SPREADSHEETS

Using MS Excel

BASICS

SS LESSON ONE

Acknowledgements

John Sandercock

Software Publications Pty Ltd

for use of files

Spreadsheets using MS Excel

What is a Spreadsheet?

A Spreadsheet is essentially a large working area composed of rows and columns. The intersection of a row and column is called a cell. The data that is entered into the cells can be stored as text, numbers or formulas.

MS Excel or any spreadsheet program makes calculations easy. If data is changed within the worksheet, every formula associated with that data will be automatically recalculated.

Often spreadsheets are used simply to display large amounts of data without any calculations. With its grid format and the use of colour, a spreadsheet can provide an excellent visual representation of data.

What can they be used for?

- Solving mathematical problems with complex equations
- Repeating calculations with various values
- Creating charts (graphs)
- Inserting a number of graphs into a single plot
- Data can be manipulated, grouped and sorted into a specific order for lists etc
- Storing data for mail merge operations in Word

Who uses Spreadsheets?

- At home for
  - Budgeting
  - Calculations eg redecorating the house
- In Schools for
  - Timetables
  - School Rolls
  - Test Results
- At Clubs for
  - Membership Fees
  - Sports Results
- In Industry and Commerce for
  - Financial Accounts
  - Personnel Details
  - Forecasting and Projection of Results

In the QFA Cat-A-Log program, spreadsheets are used for making lists of exhibitors, storing information and storing data for use in mail merge in Word. They can be used to collate large amounts of data which would be beyond the scope of the table feature in Word.

Creating Formulas

In Excel, certain symbols are used as Arithmetic Operators. These allow you to combine numerical values (using references to the cells) to produce a numerical value. For example, two numbers multiplied together would have the * between the two cell addresses. In Excel, formulas always begin with the equal sign =

=A1*B1 means multiply the two numbers that are located in cells A1 and B1.

The letters A, B, C etc are used as column headings while 1, 2, 3 etc designate the rows.

This is a list of the common symbols used in Excel:

Arithmetic Operator	Purpose	Example
+	Addition	A1+B1
-	Subtraction	A1-B1
*	Multiplication	A1*B1
/	Division	A1/B1

Example 1

1. Open the Excel file **Candy World** (file extension is xls)
2. This spreadsheet is made up of labels (text entries), values and formulas. The amounts in both the total row and total column have been created using the Excel function SUM. The function =SUM(B5:E5) in cell F5 means 'add all values between B5 and E5'. B5:E5 is referred to as the Range of values.
3. The total values have also been formatted to show the $ sign.
4. The text has been formatted with changes to alignment, font style and size, bold and italics.
5. Shading and lines have been added to improve the appearance of the worksheet.
6. Select Print Preview from the MS Office button  , Print, to see how the spreadsheet will print out. Close out of Print Preview.
7. Close the file.

Example 2

1. Open the file **Supreme Supermarkets**.
2. *Cost Price* values have been formatted to show 2 decimal places and the *% Markup* values have been formatted to show percentages.
3. Formulas have been created for the *Markup Amount* and the *Retail Price*; one uses multiplication, the other addition.
4. Text formatting, alignment and a dividing line improve the look of the spreadsheet.
5. Close the file.

Example 3

1. Open the file **Staff Details**
2. This spreadsheet does not contain any formulas or functions; it is more an ordered list of information under specific headings.
3. When numbers are entered, they appear to the right of the cell. When text is entered, it aligns to the left of the cell.
4. Note that the dates are displayed in a specific format i.e. dd/mm/yyyy. The contents of a cell can be displayed in many formats; see the list below:

General	Number	Currency
Accounting	Date	Time
Percentage	Fraction	Scientific
Text	Special	Custom

5. Close the file.

Exercise 1

*This exercise shows how to **Enter Data**, use an **Excel Function** and **Copy the Formula***

1. A group of students have the following exam scores. Enter the information into a new Excel worksheet.

Student	**Test 1**	**Test 2**	**Final Test**
Clifford	95	100	97
Downer	82	77	94
Jennings	60	81	77
Masters	50	63	69
Roberts	76	80	88
Smith	57	62	67
Williams	68	70	75

