

UNIT 4

APPLICATION SOFTWARE

UNIT OUTCOME

Students will be able to:

- ☞ recognize the uses of spreadsheets;
- ☞ understand the screen elements in the spreadsheet window;
- ☞ recognize how to create and use simple spreadsheet using text and numbers;
- ☞ understand how to format worksheets;
- ☞ recognize to use built in functions and create custom formula.

4.1 SPREADSHEETS

● Introduction

A *spreadsheet* is a document which helps you organize data in rows and columns that intersect to form cells.

The electronic spreadsheet is the brain child of *Dan Bricklin* and *Bob Franktor*. Behind the invention of first electronic worksheet *VisiCalc* (Visible Calculator) was this duo. *Bricklin*, a Harvard Business school student, got the idea of *VisiCalc* while spending hours manually to solve financial-planning problems.

Purpose of a Spreadsheet

A *spreadsheet package* is a numeric data analysis tool, which not only allows us to quickly calculate and analyse numbers, but also lets us quickly explore a variety of possible outcomes. *The spreadsheet allows users to create tables and financial schedules by entering data and formulae into rows and columns arranged as a grid on a display screen.* Some examples of spreadsheets are Microsoft Excel, Corel Quattro Pro, OpenOffice Calc, Google Spreadsheets, Lotus-123 etc.

● Starting Spreadsheets

MS-Excel 2007 is a GUI based spreadsheet package that is part of Microsoft Office 2007 suite of software. It is a powerful spreadsheet package that supports data of various formats, pictures, graphs and drawing objects. There are 1,048,576 rows and 16,384 columns in an Excel worksheet. It has got many user friendly features that makes it the first choice of its users.

Suppose you are having MS-Excel 2007 installed on your computer. To start MS-Excel 2007 perform the following:

Double-click on the MS-Excel 2007 icon on the desktop.

OR

Click Start → All Programs → Microsoft Office → Microsoft Office Excel 2007 (see Fig. 4.1).

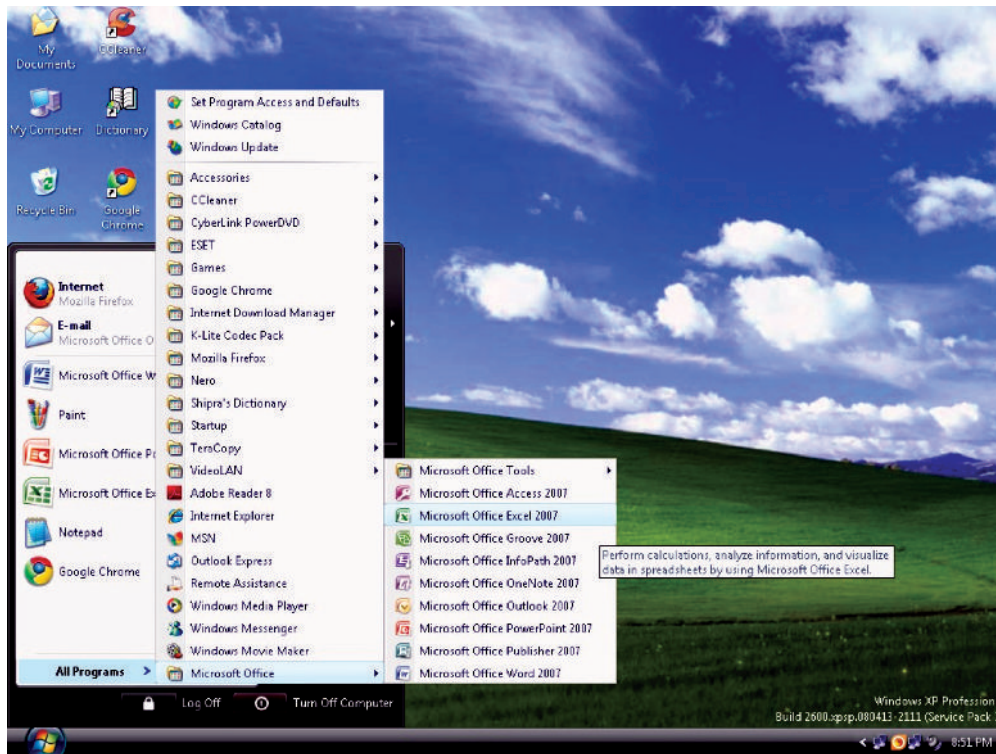


Fig. 4.1: Starting MS-Excel 2007

● **Screen Elements of Spreadsheets**

A spreadsheet is a collection of rows and columns. It is also known as a worksheet. A worksheet is a primary document to store data.

On starting spreadsheet *i.e.*, MS-Excel 2007, a spreadsheet window appears. Screen elements of Excel spreadsheet are shown in Fig. 4.2.

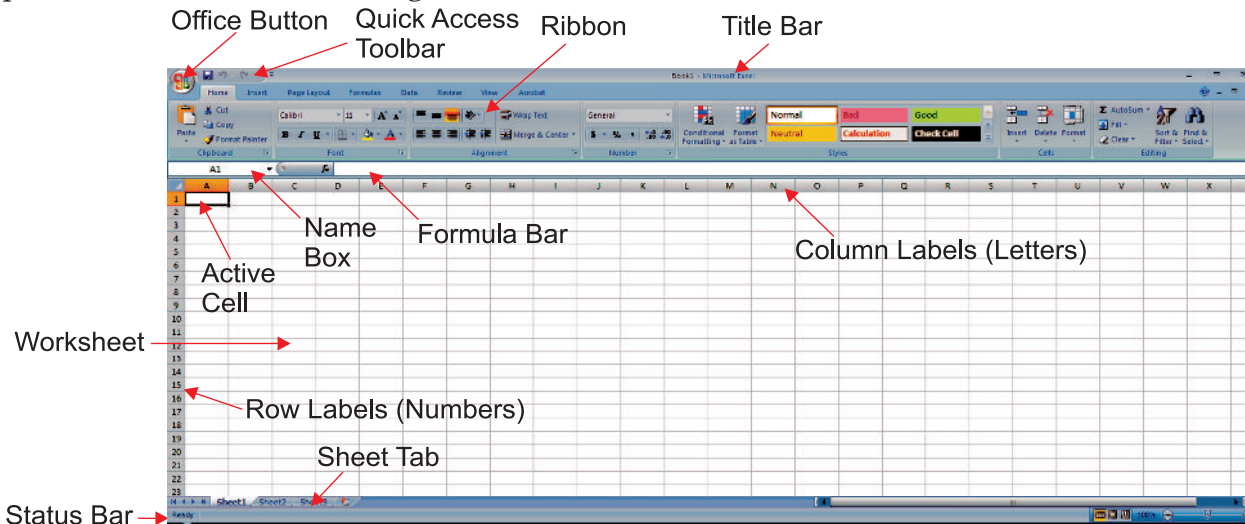


Fig. 4.2: Screen elements of Spreadsheet-Excel 2007

Some important screen elements are discussed below:

Office Button: Clicking on the Office Button displays a drop down menu containing a number of options, such as New, Open, Save, and Print. The options in the Office Button menu are very similar to those found under the File menu in previous versions of Excel.

