Computer Science – Lecture 5 Spreadsheets Applications

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Objectives of the Lecture

- To understand “IF” expressions
  - Needed for the homework!
- To examine a spreadsheet “form”
  - An expenses claim!
- To understand what a database is
  - What things are done with a database
  - How Excel works as a database

Spreadsheet Refresher

- A spreadsheet is a (sparse) grid of cells
  - Empty cells do not occupy any memory space
- Cells contain formulas
  - Can be simple numbers
  - Can contain calls to functions { like `log()` }
  - Can contain references to other cells
- If you copy formulas, cell references are updated to match (e.g. line below)
  - Use A1 format if you do not want this

The IF Expression

- = IF (expression, value-if-true, value-if-false)
- Expression is a logical operation
  - E.g. A10 < 7
- Can be more complicated
  - E.g. AND (A10 < 7, A10 > 0)
- The values are displayed in the cell according to the truth of the expression
- They can be simple strings, or formulas
  - E.g. “PASS”, “RESIT”
  - E.g. A12 * A10 / 100
- = IF (A13 > 40, “PASS”, “RESIT”)

Spreadsheets for Form Filling

- Probably the most common use – Expenses Claims
  - Automatic calculation of totals
  - Separation of VAT
  - Checking claim limits
  - Adjusting mileage claims
  - Formatting and printing for signature
- An example (real!) expenses claim…
  - (See .xls file on blackboard)

Advanced Features Used

- Some cells are “protected” from editing
  - Why is this?
- Macros are used extensively
  - Functions written by users
- Macros are called on open and close
  - Automatically running functions
- Buttons to change views, print etc.
  - All driven by macros
- Complex layout and formatting
  - Exactly the same as printed form

Spreadsheets as Databases

- Good for “simple” data
  - I.e. data is all of the same “type”
  - Can be entered into a single sheet
  - Like one table of a database
- Can sort and filter data
- Can use data entry screen

- Can be used for more complex data
  - Other types of data in other sheets
  - Cross referenced / index links to other data

- Access or other true database package better

Database Operations

- Create data
  - Manually or by importing from another source
- View data
  - Display a single item of data
- Filter data
  - Select some subset of data based on some criteria
- Sort data
  - Present selected data in a particular order
- Modify data
  - Change the contents / add / delete
- Report data
  - Produce printed summaries

This Week's Practical – Excel As a Database

- Reading a "CSV" file into excel
- Simple filtering and sorting
- Advanced filtering and selection
- Data entry and update forms

Next Week

- **Powerpoint and presentation skills!**