



Excel

Using a computer for Numerical Calculations

Microsoft Office 2016

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These notes are designed for you to work through at your own pace. These notes do not explain every feature of the program therefore you are expected to make use of the Help facility.



Note: This icon denotes important information – read it carefully.



Tasks This icon denotes a task which should be carried out to help you gain the skills required.

If you have any comments or queries, please contact:

The ICT Skills tutor within your Learning Development Centre.

Glasgow School for Business and Society – 0141 331 3300

School of Health and Life Sciences – 0141 331 3456

School of Engineering and Built Environment – 0141 273 1230

Spreadsheets - Using A Computer For Numerical Calculations

When you have completed these notes you should be able to:

- Insert, format and edit data in a spreadsheet
- Use Excel's Help facility
- Perform calculations on numbers
- Save and print a spreadsheet
- Create a simple chart using a spreadsheet

A spreadsheet is a program used for performing numerical calculations and analysis. For students, spreadsheets are useful when working with numbers, e.g. when analysing numerical data, or carrying out research. The spreadsheet program most commonly used in the University is **Microsoft Excel**.

The following notes will introduce some elementary features of spreadsheets using Excel. They do not cover all aspects of the program.


When/If Things Go Wrong

Before you start using spreadsheet software, remember that when/if an error occurs try the following to rectify the situation:

- **To rectify problems such as a wrongly entered menu command:**

Use the **Undo** option by clicking on the **Undo** icon  from the **Quick Access Toolbar**.

- **To close a command/dialogue box:**

Click on the Close icon  at the top right-hand side of the box or press the **Cancel** button.

If all else fails, close Excel (click on the **File** tab and then choose the Close option), and start again.

Using Help

If there is a command or feature of Excel you would like to use but do not know how, use the help facility within the software. This provides instructions on using all features of the software. To use the help simply click on the **Tell me what you want to do** entry field, Figure 1, in the middle above the ribbon. Some help options will be provided, or choose the **Get Help** option from the menu to type a phrase to search by in the search box.

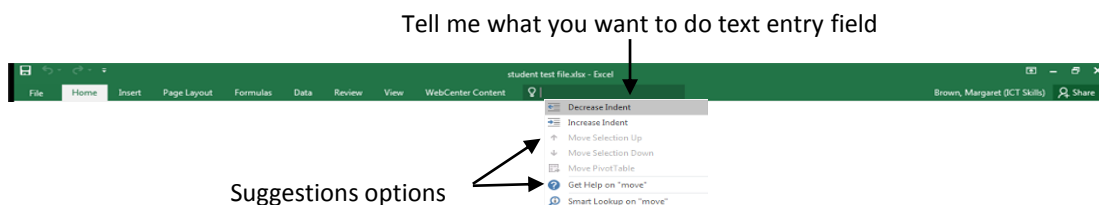


Figure 1: Tell me what you want to do text entry field

Opening and Starting Excel

Excel is opened from the **Start** menu (displayed on the **Taskbar** at the bottom left of the screen). After clicking the **Start** button, click on **All Programs** then **Microsoft Office** then **Microsoft Excel 2016**. This should open and display different workbook templates to choose from, Figure 2.

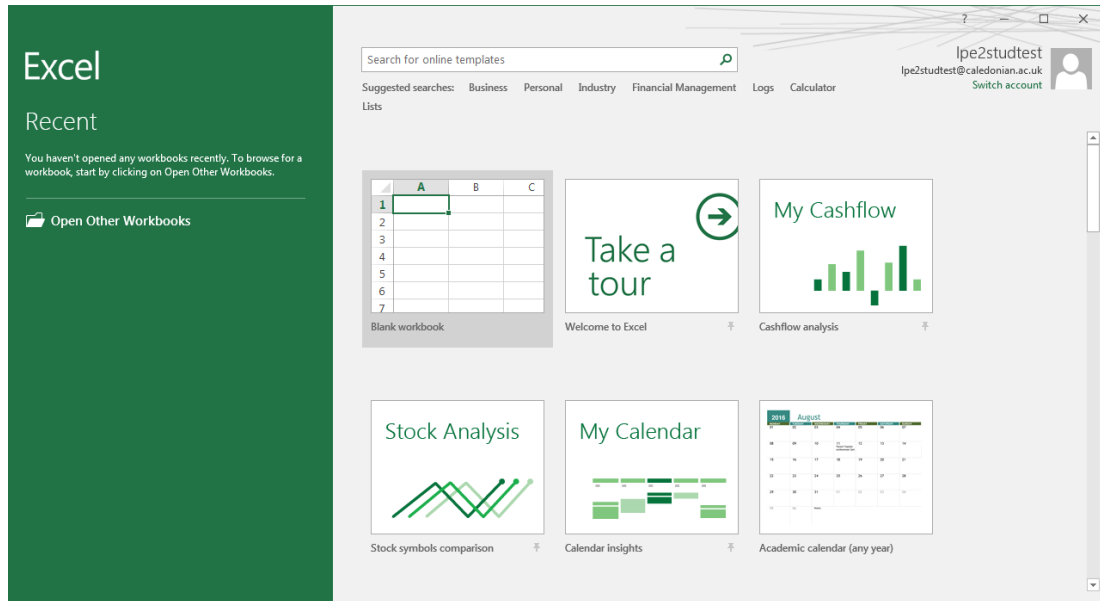


Figure 2: Excel template screen

To start working in Excel choose the **Blank workbook** option by clicking on it. The Blank workbook will open ready for you to insert data, Figure 3.