Title Bar: This shows the name of the workbook (a collection of worksheets).

Quick Access Toolbar: This customizable toolbar allows you to add frequently used commands. Click on the down arrow at the end of the toolbar to display the toolbar's options.

Formula Bar: Located above the worksheet, this area displays the contents of the active cell. It can also be used for entering or editing data and formulas in the active cell.

Name Box: Located on the left of the formula bar, the Name Box displays the cell reference or the name of the active cell.

Ribbon: The Ribbon is the strip of buttons and icons located above the work area in Excel 2007. The Ribbon replaces the menus and toolbars found in earlier versions of Excel.

Sheet Tab: Switching between worksheets in an Excel 2007 file is done by clicking on the sheet tab at the bottom of the screen.

Status Bar: This shows the status of the active worksheet.

Worksheet: This stores the data.

Active Cell: It is the cell with the black outline. Data is always entered into the active cell. The cell address is (column letter, row number)



1. There are screen similarities between MS-Excel, MS-Word and other MS products. The main differences in a spreadsheet are:
 - (i) the formula bar which is used for operations on cells such as calculations
 - (ii) the working area
2. Formula bar is only present in Excel. MS-Excel 2007 has panels in place of menus available in earlier versions of Excel.

● Create and Use a Simple Spreadsheet

Creating a Worksheet

To create a worksheet, perform the following steps:

- 1 Click the *Office Button*.
- 2 Click the *New* option (see Fig. 4.3).

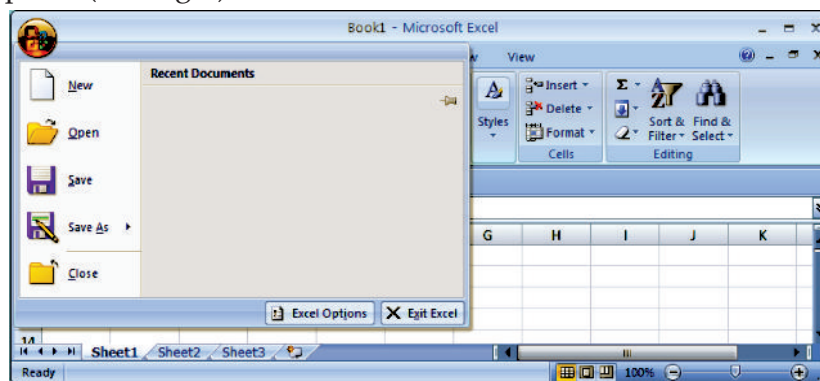


Fig. 4.3: Selecting new option

3 Double click the *Blank Workbook* or click on the *Create* button (see Fig. 4.4).

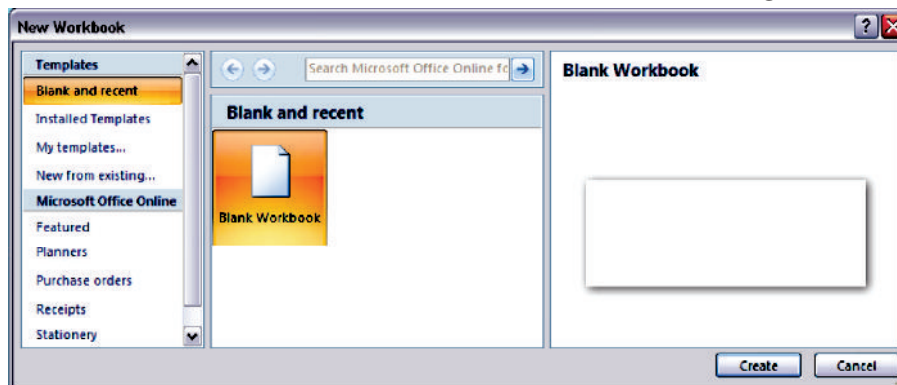


Fig. 4.4: Double clicking the blank workbook

A new worksheet is created (see Fig. 4.5).

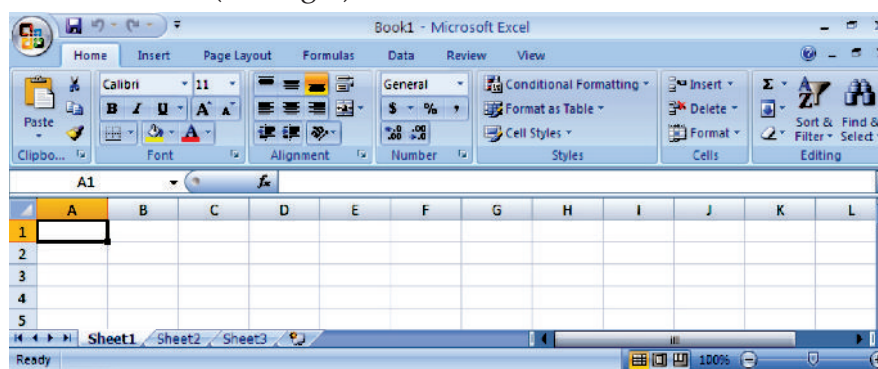


Fig. 4.5: A newly created worksheet

Cells are the basic working unit on a spreadsheet. These fall at the intersection of each column and row. They are referred to by their coordinates, or *cell address*. A cell's address is its column letter followed by its row number *i.e.*, (column letter, row number). For example, the address of the cell at the intersection of column A and row 1 is cell A1 as shown in Fig. 4.5. It is also the *active cell*.

Using a Spreadsheet

Each cell in a spreadsheet can contain words, a number, or a formula. Data is always entered in the active cell and at one time only one cell can be active. Now, you can use the spreadsheet as per your requirement.



Fill Handle is a small black dot or square in the bottom right corner of the active cell. The fill handle has a number of uses including copying a cell's contents to adjacent cells or to create a series.

If Excel recognizes the cell contents as part of a series it will *Auto Fill* other selected cells with the next items in the series. Use the fill handle by clicking on it with the mouse pointer to drag select adjacent cells.

• Entering and Editing Text

Entering Data

To enter data,

- 1 Select the cell where the data has to be added.
- 2 Type the data. To enter data in active cell, type the characters. Either press *Tab* key to go to the next cell in the same row or press *Enter* key to go to the next cell in the same column.

