Word processing and Excel

Computer Literacy lecture 8
07/10/08

Tutorial to CL1

- Drop in Lab
- ➔ Every Wednesday from 1 - 2 pm (starts 08/10)
- ➔ Computer Lab West 5.05
- ➔ Level 5 Appleton Tower
- ➔ Tutor: Xavier Oliver Duocastella

Topics

- Wordprocessing
- LaTeX
- Spreadsheet - Excel
- What can you do with a spreadsheet

Word processor

- Word processing is an application to produce any sort of printable material
- Word processing is one of the earliest applications for the PC in office productivity
- Microsoft Word is the most widely used word processing system

Different word processors

- Open source:
  - LaTeX/TeX
  - Openoffice
- Proprietary:
  - Apple/Microsoft Works
  - Microsoft Word

LaTeX

- Mostly used by academics in mathematics, engineering but also philosophy
- High level language

http://www.latex-project.org/

http://www.troubleshooters.com/linux/lyx/lyx_latex_tex.htm

Example for LaTeX

```
\documentclass[12pt]{article}
\title{\LaTeX}
\date{}
\begin{document}
  \maketitle
  \LaTeX{} is a document preparation system for the \TeX{}
  typesetting program. It offers programmable desktop publishing
  features and extensive facilities for automating most aspects of
  typesetting and desktop publishing, including numbering and
  cross-referencing, tables and figures, page layout, bibliographies,
  and much more. \LaTeX{} was originally written in 1984 by Leslie
  Lamport and has become the dominant method for using \TeX; few
  people write in plain \TeX{} anymore. The current version is
  \LaTeXe.
  \newline
  % This is a comment, it is not shown in the final output.
  % The following shows a little of the typesetting power of LaTeX
  \begin{eqnarray}
    E &=& mc^2                                  \\
    m &=& \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}
  \end{eqnarray}
\end{document}
```

Example taken from http://en.wikipedia.org/wiki/LaTeX, please go there to see output file

Spreadsheet - Introduction

- Invented 1978 in Harvard by grad student Dan Bricklin
- Vastly expanded the range of business and personal computing
- In the same way that word processor gives a user power over text
- Spreadsheet software yields desktop control over numerical data and tabular information
- Most common spreadsheet software: **Excel**

Spreadsheet - Basics

- A spreadsheet document or “worksheet” appears on screen as a grid of numbered rows and alphabetically lettered columns
- The box representing the intersection of rows and columns is called a cell
- Every cell in the grid has a unique address made up of a row number and a column letter

Spreadsheet -More Basics

- Cells start out empty
- In any cell you can enter text, numerical data, or a formula representing a relationship between other cells
- Numbers (values) are the raw material the spreadsheet uses to perform calculations
- The number in a spreadsheet can represent anything that can be quantified (polling results, test scores, wages, etc…)

Spreadsheet - Functions

- Data input, some validation
- Calculation, Modelling
- Analysis
- Experimentation
- Simple database functions
- Sorting, look-up, filtering
- Visualisation, graphs/charts, presentation
- Versatile but not ultimate answer to any of these

Text in Spreadsheet

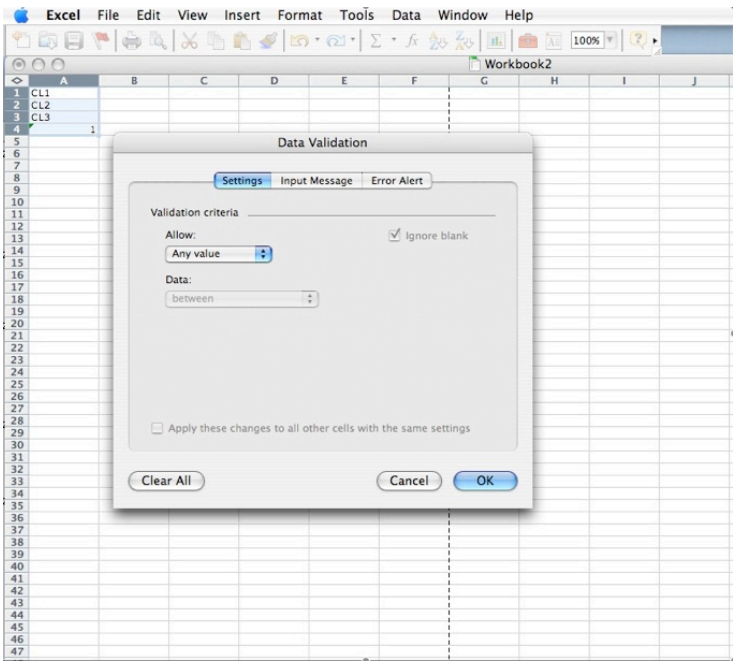
- Entered text serves to label or classify numerical data for the use
  - BUT is meaningless string of characters to the computer
- **FORMULAS** not text tell the computer what to do

Data Validation

- Data validation is a dominant concern in computer systems
  - How to ensure that user enters data correctly
  - There are numbers of ways for checking and regimenting data entered for worksheets

