Spreadsheets – A Quick Introduction

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Why Spreadsheets?

Spreadsheets were created to simplify and automate business models involving many dependent calculations originally created with chalk and blackboards. They are very useful and easy to use, but if you have never been shown how to use one they can be daunting. The aim of this document is to give you a quick introduction into how they work.

Libre Office contains an excellent spreadsheet that can also open Excel and other formats and is available absolutely free from Libre Office. If you don't already have a spreadsheet application installed on your Windows or Linux PC, then download and install it now. A spreadsheet for Android is Google Sheets, one for Apple iOS machines is Numbers.

After installing your chosen application, open up a spreadsheet. In Libre Office this is called 'Calc'. When you run it you will get a window which the top left of looks like the image below.

To start with, ignore the ribbon across the top will all the buttons and concentrate on the grid area below. This is the working area. It is divided into columns and rows by grey lines, creating 'cells'.
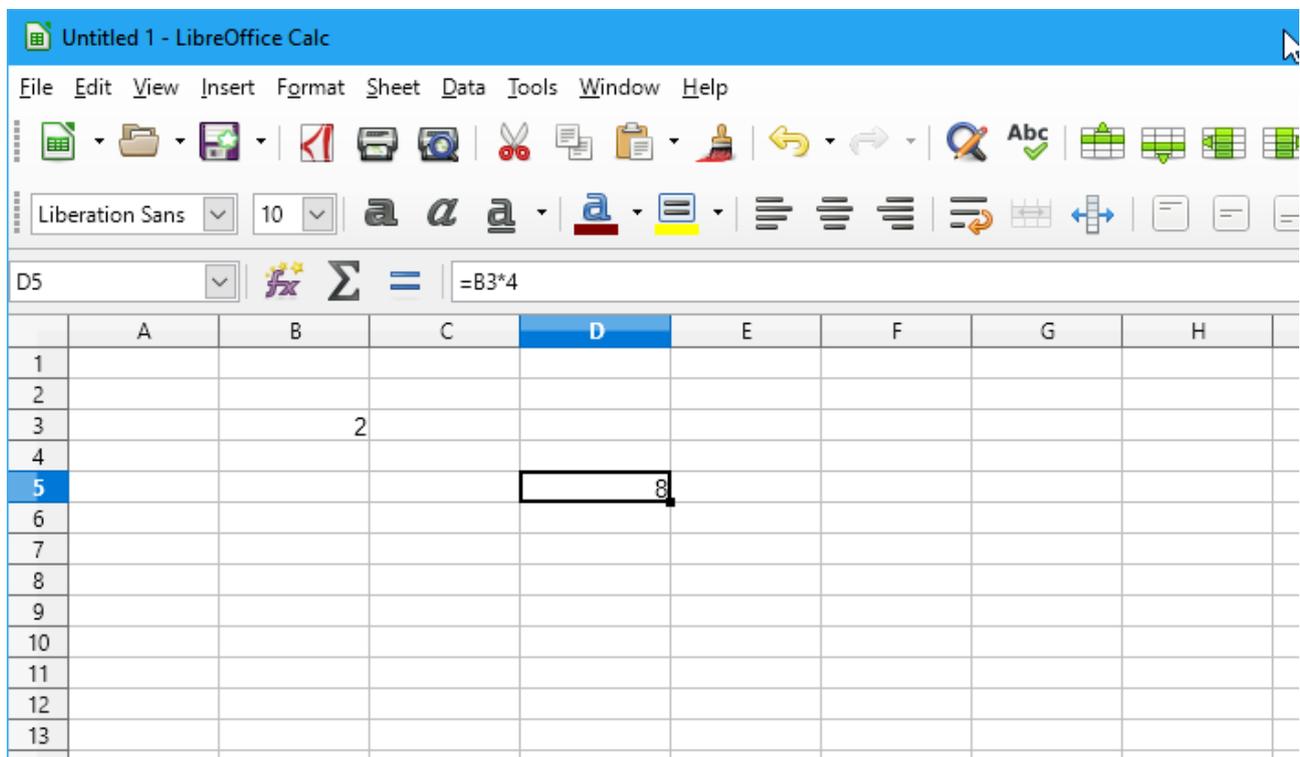
In the image the current, or 'active', cell is outlined in black. Each cell has a line and column reference. The current cell in the image is referred to as 'D5', shown by the blue highlights on the column head and row number, and also in the 'Name' box just above the A column heading.

The active cell is where anything that you type on the keyboard appears. To change the active cell, either move the mouse pointer and click on another cell, or use the arrow cursor keys to move the active cell indicator to the cell you want to make active.

