Database – Creating, Opening Database, Entering data and retrieving Database Records

UNIT 9

Editing and Modifying Databases

UNIT 10

File Maintenance and Performances.

Text Book:

1. "M. S. OFFICE" by C.Nellaikannan. Nels Publications. 3rd edition, 2004.
2. "COMPUTER TODAY" by Suresh K. Basandra. Galgotia Publishing Pvt Ltd, 1995, Chapter 9.

B. SC MATHEMATICS - FIRST YEAR

PAPER - II DATA BASE

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UNIT VI

OBJECTIVES

After going through this lesson you would be in a position to

- Understand the concept of database system
- Explain the concept of database
- Appreciate the features of DBMS
- Use of Database
- Difference between data and information
- Describe a database system
- Summarize need of database
- Demonstrate the relationship between entities with the help of entity relationship diagram

Introduction

Space for
Hint

Information, no doubt, is a key word in modern management. All of us are familiar with the term *data*. In fact, unknowingly we come across data in our day to day life everyday. A database is an organized, integrated and shared collection of related data designed to meet the needs of multiple users. A database can be defined as a storehouse of interrelated data. The age of a person, price of potato, number of students in a school, pin code of a city, etc. are some examples of data. In our life we have to remember so much of data. But it is easier for us to remember all information for a few individuals. For example, you may be in a position to tell accurately the age, height, complexion, income, educational qualification, residential address, etc. of your close friends. But it is too difficult for you to memorize all these information for a large number of individuals. Data base management systems have the potential to meet this challenge. Database is a structured collection of records or data that is stored in a computer system. In order for a database to be truly functional, it must not only store large amounts of records well, but be accessed easily. In addition, new information and changes should also be fairly easy to input. In order to have a highly efficient database system, you need to incorporate a program that manages the queries and information stored on the system. This is usually referred to as DBMS or a Database Management System. Besides these features, all databases that are created should be built with high data integrity and the ability to recover data if hardware fails. A database is an organized, integrated and shared collection of related data designed to meet the needs of multiple users. A database can be defined as a storehouse of interrelated data.

Space for
Hint

6.1 DATABASE DEFINITION

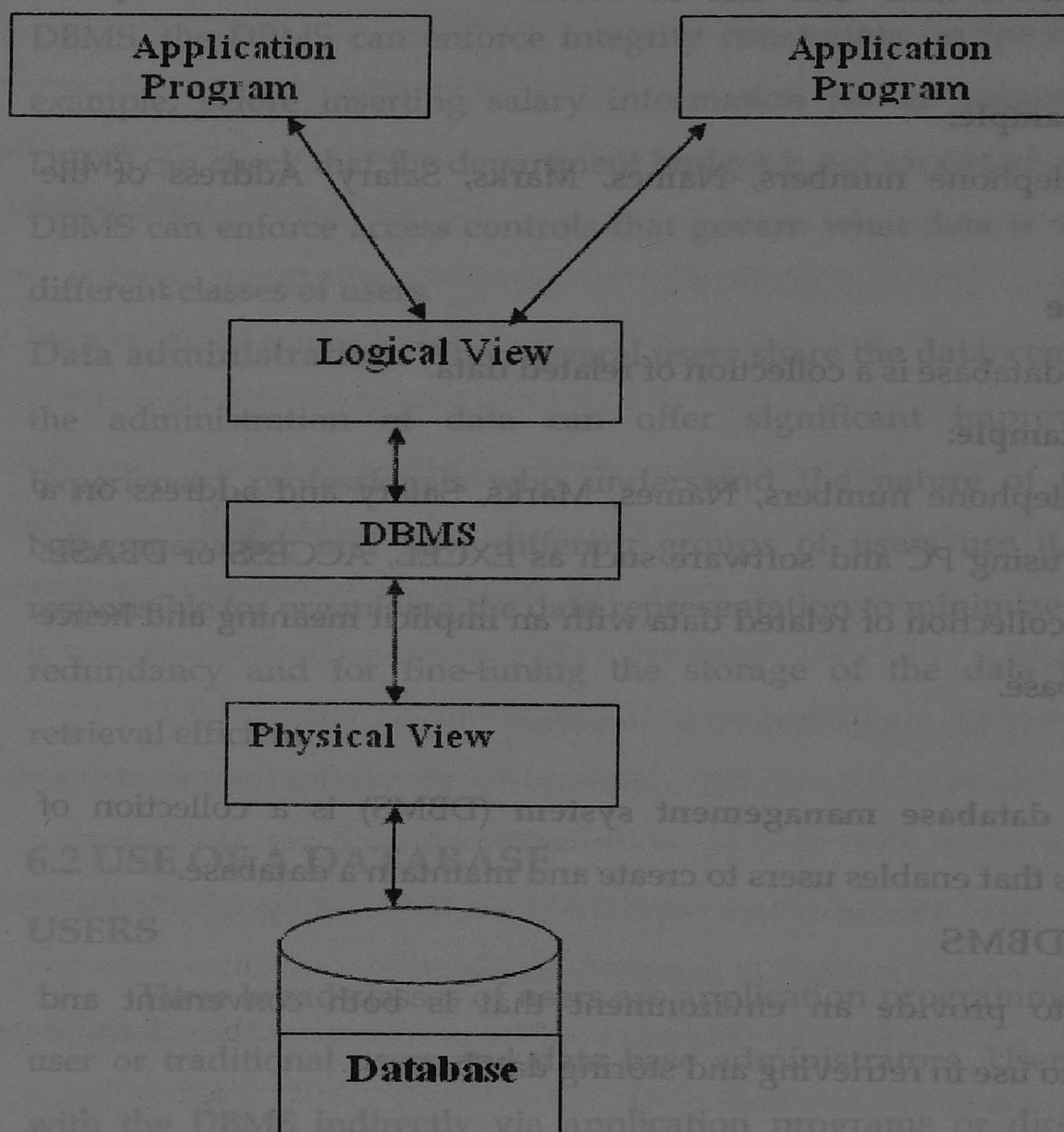
Database is the physical collection of data. The data must be stored on direct-access devices like magnetic disks. However, well managed installations create backup copies of the data base on offline storage media such as magnetic tapes. The hardware, then, consists of the secondary storage volumes such as disks, drums, tapes, etc., on which the data base resides, together with the associated devices, control units, channels, and so forth. The security measures are extremely important in a data base environment, since many departments and application programs may be dependent on a single, centralized data base.

Data base management systems are designed with a view towards optimizing the use of physical storage and CPU processing time. The logical view may contain redundant data items in order to make them more understandable to users. But the physical implementations of the DBMS attempt to make the physical storage nonredundant. This not only saves space but also precludes the possibility of different values existing for the same data item at one time. The DBMS also uses other techniques to optimize resource utilization. Data records that are seldom used may be placed on inexpensive, slow-memory devices: whereas frequently used data may be put on the faster, but more expensive media.

Database systems are rapidly gaining popularity among business users. Since database operations tend to be high-volume processes, they often consume a large portion of the time and memory resources of the computer. Some vendors have developed computers that are dedicated entity to database operations. These computers, frequently referred to as database machines, are special - purpose units. Certain capabilities are built into the hardware which makes

retrieval, sorting, updating, and other operations more efficient than with software programs.

Space for
Hint



Data stored in the system is partitioned into one or more databases. A database, then, is a repository for stored data. In general, it is both integrated and shared. By "integrated" we mean that the database may be thought of as a unification of several otherwise distinct data files, with any redundancy among those files partially or wholly eliminated. By "shared" we mean that individual pieces of data in the database may be shared among several different users in the sense that each of those users may have access to the same piece of data and may use it

for different purposes. Such sharing is really a consequences of the fact that the database is integrated.

Data

Known facts that can be recorded and that have implicit meaning.

Example:

Telephone numbers, Names, Marks, Salary, Address of the people.

Database

A database is a collection of related data.

Example:

Telephone numbers, Names, Marks, Salary and address on a diskette, using PC and software such as EXCEL, ACCESS or DBASE. This is a collection of related data with an implicit meaning and hence is a database.

DBMS

A database management system (DBMS) is a collection of programs that enables users to create and maintain a database.

Goal of DBMS

- to provide an environment that is both convenient and efficient to use in retrieving and storing database.

6.1.1 ADVANTAGES OF A DBMS

Using a DBMS to manage data has many advantages:

Data independence: Application programs should be as independent as possible from details of data representation and storage. The DBMS can provide an abstract view of the data to insulate application code from such details.

Efficient data access: A DBMS utilizes a variety of sophisticated techniques to store and retrieve data efficiently. This feature is especially important if the data is stored on external storage devices.

Data integrity and security: If data is always accessed through the DBMS, the DBMS can enforce integrity constraints on the data. For example, before inserting salary information for an employee, the DBMS can check that the department budget is not exceeded. Also, the DBMS can enforce access controls that govern what data is visible to different classes of users.

Data administration: When several users share the data, centralizing the administration of data can offer significant improvements. Experienced professionals who understand the nature of the data being managed, and how different groups of users use it, can be responsible for organizing the data representation to minimize redundancy and for fine-tuning the storage of the data to make retrieval efficient.

6.2 USE OF A DATABASE

USERS

Three broad classes of users are application programmer, end-user or traditional users and data base administrators. User interact with the DBMS indirectly via application programs or directly via simple query language. The user's interactions with the DBMS also include the definition of the logical relationships in the data base (the logical view), and the input, alteration, deletion and manipulation of data.

1. **The application programmer** is responsible for writing application programs that use the data base, typically in a language

such as Pascal, COBOL or PL/I. These applications programs operate on the data in all the usual ways: relative information, creating new information, deleting or changing existing information.

2. The **end-user** access the data base from a terminal and he may employ a query language provided as an integral part of the system, or may invoke a user-written application program that accepts commands from the terminal and in turn issues requests to the DBMS on the end user's behalf. Either way the user may again, in general perform all the functions of retrieval, creation, deletion and modification, although retrieval is the most common function used by this class of user.

3. The **data base administrator (DBA)** is the third class of user and is the person (or group of persons) responsible for overall control of the data base system. DBA and staff, if any, perform the following functions:

- i). Maintain data base dictionary
- ii). Determines and maintains the physical structure of the data base.
- iii). Provides for updating and changing the data base, including the deletion of inactive records.
- iv). Create and maintains edit controls regarding changes and additions to the data base.
- v). Develops retrieval methods to meet the needs of the users
- vi). Implements security and disaster-recovery procedures.
- vii). Maintain configuration control of the data base.
- viii). Assigns user access codes in order to prevent unauthorized use of data.

A data base administrator is extremely important, working very closely with users in order to create, maintain, and safeguard the data

base. In effect, DBA is the liaison between the data base and its users and, therefore, must be familiar with their information requirements. The administrator must also be technically competent in the areas of DBMS and data storage and processing. Data base administration is becoming an attractive career option to individuals with programming, systems, and business backgrounds.

6.3 WHY DATA BASE?

An enterprise chooses to store its operational data in an integrated data base because, broadly, a data base system provides the enterprise with centralized control of its operational data as data is one of its most valuable assets. This is in sharp contrast to the situation when each application has its own private files, quite often its own private magnetic tapes and disk packs too, so that the operational data is widely disposed and is, therefore, probably difficult to control.

The forgoing implies that in an enterprise with a data base system there will be one identifiable person who has this central responsibility for the operational data. This person is the data base administrator whose job involves both a high degree of technical expertise and the ability to understand and interpret management requirements at a senior level. It is important to realize that the position of the DBA within the enterprise is a very senior one. Some of the advantage that accrue from having centralized control of the data are discussed further.

1. Redundancy can be reduced

In non data base systems each application has its own private files which can often lead to considerable redundancy in stored data, with resultant waste in stored space. For example, a personal application and an education-records application may each own a file

containing department information for employees. These two files can be integrated, and the redundancy eliminated, if the DBA is aware of the data requirements for the both applications, that is, if the DBA has the necessary overall control. It is not suggested that all redundancy should necessarily be eliminated. Sometimes there are sound businesses or technical reasons for maintaining multiple copies of the same data. In a data base system, however, redundancy should be controlled, that is, the system should be aware of the redundancy and should assume responsibility for propagating updates.

2. Inconsistency can be avoided

This is related to the previous point. Suppose that a given fact about the real world, say the fact that employee EMP3 works in department DEP9, is represented by two distinct entries in the data base, and that the system is not aware of this duplication; in other words, the redundancy is not controlled. Then, there will be some occasion on which the two entries will not agree, that is, when one and only one has been updated. At such times the data base is said to be inconsistent. A data base in an inconsistent state is capable of supplying incorrect or conflicting information. It is clear that if the given fact is represented by a single entry, that is, if the redundancy is removed, such an inconsistency cannot occur. Alternatively, if the redundancy is not removed but is controlled by making it known to the system, that the system could guarantee that the data base is never inconsistent as seen by the user, by ensuring that any change made to either of the two entries is automatically made to the other. This process is known as propagating updates. Here the term 'update' is used to cover all the operations of creation, deletion, and modification.

3. Data can be shared

It means not only that existing application can share the data in the data base, but also that new applications can be developed to operate against the same stored data. In other words, the data requirements of new applications can be may be satisfied without having to create any new stored files.

4. Standards can be enforced

With central control of the data base, the DBA can ensure that all applicable standards are followed in the representation of the data.

The applicable standards may include any or all of the following: company, installation, departmental, industry, national and international standards. Standardizing stored data formats is particularly desirable as an aid to data interchange or migration between systems.

5. Security restriction can be applied

Having complete jurisdiction over the operational data, the DBA (a) can ensure that the only means of access to the data base is through the proper channels, and hence, (b) can define authorization checks to be carried out whenever access to sensitive data is attempted. Different checks can be established for each type of access, that is, retrieve, modify, delete, etc., to each piece of information in the data base.

6. Integrity can be maintained

The problem of integrity is the problem of ensuring that the data base is accurate. Inconsistency, between two entries representing the same 'fact' is an example of lack of integrity which of course can occur only if redundancy exists in the stored data. Even if redundancy is eliminated, however, the data base may still contain incorrect data. For example, an employee may be shown as having worked 200 hours

in a week, or list of employee numbers for a given department may include the number of a nonexistent employee. Centralized control of the data helps in avoiding these situations, in so far as they can be avoided, by permitting the DBA to define validation procedures to be carried out whenever any update operation is attempted. Data integrity is even more important in a data base system than in a file-oriented environment, precisely because the data base is shared; for without appropriate validation procedures it is possible for a program with errors in it to generate bad data and, thus, to 'infect' other innocent programs using that data.

7. Conflicting requirements can be balanced

Knowing the overall requirements of the enterprise, as opposed to the requirements of any individual user, the DBA can structure the data base system to provide an overall service that is 'best for the enterprise'. For example, a representation can be chosen for the data in storage that gives fast access for the most important applications at the cost of poor performance in some other applications.

8. Synchronization

Often many users are running programs that access the data base at the same time. DBMS provides protection against inconsistencies that result from two approximately simultaneous operations on a data item. For example, suppose that at about the same time, two reservation clerks issue requests to reserve a seat on flight 757. Each request results in the execution of a program that might examine the number of seats available (say one seat is left), subtracts one, and stores the resulting number of seats in the data base. If the DBMS does not sequence these two transactions properly, two passengers might wind up sitting on the same seat.

9. Data Independence

Space for
Hint

Data independence may be most easily understood by first considering its opposite. Most present-day application is data independent. This means that the way in which the data is organized in secondary storage and the way in which it is accessed are both dictated by the requirements of the application and, moreover, that knowledge of the data organization and access technique is built into the application logic. For example, it may be decided that a particular file is to be stored in indexed sequential form. The application, then, must know that the index exists and must know the file sequence, and the internal structure of the application will be built around this knowledge. In addition, the precise form of the various accessing and exception-checking procedure within the application will depend very heavily on details of the interface presented by the indexed sequential software.

Such an application is called data dependent because it is impossible to change the storage structure or access strategy without affecting the application, probably drastically. For example, it would not be possible to replace the indexed sequential file above by a hash-addressed file without making major modifications to the application. The portions of the application requiring alternation in such a case are the portions that communicate with the file handling software, and the difficulties involved are quite irreverent to the problem the application was written to solve. They are difficulties introduced by the structure of the file-handling software interface.

