Chapter 14: Fill-in-the-blank Computing: The Basics of Spreadsheets

Fluency with Information Technology
Third Edition

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Arranging Information

• Organizing textual information into lists
• An array of cells
  – Spreadsheets give us cells we fill in to set up our list
  – Entry that is too long for a cell may spill over in appearance, but still only occupies the cell into which it is typed

Sorting the Data

• Alphabetize or sort, especially when the list is long
  – Say what items to alphabetize by selecting/highlighting the list
  – Sort operation is found under Data menu
    • Ascending or descending order, as strings or numbers
Adding More Data to the List

- We can format cell entries
  - Italic, bold, underline, font styles, sizes, justification, color
  - Found under the Format menu
- Naming rows and columns
  - Automatic naming scheme—columns are labeled with letters, rows with numbers
  - We can refer to a whole column (column C), whole row (row 4), or single cell (C4)

Headings

- In addition to cell addresses, it is convenient to name rows and columns meaningfully
- Example:
  
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Genus</th>
<th>Species</th>
</tr>
</thead>
</table>

Table 14.1: Common spreadsheet operations

<table>
<thead>
<tr>
<th>Operation</th>
<th>Using Excel…</th>
<th>Using Open Office…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change column width manually</td>
<td>Place cursor at right side of column name, then drag</td>
<td>Place cursor at right side of column name, then drag</td>
</tr>
<tr>
<td>Change column width automatically</td>
<td>Format &gt; Column &gt; AutoFit Selection</td>
<td>Format &gt; Column &gt; Optimal Width…</td>
</tr>
<tr>
<td>Fancy formatting</td>
<td>Format &gt; Cells…</td>
<td>Format &gt; Cells…</td>
</tr>
<tr>
<td>Clear cells</td>
<td>Edit &gt; Clear &gt; All</td>
<td>Edit &gt; Delete Contents…</td>
</tr>
<tr>
<td>Delete columns, rows</td>
<td>Edit &gt; Delete</td>
<td>Edit &gt; Delete Cells…</td>
</tr>
<tr>
<td>Hide a column or row</td>
<td>Format &gt; Column &gt; Hide</td>
<td>Format &gt; Column &gt; Hide</td>
</tr>
</tbody>
</table>

*Note: All spreadsheet applications provide these common operations, explore your system.*
Computing with Spreadsheets

• Most common application is to process numerical data

• Writing a Formula
  – Begin with = sign, define the value for the entry based on the value of the other entries
  – Formulas contain numbers, cell references, and standard arithmetic operations
    \[ =F2\times0.621 \]

Computing with Spreadsheets (cont'd)

• Repeating a Formula
  – Copy/Paste
    • Replicates equation to other cells
    • Software automatically adjusts references
  – Filling
    • Small box or tab beyond the cell's lower right corner (fill handle)
    • Grab with cursor and pull to other cells
    • Automated copy/paste
Transforming Formulas: Relative versus Absolute

- Relative means "relative position from a cell" – If we're copying a formula to a cell two columns to the right of the original, the formula adjusts all cell references two columns right.

- Absolute means unchanging—denoted by using $ in front of the part of the cell address that does not change.
  - $C3
  - C$3
  - $C$3

Cell Formats

- Control over the format of information displayed
  - Format > Cells > Number
  - We can control number of decimal places, setting of 1000's separators, and how to display negative numbers.
Functions

• Give the function name, and specify the cell range to be summarized in parentheses
  
  =max(J2:J7) finds highest value in range
  : denotes a range

• Available function names are listed in the f<sub>x</sub> symbol and in Insert > Function… menu
Filling Hidden Columns

- If columns are hidden, but we have copied formula across all columns, formula operates on hidden column also.
Charts

- Graphical representation of spreadsheet data
  - Select values to be plotted/charted, then *Insert > Chart…*(Chart Wizard)
  - The Chart Wizard walks us through the graphing process
  - Can see a preview of different graphs with our data

Figure 14.3 GUI from the Excel charting wizard: (a) initial display; (b) the preview of a scatter plot graph.
Daily Spreadsheets

- Spreadsheets can organize personal information
  - Track exercise performance
  - Set up expense budget
  - Keep lists of books and CD's we've lent out
  - Follow a team's successes
  - Record flight hours after each flying lesson
  - Document expenses or income
  - Save records generated by online banking

Calendar

- To make a custom calendar with spreadsheet software:
  - Enter first day of week (Sunday) and fill across next six columns (list of days completes automatically)
  - Below Sunday, enter date and fill across
  - Enter first two times going down a column on left side (format to taste) and fill down
Discount Table

- Suppose a store offers
  - $1.00 store credit for each $10.00 spent plus
  - $3.00 store credit for every two CDs purchased (one CD earns only one $1.00 credit)
- Construct a table to figure your credits
  - Left column is dollars spent, in $10 increments
  - Top row is CDs Purchased, in 1 CD increments
  - These are the axes of the table
  - Table entries: Formulas to calculate the correct credits, remembering some references have to be absolute
    - Get first cell formula correct then fill across and down to fill the table

Paying Off a Loan

- Suppose you are considering a large purchase
  - You have been offered a loan at 5% interest
  - Create a table of the monthly payments required for different amounts borrowed for different times
  - Fill a row across the top with different numbers of payments; fill a column with different amounts
Paying Off a Loan (cont’d)

- Use the "payment" function PMT
  - Inputs are
    - Interest RATE
    - Number of payments (Nper)
    - Present value—amount of loan (Pv)
  - The result is negative; the payment is a cost to you
  - Use conditional formatting to display entries in two colors
    - All cells with a certain value or range can be formatted automatically

Importing Data

- Foreign data—data from another application we want to import into a spreadsheet
- Spreadsheets prefer to import foreign data as tab-delimited text
  - ASCII text files
  - Each cell's entry ends with a tab
  - Each row ends with a carriage return (ENTER)
  - Spreadsheets can output as tab-delimited
  - If list is in some other form, Search/Replace can often convert to tab-delimited
  - Some browsers can automatically re-format HTML tables for importing into spreadsheets
Arranging Columns

• Data in other applications, like word processors, is hard to manipulate by column
• Solve problem by importing into spreadsheet
  – First create consistently delimited text file of data
• We can rearrange order of columns, then export as text file and re-import back to original application