After entering the data, the worksheet may look as shown in Fig. 4.6

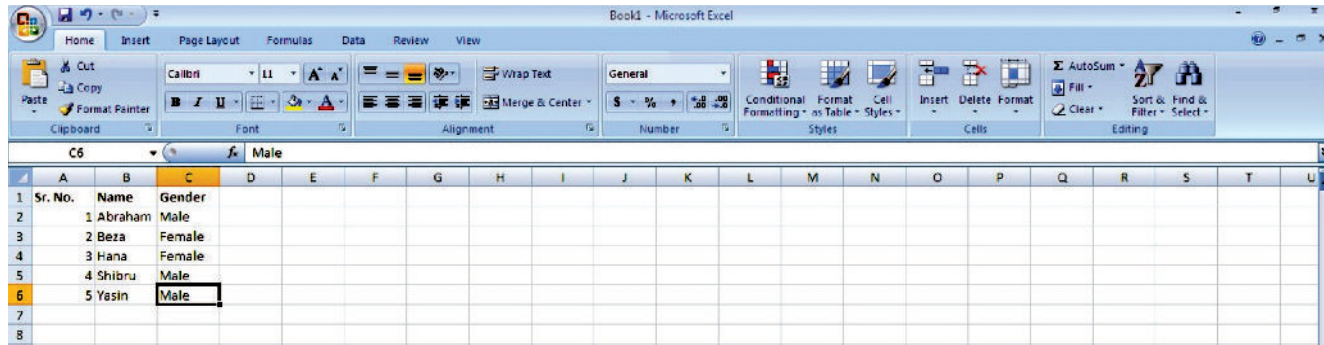


Fig. 4.6: Entering data in a worksheet



Drag Select is a method used to select a range of cells. To do so, click on a cell with the left mouse button and, without releasing the button drag the pointer over a block of cells. Release the mouse button once the correct block, or range of cells has been selected.

Editing Data

To edit data (in case we have made mistakes or some changes are required),

- 1 Double-click the cell, which has to be edited.
- 2 Use the arrow key if necessary then press Backspace or Delete key to edit the content of the cell.
- 3 Press the Enter key.

OR

- 1 Select the cell, which needs to be edited.
- 2 Click the Formula bar.
- 3 Use the Backspace or Delete key to edit the content of the cell.
- 4 Press the Enter key.

Formatting Spreadsheet

Formatting refers to the act of changing the appearance of data in cells. Data in MS-Excel can be grouped into two broad categories: text and numbers. Different formatting options are available for these two categories of data. Excel allows many formats for numeric data, for example, general number, positive number, decimal number and its precision, currency etc.

For textual data, Excel allows you to change fonts, colors, sizes and other features. Excel has a complete dialog box for formatting cells.

Inserting Columns, Rows and Cells

MS-Excel provides an easy way to insert columns, rows or cells.

To insert a column,

- 1 Open an existing worksheet (refer to Fig. 4.6). Select the cell before which you want to insert the column.
- 2 Select the *Insert Sheet Columns* option from *Insert* available in *Cells* panel of *Home* tab (see Fig. 4.7).

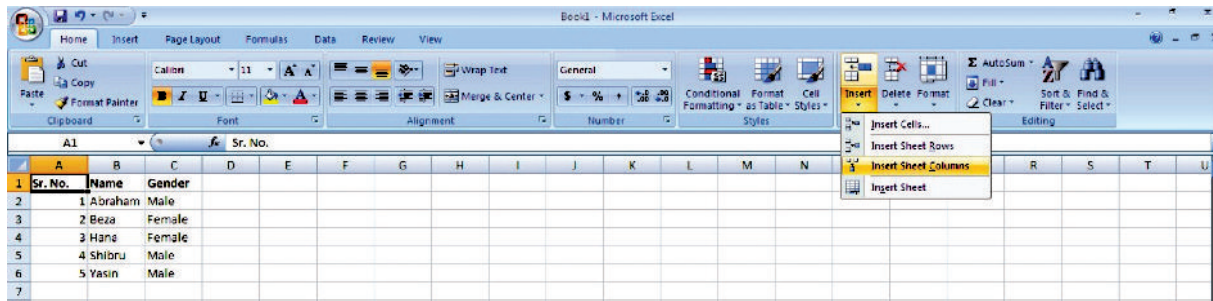


Fig. 4.7: Inserting a column

3 On clicking, a column will be inserted (see Fig. 4.7).

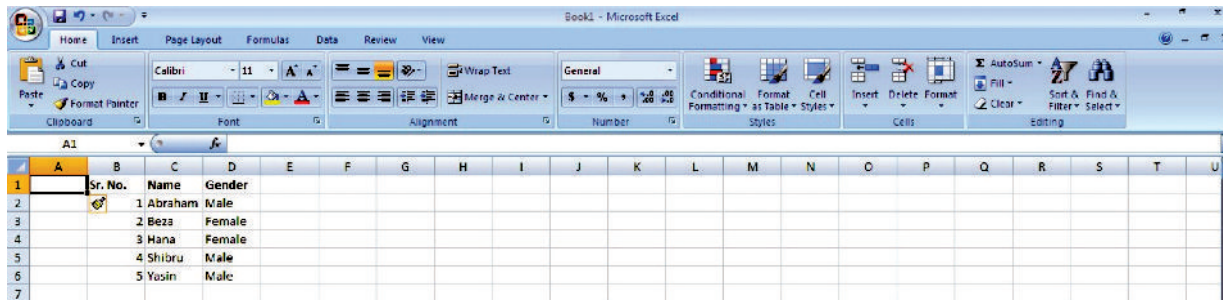


Fig. 4.8: Worksheet after inserting a column

To insert a row,

- 1 Open an existing worksheet (refer to Fig. 4.7). Select the cell before which you want to insert the row.
- 2 Select the *Insert Sheet Rows* option from *Insert* available in *Cells* panel of *Home* tab (see Fig. 4.9).