In a data base system, however, it would be extremely undesirable to allow applications to be data dependent, for at least the following two reasons:

1. Different applications will need different views of the same data. For example, suppose that before the enterprise introduces its integrated data base, there are two applications, A and B, each owning a file containing the field 'customer balance'. Suppose, however, that application A records the value in decimal, whereas application B records it in binary. It will still be possible to integrate the two files and to eliminate the redundancy, provided the DBMS performs all necessary conversions between the stored representation chosen and the form in which each application wishes to see it. For example, if the decision is to hold the value in decimal, then every access from B will require a conversion to or from binary.

2. DBA must have the freedom to change the storage structure or access strategy or both in response to changing requirements without having to modify existing applications. For example, the enterprise may adopt new standards; application priorities may change; new types of storage devices may become available; and so on. If applications are data dependent, such changes involve corresponding changes in programs, thus tying up programmer effort that otherwise is available for the creation of new applications.

6.4 Data Definition language

Data Definition Language (DDL) statements are used to define the database structure or schema. This is the means by which the content and format of data to be stored is described and the structure of the data base is defined, including relationships between records and indexing strategies. DDL is essentially the link between the logical and physical views of the data base.

Some examples:

Space for
Hint

- CREATE - to create objects in the database
- ALTER - alters the structure of the database
- DROP - delete objects from the database
- TRUNCATE - remove all records from a table, including all spaces allocated for the records are removed
- RENAME - rename an object

1. The CREATE TABLE Statement

- You must have:

- CREATE TABLE privilege
- A storage area

```
CREATE TABLE [schema.],table  
(column datatype [DEFAULT expr] [, ...]);
```

- You specify:

- Table name
- Column name, column data type, and column

The CREATE TABLE Statement

This statement is one of the data definition language (DDL) statements, that are covered in subsequent lessons. These statements have an immediate effect on the database, and they also record information in the data dictionary. To create a table, a user must have the CREATE TABLE privilege and a storage area in which to create objects.

schema is the same as the owner's name

table is the name of the table

DEFAULT *expr* specifies a default value if a value is omitted in the INSERT statement

column is the name of the column

datatype is the column's data type and length

Example: Creating Tables:

```
CREATE TABLE dept
      (deptno NUMBER(2),
       dname  VARCHAR2(14),
       loc    VARCHAR2(13));
```

Table created.

The example describes creates the DEPT table, with three columns: DEPTNO, DNAME, and LOC. Since creating a table is a DDL statement, an automatic commit takes place when this statement is executed.

2. The ALTER TABLE Statement

After you create a table, you may need to change the table structure because: you omitted a column, your column definition needs to be changed, or you need to remove columns. You can do this by using the ALTER TABLE statement.

Use the ALTER TABLE statement to:

- Add a new column
- Modify an existing column
- Define a default value for the new column
- Drop a column

Use the ALTER TABLE statement to add, modify, or drop columns.

```
ALTER TABLE table
ADD      (column datatype [DEFAULT expr]
         [, column datatype]...);
```

```
ALTER TABLE table
MODIFY   (column datatype [DEFAULT expr]
         [, column datatype]...);
```

```
ALTER TABLE table
DROP     (column);
```


You can add, modify, and drop columns to a table by using the ALTER TABLE statement.

In the syntax:

table is the name of the table

ADD | MODIFY | DROP is the type of modification

column is the name of the new column

datatype is the data type and length of the new column

DEFAULT *expr* specifies the default value for a new column

Consider the table "DEPT80"

EMPLOYEE_ID	LAST_NAME	ANNUAL_SAL
241	Haran	12,560
251	Raja	16,000
324	Aarathi	25,020

New column

"Add a new column to the DEPT80 table."

JOB_ID

EMPLOYEE_ID	LAST_NAME	ANNUAL_SAL	JOB_ID
241	Haran	12,560	
251	Raja	16,000	
324	Aarathi	25,020	

Adding a Column

The graphic adds the JOB_ID column to the DEPT80 table. Notice that the new column becomes the last column in the table.

Adding a Column

- You use the ADD clause to add columns

```
ALTER TABLE dept80  
ADD (job_id VARCHAR2(9));  
Table altered.
```

- The new column becomes the last column

EMPLOYEE_ID	LAST_NAME	ANNUAL_SAL	JOB_ID
241	Haran	12,560	
251	Raja	16,000	
324	Aarathi	25,020	

Guidelines for Adding a Column

- You can add or modify columns.
- You cannot specify where the column is to appear. The new column becomes the last column.

The example on the slide adds a column named JOB_ID to the DEPT80 table. The JOB_ID column becomes the last column in the table.

Note: If a table already contains rows when a column is added, then the new column is initially null for all the rows

3. Dropping a Table

- All data and structure in the table is deleted.
- Any pending transactions are committed.
- All indexes are dropped.
- You *cannot* roll back the DROP TABLE statement.

```
DROP TABLE dept80;  
Table dropped.
```

The DROP TABLE statement removes the definition of table. When you drop a table, the database loses all the data in the table and all the indexes associated with it.

Syntax

DROP TABLE *table*

In the syntax:

table is the name of the table

Guidelines

- All data is deleted from the table.
- Any views and synonyms remain but are invalid.
- Any pending transactions are committed.
- Only the creator of the table or a user with the DROP ANY TABLE privilege can remove a table.

Note: The DROP TABLE statement, once executed, is irreversible. If you own that table or have a high level privilege, then the table is immediately removed. As with all DDL statements, DROP TABLE is committed automatically

4. The TRUNCATE TABLE statement:

- Removes all rows from a table
- Releases the storage space used by that table

```
TRUNCATE TABLE detail_dept;  
Table truncated.
```

You cannot roll back row removal when using TRUNCATE.

- Alternatively, you can remove rows by using the DELETE statement.

Truncating a Table

Another DDL statement is the TRUNCATE TABLE statement, which is used to remove all rows from a table and to release the storage space used by that table. When using the TRUNCATE TABLE statement, you cannot roll back row removal.

Syntax

TRUNCATE TABLE *table*;

In the syntax:

table is the name of the table

You must be the owner of the table or have DELETE TABLE system privileges to truncate a table. The DELETE statement can also remove all rows from a table, but it does not release storage space. The TRUNCATE command is faster. Removing rows with the TRUNCATE statement is faster than removing them with the DELETE statement for the following reasons:

- The TRUNCATE statement is a data definition language (DDL) statement and generates no rollback information.
- Truncating a table does not fire the delete triggers of the table.
- If the table is the parent of a referential integrity constraint, you cannot truncate the table. Disable the constraint before issuing the TRUNCATE statement.

Renaming a Table

To change the name of a table, view, sequence, or synonym, you execute the RENAME statement

```
RENAME dept TO detail_dept;  
Table renamed.
```

Renaming a Table

Additional DDL statements include the RENAME statement, which is used to rename a table, view, sequence, or a synonym.

Syntax

RENAME *old_name* TO *new_name*;

In the syntax:

old_name is the old name of the table, view, sequence, or synonym.

new_name is the new name of the table, view, sequence, or synonym.

6.5 Data Manipulation Language (DML)

This is a powerful set of procedural commands that allow the programmer to easily store, retrieve and amend data on the data base, using the most appropriate access strategies. DML provides the techniques for processing the data base, such as retrieval, sorting, display and deletion of data or records. DML should include a variety of manipulation verbs and operands for each verb.

Data Manipulation Language (DML) statements are used for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain
- MERGE - operation (insert or update)

Most data manipulation languages interface with high-level programming languages. These languages enable a programmer to perform, unique data processing that the DBMS's data manipulation language cannot perform. A key feature of a DML is that it uses logical names(such as CUSTNO for customer number) instead of physical storage locations when referring to data. The capability is possible since the data definition provides the linkage between the logical view of data and their physical storage. The functions of a DML are to:

- (i). provides the techniques for data manipulation such as deletion, replacement, retrieval, sorting or insertion of data or records.
- (ii). Enable the user and application programs to process data by using logically meaningful data names rather than physical storage locations.

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(iii). Provide interface with programming languages. A DML should support several high-level languages.

(iv). Allow the user and application programs to be independent of physical data storage and data base maintenance.

(v). provide for the use of logical relationships among data items.

Check Your Progress

1. Define data base.
2. What are the advantages of data base?
3. What are the uses of data base?
4. Write detailed notes about data base.
5. Define DML and DDL
6. Write detailed notes about DDL
7. Write detailed notes about DML

UNIT VII

OBJECTIVES

After going through this lesson you would be in a position to

- Understand the concept of database Models
- Describe a components of a database system
- Explain data independence and its advantages
- Discuss the advantages of a data base approach
- Explain the data models and architecture

7.1 Database Models

Data bases from the real world are frequently described within the framework of data models. Usually there are two classes of data models associated with data base management system software: one is referred to as the conceptual or semantic data model and the other is called the physical data model.

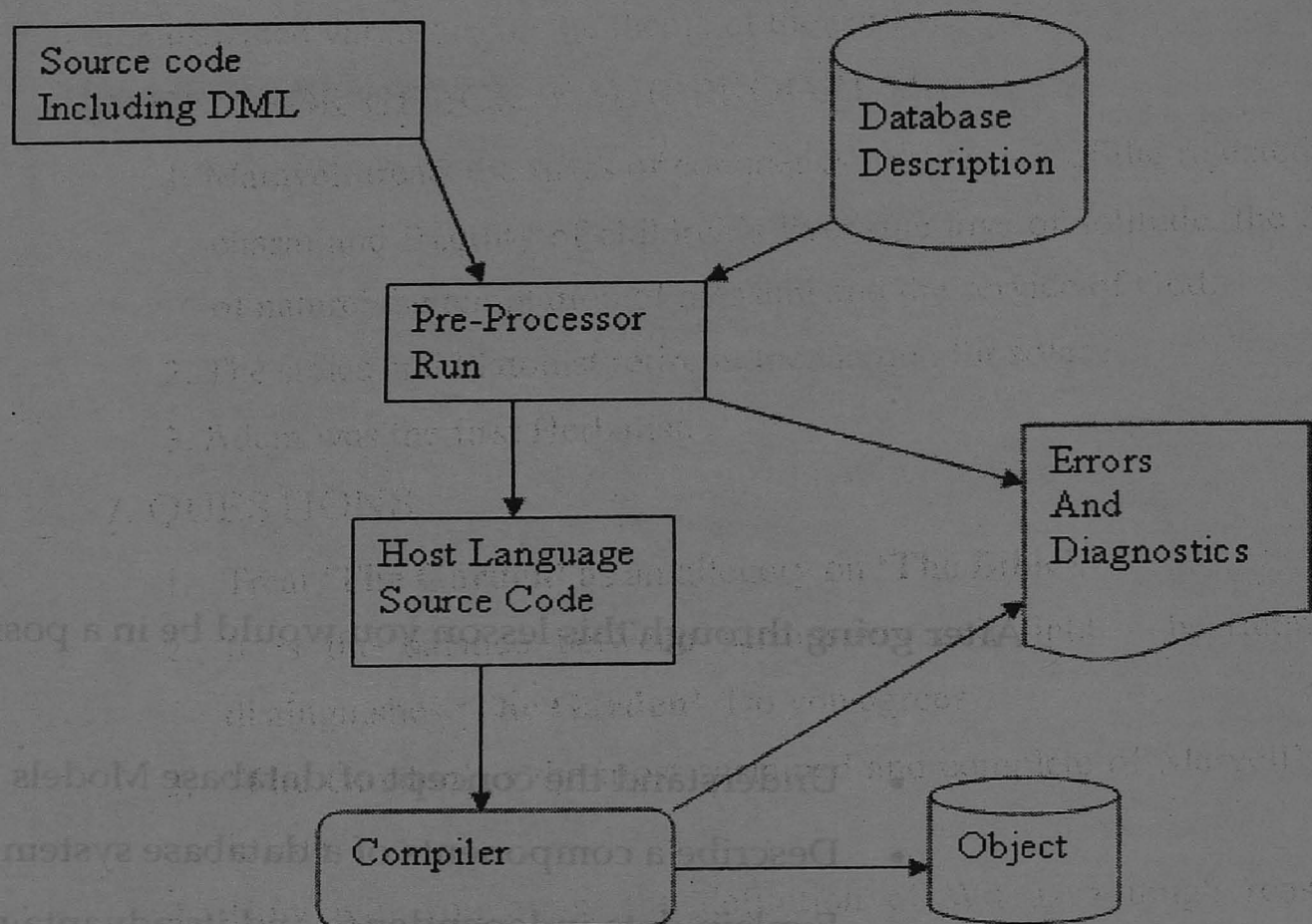
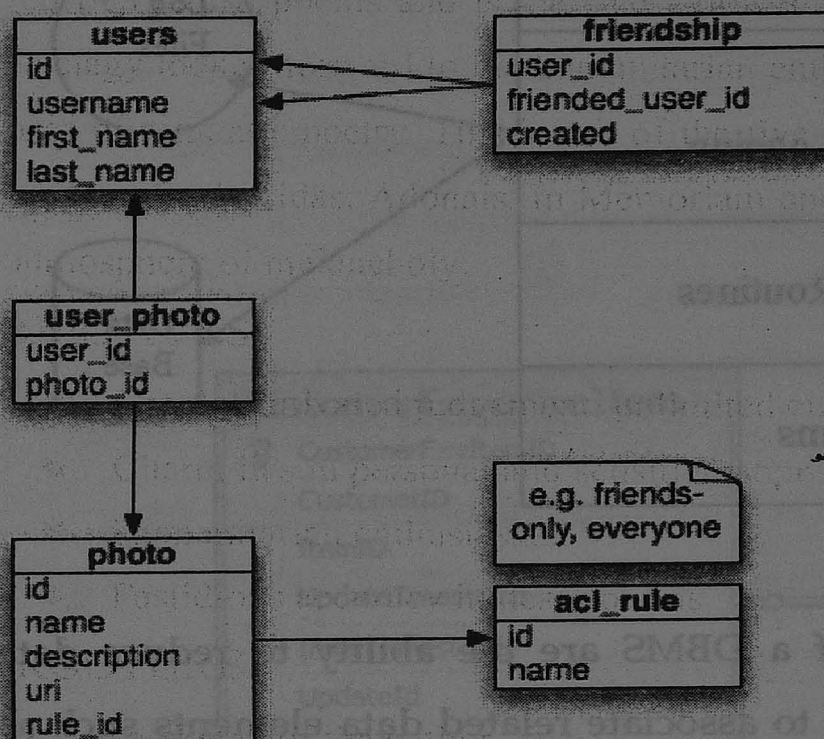


Figure: DML Pre- Processor

The conceptual data model provides an environment to the user for interacting with the data base. The user can formulate his queries pertinent to the data base within the frame of the conceptual data model. Thus, conceptual models are the basis for development of high-level query languages.

The physical data model helps the data base administrator (i.e users authorized to change the physical data) to organize the data and store them in the computer so that subsets of the data relevant to the user's request can be processed efficiently.

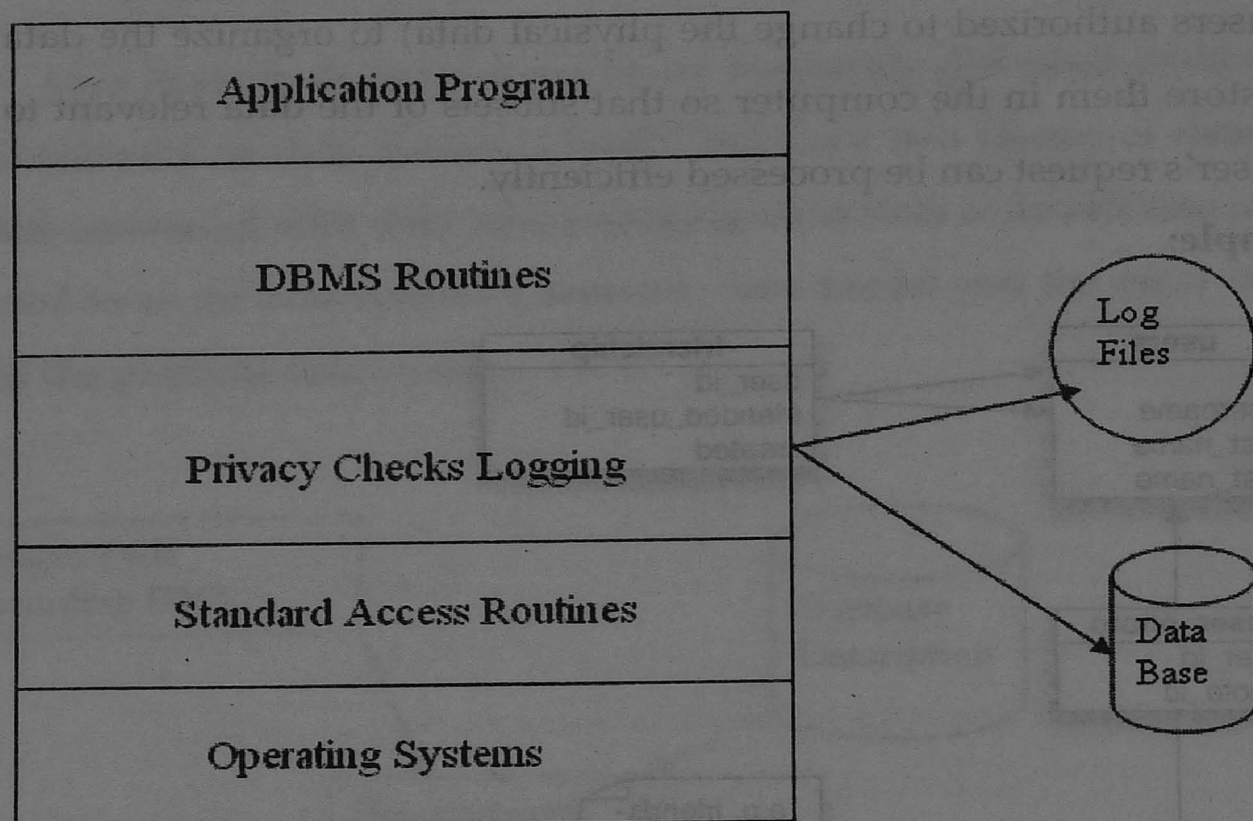
Example:



In the last few decades the major thrust of research in the area of new concepts and software development for data base models has been focused on conceptual models rather than physical models. One of the major reasons for this is to accommodate the ever growing number of application directed at the data bases supported by data base management systems.