2. Type the headings and the names down the side but not the figures.
3. Select the area B2 to D8, type the first entry `95` and press Enter; continue.
4. After `68` has been entered, the cursor will move to the top of the next column. Continue until all numbers have been entered. Click elsewhere to remove the selection.
5. Type in the heading '`Average Score`' in E1. To find the average score for each student, we will use the *Average* function.
6. With the cursor in cell E2, click on the [Formula] AutoSum drop-down arrow  , and select `Average`.
7. Note that there is a moving frame around the numbers to the left. Excel assumes that these are the numbers we are wanting to average. Press Enter for the result.
8. The formula can now be copied down to produce the average scores for all other students. Move the cursor back onto cell E2.
9. Position the mouse over the Fill Handle - the black square at the bottom right of the cell -until a black cross appears.
10. Click and drag the fill handle downwards to cell E8.
11. Save as **Sheet Ex1**

NOTE: Pressing Enter enters the data into the cell and moves the cursor down to the next cell. Pressing Ctrl Enter places the data in the cell and leaves the cursor in that cell.

Exercise 2

The worksheet does not present very well and some changes need to be made.

*Changing the **Number format***

1. Select the values for the *Average Score*.
2. Click on the [Home] Decrease Decimal button  four times to show the Average Score values to one decimal place.

***Widening** a column manually*

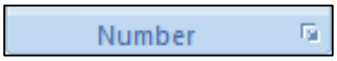
3. Take the mouse between the E and F column headers. When the mouse changes to a vertical bar with two side arrows, click and drag to the right to a width of 15.00. Repeat this exercise to increase the width of column D to 11.00.

***Aligning** and **Bolding** text headings*

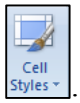
4. Place the mouse over `Test 1` until a large white cross appears. Click and hold, moving to the right to select all the column headings except '`Student`'.
5. Use the *Align Right*  button on the Home ribbon to align the headings above the numbers.
6. Finally select all the entries in the top row and apply bold.
7. Save as **Sheet Ex2**

Exercise 3

*This exercise looks at many of the **Formatting** features of Excel e.g. **Merge Cells**, **Merge and Center**, **Wrap Text**, **Vertical Alignment** in a cell, **Indent Text**, **Shading**, **Borders**, **Format Text** and **Values**, **Row Height**, **Gridlines** on/off*

1. Open the file **Building**
2. Create the `Total Cost` which is the Sum of Materials and Labour. This time click on the top of  which defaults to AutoSum (a quick way to use the SUM function).
3. Copy this formula down using the Fill Handle.
4. Use AutoSum to create the Total for Materials in cell B23.
5. Use the Fill Handle (drag to the right) to produce totals for Labour and Total Cost. (AutoSum can be activated beneath a column of numbers or to the right of a row of numbers. AutoSum is only used when you wish to add together all numbers in a contiguous row or column.)
6. Select all `Total Cost` and `Total` values.
7. Click the [Home] Number drop box 

, Number tab, and format to Currency ($) with 0 decimal places. Click `OK`.
8. Bold all headings and right align the three headings over the values.
9. Select the entries in row 23. From the [Home] Border button  dropdown menu, select `Top and Double Bottom Border`.
10. In A1, type `Southbank Builders` and hit Enter.
11. Select A1 to D1. Click on the [Home] `Merge and Center` button 

12. Format the text to Arial 18pt, bold. Apply shading through [Home] Alignment drop box, Fill tab or clicking the [Home] Cell Styles button 

. Choose a light colour.
13. Choose Thick Box Border from [Home] Border button  drop menu, to place a border around the shaded area.
14. Click between the row headers 1 and 2, drag down to increase the row height to 30.00.
15. In D3, type `=TODAY()` to produce today's date. Make it Italic.
16. In A5 type `Quotation to:` and make this text Italics
17. Select B5 to C8. With cells selected, click the [Home] Alignment dropbox, Alignment tab. Tick `Wrap text` and `Merge cells` and change the `Text alignment` for `Vertical:` to `Top`. (This will create one large cell and allow the text to wrap as in a paragraph from the top down or, as in our case, be placed on separate lines.)
18. Enter the following address information pressing Alt and Enter at the end of each line.

```
Mr John Smithers
23 Grove Street
Carindale
Queensland 4152
```