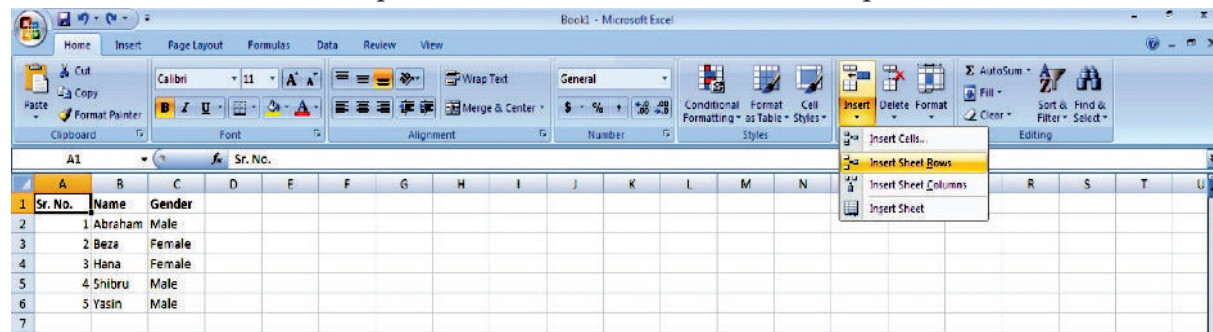


Fig. 4.9: Inserting a row

3 On clicking, a row will be inserted above the active cell (see Fig. 4.10).

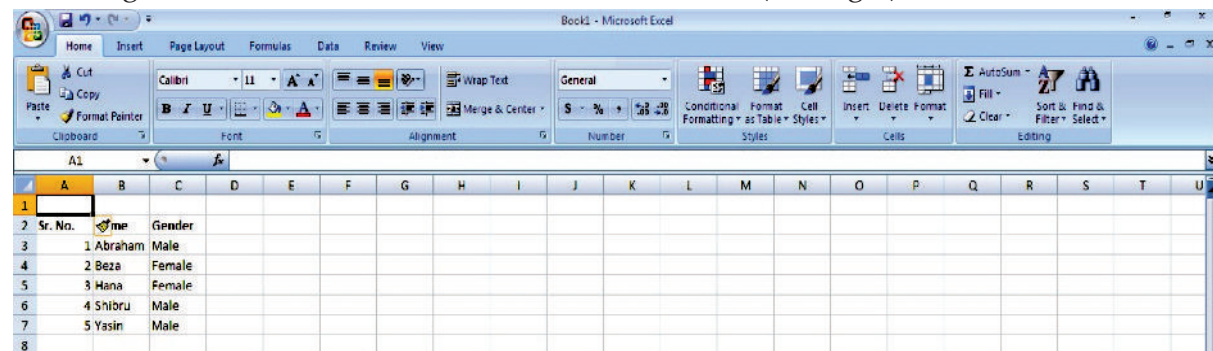


Fig. 4.10: Worksheet after inserting a row

To insert a cell,

- 1 Open an existing spreadsheet (refer to Fig. 4.10).
- 2 Select the *Insert Cells...* option from *Insert* available in Cells panel of Home tab (see Fig. 4.11).

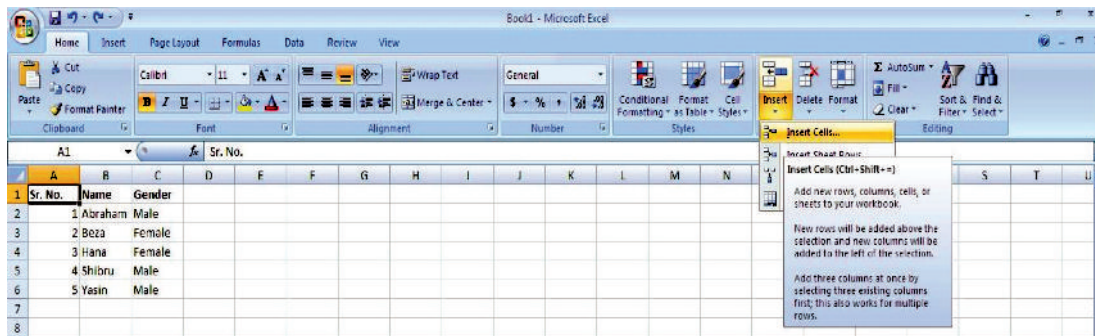


Fig. 4.11: Inserting a cell

- 3 On clicking, an *Insert* dialog box appears. The dialog box has 4 options out of which 2 are *Shift cells right* and *Shift cells down*. The *Shift cells right* option shifts the data of the selected cell and all cells to the right of the selected cell one position right. The *Shift cells down* option shifts the data of the selected cell and all the data of the cell below the selected cell one position down. Select the desired option (see Fig. 4.12). Here, we select the *Shift cells down* option.

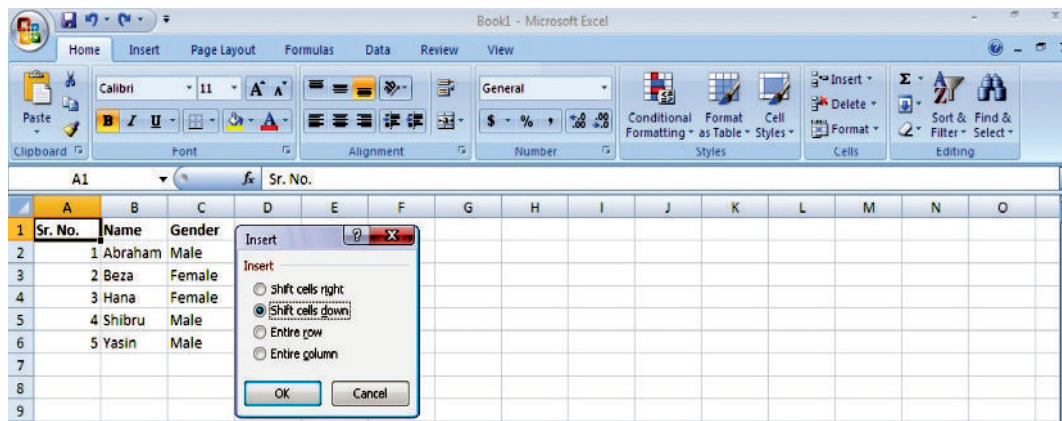


Fig. 4.12: Insert dialog box

- 4 Click *OK*.
- 5 A cell will be inserted at the applied location (see Fig. 4.13).

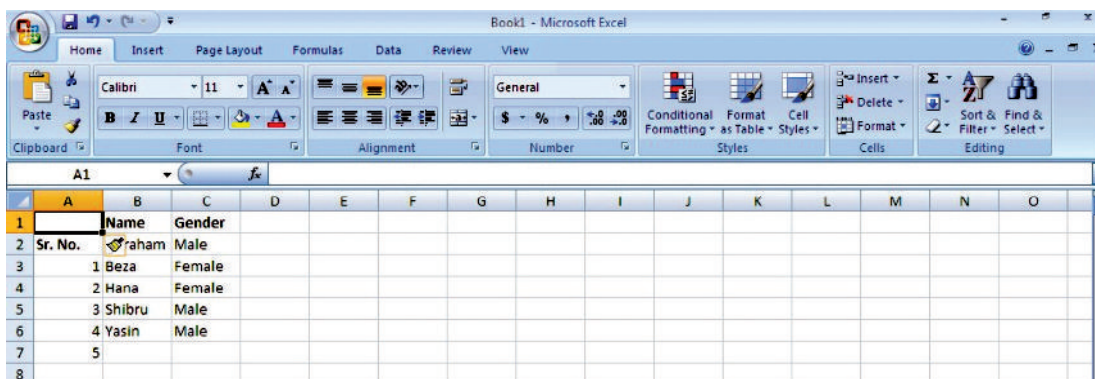


Fig. 4.13: Worksheet after inserting a cell



Deleting Columns, Rows and Cells

MS-Excel provides an easy way to delete columns, rows or cells.

To delete a column,

- 1 Open an existing worksheet (refer to Fig. 4.13).
- 2 Select the column to be deleted.
- 3 On right clicking the selected column, a shortcut menu appears.
- 4 Select the *Delete* option from the shortcut menu (see Fig. 4.14).