Three major types of conceptual models are widely used in data base management systems. These are the relational model, hierarchical model, and network models are based on the concepts of graph theory. Each of these types of models has some advantages over the others.

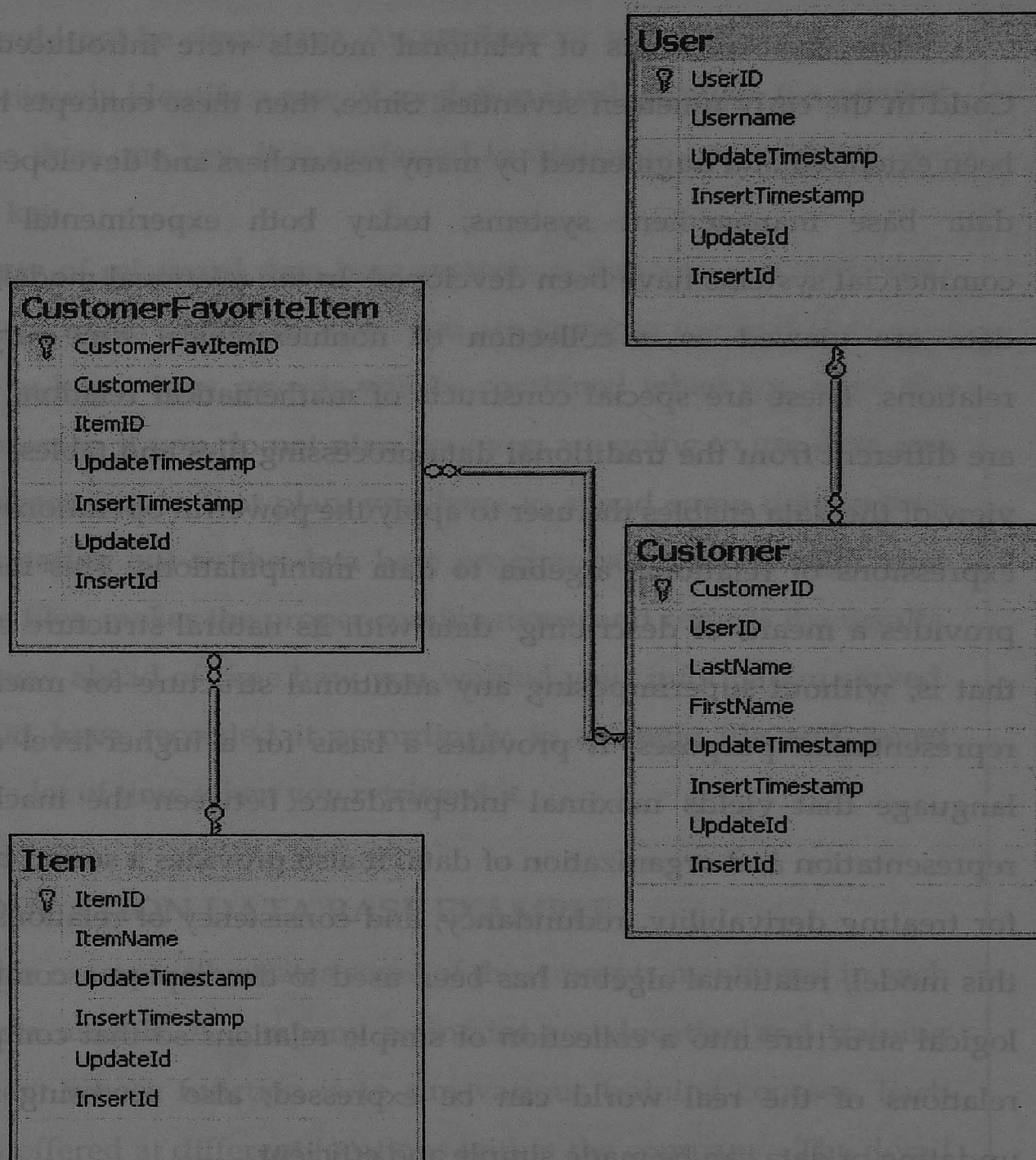
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Two key features of a DBMS are the ability to reduce data redundancy and the ability to associate related data elements such as related fields and records. These functions are accomplished through the use of keys, embedded pointers, and linked list. An embedded pointer is a field within a record containing the physical or relative address of a related record in another part of the data base. The record referred to may also contain an embedded pointer that points to a third record, and so on. The series of records tied together by embedded pointers is a linked list. Some real world data base management systems allow users to model and implement data on a tree, network, or relational basis; others allow only one model, such as relational. Tree and network structured DBMSs usually tie related data together through linked lists. Relational DBMSs relate data through information contained in the data, as we will see later.

In order to select a particular data model, the designer of a large data base has to consider many potential users, each with a distinct

perception of what the database should look like. The way you organize information for a particular application is usually dictated by your information retrieval requirements. Information should be stored in a format that allows the data base management system to answer questions quickly and produce reports efficiently.



Briefly, in non relational systems, a cross file query can be answered only if the link between the files has been described to the system. Such relationships must be defined when the data base is

designed and created. As data base grows they can acquire new files with new relationships. With a relational data base system, the query language can use any relationship that exists between files at any time. You do not have to predict the requirement for a relationship when you design the data base.

7.2 Relational DATA BASE

The basic concepts of relational models were introduced by Codd in the early nineteen seventies. Since, then these concepts have been extended and augmented by many researchers and developers of data base management systems; today both experimental and commercial systems have been developed. In the relational model, the data are viewed as a collection of nonhierarchical time-varying relations. These are special constructs of mathematical relations and are different from the traditional data processing files and tables. This view of the data enables the user to apply the powerful operations and expressions of relational algebra to data manipulations. This model provides a means of describing data with its natural structure only, that is, without superimposing any additional structure for machine representation purposes. It provides a basis for a higher-level data language that yields maximal independence between the machine representation and organization of data. It also provides a sound basis for treating derivability, redundancy, and consistency of relations. In this model, relational algebra has been used to decompose a complex logical structure into a collection of simple relations so that complex relations of the real world can be expressed; also accessing and updating of data can be made simple and efficient.

A relational data base is composed of one or more relations. Each can be visualized as a table of data or file. Each row in the

relation represents one entity (such as student in a student data base or an employee in a personnel data base). Each column (attribute) 'name' is drawn from the domain of names in the data base, or the attribute 'age' is drawn from the domain of possible ages. The value of an attribute is called an item.

In any relation no two rows can be identical, and the ordering of the rows should not be significant. An attribute or set of attributes whose values uniquely identify a row of a relation is called a key. If a relation has more than one key, it is preferred to designate one of them as a primary key.

The beauty of relational data base systems is that you can enter data without too much regard for how you are going to use it; that is, you do have to know how records will be combined when you enter the data. However, if you do not plan how you are going to use data and enter it according to that plan, you have to spend some time getting the information out as the data base program searches through your data base files, makes the proper combinations, and records the results. If you knew ahead of time how you wanted your information served, you could have recorded it accordingly in a single file and saved yourself a lot of time when you retrieved it.

7.2.1 EDUCATION DATA BASE EXAMPLE

This example illustrates some of the concepts mentioned in each of the data models. A company maintains an education and training department whose function is to run various training courses. Each course is offered at different locations within the company. The detail of this education data base is as follows.

1. For each course; course number (unique), course title, course description, details of prerequisite course, and details of all offerings.

2. For each prerequisite course; course number and title.
3. For each offering of a given course: Date, location, format, details about teachers and students.
4. For each teacher of a given offering: Employee number and name.
5. For each student of a given offering: Employee number, name and grade.

Example 1: Relational view of Education Data Base.

Course		Preeq		Offering			
Course #	Title	Course #	Pre#	Course #	Off#	Date	Location

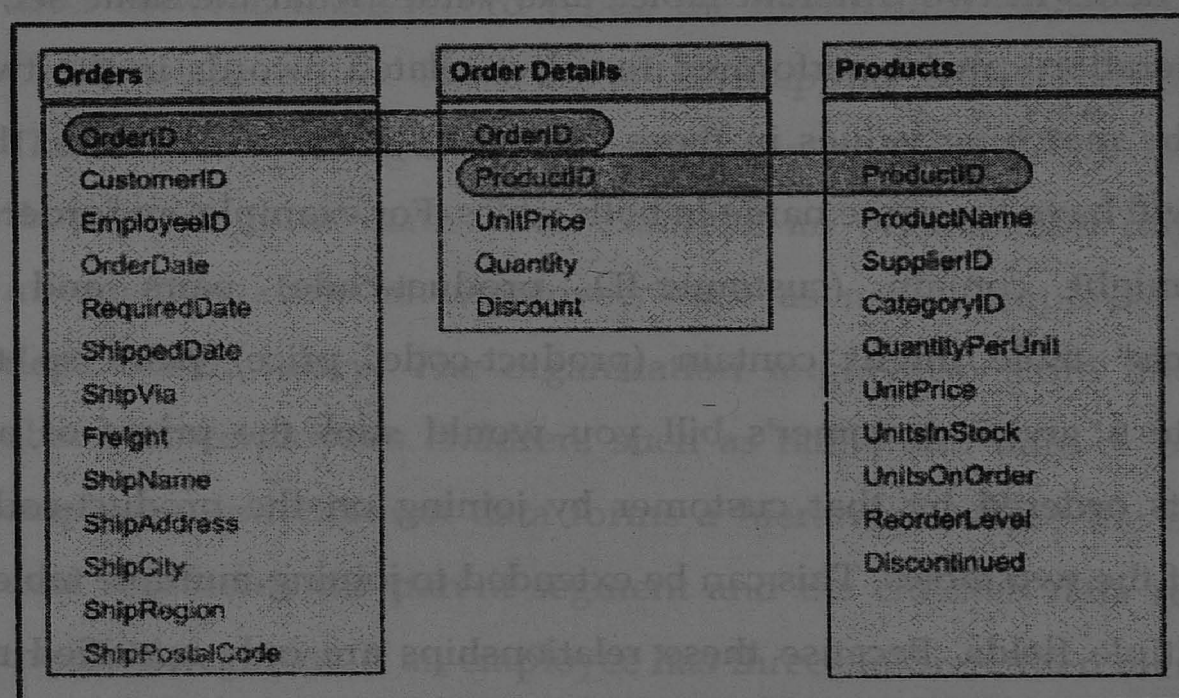
Teacher		Employee		Student			
Course #	Emp#	Emp#	Name	Course #	Off#	Emp#	Grade

In relational data base, one can combine records from different files as long as the records in the different files have one field in common. Under this system one can, theoretically, combine and retrieve selected records using a common field from an unlimited number of files with commands as SELECT, PROJECT and JOIN. SELECT operation selects a record or set of records corresponding to the value of a field. PROJECT creates subset records from existing records whereas JOIN command combines records into new records.

Example 2:

A relational database is a more-complex database that stores data in multiple tables that are interrelated. Usually the tables in a relational database have one-to-many relationships. For example, you might have one table that stores customer orders and another that stores the line items for each order, and each order table would have one or more line items in the order details table. Another example might be a customers table and an orders table. Each customer may place multiple orders.

The following image shows the Orders, Order Details, and Products tables..



As you can see, each table has one or more fields that connect it to a neighboring table. This indicates how each table is related to another table. For example, in this image the Orders table has an OrderID field. The Order Details table also has an OrderID field. Each record in the Order Details table has a value in the OrderID field that

matches an order in the Orders table. That's how you can determine which order line items in the Order Details table belong to a specific order in the Orders table.

Properties of Relational Tables:

- Values Are Atomic
- Each Row is Unique
- Column Values Are of the Same Kind
- The Sequence of Columns is Insignificant
- The Sequence of Rows is Insignificant

Certain fields may be designated as keys, which mean that searches for specific values of that field will use indexing to speed them up. Where fields in two different tables take values from the same set, a join operation can be performed to select related records in the two tables by matching values in those fields. Often, but not always, the fields will have the same name in both tables. For example, an "orders" table might contain (customer-ID, product-code) pairs and a "products" table might contain (product-code, price) pairs so to calculate a given customer's bill you would sum the prices of all products ordered by that customer by joining on the product-code fields of the two tables. This can be extended to joining multiple tables on multiple fields. Because these relationships are only specified at retrieval time, relational databases are classed as dynamic database management system. The RELATIONAL database model is based on the Relational Algebra

7.3 HIERARCHICAL DATA BASE

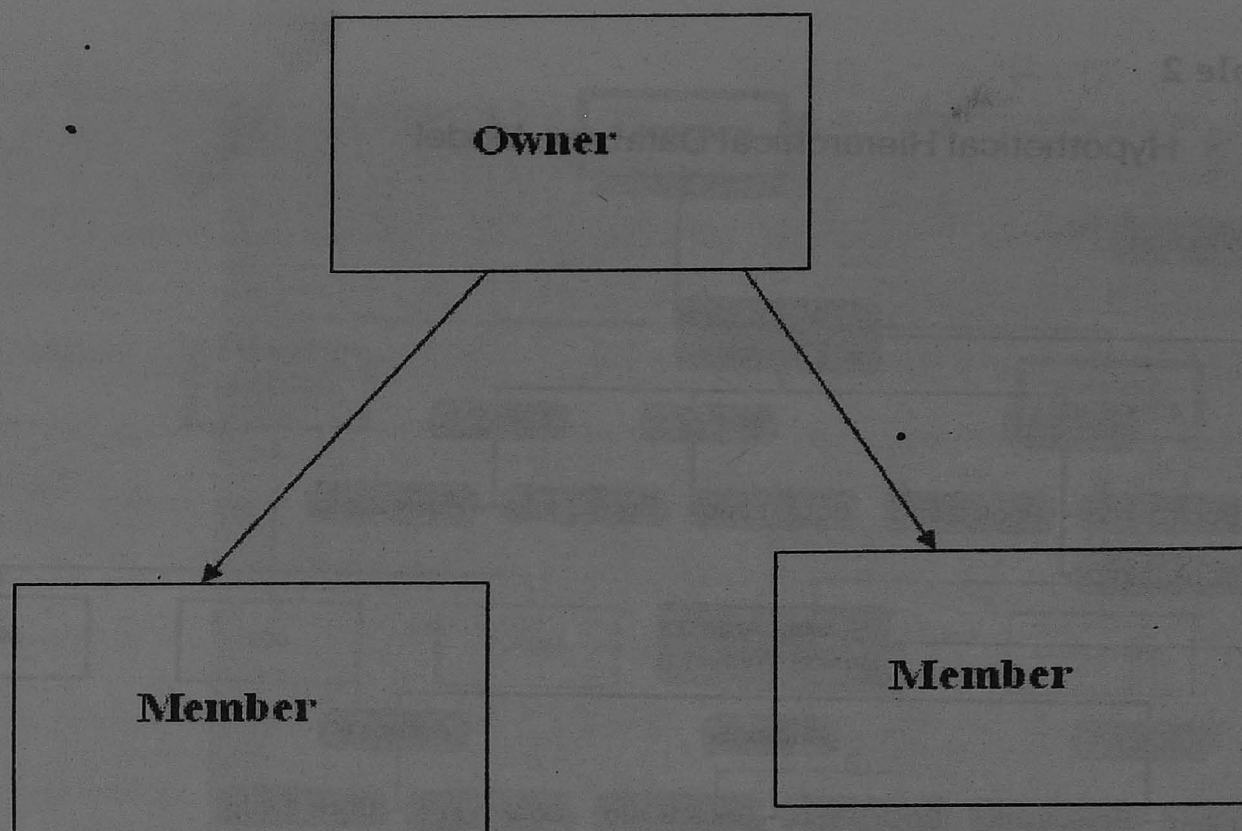
Data is represented by a tree-structure type of organization. The hierarchical tree specifies what record types are followed to be

included in the data base and the permissible relations between record types. Any record other than the root of the tree must be connected with a superior record (the parent). Thus, to insert a record, the user must select the parent record first. When a record is deleted, all the descendants of the record are also deleted. The hierarchical data model organizes data in a tree structure. There is a hierarchy of parent and child data segments. This structure implies that a record can have repeating information, generally in the child data segments. Data in a series of records, which have a set of field values attached to it. It collects all the instances of a specific record together as a record type. These record types are the equivalent of tables in the relational model, and with the individual records being the equivalent of rows. To create links between these record types, the hierarchical model uses Parent Child Relationships. These are a 1:N mapping between record types. This is done by using trees, like set theory used in the relational model, "borrowed" from maths. For example, an organization might store information about an employee, such as name, employee number, department, salary. The organization might also store information about an employee's children, such as name and date of birth. The employee and children data forms a hierarchy, where the employee data represents the parent segment and the children data represents the child segment. If an employee has three children, then there would be three child segments associated with one employee segment. In a hierarchical database the parent-child relationship is one to many. This restricts a child segment to having only one parent segment. Hierarchical DBMSs were popular from the late 1960s, with the introduction of IBM's Information Management System (IMS) DBMS, through the 1970s.

