# Spreadsheet Software

A spreadsheet program is a tool for entering, calculating, manipulating and analysing sets of numbers.

## The spreadsheet's interface

The main editing window displays a document and several tools.

- Document area where you view the document is called a **worksheet**. Collect related worksheets in a **workbook**.
- **Menu bar** displaying titles of commands.
- One or more **toolbars** provide tools that resemble buttons representing frequently used commands.
- A **formula bar** where you can create or edit data and formulas in the worksheet.
- Horizontal and vertical **scroll bars** let you scroll through a document too large to fit in the document area.
- The **status bar** that tells you specific information about the worksheet.
- A **cell** is the intersection of any column and row. A typical worksheet contains thousands of cells.

## Entering data in a worksheet

Cells can hold several types of data including
- Labels
- Values
- Dates
- Formulas

To enter data, select a cell with mouse or arrow keys to make it active. An active cell is indicated by a **cell pointer** – rectangle that makes the cell's borders look bold. Cell addresses – all spreadsheets use row and column identifiers as the basis for their cell addresses. When you have selected a cell you simply type the data into it. While the cell is active you can also enter data by typing it into the formula bar.

**Different type of data:**
- **Labels** – Worksheets can contain text – called labels – as well as values and formulas. Text is referred to as a label because it is usually used to identify a value or series of values or to describe the contents of a specific cell. Labels help you make sense of a worksheet's contents. Many of the same text formatting features found in word processors can be found in spreadsheet programs.
- **Values** – A value is any number you enter or that results from a computation. Spreadsheets can work with whole numbers, decimals, negative numbers, currency and other types of values including scientific notation.
- **Dates** – A date may be added to indicate when the spreadsheet was created, or a date function may be updated whenever the worksheet is opened. Dates can be used in calculations.
- **Formulas** – Power of the spreadsheet lies in formulas, which calculate numbers based on values of formulas in other cells. Formulas can be created manually to do basic arithmetic operations, calculus, trigonometric operations and so on.

Formulas typically refer to the values in other cells throughout the worksheet.  To reduce time and errors you use a cell reference in formulas.  A **cell reference** tells the formula to look up the contents of the referenced cell; this feature saves the user the trouble of typing the reference cells contents into the formula.  If the referenced cell contents change the formula automatically reflects this change.

If your formula uses cells that are contiguous, you can refer to all the cells at once as a **range**.  Ranges can consist of a group of cells in a column, a row, or even a group containing several rows and columns.

Functions
Built in formulas are called **functions**.  These perform specialised calculations automatically.  You can include these functions in your own formulas.  You add **arguments** within the parenthesis of a function. Arguments are values – often cell references – that the function uses in its operation.

## Editing and Formatting a Worksheet

After a worksheet has been created anything in it can be edited.  To change a label or a date simply select the cell and make the changes.  You can manually edit any part of a formula or function by selecting the cell and making the changes in the formula bar.

When you move formulas and data to a new location the spreadsheet automatically adjusts the cell referencing for formulas based on the data.

Relative and Absolute Cell Referencing
The spreadsheet program changes the formulas when you copy them because it remembers that the formula being copied will reference the same rows as the original but will automatically change the column reference when the formulas are moved to a new column.  When they are used in formulas such cell references are known as **relative cell references**.

Sometimes you do not want the formulas to change when you copy them.  You want all formulas no matter where they are to refer to a specific cell.  In this case you use **absolute cell references**, which is usually written using the dollar sign, $.

E.g. A1 is a relative cell reference, $A$1 is an absolute cell reference.

Formatting Values, Labels and Cells
Numbers can appear as dollars, percentages, dates, times and fractions.  They can also be shown with or without commas, decimal points, and so on.  Spreadsheets offer a choice of fonts, type styles, shadowed borders and more.  You can also create special effects by adding graphics to your worksheets.

## Adding Charts

Popular feature of spreadsheet software is the ability to generate **charts** based on numeric data. Creating charts is simple.  Select the data you want to chart, select a chart type and set the desired chart options.  After the chart is created you can continue to adjust its appearance by using a set of special chart tools.

## Analysing data in a spreadsheet

You can use a worksheet to analyse data.

- **What-if analysis** – Process of using a spreadsheet to test how alternative scenarios affect numerical results.  You can change one part of a formula or cell to see how it affects the rest of the worksheet.  You can create several scenarios or versions of the same spreadsheet, each containing different assumptions reflected in its formulas.  Then you can create a report summarising the different scenarios.
- **Goal seeking** – Finds the values for one or more cells that makes the result of a formula equal to a value that you specify.
- **Sorting** – When you sort data you arrange it in a specific manner based on certain criteria.  After the data is sorted it is easier to perform calculations on the results.