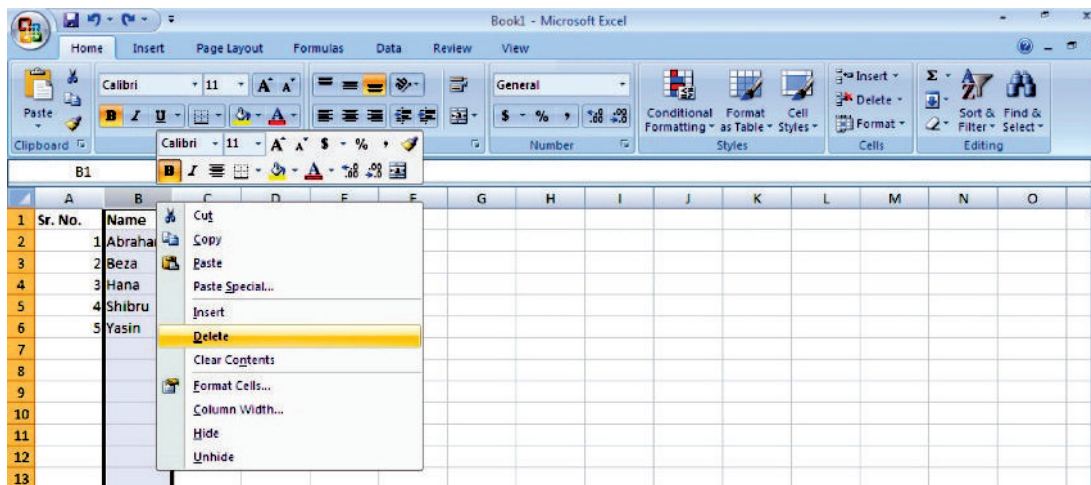


Fig. 4.14: Deleting a column

- 5 On clicking, the selected column will be deleted.

To delete a row,

- 1 Open an existing worksheet (refer to Fig. 4.13).
- 2 Select the row to be deleted.
- 3 On right clicking the selected row, a shortcut menu appears.
- 4 Select the *Delete* option from the shortcut menu (see Fig. 4.15).

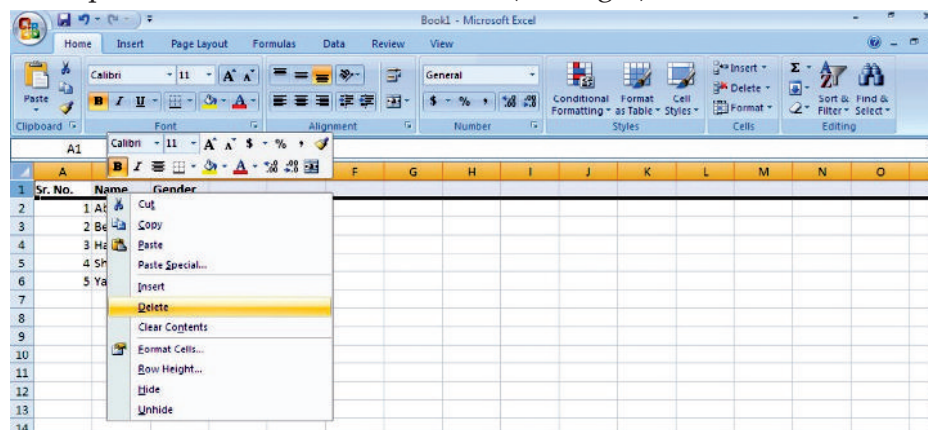


Fig. 4.15: Deleting a row

- 5 On clicking, the selected row will be deleted.

To delete a cell,

- 1 Open an existing worksheet (refer to Fig. 4.13).

- 2 Select the cell to be deleted.
- 3 Select the *Delete Cells...* option from *Delete* available in Cells panel of Home tab (see Fig. 4.16).

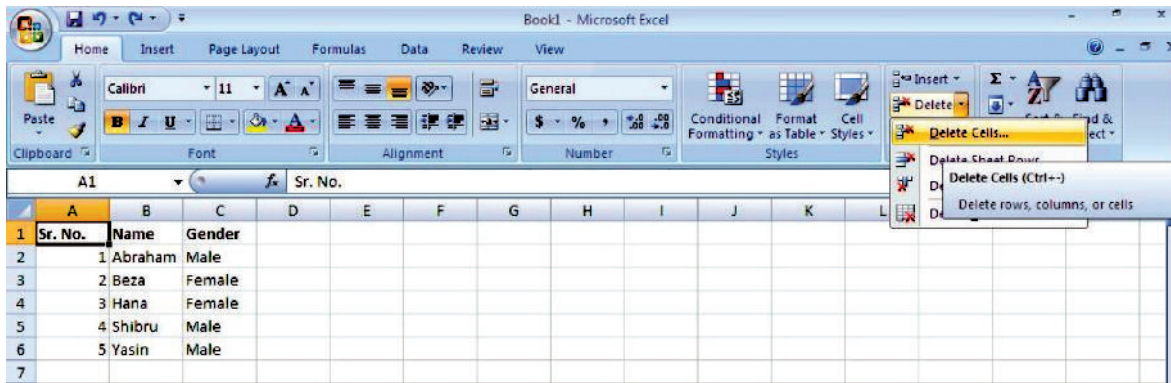


Fig. 4.16: Deleting a cell

- 4 On clicking, a *Delete* dialog box appears. The dialog box has 4 options out of which 2 are *Shift cells left* and *Shift cells up*. The *Shift cells left* option deletes the data of the selected cell and moves the data of the cells to its right one position left. The *Shift cells up* option deletes the data of the selected cell and moves the data of the cells below it one position up. Select the desired option (see Fig. 4.17). Here, we select the *Shift cells up* option.
- 5 Click OK.
- 6 The selected cell will be deleted.

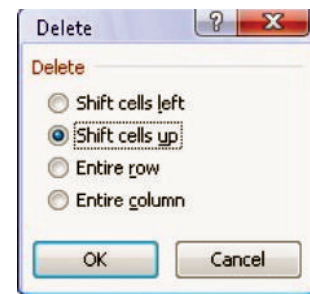


Fig. 4.17: Delete dialog box

● Saving the Worksheet

For saving a worksheet the first time,

- 1 Click the *Office Button*.
- 2 Click the *Save As* option.
- 3 Click the *Excel Workbook* option. A *Save As* dialog box appears (see Fig. 4.18).

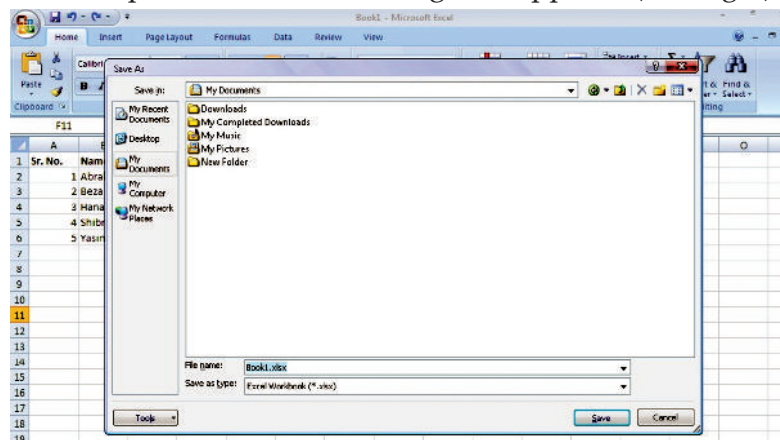


Fig. 4.18: Saving a worksheet

- 4 Identify the location where the file to be saved and type the name for the worksheet in the *File name* textbox.
- 5 Click the *Save* button.