The hierarchical data base is made up of records, as is the relational data base, except that the records in a hierarchical data base do not have to be broken up into fields. The records can look like relational records with several fields per record, like a word processor file, or like a one-dimensional array of data items. They can look like anything you want because the hierarchical system does not look at the contents of a record the way a relational system does. In a relational data base system, the connections between files depend on the data itself. For instance, although two files may have a common field, you do not join the files if the data in the two common fields is not alike.

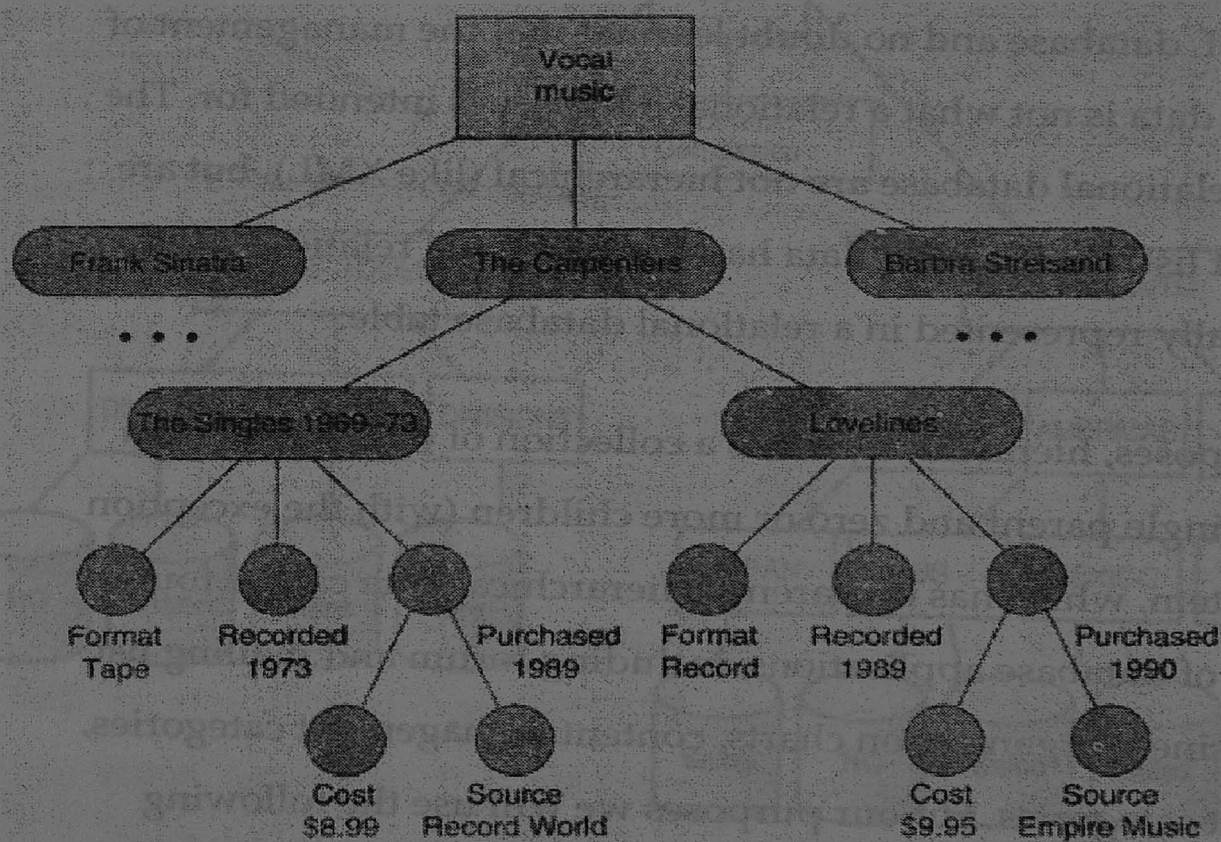
In a hierarchical system however, the connections between files do not depend on the data in the files. The connections are defined at the start and are fixed for the life of the data base. In this system, file A is always linked to file B, no matter what the contents of these two files are. And, naturally enough, the connection between record types is hierarchical.

These connections are called the structure of the data, and a diagram of them looks like an upside-down tree. The file at the top is called the parent or owner file, while the files at the bottom are called the child or member files. The identifying characteristic of this system is the one to many connections between the owner and the member files. In other words, the member files have only one owner file.

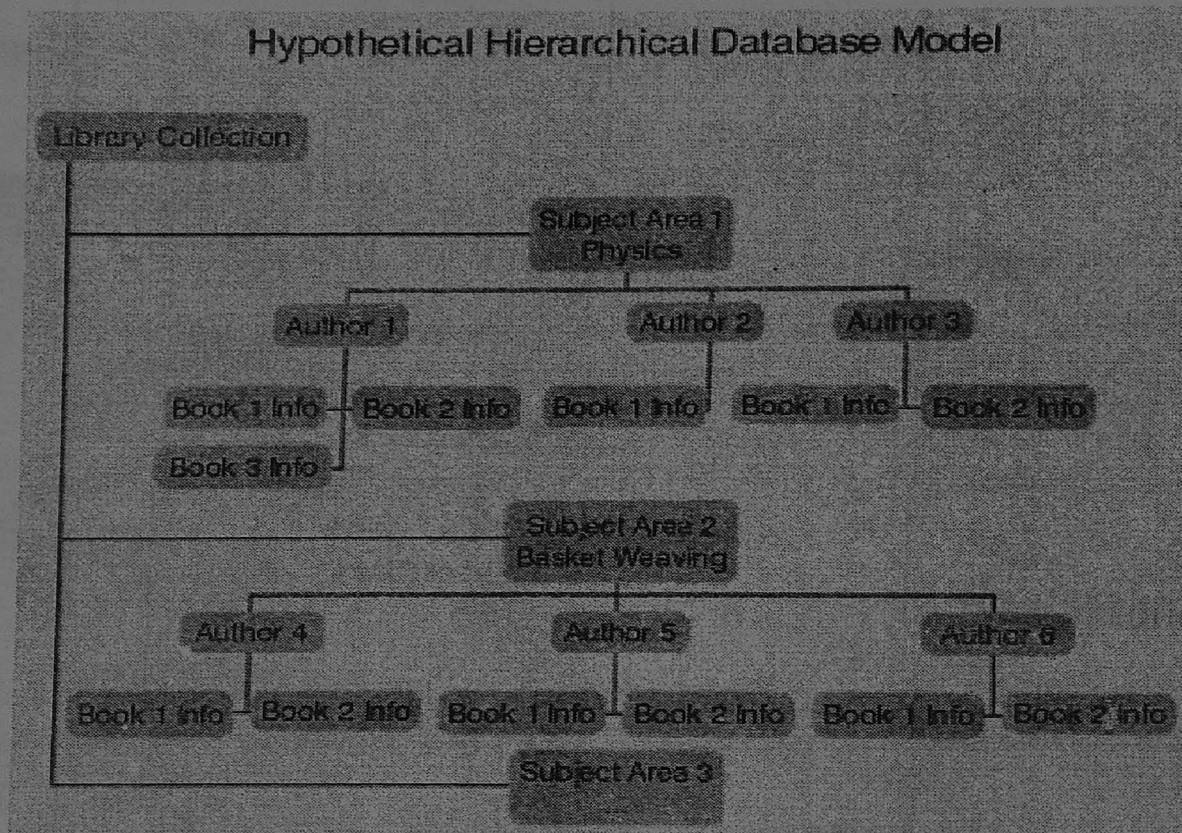


Example 1:

A method for storing data in a database that looks like a family tree with one root and a number of branches or subdivisions.



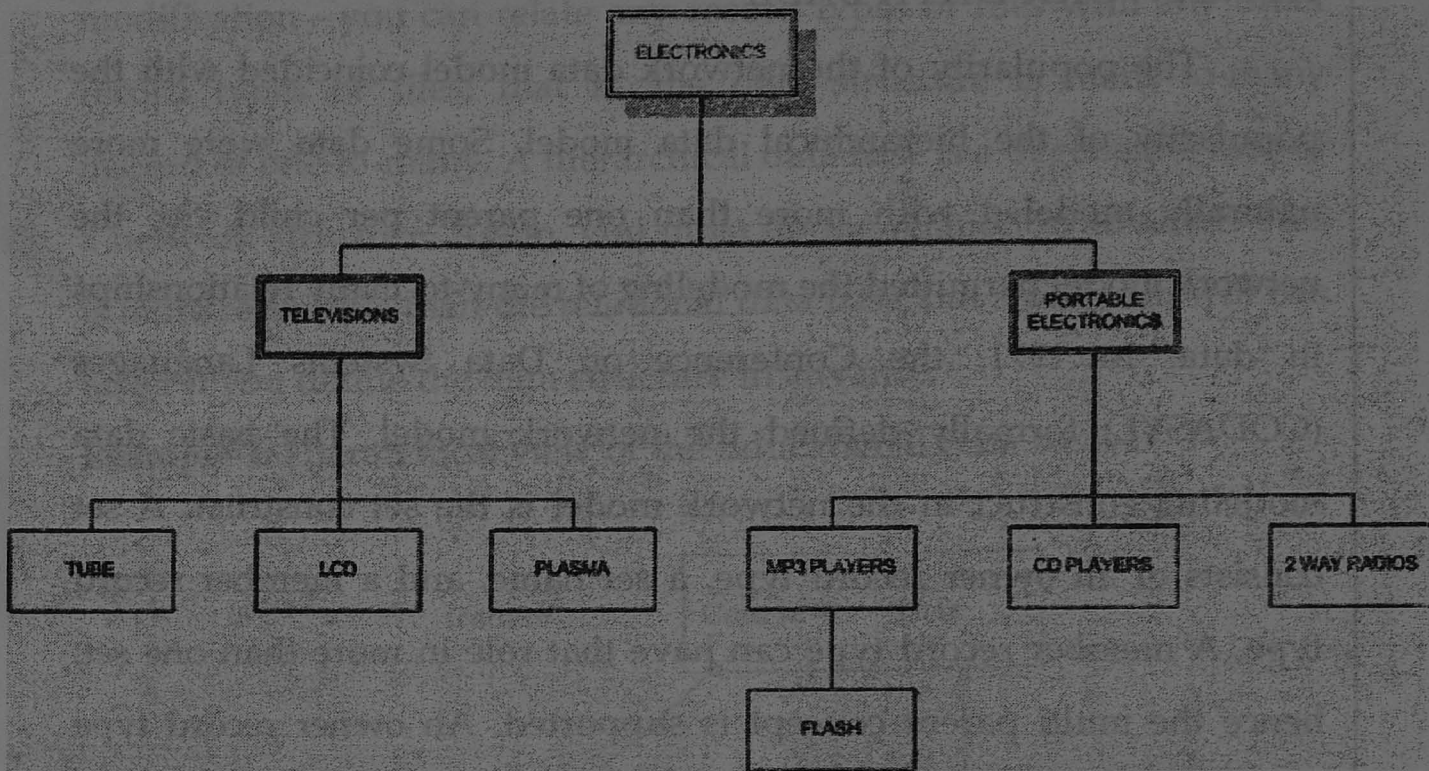
Example 2



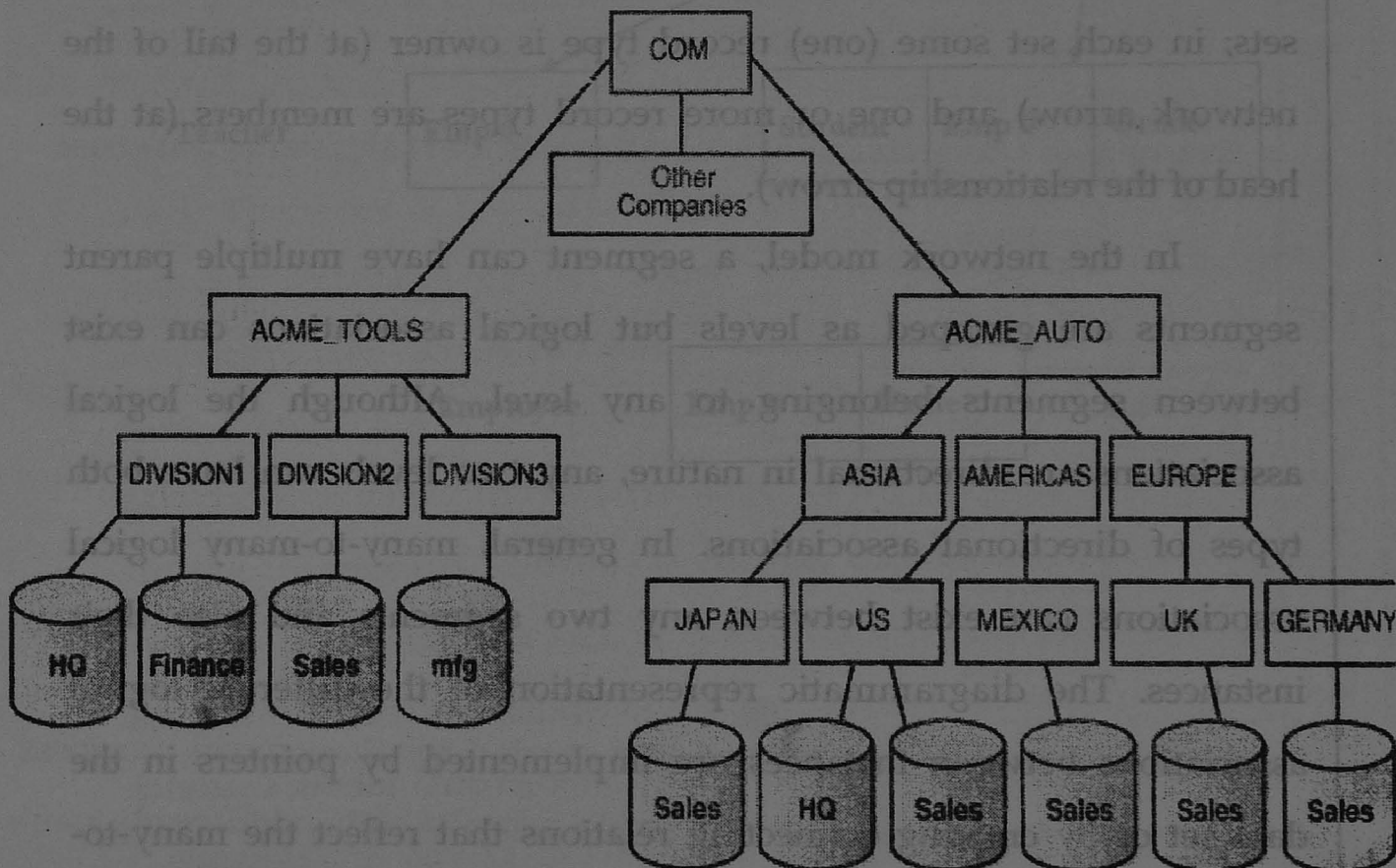
Example 3:

Most users at one time or another have dealt with hierarchical data in a SQL database and no doubt learned that the management of hierarchical data is not what a relational database is intended for. The tables of a relational database are not hierarchical (like XML), but are simply a flat list. Hierarchical data has a parent-child relationship that is not naturally represented in a relational database table.