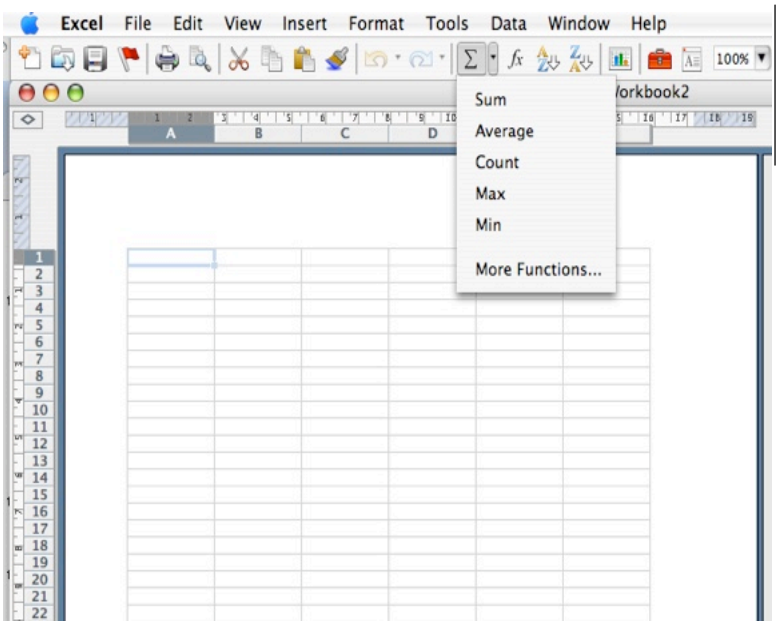
Methods of Validation

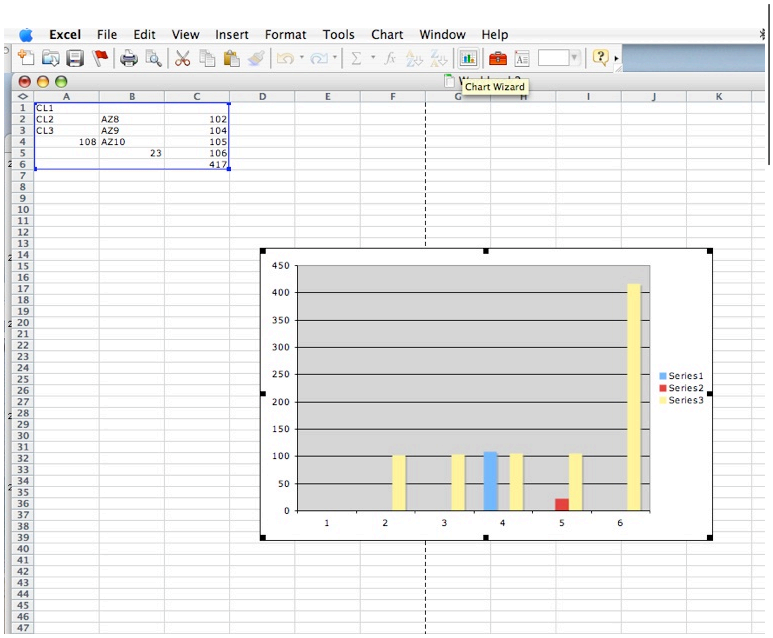
- **Mandatory Entry:** All items of information must be entered, no cells can be left blank
- **Range/Limit Checks:** Entered values must all fall within certain upper and lower limits
- **Format check**: All entered items should conform to a certain pattern, e.g. all numeric, or alphanumeric



Statistical Functions

- Amongst the library of built-in functions that Excel can apply to data are various statistical functions, including:
  - **MIN** to return to the minimum value for a range of cells
  - **MAX** to return the maximum value
  - **AVERAGE** and **COUNT** (etc…)
- Use the drop down list next to the AutoSum tool ∑ to display these functions


Excel File Edit View Insert Format Tools Data Window Help
100%
Sum
Average
Count
Max
Min
More Functions...


Excel File Edit View Insert Format Tools Chart Window Help
Chart Wizard
CL1
CL2 AZ8 102
CL3 AZ9 104
108 AZ10 105
23 106
417
Series1
Series2
Series3

Sorting

- Worksheet can be arranged in ascending and descending order
- Sorting can be based on numbers, dates, alphabetical order, etc…
- To perform a simple sort, select any cell in the relevant column and click **Sort Ascending** or **Sort Descending**

Sorted

- For more complex sorts open Data menu and choose Sort
- Select the main sort field from the list and click ascending or descending
- Select second level sort field
- Select third level if required
- Sorting affects data, so please be careful

More about sorting algorithms:
http://en.wikipedia.org/wiki/Sorting_Algorithm

Filtering

- Selects which rows you see based on criteria
- Only a **viewing operation** doesn't effect data

IF Function

- The **IF** function is used to return one value if the condition you specify is True, and another value if the condition is False
- The values returned can be numbers or the result of a formula

Relative Addresses

- When you AutoFill or copy a formula, the cell addresses used in it change automatically, relative to the position the formula is copied to
- So by default the cell addresses used in formulas are relative addresses
- Not always what you want

Absolutism

- Sometimes you want to keep one or both the coordinates of a cell address constant
- To this type the **$** sign in front of each coordinate that you want to keep
- Example: **C1** - Neither coordinate will change

Absolutism: What does it mean?

- Suppose in C1 you use a formula referencing A1. If you copy the formula to C2 it will reference A2 and likewise if you copy the formula to D1 it will reference B1. By adding $ in front of A and 1 then no matter where the formula is moved/copied to it will reference A1

Absolutism

- To make it a bit clearer:
  - **C$1** - the column will change if you copy the formula across columns (row is fixed)
  - **$C1** - the row will change if you copy the formula down rows (column is fixed)
  - **C1** - Both coordinate will change relative to their new position (default)

Pivot Tables

- Pivot tables allows cross-tabulation of data
- Using a Pivot table you can rearrange the columns and rows of a database to present the information in a new way
- Often quicker and easier to use than using formulas or queries
- Use the Pivot Table Wizard and Pivot Chart to visualise

Key points

- Microsoft Word most used Word processing system
- LaTeX most stable word processing system for very long files (like e.g. a book)
- Excel
  - Basics
  - Data Validation
  - Different functions in Excel