● Using the Four Mathematical Operators on Data to Create Custom Formula

Formula

A spreadsheet formula is a simple expression created by using operators and cell addresses using algebra.

In MS-Excel, you can enter numbers and mathematical formulas into cells. Whether you enter a number or a formula, you can reference the cell when you perform mathematical calculations such as addition, subtraction, multiplication, or division. When entering a mathematical formula, precede with an equal (=) sign. Use the following four mathematical operators to indicate the type of calculation you wish to perform:

- + Addition
- Subtraction
- * Multiplication
- / Division

For example, = A2 + A3 can be typed in cell A5 (where cells A2 and A3 have data to be added).

● Addition

For addition, perform the following steps:

- 1 Create a new worksheet.
- 2 Type *Add* in cell A1 Press *Enter* key.
- 3 Type 2 in cell A2 Press *Enter* key.
- 4 Type 3 in cell A3 Press *Enter* key.
- 5 Type = A2 + A3 in cell A5
- 6 Click the check mark on the Formula bar. Excel adds cell A1 to cell A2 and displays the result in cell A5 The formula is displayed on the Formula bar (see Fig. 4.19)

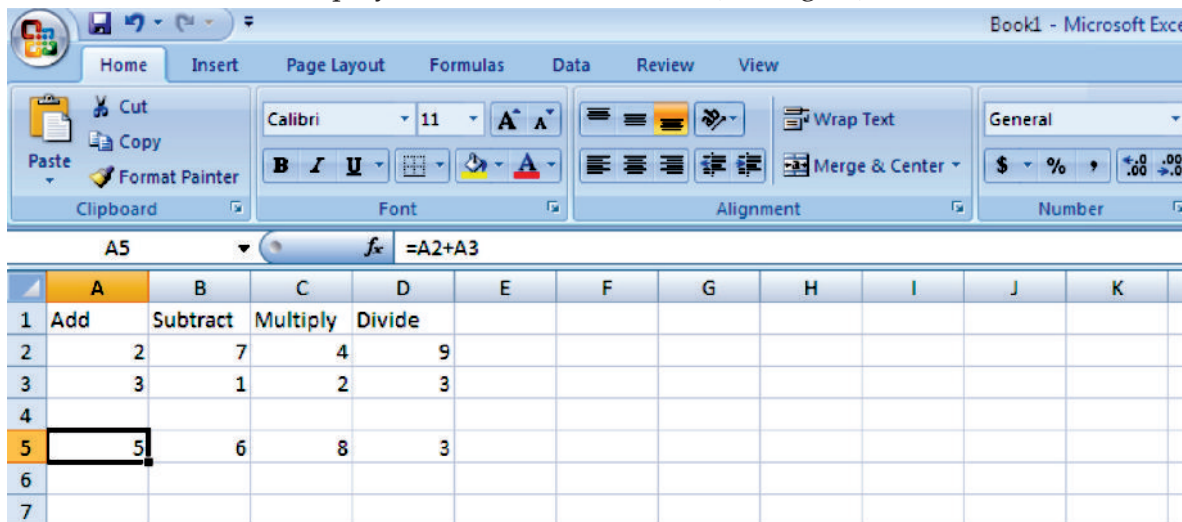


Fig. 4.19: Performing mathematical calculations



Clicking the check mark on the Formula bar is similar to pressing Enter key. Excel records your entry but does not move to the next cell.

Similarly, you can subtract, multiply and divide the data by using the proper operators (see Fig. 4.19).

● Sum (dragging)

To find sum by dragging method, perform the following steps:

- 1 Type your data and apply sum formula in a cell where you wish to store the result.
- 2 Select the cell with the sum formula.
- 3 Activate the formula drag corner. To drag a formula you can easily do so by using the cursor to highlight the lower right corner of the cell, where a drag box will appear.
- 4 Drag the formula to the new cells. To drag the sum formula across the span of other cells, left-click on this drag box and hold as you drag the box to highlight new cells. When you let go off the mouse button, the formula will appear in all of the cells that you highlighted when you used the drag box (see Fig. 4.20).

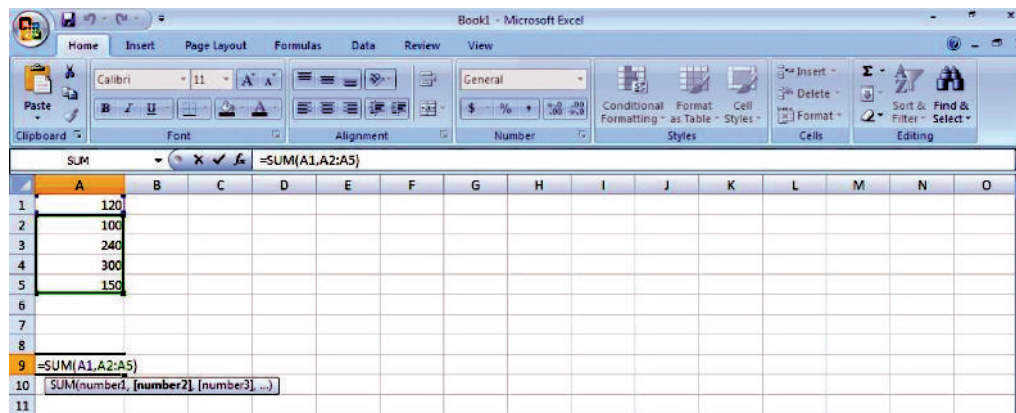


Fig. 4.20: Sum by dragging

- 5 On pressing *Enter* key you will get the result (see Fig. 4.21).

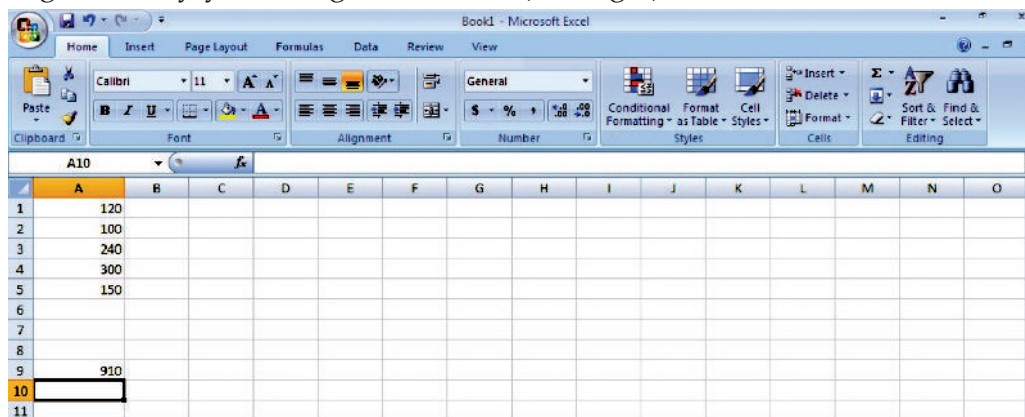


Fig. 4.21: Result after dragging

● Entering a Formula into a Cell

As explained earlier, entering a formula is as simple as the other commands of Excel. To enter the formula in a cell, click on the cell in which you want to have result of the calculation. Type = sign and write the formula using cell addresses and the operators supported by Excel.