For our purposes, hierarchical data is a collection of data where each item has a single parent and zero or more children (with the exception of the root item, which has no parent). Hierarchical data can be found in a variety of database applications, including forum and mailing list threads, business organization charts, content management categories, and product categories. For our purposes we will use the following product category hierarchy from an fictional electronics store:



Example 4:



7.4 NETWORK DATA BASE

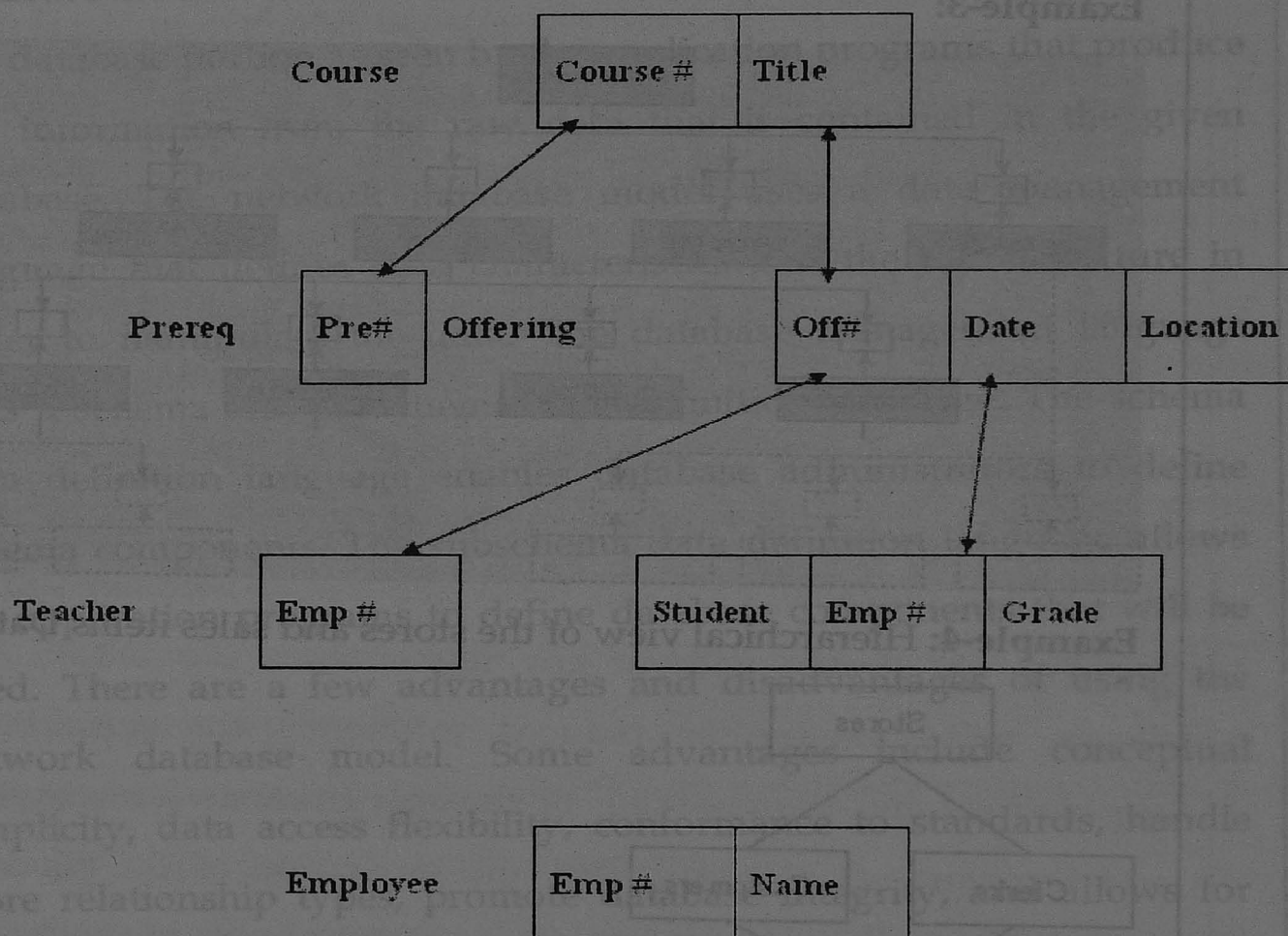
The popularity of the network data model coincided with the popularity of the hierarchical data model. Some data were more naturally modeled with more than one parent per child. So, the network model permitted the modeling of many-to-many relationships in data. In 1971, the Conference on Data Systems Languages (CODASYL) formally defined the network model. The basic data modeling construct in the network model is the set construct. A set consists of an owner record type, a set name, and a member record type. A member record type can have that role in more than one set; hence the multi parent concept is supported. An owner record type can also be a member or owner in another set. The data model is a simple network, and link and intersection record types (called junction records by IDMS) may exist, as well as sets between them. Thus, the complete network of relationships is represented by several pair wise sets; in each set some (one) record type is owner (at the tail of the network arrow) and one or more record types are members (at the head of the relationship arrow).

In the network model, a segment can have multiple parent segments are grouped as levels but logical associations can exist between segments belonging to any level. Although the logical associations are directional in nature, any two levels can have both types of directional associations. In general, many-to-many logical associations can exist between any two segments and also their instances. The diagrammatic representation of the different logical associations between instances are implemented by pointers in the data set or by creating connecting relations that reflect the many-to-many associations between the instances.

A network data base is like a hierarchical data base with one modification—you can relate any record types or files with any other record types or files; that is, the data structure is many-to-many instead of one-to-many. A hierarchical data base is a degenerate case of a network structure. Again, you must do the relation in advance. This is more restrictive than the relational data base, but a program will run faster if you define the data structure in advance.

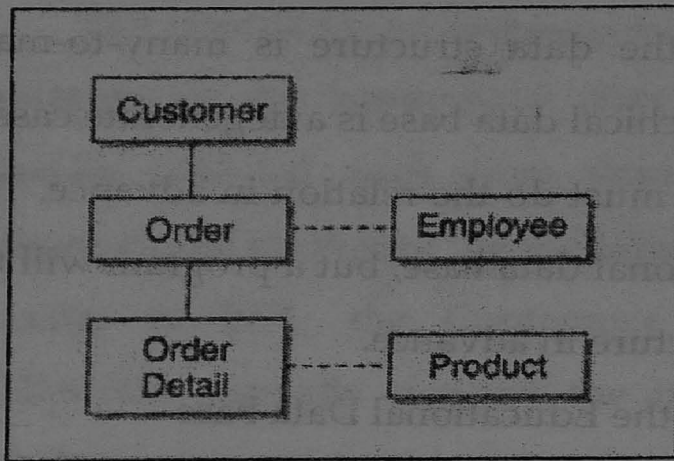
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Example 1: Hierarchical view of the Educational Data base

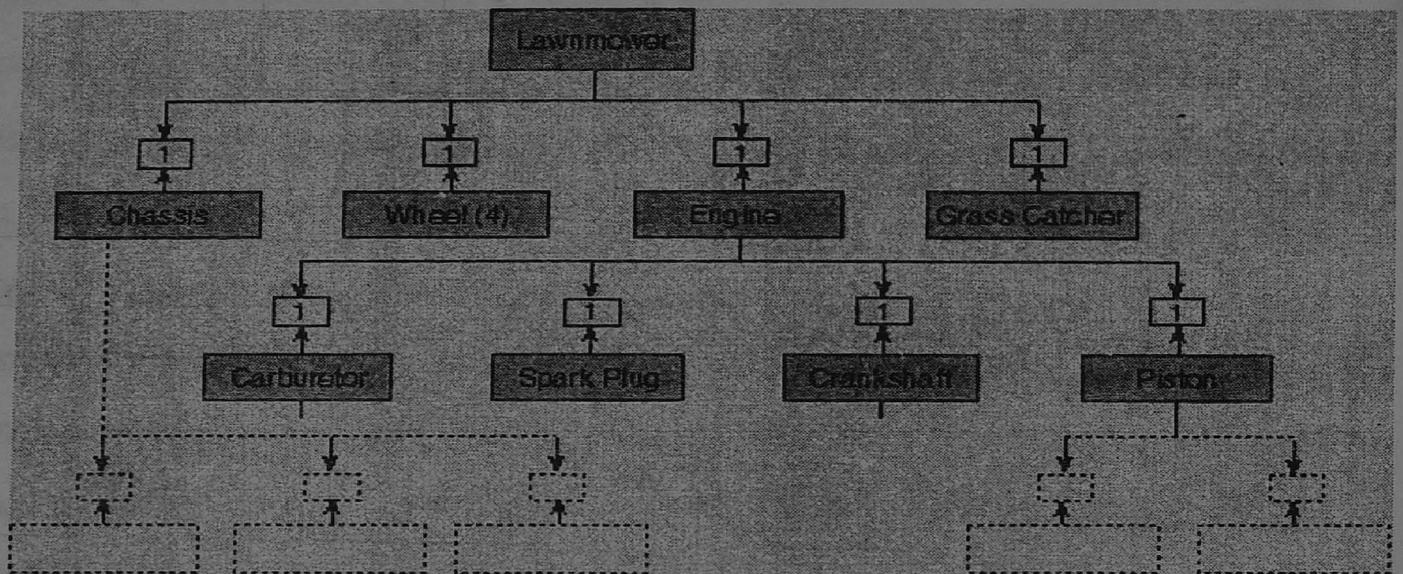


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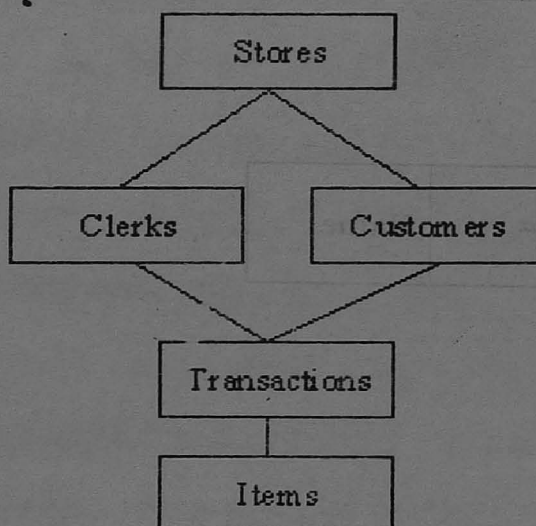
Example 2: Hierarchical view of the customer and product Data base



Example-3:



Example-4: Hierarchical view of the stores and sales items Data base



The *Network Database Model* was created for three main purposes. These purposes include representing a complex data relationship more effectively, improving database performance, and imposing a database standard. The network model highly resembles the hierarchal model.

Another characteristic is the network database model is composed of at least two record types including an owner, which is a record type equivalent to the parent type in the hierarchal database model, and the member record type which resembles the child type in the hierarchal model. The schema, subschema, and data management language are a few of the key components that make this database model unique. The schema used for this model is conceptual organization of the entire database as the database administrator intends. The subschema defines the database portion as seen by the application programs that produce the information from the raw data that is contained in the given database. The network database model uses a data management language that defines data characteristics and the data structure in order to manipulate the data. The database management language uses a schema and subschema data definition language. The schema data definition language enables database administrators to define schema components. The subschema data definition language allows the application programs to define database components that will be used. There are a few advantages and disadvantages of using the network database model. Some advantages include conceptual simplicity, data access flexibility, conformance to standards, handle more relationship types, promote database integrity, and allows for data independence. The disadvantages of the network database model are the structure is difficult to change, this type of system is very complex, and there is a lack of structural independence. In summary the network database model is similar but different then the hierarchal database model. The network database model should be used when it is necessary to have a flexible way of representing objects and their relationships.

7.5 DATA BASE DESIGN

Although data base applications have been in existence for more than a decade, advances in techniques for data base design have not kept pace with the advances in DBMS development and their applications. As data base applications become more prevalent and more complex, problems in designing a data base to support the applications become more difficult. Furthermore, as end-users of the data bases become sophisticated, they place additional demands on design issues like integrity and consistency, which in earlier days were ignored, but now are an integral part of the design requirements.

Traditionally data base design has been separated into logical and physical design. Logical design covers that part of the design process wherein one designs a data base without the constraint of a DBMS and its storage and access techniques. Physical design is that part of the process that deals with the dependency of a DBMS. Unfortunately, although such a separation is desirable, in reality it is not quite achievable. One can easily see that it becomes difficult to evaluate the design without any reference to any DBMS. Logical design will therefore be reduced to merely the specification of applications and the checking of the specifications for completeness and inconsistency. Nevertheless, the separation of the process into logical and physical design is useful in that the levels of the design will correspond to the levels of the DBMS.

Generally speaking, the steps in a data design process involve:

- Collecting information, which includes defining fields, assigning and resolving fields, defining usage, and so forth,
- formulating the requirements, including performance,
- forming records and files,

- analyzing structure with respect to the needs and,
- forming an overall structure for the data base that includes the specification of access paths and the placement of files in storage if needed.

APPLICATIONS

Application areas that can employ data base systems include:

1. Manufacturing with inventory management, Bills-of-material processing, and production equipment scheduling.
2. Government, at all, levels with records on taxpaying individuals and property.
3. Financial institutions with lists of individual accounts, assets, and convertibility of funds.
4. Service industries with lists of service capabilities and allocation schedules.
5. Medical services with patient records, disease histories, problem classification, and treatment effectiveness data.
6. Economic models with production and consumption data for allocation and planning.
7. Scientific research with collection of previously gathered data used to determine future research directions.
8. Officers who are automating their document management.
9. Libraries cataloging abstracts and indexes of their holdings.
10. Airline reservations
11. Ports management
12. Railway information system
13. Statistics, used for survey and statistical data.
14. Others, i. e Electronic Mail.

Check Your Progress

1. Write notes about data base model.
2. Define Relational database and applications
3. Define Hierarchical database and applications
4. Define Networking database and applications
5. Write down the applications of data base model.
6. Write down short notes about Relational, Hierarchical and Network models.