19. Place a border around the address (use Outside Borders this time).
20. With the address still selected, press the `Increase Indent` button  twice.
21. Select `Excel Options` from the MS Office  drop menu. Select `Advanced`, and under `Display Options for this Worksheet`, untick the checkbox for `Show gridlines`.
22. Save as **Sheet Ex3**

NOTE: For long headings in a spreadsheet, it is sometimes advantageous to run the text vertically within the cells or at an angle. This is done through [Home] Alignment drop box, Alignment tab, Orientation.

NOTE: And don't forget Format Painter, the paintbrush icon, for copying formatting across cells.

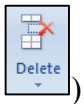
Exercise 4

*This exercise looks at **Printing** options*

1. With **Sheet Ex3** on the screen, Print Preview the document.
2. In the Print Preview area, gridlines are normally removed for printing regardless of whether or not they are visible on the worksheet in Normal View.
3. Under the [Page Layout] tab, there are options to change the paper size, the orientation, the scale and force a large worksheet to fit on a specified number of pages.
4. Margins can be changed through the [Page Layout] Margins.
5. In the [Page Layout] Margins, click Custom margins and tick both `Horizontally` and `Vertically` for `Center on page` and `OK`.
6. In the [Page Layout} tab, use the Page Layout Launcher and select the [Header/Footer] tab, click on `Custom Header`. Click in the `Right section` and choose the page number button  and `OK`.
7. Click on `Custom Footer`. In the `Left section`, type your Name and Student Number. In the `Center section`, click on  to place the date. In the `Right section`, click on  for the filename. (The other buttons  and  place the sheet name and the filename with its path, respectively.)
8. Using the Format Font button  , select each part of the footer and change the font size to 9pt.
9. Close out of Print Preview and save the document as **Sheet Ex4**
10. Print a copy of the document.

Exercise 5

*This exercise looks at the **Editing** features available such as **Changing Column Widths**, **Insert/Delete Rows/Columns**, **Copy/Move Cells**, **Editing Cells**, **Delete/Clear Cells**, **Delete Sheet**, **Undo/Redo***

1. Open the file **Brisbane Uni**
2. To move the Engineering row, click row 6 header, right mouse click and select `Cut`. Now click row 8 header, right mouse click and select `Insert Cut Cells`.
3. Delete column B - click column B header to highlight column, right mouse click and choose `Delete` (the same option is available through [Home] Delete 

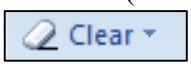
).
4. Now select column D, right mouse click and choose `Insert`. In the new column type `December` and the figures `270`, `270`, `500`.
5. When a green flag appears in a cell, it is a warning to check the formula - click in E6. It still reads `=SUM(B6:C6)` and does not include the new figures.
6. To edit the formula, we will click in the Formula Bar, delete the `C` and replace with `D`. Press Enter (or Ctrl Enter) then copy the new formula down. (Cell contents can be edited in several different ways: typed over to replace the existing entry, edited in the Formula Bar or edited within the cell.)
7. Click in C11 and copy the `SUM` formula across using the Fill Handle.
8. Insert a row above row 8 (`IT`) - click row 8 header to highlight row, right mouse click and choose `Insert`. Type in the figures for the months and the fees:

   `Humanities  380  355  365  260`
9. Copy the formula down to produce the Total Roll value. Repeat for TOTAL column.
10. Select row 10 and delete it using the right mouse button.
11. Increase the width of rows B to G. Select them all; go to [Home] Format 

, Column Width, type in `10` and `OK`.
12. Click on `Undo`  to undo this action. A much quicker way, with columns selected, is to drag column G to a width of 10.00. All selected columns will change to this width.