Function

A function is a built-in formula that performs calculations on a range of values. It allows you to perform mathematical, statistical and date-time functions. For example, Sum, Average, Count, Max, Min etc.

The syntax of writing a function in Excel is:

= {function name} {list of arguments}

The following examples illustrate the use of functions:

= SUM(A2:E2) will find the sum (total) of numbers

= AVERAGE(A2:E2) will find the average of numbers

Figure 4.22 uses these built-in functions to calculate the total and average.

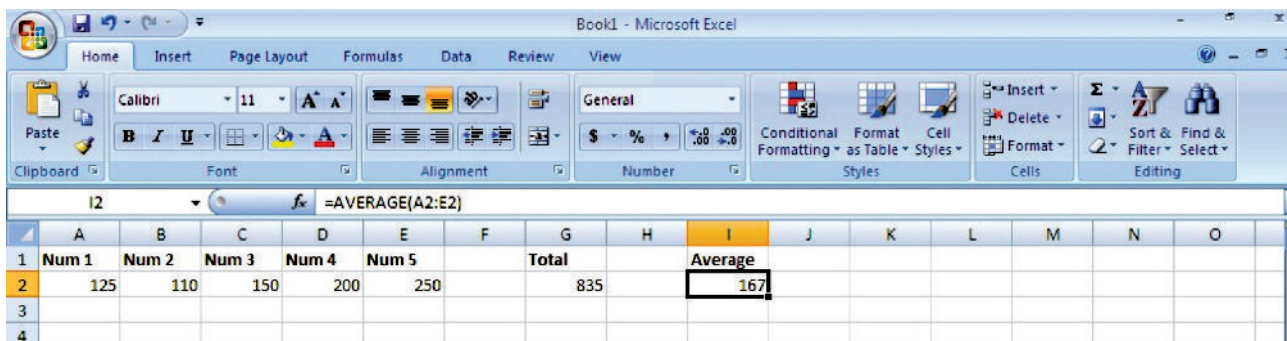


Fig. 4.22: Using built-in functions



The **Auto Sum** feature is used to calculate the sum of the values in a range of cells. This feature adds the range of values either above the destination or in the row to the left of the destination cell. Click on Σ AutoSum in Formulas tab to use this feature.

• Copying by Using the Fill Handle

Using the fill handle, located in the bottom right corner of the active cell is a quick and easy method of copying data, formulas, and functions from one cell to another.

To copy data with the fill handle, perform the following steps:

- 1 Open a worksheet and type data in it. Here, we have typed *Ethiopia* in cell A1
- 2 Click on cell A1 to make it the *active cell*.

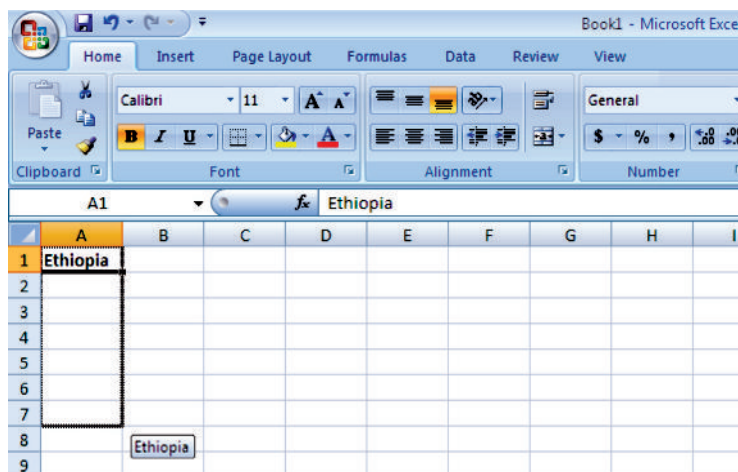


Fig. 4.23: Using fill handle for copying after applying bold to a cell

- 3 Add bold formatting (*Ctrl + B*) to the data in cell A1
- 4 Place the mouse pointer over the small black dot in the bottom right corner of cell A1
- 5 The mouse pointer will change to a small plus sign(+) when you have it over the fill handle.

- 6 When the mouse pointer changes to the plus sign, click and hold down the mouse button.
- 7 Drag the fill handle to cell A7 to copy the data and the bold formatting to cells A2, A3, A4, A5, A6 and A7 (see Fig. 4.24).
- 8 Cells A1 to A7 now all contain the bold formatted data *Ethiopia* (see Fig. 4.24).

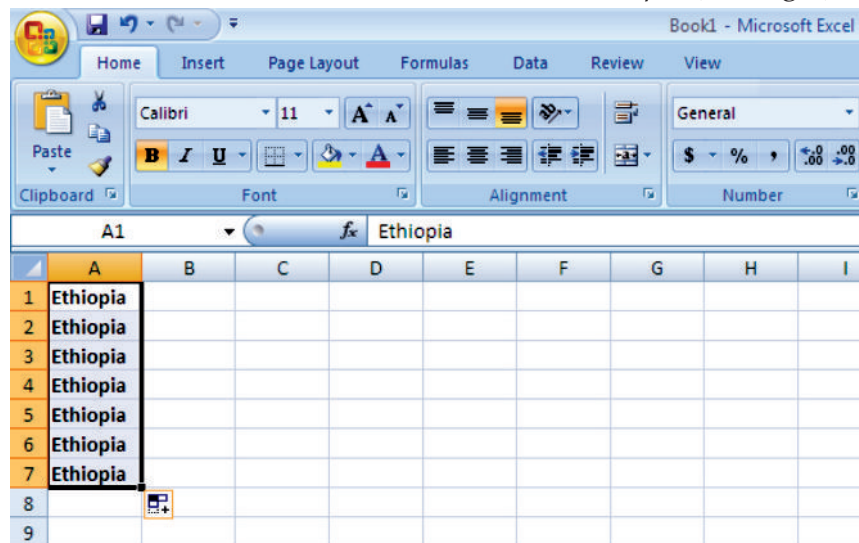


Fig. 4.24: Worksheet after copying

Similarly, you can copy formulas with the fill handle.



Copying formulas to other cells only works if the formula is created using cell references.