UNIT VIII

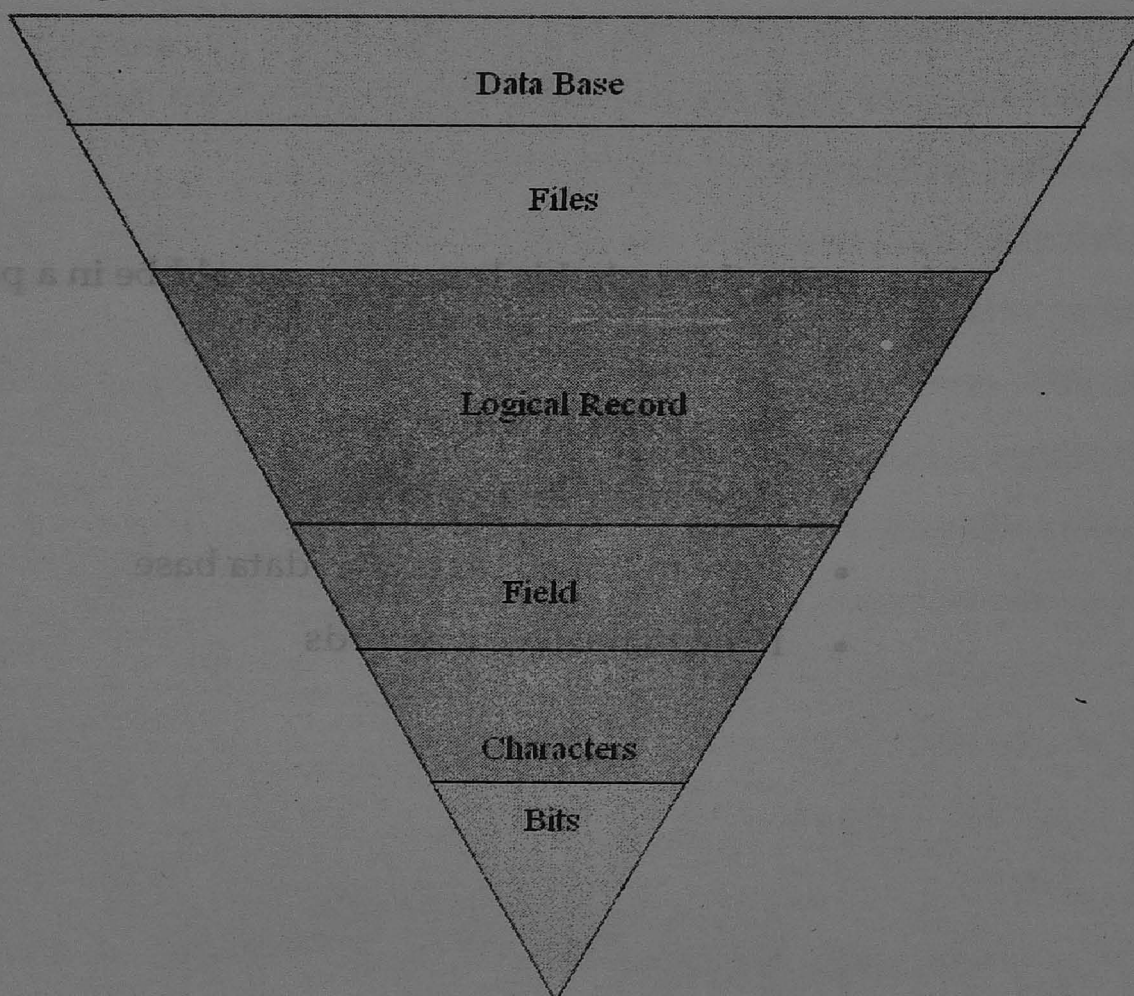
OBJECTIVES

After going through this lesson you would be in a position to

- How to build a data base.
- How to create a data base.
- How to Enter a data into data base
- How to retrieve a records

8.1 BUILDING A DATABASE

As students or businesspersons, we may want to keep information on taxes, customers, purchases, inventory, personnel, and so on. With data management software, you can create and maintain a data base and extract information from the data base. To use data management or "data base" software, you first identify the format of the data, then design a display format that will permit interactive entry and revision of the data base. Once the data base is created, its records (related data about a particular event or thing) can be deleted or revised and other records can be added to the data base. "Data base", as one word the hierarchy of data organization. The following figure represents hierarchy of data organization.



All data base software packages have the following fundamental capabilities:

1. Create and maintain (e.g., add, delete, and revise records) a data base
2. Extract and list all records or only those records that meet certain conditions.
3. Make an inquiry (e.g., the average value of a particular field in a series of records).
4. Sort records in ascending or descending sequence by primary, secondary, and tertiary fields.
5. Generate formatted reports with subtotals and totals.

8.2 CONCEPTS

Many similarities exist between commercially available word processing and electronic spreadsheet packages. With word processing, the user sees and manipulates lines of text. With electronic spreadsheets, the user sees and manipulates data in numbered rows and lettered columns. This is not the case with data management packages. All commercial data management software packages permit the creation and manipulation of data bases, but what the user sees on the screen may be vastly different for the various packages. However, the concepts embodied in these data base packages are very similar. The conceptual coverage that follows is generic and can be applied to all data base packages; however, the examples are oriented to dBASE IV product of Ashton-Tate.

Files

A file is a collection of data stored on a secondary memory device. The typical business maintains hundreds of files containing

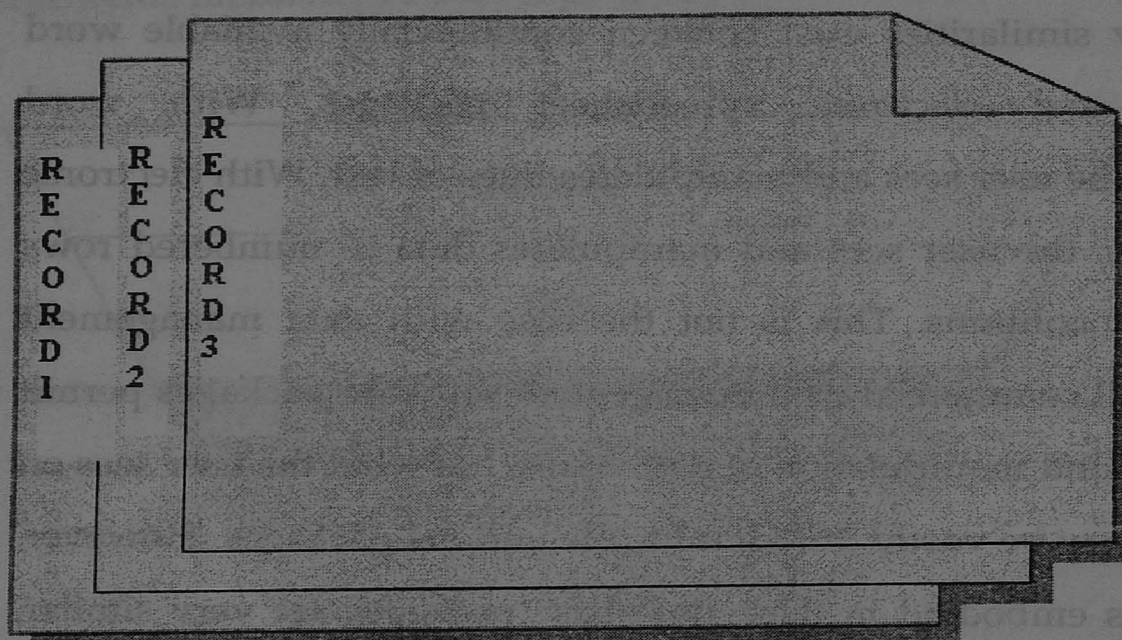
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records of its various activities. Consider the records kept by a bank, for example. A bank would maintain an installment loan file containing information about each of the installment loans it makes; it would maintain a checking account file containing information about each of its checking accounts; similarly, it would maintain a savings account file containing information about each of its savings account.

Files and Records

You may think of a file as a file folder containing pieces of information about a particular subject. The individual pieces of paper in the file are called records for example.

- A student grade the contains a record for each student.



- An airline reservation file contains a record for each reservation.

Record 1			
Commuter Airlines			
Passenger Name		Agents No	Date of Issue
Flight #	Flight Date	Flight Time	Carrier
Departure City	Cost	No. of Seats	Class
Destination City	Total	Route code	Form of Payment

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Record 2			
Commuter Airlines			
Passenger Name		Agents No	Date of Issue
Flight #	Flight Date	Flight Time	Carrier
Departure City	Cost	No. of Seats	Class
Destination City	Total	Route code	Form of Payment

Record 3			
Commuter Airlines			
Passenger Name		Agents No	Date of Issue
Flight #	Flight Date	Flight Time	Carrier
Departure City	Cost	No. of Seats	Class
Destination City	Total	Route code	Form of Payment

- A telephone customer file contains a record for each telephone customer

In this sense, a file is a collection of related records. These records provide a structure for the entry and storage of data in the file.

A record is composed of related fields. Each field contains a piece of data to be placed into the record. Consider an airline reservation file, which is organized to contain one record per reservation. Each record may contain the following fields.

1. Passenger name
2. Flight number
3. Flight date
4. Flight Time
5. Number of seats
6. Departure city
7. Destination city

This list represents the structure of each record in the file. If there are 100,000 reservations in the system, there are 100,000 names, 100,000

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flight numbers, and so on, in the system. When a user looks at one record, he/she sees one name, one flight number, one date, one time, one cost, one departure city, and one destination city.

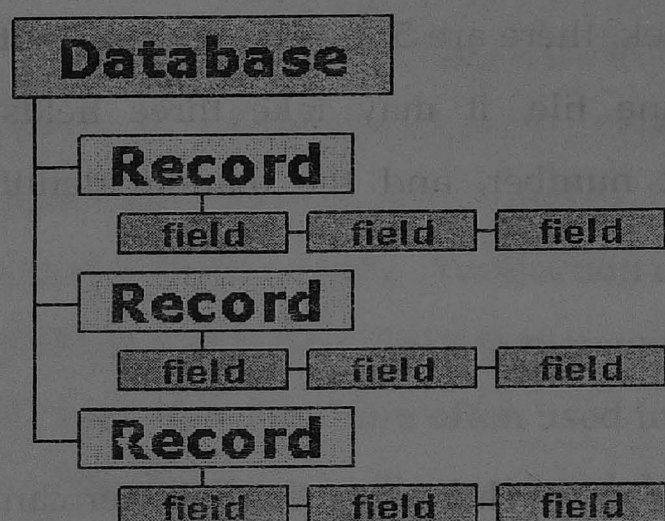
Commuter Airlines			
Passenger Name		Agents No	Date of Issue
Flight #	Flight Date	Flight Time	Carrier
Departure City	Cost	No. of Seats	Class
Destination City	Total	Route code	Form of Payment

Some fields of record of a record are used in locating a record within a file. If you have ever asked for a transcript of your grades, you may have found that you must furnish your student identification number before anyone can help you. This number is necessary for the computer to find your record. It is simply a matter of efficiency. Telling the system to get the record of student 1234567 is far more efficient than telling system to find the record of a student with your name. In that case, the computer would have to search every student record to see if the name matches. In a large school, there may be other students with the same name, so the search could be indecisive, and the computer could produce several records rather than just one.

A key field is a field that can be used to locate one particular record. In the above example, the field containing the student number is an example of a key field. Other examples of key fields are the loan number in a loan, the phone number in a phone company customer file, and the credit number in a department store's credit cardholder file.

Records the building blocks of databases, records describe information sources. It is unrealistic, at this time, to expect all information sources to come directly to a computer screen on demand. The reasons for this

will be clearer to you as you become more experienced finding and using information. In the meantime, having a record describing a source that you can then find using your own abilities and knowledge is an excellent starting point. The description in a record uses elements called metadata [information about information]. In many cases, the text itself will have to be located using other finding tools. Some libraries provide links to the text of articles, when available, at their own expense.



Fields the building blocks of records; these are the sections of a record where information is stored.

For example, your driver's license or ID card is a record about you with fields describing your name, eye color, height, address, and so on. Field names can vary, but in library databases author, title, subject, publisher, and publication date are common

Denton High School
Pupil Record Card

Student Number	0125
Forename	Lisa
Surname	Knapper
Date-of-Birth	12-Jan-1985
Form	T3

← **Record**

← **Field**

Sometimes one key field is not enough to identify a record uniquely. Consider the airline reservation file. A passenger is an adequate key by itself, because many people across the country have the same name, and one person may hold several reservations. The flight number alone is not adequate either, because there are dozens of people on each flight and the same flight goes up each day. If the airline combines the passenger name and flight number, its chances of finding the correct record are greatly improved. But even the two keys are not sufficient to identify the record uniquely; if the same customer rides the same flight each week, there are 5 records per year with the same two keys. In an airline file, it may take three fields- the passenger's name, the flight number, and the date-to identify a record uniquely.

8.3 Fields and Characters

A field contains one or more characters. A character can be a letter of the alphabet, a number or some other single symbol. A field might contain the character of person's name or the digits of a telephone number. In many files, the length of a field is defined in advance. For example, a field containing a name might be specified to contain no more than 30 characters, whereas a field for a telephone number might be specified to contain ten characters.

Example :

(i). A field for a name having 18 characters

H	E	A	L	T	H	C	A	R	E		L	I	M	I	T	E	D
---	---	---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---

(ii). A field for a student Exam number having 11 characters.

5	2	3	6	1	2	8	9	0	1	0
---	---	---	---	---	---	---	---	---	---	---

(iii) A field for employee salary 5 characters.

1	5	0	0	0
---	---	---	---	---

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Let us go back to the beginning. If you combine the characters into a field, then group together many fields, you have a record. If you collect other similar records, you have a file. Eventually, the company's file combines to form a complete database. We will now move on to discuss databases.

The organization of the data in a microcomputer data base is similar to the traditional hierarchy of data organization related fields, such as course identification number, course title, and course type are grouped to form records. A collection of related records make up a data file or a data base. In data management software terminology, "file" and "data base" are often used interchangeably.

The best way to illustrate and demonstrate the concepts of data management software is by an example. Let us take the case of ABC Company, who uses a micro-based data management software package to help with his employee record-keeping tasks. To do this, business coordinator crated two data bases. The EMP data base contains a record for each course that ABC Company offers to their employees and for several departments. Each record in the EMP data base contains following fields.

(i) Consider a EMP data base

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EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

(ii) Consider a RECORD data base

EMPNO	DEPTNO	JOB	JOIN_DATE
7369	20	CLERK	17-DEC-80
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7654	30	SALESMAN	28-SEP-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7788	20	ANALYST	19-APR-82
7839	10	PRESIDENT	17-NOV-81
7844	30	SALESMAN	08-SEP-81
7876	20	CLERK	23-MAY-82
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81
7934	10	CLERK	23-JAN-82

1. Creating a Data Base

Our first step is to create the database itself. Many database management systems offer a series of options to customize database parameters at this step, but our database only permits the simple creation of a database. As with all of our commands, you may wish to

consult the documentation for your DBMS to determine if any advanced parameters supported by your specific system meet your needs. To create a data base, the first thing you do is to set up a screen format that will enable you to enter the data for a record. The data entry screen format is analogous to a hardcopy form that contains labels and blank lines. Data are entered and edited with data management software one record at a time, like they are on hard copy forms. Data for the different variables are entered in different columns of the spreadsheet. All data for a single subject or case are entered in one row in the spreadsheet. In the top row of the columns you can enter the names of the variables.

A variable name should not include any spaces. If necessary, you can use the underscore character `_` to separate words, e.g. `GRADE_A`. Also the following characters cannot be used in a variable's name:

`- + / * = < > ^ ( ) $ " ' : , .`

In addition, the variable name must not start with a number and must be different from reserved words such as `TRUE`, `FALSE`, `ROW` and `COLUMN`.

8.4 The structure of the Data Base:

To set up a data entry screen format you must first specify the structure of the data base by identifying the characteristics of each field in the data base. This is done interactively, with the system prompting you to enter the field name, field type and so on. For example, field name is `job`, field length is 9 characters. Field name is `sal`; field length is 7 numbers and two decimal positions.

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Name	Type
SAL	NUMBER(7,2)
EMPNO	NUMBER(4)
ENAME	VARCHAR2(10)
JOB	VARCHAR2(9)
DEPTNO	NUMBER(2)

For numeric field types, you must specify the maximum number of digits and the number of decimal positions that you wish to have displayed.

8.5 Entering and Editing Data Base

The screen format for entering editing, and adding records to the EMP .

To add a record to an existing EMP data base, the business coordinator would issue a command such as append or add. This command displays the format screen shown as,

FILE	EMP	RECORD1
EMPNO	4444	
EMPNAME	SRUTHI	
JOB	ANALYST	
DEPTNO	20	
SAL	4000	

After entering the record the EMP table shows the following records.

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EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300
4444	sruthi	analyst	20	4000

Now we have to be adding a one more record to an existing EMP data base, the business coordinator would issue a command such as append or add. This command displays the format screen shown as

FILE	EMP	RECORD2
EMPNO	5566	
EMPNAME	SMITH	
JOB	SALESMAN	
DEPTNO	30	
SAL	3500	

After entering the record the EMP table shows the following records

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300
4444	sruthi	analyst	20	4000
5566	SUJITH	SALESMAN	30	3500

8.6 Retrieving Database Records

Data management software also permits you to retrieve, view, and print records based on present conditions. You set conditions for the selection of records by composing a relational expression that reflects that desired conditions. The relational expression normally compares one or more field names to number or character strings using the relational operators. Several expressions can be combined in a single condition with logical operators.

The business coordinators wanted to list of "salesman" in that company. To retrieve these records, the condition is

TYPE = "salesman"

The salesman records are:

EMPNO	ENAME	JOB	DEPTNO	SAL
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7654	MARTIN	SALESMAN	30	1250
7844	TURNER	SALESMAN	30	1500
5566	SUJITH	SALESMAN	30	3500

The business coordinators wanted to list of "manager" in that company.