In the image there are two entries. In cell B3 is the number 2. Cell D5 is displaying the number 8, but if you look at the 'Formula Bar', the white field above the C and D column heads, you can see that this cell actually contains the formula =B3*4. When a cell contains a formula, the Formula Bar shows the formula, the cell itself displays the result of the calculation.

Formulas always start with an equals sign =, which is what tells the spreadsheet that they are a formula. The formula shown contains a reference to cell B3, the cell with the number 2 in it, and tells the spreadsheet to display the value of B3 times 4, which is 8 as shown.

This is the great power of a spreadsheet, you can create formulas that refers to values in other cells, more than one cell if you like, and perform calculations on them.

Try this yourself. Text, numbers or formulas are entered into a cell by first making it active, then typing the entry and pressing 'Enter' to finish. You make a cell the active cell by clicking on it with the mouse, or use the cursor keys move the active cell indicator around.

In your spreadsheet, enter '2' in cell B3 and '=B3*4' in cell D5 (without the quote marks). It should now look like the example in the image. Now change the value in cell B3, for example enter 4 in B3, overwriting the current entry. You should see the value in cell D5 immediately change to 16. Now you understand spreadsheets! This is it in a nutshell:

Every cell can use the contents of every other cell in calculations.
If the contents of one of the other cells changes, the calculation is instantly updated.

Just try playing with the spreadsheet using formulas like this until you get familiar with the basic operations of moving the active cell indicator and entering numbers, text and formula. Any cell in the spreadsheet can be referenced from any other cell.

For instance, make the active cell A1, type 'My First Spreadsheet', hit enter and see what happens. Or go to any empty cell you like and enter "=D5*10". Now if you change the value in cell B3, the values displayed in cell D5 by the formula you entered earlier will change, and this new cell formula will also automatically update.

Here is something else to try. Create a column of numbers by typing a number into a cell and pressing Enter. The active cell will become the one below; type another number in that and press enter. When you have a column of half a dozen or so numbers, stop. Now find the summation sign 'Σ' (the Greek capital letter Sigma, often used to signify a sum) just above the column heading 'B'. Press that and see what happens. It will highlight all the numbers in the column above and offer a formula like, e.g. '=SUM(H4:H8)', which means 'Sum the contents of the cells from H4 to H8'. (Your cell references will probably be different.) Press Enter and this formula will immediately be entered into the cell and the resulting sum displayed. Try changing one of the entries in the column and see how the sum changes.

Editing Cell Contents

If you want to edit or change the contents of a cell without overwriting it, first make it the active cell and then press F2. You can then edit the contents, moving the cursor about with the left and right arrow keys. Press Enter to finish editing. Alternatively, highlight the cell and click in the formula bar with the mouse, and then edit the cell contents there.

Number Formats

Spreadsheets contain many built in ways of formatting text or numbers.

For example, if you want to display the numbers in the column as currency, first use the mouse to highlight all the numbers. Do this by clicking on the first cell with the left mouse button and, while holding the button down, drag the mouse so that all the cells containing numbers are highlighted. Then look across the ribbon until you see a button with a picture of a stack of gold coins which says 'format as currency' when you hover the mouse over it. Click on that and the format of the numbers will change to the currency set on your device. The other buttons near to that one format cells as numbers, percentages, dates, etc. Try them out!

More About Formulas

Spreadsheets contain many built in mathematical operators such as powers, square roots, trigonometric functions, etc.

Some of the most useful are powers such as squares, square roots, and the value of π (pi - the ratio of the circumference of a circle to its diameter).

Remember that all formulas start with an = (equals) sign, that is what tells the spreadsheet that it is a formula and not just text. If you forget the equals sign, what you type in will be displayed as text.

> For a square root, enter "=sqrt(x)" where x is the thing you want to find the square root of, it can be either a number or a cell reference e.g. sqrt(2) or sqrt(D5).

> For a square, enter "=x^2" where x is the number you want to square. The ^ is found above the 6 on most keyboards. Similarly, for a cube, enter "=x^3".

> To use π in a calculation, enter "=pi()". For example, if cell B5 contains the diameter of a circle (make sure it does – anything will do), in another cell type "=Pi()*B5" to find the circumference of the circle. The * (multiply) sign is found above the 8 on most keyboards. To find the area of the circle, in another cell type "=Pi()*B5^2/4", i.e. $\pi \times D^2/4$. The formula works because the spreadsheet knows that it must square the diameter first.

> You can use brackets to make sure that things are executed in the correct order. For instance, if you are more familiar with writing A = $^\pi/_4 D^2$, you might prefer to enter "=(Pi()/4)*B5^2".

This is a very short introduction, but I hope it fires your imagination as to what you can do with a spreadsheet. If you have any questions or comments, or anything is not clear, please let me know so that I can update this document for the benefit of others.