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}
\begin{document}
\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. 
\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 alphanumerical
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 $\sum$ to display these functions
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

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: $C$1 - 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