    `Redo`  reverses undo. Several actions can be undone/redone from drop-down list.
13. To copy the entire worksheet, click on the `Select All` button  - the blank button at the intersection of the row and column headers. Click on the `Copy` button 

. Now select the `Sheet2` tab. Click again on the `Select All` button and click on the `Paste` button 

.
14. We will now edit Sheet2 information. Click on cell M. In the Formula Bar, edit the text to read: `For 1st Quarter 2010` (or try changing it in the cell itself then press Enter).
15. We wish to keep the formulas in place but erase the figures. Select B6 to D9, hold down the Ctrl key and select F6 to F9. (Ctrl allows us to select non-adjacent cells.)
16. Choose [Home] Clear 

, `Clear Contents`. Through [Home] Clear, there are options to clear the contents and leave the formatting or vice versa. Zeros appear where formulas remain.
17. Select `Sheet3` tab. Choose [Home] Delete 

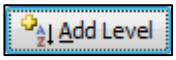
, `Delete Sheet`.
18. Double-click on the Sheet tabs and change to 2010_1 and 2009_4 respectively.

19. Save as **Sheet Ex5**

NOTE: Data can be moved within a worksheet by selecting it and using the Cut & Paste buttons or the Drag and Drop method. Columns cannot be moved if cells are merged.
Data can also be moved across worksheets using Cut & Paste (also from the Home ribbon).
To move or copy sheets, use [Edit] Move or Copy Sheet option or drag the Sheet tabs to reposition.

Exercise 6

*This exercise looks at **Sorting data** and **Filtering lists***

1. Open the file **Sorting**
2. Click in C4 and then click on the [Data] Sort Ascending button  . The employees will now be sorted in alphabetical order by their last name. Use the `Undo` button to undo this action.
3. Click on Department then on the [Data] Sort Descending button  . Again, undo this action.
4. To sort data on more than one column at a time, click anywhere in the list then click on [Data] Sort  . The Sort dialog box offers more options. (Note that the entire table is selected but not the headings. Excel has assumed the table has a header row and the `My data has headers` checkbox is selected. When sorting a list without a header row, make sure `My data has headers` checkbox is not selected.)
5. From the drop-down arrow under `Sort by` select `Department`, and under `Order` select `A to Z`.
6. Click on `Add Level`  .
7. From `Then by` select `Salary`, `Largest to Smallest` then `OK`. The table now shows within each Department, listed alphabetically, the Salaries ordered from the largest to the smallest.
8. Close the document without saving and open it again.
9. Sometimes you need to find particular information from a list. To do this, you filter the list using criteria.
10. Click anywhere in the list. Select [Data] Filter  . Drop-down arrows appear beside each of the field names in the top row.
11. Click on the arrow beside Department, deselect `(Select all)` by clicking on it, then select `Engineering`. The list has now been filtered to show only those employees in the Engineering Department and their details.
12. To remove the filter, click again on Department and `(Select all)`.
13. Click on the arrow beside Salary, choose `Number Filters`, and then `Top 10`. Press `OK` on the dialog box. This filter shows the top 10 salaries in the list. (The number of records displayed can be changed.) Remove the filter by clicking `(Select all)`.
14. As with Sorting, records can be filtered using more than one set of criteria.
15. Click on Department, filter on `Engineering`. Click on Social Club Member and filter on `Yes`. The result is those people in Engineering who are members of the Social Club.
16. When filters are applied, the drop-down arrows change colour. Remove both filters by returning the lists to `(Select all)`.
17. To remove the filter arrows from the worksheet, clicking [Data] Filter again.
18. Close the file without saving.

Exercise 7

*This exercise shows when to use an **Absolute Cell Reference** instead of a **Relative Reference***

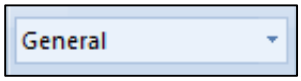
When the Fill Handle is used to copy formulas, the coordinates of the cells change relative to their position.

Sometimes a formula has a reference to a value located in one particular cell. When the formula is copied, the coordinates in the copied formula will automatically change and this will provide a useless result.

In order to fix this problem so that the formula can still be copied, the cell reference is made Absolute by applying a $ prefix to the column and row coordinates.

The F4 key is a quick way of adding the $ prefixes.