ACTIVITY 4.1

ADDING BACKGROUND TO A WORKSHEET, FORMATTING CELLS, NUMBERS, ALIGNMENT, FONT, BORDERS AND PATTERN

In small groups students will discuss “Formatting of Worksheet” to make screen displays more readable and attractive.

For formatting a worksheet, perform the following steps:

1. Open a worksheet.
2. Type the data you wish to format (see Fig. 4.25).

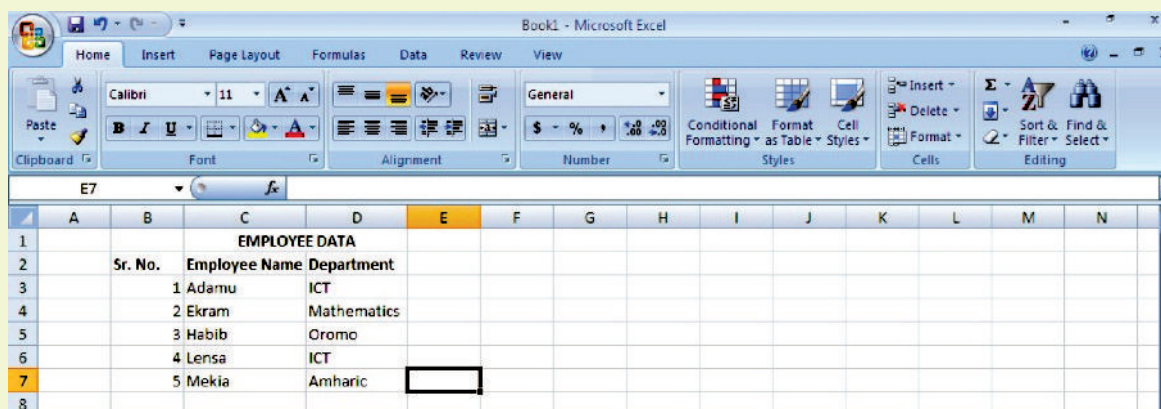


Fig. 4.25: Worksheet to be formatted

- Now apply the formatting required *i.e.*, Adding background, Formatting cells, Numbers, Alignment, Font, Borders and Pattern. Doesn't the worksheet look really attractive! (see Fig. 4.26).

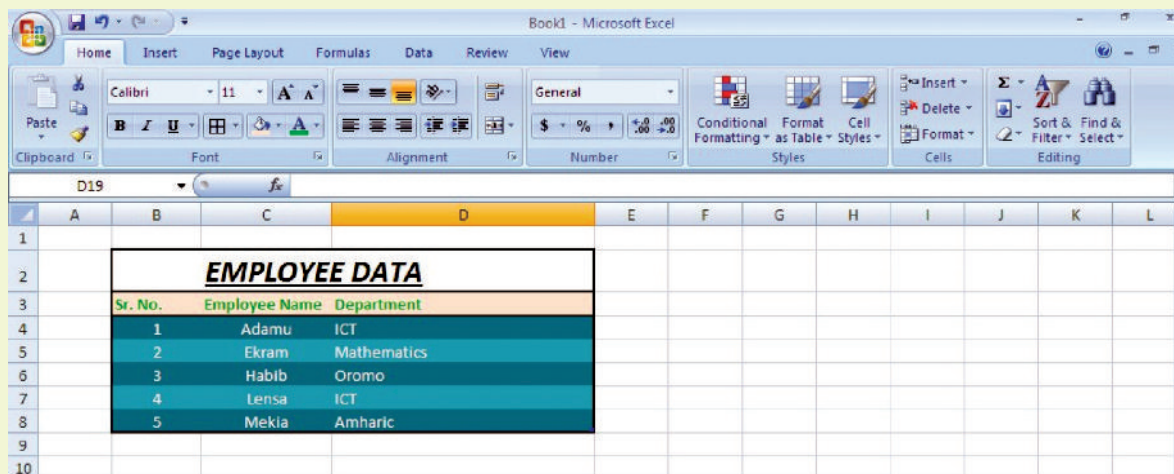


Fig. 4.26: Worksheet after formatting



KEY CONCEPTS

- A spreadsheet is a document which helps you organize data in rows and columns that intersect to form cells.
- In a spreadsheet each cell can contain words, a number, or a formula.
- Some examples of spreadsheets are Microsoft Excel, Corel Quattro Pro, OpenOffice Calc, Google Spreadsheets and Lotus-123 etc.
- MS-Excel has screen similarities with MS-Word and other MS products; main differences in a spreadsheet are
 - (i) the formula bar which is used for operations on cells such as calculations
 - (ii) the working area.
- A function is a built-in formula that performs calculations on a range of values. Some examples of functions are Sum, Average, Count, Max, Min.



REVIEW QUESTIONS

Fill in the Blanks

- is a GUI based spreadsheet package that is a part of MS-Office suite of software.
- In Excel, Title Bar shows the name of the
- The is a small black dot or square in the bottom right corner of the active cell.
- In MS-Excel, we can use some to calculate totals and averages.


State Whether True or False

- 1 The electronic spreadsheet is the brain child of Dan Bricklin and Bob Franktor.
- 2 In a spreadsheet each cell cannot contain words, a number, or a formula.
- 3 In MS-Excel, we can adjust either freehand or using *Cells* panel of *Home* tab to insert rows and columns and delete rows and columns.
- 4 In MS-Excel we cannot apply different effects to a cell and its contents.



Multiple Choice Questions

- 1 Which of the following is application software?
(a) Operating System (b) Compiler (c) Interpreter (d) MS-Excel
- 2 Which of the following is the basic unit of data entry in MS-Excel?
(a) Worksheet (b) Workbook (c) Cell (d) Row
- 3 Which of the following is only found in MS-Excel?
(a) Formula Bar (b) Quick Access Toolbar (c) Office Button (d) Format Painter
- 4 Which of the following function will you use to calculate the average of data range?
(a) SUM() (b) AVERAGE() (c) MAX() (d) MIN()

Match the Following**Column A**

- 1 MS-Excel  worksheet
- 2 Formula bar
- 3 Fill handle
- 4 SUM() function

Column B

- (a) Adds all the numbers in a range of cells
- (b) Used to copy a cell's contents to adjacent cells or to create a series
- (c) Contains  rows and  columns
- (d) Displays the contents of the active cell


Answer the Following

- 1 What is a spreadsheet? Give its purpose and examples.
- 2 How will you create and save worksheet in MS-Excel? Explain the steps.
- 3 Explain the insertion and deletion of columns, rows and cells in Excel.
- 4 What are built-in functions in Excel? Explain SUM and AVERAGE functions.

Suggested Activities

- 1 Explain and demonstrate the features of spreadsheet.
- 2 Explain and demonstrate how to calculate sum(total) using auto sum.
- 3 Explain and demonstrate formatting text and numbers in a cell.
- 4 Explain and demonstrate cell reference: Absolute and Relative.

Field Trip

Using the Internet or computer magazines, look up information on MS-Excel  List any features you find. List which of these features appeal to you and describe why they do.