To retrieve these records, the condition is

TYPE = "manager"

The manager records are:

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	2975
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450

The business coordinators wanted to list of employee name those who are getting salary of greater than 1750. To retrieve these records, the condition is TYPE = "SAL > 1750". The records are:

EMPNO	ENAME	JOB	DEPTNO	SAL
7782	CLARK	MANAGER	10	2450
7698	BLAKE	MANAGER	30	2850
7566	JONES	MANAGER	20	2975
7788	SCOTT	ANALYST	20	3000
7902	FORD	ANALYST	20	3000
5566	SUJITH	SALESMAN	30	3500
4444	sruthi	analyst	20	4000
7839	KING	PRESIDENT	10	5000

The business coordinators wanted to list of employee name those who are under deptno 10. To retrieve these records, the condition is

TYPE "deptno=10". The records are:

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EMPNO	ENAME	JOB	DEPTNO	SAL
7782	CLARK	MANAGER	10	2450
7839	KING	PRESIDENT	10	5000
7934	MILLER	CLERK	10	1300

The business coordinators wanted to list of employee name those who are under deptno either 20 or 30. To retrieve these records, the condition is

TYPE "deptno = 20 .OR. 30"

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7788	SCOTT	ANALYST	20	3000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
4444	sruthi	analyst	20	4000
5566	SUJITH	SALESMAN	30	3500

The business coordinators wanted to list of employee whose getting salary grater than 2500 and deptno is 20. To retrieve these records, the condition is TYPE = "SAL > 2500 .AND. DEPTNO = 20"

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	2975
7788	SCOTT	ANALYST	20	3000
7902	FORD	ANALYST	20	3000
4444	sruthi	analyst	20	4000

The business coordinators wanted to list of ALLEN and MARTIN employee records. To retrieve these records, the condition is

TYPE = "ENAME IS ALLEN .OR. MARTIN"

EMPNO	ENAME	JOB	DEPTNO	SAL
7499	ALLEN	SALESMAN	30	1600
7654	MARTIN	SALESMAN	30	1250

The business coordinators wanted to number of salesman in their company. To retrieve these records, the condition is
COUNT FOR SOURCE = "salesman".

The result of 5 is displayed on the monitor.

The business coordinators wanted to number of clerk in their company. To retrieve these records, the condition is
COUNT FOR SOURCE = "clerk".

The result of 4 is displayed on the monitor.

The business coordinators wanted to display the employees those who joined after January 1982. To retrieve these records, the condition is
TYPE = " JOIN_DATE > 01-JAN-1982"

EMPNO	DEPTNO	JOB	JOIN_DATE
7788	20	ANALYST	19-APR-87
7876	20	CLERK	23-MAY-87
7934	10	CLERK	23-JAN-82
4444	20	analyst	02-JAN-82
5566	30	SALESMAN	02-JAN-83

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Check Your Progress

1. How to build a database?
2. Explain data base concepts and application
3. Write a note about files and records.
4. Write detailed notes about fields and characters
5. Explain structure of data base
6. How to enter and edit a data base?

UNIT IX

OBJECTIVES

After going through this lesson you would be in a position to

- How to edit a data base.
- How to modify a data base.
- How to sort a records

9.1 EDITING & MODIFYING DATABASE:

1. UPDATING

Data management software permits you to editing a database such as delete a record, update a record, delete all records, and create a duplicate table. You set conditions for the selection of records by composing a relational expression that reflects that desired conditions.

(a) Consider a EMP data base

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

(b) Consider a RECORD data base

EMPNO	DEPTNO	JOB	JOIN DATE
7369	20	CLERK	17-DEC-80
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7654	30	SALESMAN	28-SEP-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7788	20	ANALYST	19-APR-81
7839	10	PRESIDENT	17-NOV-81
7844	30	SALESMAN	08-SEP-81
7876	20	CLERK	23-MAY-81
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81
7934	10	CLERK	23-JAN-82

(i). The business coordinators wanted to change the department number 30 into 60 for the EMP table. To retrieve these records, the condition is

SET DEPTNO = 60 WHERE DEPTNO=30. After this command the modified EMP table is

UPDATE rows in EMP table.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	60	1600
7521	WARD	SALESMAN	60	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	60	1250
7698	BLAKE	MANAGER	60	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	60	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	60	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

(ii). The business coordinators wanted to increase the salary 500 for clerk employees. The condition is

SET SAL = SAL+500 WHERE JOB='CLERK'

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	60	1600
7521	WARD	SALESMAN	60	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	60	1250
7698	BLAKE	MANAGER	60	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	60	1500
7876	ADAMS	CLERK	20	1600
7900	JAMES	CLERK	60	1450
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1800

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(iii). The business coordinators wanted to increase the salary 2500 for analyst employees.

EMPNO	ENAME	JOB	DEPTNO	SAL
7788	SCOTT	ANALYST	20	3000
7902	FORD	ANALYST	20	3000

To retrieve these records, the condition is SET SAL = SAL+500 WHERE JOB='ANALYST'

The updated records for EMP table is

EMPNO	ENAME	JOB	DEPTNO	SAL
7788	SCOTT	ANALYST	20	5500
7902	FORD	ANALYST	20	5500

(iv). The business coordinators wanted to change the position of the employee SMITH, clerk into analyst.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300

To modify this record, the condition is, SET JOB='ANALYST' WHERE ENAME='SMITH'. The updated records for EMP table is

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	ANALYST	20	1300

(v). The business coordinators wanted to increase the salary 1000 for the employees those who are getting more than Rs.2500 salary.

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	2975
7698	BLAKE	MANAGER	30	2850
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7902	FORD	ANALYST	20	3000

The condition is SET SAL = SAL+1000 WHERE SAL > 2500

The updated records for EMP table is

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	3975
7698	BLAKE	MANAGER	30	3850
7788	SCOTT	ANALYST	20	4000
7839	KING	PRESIDENT	10	6000
7902	FORD	ANALYST	20	4000

2. DELETION

You can remove existing rows from a table by using the DELETE statement.

(i). The business coordinators wanted to delete a record from database those who are under the deptno 20 or 30.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	3975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	3850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	4000
7839	KING	PRESIDENT	10	6000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1400
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	4000
7934	MILLER	CLERK	10	1300

The condition is DELETE DEPTNO = 20 .OR. 30. After the execution of this command, the EMP table becomes,

EMPNO	ENAME	JOB	DEPTNO	SAL
7782	CLARK	MANAGER	10	2450
7839	KING	PRESIDENT	10	6000
7934	MILLER	CLERK	10	1300

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(ii). The business coordinators wanted to delete a SMITH record from database.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	3975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	3850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	4000
7839	KING	PRESIDENT	10	6000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	4000
7934	MILLER	CLERK	10	1300

The condition is DELETE ENAME = 'SMITH'. After the execution of this command, the EMP table becomes,

EMPNO	ENAME	JOB	DEPTNO	SAL
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

(iii). The business coordinators wanted to delete a "CLARK" record from the database.

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	2975
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450

The condition is `DELETE ENAME = 'CLARK'`. After the execution of this command, the table becomes

EMPNO	ENAME	JOB	DEPTNO	SAL
7566	JONES	MANAGER	20	2975
7698	BLAKE	MANAGER	30	2850

(iii). The business coordinators wanted to delete a record from database those who are getting salary less than 4000

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

The condition is `DELETE SAL < 3000`. After the execution of this command, the EMP table becomes

```
select empno,ename,job,deptno,sal from aa;
```

EMPNO	ENAME	JOB	DEPTNO	SAL
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7902	FORD	ANALYST	20	3000

3. SORTING

Data can also be sorted for display in a variety of formats. In sorting, Numeric values are displayed with the lowest values first—for example, 1-999. Character values are displayed in alphabetical order—for example, A first and Z last. Null values are displayed last for ascending sequences and first for descending

sequences. Sorting is very important to analyze the data. We can able to sorting a record either by ascending order or descending order. The default order is ascending order. We can able to sort a particular column using a LIST SOURCE command.

Example (i):

The business coordinators wanted to sort a record from EMP database under the salary.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

The condition is LIST SOURCE SAL. After the execution of this command, the EMP table becomes

EMPNO	ENAME	JOB	DEPTNO	SAL
7900	JAMES	CLERK	30	950
7876	ADAMS	CLERK	20	1100
7521	WARD	SALESMAN	30	1250
7654	MARTIN	SALESMAN	30	1250
7369	SMITH	CLERK	20	1300
7934	MILLER	CLERK	10	1300
7844	TURNER	SALESMAN	30	1500
7499	ALLEN	SALESMAN	30	1600
7782	CLARK	MANAGER	10	2450
7698	BLAKE	MANAGER	30	2850
7566	JONES	MANAGER	20	2975
7788	SCOTT	ANALYST	20	3000
7902	FORD	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000

Example (ii):

The business coordinators wanted to sort a record from EMP database under the salesman job, on the basis of salary.

Space for
Hint

EMPNO	ENAME	JOB	DEPTNO	SAL
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7654	MARTIN	SALESMAN	30	1250
7844	TURNER	SALESMAN	30	1500

- The condition is LIST SOURCE JOB FOR TYPE ='SALESMAN' .AND. TYPE ='SAL'. After the execution of this command, table becomes

EMPNO	ENAME	JOB	DEPTNO	SAL
7521	WARD	SALESMAN	30	1250
7654	MARTIN	SALESMAN	30	1250
7844	TURNER	SALESMAN	30	1500
7499	ALLEN	SALESMAN	30	1600

Example (iii):

The business coordinators wanted to sort a record from EMP database under the employee name and under the salary.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

- The condition is LIST SOURCE JOB FOR TYPE ='ENAME' .AND. TYPE ='SAL'. After the execution of this command, the EMP table becomes

Space for
Hint

EMPNO	ENAME	JOB	DEPTNO	SAL
7876	ADAMS	CLERK	20	1100
7499	ALLEN	SALESMAN	30	1600
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7902	FORD	ANALYST	20	3000
7900	JAMES	CLERK	30	950
7566	JONES	MANAGER	20	2975
7839	KING	PRESIDENT	10	5000
7654	MARTIN	SALESMAN	30	1250
7934	MILLER	CLERK	10	1300
7788	SCOTT	ANALYST	20	3000
7369	SMITH	CLERK	20	1300
7844	TURNER	SALESMAN	30	1500
7521	WARD	SALESMAN	30	1250

Example (iii):

The business coordinators wanted to sort a record from EMP database under the employee name under the descending order.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

The condition is LIST SOURCE JOB FOR TYPE = 'ENAME'
DESCENDING. After the execution of this command, the EMP table
becomes

EMPNO	ENAME	JOB	DEPTNO	SAL
7521	WARD	SALESMAN	30	1250
7844	TURNER	SALESMAN	30	1500
7369	SMITH	CLERK	20	1300
7788	SCOTT	ANALYST	20	3000
7934	MILLER	CLERK	10	1300
7654	MARTIN	SALESMAN	30	1250
7839	KING	PRESIDENT	10	5000
7566	JONES	MANAGER	20	2975
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7782	CLARK	MANAGER	10	2450
7698	BLAKE	MANAGER	30	2850
7499	ALLEN	SALESMAN	30	1600
7876	ADAMS	CLERK	20	1100

Example (iv):

The business coordinators wanted to sort a record from EMP database under the deptno 20 and 30.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7788	SCOTT	ANALYST	20	3000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000

The condition is LIST SOURCE DEPTNO = 20 .OR. DEPTNO=30. After the execution of this command, table becomes

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7566	JONES	MANAGER	20	2975
7788	SCOTT	ANALYST	20	3000
7902	FORD	ANALYST	20	3000
7876	ADAMS	CLERK	20	1100
7499	ALLEN	SALESMAN	30	1600
7900	JAMES	CLERK	30	950
7844	TURNER	SALESMAN	30	1500
7698	BLAKE	MANAGER	30	2850
7654	MARTIN	SALESMAN	30	1250
7521	WARD	SALESMAN	30	1250

Space for
Hint

Example (iv):

The business coordinators wanted to calculate a annual salary for each employee from the EMP table.

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	1300
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

The condition is LIST SOURCE SAL = SAL* 12. After the execution of this command, EMP table becomes

EMPNO	ENAME	JOB	DEPTNO	ANNUAL SAL
7369	SMITH	CLERK	20	15600
7499	ALLEN	SALESMAN	30	19200
7521	WARD	SALESMAN	30	15000
7566	JONES	MANAGER	20	35700
7654	MARTIN	SALESMAN	30	15000
7698	BLAKE	MANAGER	30	34200
7782	CLARK	MANAGER	10	29400
7788	SCOTT	ANALYST	20	36000
7839	KING	PRESIDENT	10	60000
7844	TURNER	SALESMAN	30	18000
7876	ADAMS	CLERK	20	13200
7900	JAMES	CLERK	30	11400
7902	FORD	ANALYST	20	36000
7934	MILLER	CLERK	10	15600

Example (v):

The business coordinators wanted to sort a employee under a joining date from the RECORD table.

EMPNO	DEPTNO	JOB	JOIN_DATE
7369	20	CLERK	17-DEC-80
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7654	30	SALESMAN	28-SEP-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7788	20	ANALYST	19-APR-87
7839	10	PRESIDENT	17-NOV-81
7844	30	SALESMAN	08-SEP-81
7876	20	CLERK	23-MAY-87
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81
7934	10	CLERK	23-JAN-82

The condition is LIST SOURCE JOIN_DATE. After the execution of this command, RECORD table becomes

EMPNO	DEPTNO	JOB	JOIN_DATE
7369	20	CLERK	17-DEC-80
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7844	30	SALESMAN	08-SEP-81
7654	30	SALESMAN	28-SEP-81
7839	10	PRESIDENT	17-NOV-81
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81
7934	10	CLERK	23-JAN-82
7788	20	ANALYST	19-APR-87
7876	20	CLERK	23-MAY-87

Example (vi):

The business coordinators wanted to sort a employee under a joining date from January 1981 to December 1981 and then order by date from the RECORD table

Space for
Hint

EMPNO	DEPTNO	JOB	JOIN_DATE
7902	20	ANALYST	03-DEC-81
7900	30	CLERK	03-DEC-81
7566	20	MANAGER	02-APR-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7839	10	PRESIDENT	17-NOV-81
7499	30	SALESMAN	20-FEB-81
7654	30	SALESMAN	28-SEP-81
7844	30	SALESMAN	08-SEP-81
7521	30	SALESMAN	22-FEB-81

The condition is LIST SOURCE JOIN_DATE BETWEEN 01-JAN-1981 .AND. 01-DEC-1981. After the execution of this command, RECORD table becomes

EMPNO	DEPTNO	JOB	JOIN_DATE
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7844	30	SALESMAN	08-SEP-81
7654	30	SALESMAN	28-SEP-81
7839	10	PRESIDENT	17-NOV-81
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81

4. REPORT GENERATION

A data base is a source of information and data management software provides the facility to get at this information. A report is the presentation of information that is derived from one or more data bases.

(a) Consider a EMP data base

Space for
Hint

EMPNO	ENAME	JOB	DEPTNO	SAL
7369	SMITH	CLERK	20	800
7499	ALLEN	SALESMAN	30	1600
7521	WARD	SALESMAN	30	1250
7566	JONES	MANAGER	20	2975
7654	MARTIN	SALESMAN	30	1250
7698	BLAKE	MANAGER	30	2850
7782	CLARK	MANAGER	10	2450
7788	SCOTT	ANALYST	20	3000
7839	KING	PRESIDENT	10	5000
7844	TURNER	SALESMAN	30	1500
7876	ADAMS	CLERK	20	1100
7900	JAMES	CLERK	30	950
7902	FORD	ANALYST	20	3000
7934	MILLER	CLERK	10	1300

(b) Consider a RECORD data base

EMPNO	DEPTNO	JOB	JOIN_DATE
7369	20	CLERK	17-DEC-80
7499	30	SALESMAN	20-FEB-81
7521	30	SALESMAN	22-FEB-81
7566	20	MANAGER	02-APR-81
7654	30	SALESMAN	28-SEP-81
7698	30	MANAGER	01-MAY-81
7782	10	MANAGER	09-JUN-81
7788	20	ANALYST	19-APR-87
7839	10	PRESIDENT	17-NOV-81
7844	30	SALESMAN	08-SEP-81
7876	20	CLERK	23-MAY-87
7900	30	CLERK	03-DEC-81
7902	20	ANALYST	03-DEC-81
7934	10	CLERK	23-JAN-82

The simple listings of selected records and fields of the above two data bases are "quick and dirty" reports. Such reports are bread and butter of data base capabilities. These listings are fancy, but in most instances the user is more interested in the information than the format in which it is displayed. The generation of formatted reports is discussed in a later section.