1. Open the file **CE Courses**
2. Place the cursor in cell C10 and type `=B10*B6` (No. of Students x Course Cost)
3. Copy this formula down. Click on C11, 12 & 13 to examine the formula and see why the results are incorrect. Delete the entries.
4. Retype the formula. This time immediately after typing B6, press the F4 key. This will place dollar signs around the coordinates i.e. `$B$6`. Press Enter.
5. Copy the formula down to obtain correct results this time.
6. Select cells C15 to D15. Click [Home] Autosum 

to create the totals. Place lines above and below.
7. To find the percentage of each amount against the total, create the following formula in cell D10: `=C10/$C$15` (in order to copy the formula, we need to fix the total amount).
8. Copy the formula down. The values need to be formatted to percentage.
9. Select all the values in the `% Total` column including the total, choose [Home] Number Format drop down menu 

, and select `Percentage` with 2 decimal places.
10. As a double-check of the formula, the total of the percentage total column will always be 100%
11. Save as **Sheet Ex7**

Department of Civil Engineering

Computer Courses

Semester 1, *2010*

Course Cost: 425

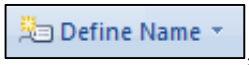
Program	No. of Students	Amount	%Total
Acesss 2007	140	$59,500.00	27.40%
Excel 2007	126	$53,550.00	24.66%
Powerpoint 2007	110	$46,750.00	21.53%
Word 2007	135	$57,375.00	26.42%
		$217,175.00	100.00%

Exercise 8

***Range Names** can be useful as shown in this exercise*

1. Create a new worksheet for the following data. Start with `ITEM` in A1 and use the selected range method for entering the numbers.

ITEM	JOB1	JOB2	JOB3	TOTAL
Aluminium	379	256	145	
Glass	280	400	375	
Wood	1050	980	875	
Total				

2. We will now assign Names to blocks of figures. Select the numbers B2 to B4. Click [Formulas] Define Name 

, type `Job1` for `Name:`, choose `Sheet1` for `Scope:` and press `OK`.
3. Repeat this for the Job2 and Job3 values.
4. Select B2. Give this cell the name `Aluminium`.
5. Repeat this for Glass and Wood.
6. Drop down the arrow next to the Name Box 

and you will now see a list of the Named Ranges that we have created.
7. Click in B5 and press for 

AutoSum. Excel will create the formula `=SUM(Job1)`
8. Continue to create totals for the other two Jobs - the Fill Handle method of copying cannot be used when you assign Range Names.
9. In E2, using AutoSum, calculate the `SUM` for Aluminium and then for Glass.
10. In E4, when using AutoSum, the frame may appear around the figures immediately above. If this happens, take the mouse and redraw the frame across the Wood values.
11. Finally, in E5, calculate the total of the totals. This is not using a Named Range.
12. Right align the JOB and TOTAL headings. Bold all headings and the word `Total`. Create lines above and below the Total row.
13. Format all the totals to Currency with 0 decimal places.
14. Save as **Sheet Ex8**

NOTE: Assigning Names to Ranges has certain advantages. It is more meaningful to see `SUM(Job1)` than `SUM(B2:B4)`. Having names reduces the risk of using incorrect cell references within a formula. Using the Name Box drop down menu allows you to access certain ranges quickly within a worksheet or across worksheets. This is particularly useful in a very large worksheet.

Exercise 9

Try this exercise on your own - create formulas for all areas marked '?'

DRAFTING CHARGE SHEET

Drafter Name: Your Name Here (merge cells for name)

Project	Monday	Tuesday	Wednesday	Thursday	Friday	Project Hours	Project Charge
GCIT Pavement	1	2	6	3	1	?	?
Angliss Rd upgrade	4	4	1	3	3	?	?
Western Bypass Study	3	2	1	2	5	?	?
Total Hours/Day	?	?	?	?	?		Total Project Charges here ?
Income:	?	?	?	?	?		
				Total Hours/Week		?	
				Total Income/Week		?	

Project Charge-out Rate per Hour $75.00

Employee Hourly Rate (Income) $22.50

NOTE: Where necessary, merge cells and use Absolute Cell References in formulas.

Shade the areas as shown - no data is required in these cells. Format the spreadsheet attractively (do not use all the lines as shown).

Save under an appropriate name. Change orientation to Landscape, centre horizontally and vertically and print a copy.

My Notes

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