9.2 Combining Two Data Bases:

The business coordinator wanted to produce a "quick and dirty" status report that contained an alphabetical listing of those employees. Producing these reports is a little more challenging because the data required are on two different data bases. The joining is possible only when both data bases having one common field.

(i). The following command "join" the EMP data base with RECORD data base and generate the temporary data base (TEMP1).

JOIN EMP WITH RECORD TO TEMP1 FOR EMP → DEPTNO
=DEPTNO FIELDS, DEPTNO, ENAME, JOB, JOIN_DATE

DEPTNO	ENAME	JOB	JOIN_DATE
20	SMITH	CLERK	17-DEC-80
30	ALLEN	SALESMAN	20-FEB-81
30	WARD	SALESMAN	22-FEB-81
20	JONES	MANAGER	02-APR-81
30	MARTIN	SALESMAN	28-SEP-81
30	BLAKE	MANAGER	01-MAY-81
10	CLARK	MANAGER	09-JUN-81
20	SCOTT	ANALYST	19-APR-87
10	KING	PRESIDENT	17-NOV-81
30	TURNER	SALESMAN	08-SEP-81
20	ADAMS	CLERK	23-MAY-87
30	JAMES	CLERK	03-DEC-81
20	FORD	ANALYST	03-DEC-81
10	MILLER	CLERK	23-JAN-82

(ii). The following command "join" the EMP data base with RECORD data base and generate the temporary data base (TEMP2).

JOIN EMP WITH RECORD TO TEMP2 FOR EMP → JOB =JOB
FIELDS, ENAME, JOB, JOIN_DATE

ENAME	JOB	JOIN_DATE
SMITH	CLERK	17-DEC-80
ALLEN	SALESMAN	20-FEB-81
WARD	SALESMAN	22-FEB-81
JONES	MANAGER	02-APR-81
MARTIN	SALESMAN	28-SEP-81
BLAKE	MANAGER	01-MAY-81
CLARK	MANAGER	09-JUN-81
SCOTT	ANALYST	19-APR-87
KING	PRESIDENT	17-NOV-81
TURNER	SALESMAN	08-SEP-81
ADAMS	CLERK	23-MAY-87
JAMES	CLERK	03-DEC-81
FORD	ANALYST	03-DEC-81
MILLER	CLERK	23-JAN-82

(iii). The following command "join" the EMP data base with RECORD data base and generate the temporary data base (TEMP3).

JOIN EMP WITH RECORD TO TEMP3 FOR EMP → EMPNO=EMPNO FIELDS, EMPNO, ENAME, JOB, JOIN_DATE

EMPNO	ENAME	JOB	JOIN_DATE
7369	SMITH	CLERK	17-DEC-80
7499	ALLEN	SALESMAN	20-FEB-81
7521	WARD	SALESMAN	22-FEB-81
7566	JONES	MANAGER	02-APR-81
7654	MARTIN	SALESMAN	28-SEP-81
7698	BLAKE	MANAGER	01-MAY-81
7782	CLARK	MANAGER	09-JUN-81
7788	SCOTT	ANALYST	19-APR-87
7839	KING	PRESIDENT	17-NOV-81
7844	TURNER	SALESMAN	08-SEP-81
7876	ADAMS	CLERK	23-MAY-87
7900	JAMES	CLERK	03-DEC-81
7902	FORD	ANALYST	03-DEC-81
7934	MILLER	CLERK	23-JAN-82

Check Your Progress

1. How to create a report generation?
2. Write a note about sorting a data base.
3. Write notes about updating a data base?
4. Write detailed notes about deletion of data base.
5. Write detailed notes sorting and updating data bases.
6. Write detailed notes about report generation and deletion of data base.

UNIT X

OBJECTIVES

After going through this lesson you would be in a position to

- Data base specifications
- File operations
- File types
- Data base structure
- File Maintenance and performance

File Maintenance and Performances

10.1 DBASE IV

DBASE-IV is one of the most popular and powerful relational data base management systems. DBASE-IV has got many powerful commands, but these are simple 'English like' commands, DBASE-IV provides facilities to add, delete, modify, locate, print and sort information which is stored in files, with the help of simple 'English like' commands DBASE-IV software has been developed by Ashton-Tate, USA to run on IBM PC- AT/80X86.

DBASE-IV software can broadly be divided into two parts. The first part provides the facilities to define the data base structure and record size of the built-in programming language, which is as simple, as BASIC, and includes arithmetic operation and commands like: IF-ELSE-ENDIF, DO-WHILE and DO-PROCEDURE (similar to COBOL), etc.

DBASE-IV stores the data in the files. Each file can have up to 255 fields and up to 4000 characters per record. Each file can have up to one billion records. However, hard disc storage will be required for very large files as floppy disc and available up to 1.44 M bytes capacity only.

10.2 DBASE-IV SPECIFICATIONS

This section describes the technical specifications of DBASE-IV. As an overview, it also describes the different file types and field types, and discusses memory variables, which gives more flexibility in handling data. The following values may be limited by the amount of RAM in the personal computer.

Database File

- Number of records - 1 billion maximum.
- Number of bytes - 2 billion maximum.
- Record size - 4,000 bytes in .dbf file
- File size - 512 kilobytes in .dbf file

Arrays

- Dimensions - 2
- Total elements (column $\times$ rows) - 1170

Field size

- Character fields - 254 bytes maximum
- Date fields - 8 bytes
- Logical fields - 1 byte
- Memo fields - 5000 bytes maximum or
the capacity of word
processor used.

Numeric fields

- Type N (BCD) fields - 20 decimal digits
- Type F (Floating Fields) - 20 decimal digits
- Field Names - 10 characters.

File Operations

- 99 open files of all types
- 10 open database files. A database file counts as two files if
memo fields are used.
- 10 open index files per active database file.
- One open format files per active database file.

NUMERIC ACCURACY

15.9 digits. Note that the decimal point does not count as a digit in determining accuracy. Accuracy is 13 digits when comparing numbers, except zero.

MEMORY VARIABLES

Number of active memory variables: 15,000 maximum.

Number of bytes available for memory variables: 6000 default.

The size of a memory variable depends on its type:

Character	- assigned string + 2 bytes
Numeric	- 9 bytes
Date	- 9 bytes
Logical	- 2 bytes

COMMAND LINE

Maximum length – may be larger than 254 characters.

10.3 FILE TYPES

DBASE-IV saves information as disk files in several specialized formats. Each serves a specific DBASE-IV processing need. Each disk file has a filename of not more than eight characters and a file extension consisting of a period and three characters maximum. A filename can contain letters, numbers, and the underscore (_) character, but not special character or spaces. It can not begin with a number.

A filename is assigned at the time the file is created. The file extension must be assigned at the same time. Normally, DBASE-IV assigns a default filename extension according to the type of file being

1. However, you can override the DBASE-IV assignment by simply typing in an extension when you enter the filename. The default extensions as well as the kinds of files are defined in the following:

Kind of file	File Type
Binary	.bin
Catalog	.cat
Command and Procedure	.prg
Database	.dbf
Database Backup	.bak*
Database Memo	.dbt
Database Memo Backup	.tbk
Format	.fmt
Index	.ndx
Label	.lbl
Memory	.mem
Query	.qry
Report Form	.frm
Screen	.scr
Text Output	.txt
View	.vue

*Command and procedure backup files also have a .bak extension.

If you do not default extension, you must include the extension whenever the file is selected for use.

1. Binary (.bin) Files:

Binary files are assembly language programs that are assembled, linked, and converted to a binary form so they can be loaded directly into memory and executed with the CALL command. Binary files are created when an assembled and linked program is converted from the .EXE format to the .COM format with the DOS EXE command.

2. Catalog (.cat) Files:

A catalog (.cat) file (or catalog for short) is like a register to help you keep of all your files. For example, if you have a database file that you use regularly with an index file, a custom screen format, a report from a view file, and a query file, you can store the names of all these files in a catalog. When you activate the catalog, only these files can be opened. A catalog file is created and activated with the SET CATALOG TO command.

3. Command and Procedure (.prg) Files:

Command files contain sets of DBASE-IV commands that have been stored programs. They are ASCII (American Standard Code for Information Interchange) files and may be created with either MODIFY, COMMAND or any word processing program that creates ASCII text files.

Procedure files also contain DBASE-IV instructions, but they are stored in memory. A procedure file is like a programming tool kit. It contains utility programs (called procedure) which complete simple tasks that you do often in DBASE-IV. Having a procedure file in memory reduces disk access time and enables an applications

program to run faster. You can only have one procedure in memory at a time.

4. Database (.dbf) Files:

Database (.dbf) files store data in records and fields. Viewing a data base file as a table, each record represents a row in the table and each field a column. Each record is intended to contain a set of unique information. The structure of records in a database file is created with CREATE and changed with MODIFY STRUCTURE.

5. Database File Backups (.bak):

Each time you modify the structure of a database file, DBASE-IV creates a backup of the file, and a new file containing the new structure. The data in the backup file is added to the new file in fields with the same name. Back-up files with .bak extension are also created when you alter a file that was created with MODIFY COMMAND.

6. Database Memo (.dbt) Files:

Database memo (.dbt) files are text files which contain the contents of memo fields. All memo fields in a database (.dbf) file are stored in the same database memo file. The .dbt file is created at the same time as the .dbf file. Because of contents of memo fields are stored in a separate file. A memo field only occupies ten spaces per record in the database file.

7. Database Memo File Backups (.tbk).

If database file has memo fields, they are stored in a memo (.dbt) file. When you modify the structure of the data base file, a

new database file with the new structure as well as a backup of the memo file is created and saved. The data in the back up file is added to the new file in memo fields with the same name.

8. Format (.fmt) Files:

You use format files to create custom screen forms for use in data entry and printed output. They are generated from screen (.scr) files set up by the CREATE SCREEN command. You can also write format files directly using MODIFY COMMAND or any word processor that creates ASCII text files.

9. Index (.ndx) Files:

Index files enable you to use a database file in a logical order rather than the physical order is the order in which you enter records in a database file. A logical order is a alphabetical, chronological, or numerical order based on the contents of one or more selected fields. The selected fields are called a key field. Index files are created with the INDEX command.

Index files store the database record numbers according to the selected field(s). When using a database with an index file, the database appears to be in the order of the key item. For example, if the key field is a name field, the records appear in alphabetical order according to the names.

The key, which can be one or more fields, may also be used to provide direct access to a particular record.

10. Label (.lbl) Files:

Label files contain the information needed by the LABEL command to print labels. They are created and altered by the CRATE/MODIFY LABEL command.

11. Memory (.mem) Files:

Memory files are used to save the contents of memory variables for later use. Memory files may contain up to 256 memory variables or 6,000 bytes (default value). These files are created by the Command SAVE and are read back into memory by the command RESTORE.

12. Query (.qry) Files:

Query files contain a filter condition that restricts the records that are displayed with commands that requires database (.dbf) file to be in USE. Query files are created with the CREATE/MODIFY QUERY command.

13. Report Form (.frm) Files:

Report form files contain the information needed by the REPORT command to prepare reports. They can be created and altered by the CREATE/ MODIFY REPORT command.

14. Screen (.scr) Files:

Screen files contain information that is used by the CREATE/ MODIFY SCREEN command to generate and modify screen files. A companion format (.fmt) file is automatically created when you use these commands.

15. Text (.txt) Files:

Text files are primarily used to interface DBASE -IV with software that reads ASCII files. These files should contain only printable ASCII characters.

You read text files from other software into DBASE -IV with a special form of the APPEND FROM command. You create text files from DBASE -IV files for use with software via special form of the COPY command. A text file is also created when you use the SET ALTERNATE command to store screen output such as the commands you type at the doc prompt and their results or the output from a program file.

16. View (.vue) Files:

A view file contains a list of selected field names from one or more specified database (.dbf) files. You set up a view files so only the selected fields are seen when using the database files. View files can also store associated index files and relationships between the database files. You can create a format file and filter conditions which reference the selected field names. You use CREATE/ MODIFY VIEW to set up the view file. A view file can also be stored in a catalog.

10.4 Database structure

The structure of a database file is established by defining fields to store data. You use the CREATE and MODIFY STRUCTURE command to define a field a field which consists of the name, type and width.

Field names may be up to ten characters long. They must begin with a letter and cannot contain embedded blank space. Letters, Numbers and Underscores are permitted.

These are five field types in DBASE -IV. They are Character (C), Date (D), Logical (L), Memo (M) and Numeric (N). Each one is discussed below.

The field width is the maximum number of characters or digits that are to be contained in the field. You define the field width for character and numeric fields. Date, logical, and memo fields have lengths. In the case of numeric fields you need to include the sign (if any), the decimal point, and the number of decimal places (digits to the right of the decimal point) in the total number of characters.

Character Fields

Character fields may be used to store any printable ASCII character (letters, numbers, special symbols, and blank spaces). The maximum field width of character field is 254.

Date Fields

Date fields are used to store dates. Dates may be entered and displayed in different ways by using the SET DATE command for the PICTURE option of the @ command. The default date entry and display format is mm/dd/yy.

Date fields is a special type of field, which occupies eight bytes of space in each record, and the DBASE program automatically takes care of the entered date for valid format of entry and for valid date/month/year, i.e., it will not access 30/02/95 as the second month (February) cannot have 30 days. Moreover, it is also possible to

configure the DATE fields per American (MM/DD/YY), British/Indian (DD/MM/YY) or ANSI (YY/MM/DD) standard.

Dates may be used in calculations with other dates and numbers. For example, a number may be added to a date calculate a date in the future; a date may be subtracted from a date.

Numeric fields

Numeric fields are of two types: integer and decimal. An integer is a number that does not have decimal places. For example, the number of students in a class. The width of a number field can hold. The decimal point and negative sign each count as one digit.

Accuracy of numeric fields extends to 15.9 digits, not including the decimal point itself. This means that the most significant 15 digits of any number will be reliable.

Logical Fields

Logical fields accept only single characters representing True/ False values. Logical True (.T.) is entered as T, t, Y, or y. Logical False is entered as F, f, N, or n. Logical fields occupy only one byte of space.

Memo Fields

Memo fields are designed to accommodate large blocks of textual information. All memo fields in a database file are stored in a database memo (.dbt) file which is created when you set up the database file. Memo fields are indicated in the database (.dbf) file by the word memo.

Memo fields may contain the same kind of information as character fields, but can have 5,000 characters or more depending on the word processor you use. Each memo field requires a minimum of 512 bytes per record if any data is specified. Each memo field occupies only ten spaces per record in the database file, because the text is stored in a separate file on your disk.

10.5 Memory Variables (Memvars)

Memory variables enable you to store data outside of the database file structure. For example, the contents of a field in several records can all be summed, and the result stored as a memory variable. The content of the memory variable could then be directly used in further calculations. Memory variables are often used in programming applications where they provide a means for controlling the program. Memory variables ordinarily provide temporary storage and their values are kept only during a current session in DBASE -IV. However, you can SAVE memory variables to a memory (.mem) file, and RESTORE them to rescue their values. Here are the specifications for memory variables.

Memvar Names:

Memory variable names can be up to ten characters long. They can contain letters, numbers, and underscores. They must begin with a letter and cannot contain embedded blank spaces.

The only restricted names for memory variables are those created with the syntax `y variable =`. In this case, the memory variable name cannot be the same as a DBASE -IV command.

Memvar Types:

There are four types of memory variables character, date, numeric, and logical.

Memvar Sizes:

In memory, the size of a memory variable depends on its type. Character type variables are the length of the assigned string plus two bytes. Date variables are nine bytes. Numeric variables are also nine bytes. Logical variables take up to two bytes.

There can be many as 256 active memory variables with a combined size of up to 6,000 bytes. The 6,000 bytes capacity can be increased by using the MVARsiz option in Congig.db, provided that you have more memory than the recommended 348 Kbytes. The memory variables may be used to store intermediate results while processing data base file.

10.6 Applications of DBASE -IV

As the DBASE-IV is a very simple and powerful data base management system, it is finding application, where the DBASE-IV is being used is given below:

1. Inventory control, costing
2. Financial Accounting
3. Mailing Lists.
4. Banking
5. Fixed deposits, debentures issues.
6. Shares issues.
7. Sales and marketing analysis.
8. Payroll's etc.
9. Human Resource Information system.

Check Your Progress

1. Write short note about DBASE-IV
2. What are the specifications of DBASE-IV
3. Explain about database structure.
4. Write detailed notes about different file types in DBASE-IV
5. Write the Applications of database.