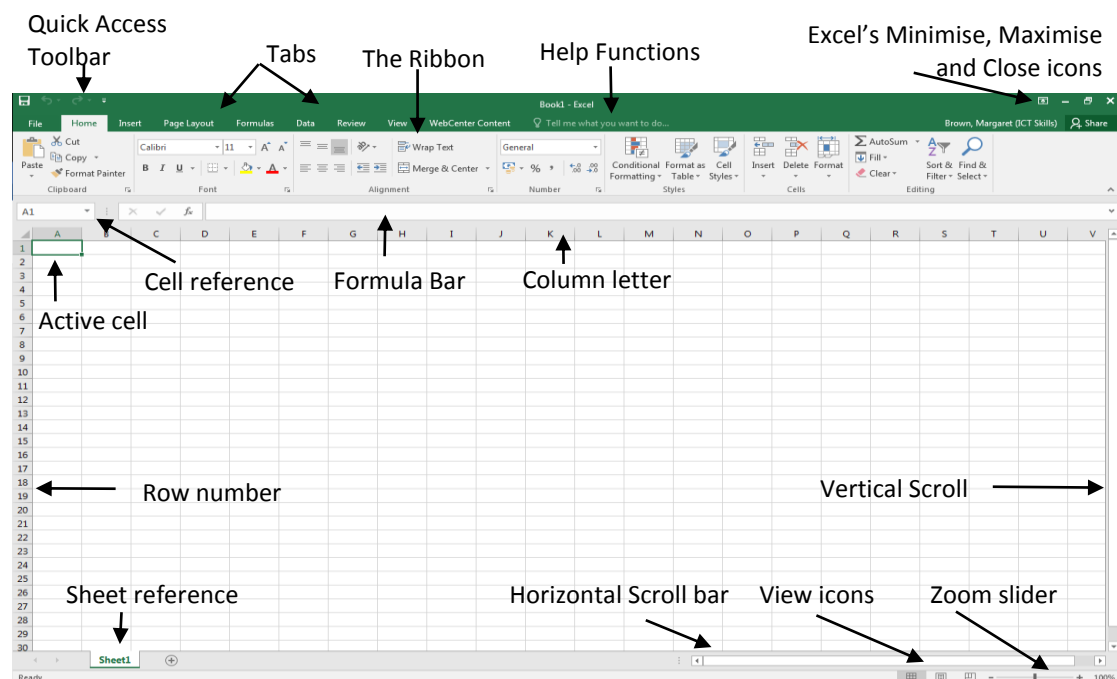


Figure 3: Microsoft Excel 2016 screen

What is a Spreadsheet?

A spreadsheet consists of a matrix (or grid) of rows and columns. It allows you to enter data in a table-like format and perform calculations on the data. When you start Excel a screen similar to that shown in Figure 3 is displayed.

Worksheet or sheet – the 2-dimensional matrix of rows and columns. Excel works with **Books** (or **Workbooks**), each book containing a number of sheets. By default, one sheet is displayed, but more can be added if necessary. Sheets are named Sheet1, Sheet2, etc. by default, but their names can be changed. To move to another sheet, click on the Sheet reference tab.

Cell – where a row and column intersect. Columns are named with letters A-Z, AA-AZ, BA-BZ, etc. and rows are numbered. In any Excel sheet there are 16,384 columns and 1,048,576 rows! On screen you only see a small section of any one sheet.

Cell reference or address – the column letter followed by the row number e.g. A1, BG700, etc. which gives the location, or address, of a cell.

Active cell – the selected cell where the next action such as typing or formatting will take place.

Formula Bar – displays the contents of the current or active cell.

Vertical Scroll bar – used to move up and down in a worksheet.

Horizontal Scroll bar – used to move left and right in a worksheet.

Excel's Minimise, Maximise and Close icons – used to minimise, maximise/restore and close the (Excel) program window.

Data

There are 3 basic types of data which can be entered into cells:

(a) **Numbers** – in Excel a number can only contain the following characters: **0 1 2...9 + - () , £ . %**




Note: When entered, numbers are right-aligned i.e. they are aligned to the right of the cell. The , £ . % characters are left aligned unless they are accompanied by numbers.

(b) **Text or labels** – text can include any character from the keyboard and is used for entering sheet, row and column headings and descriptions.



Note: When entered, text is left-aligned in a cell i.e. it is aligned to the left of the cell.

(c) **Formulae** – these allow calculations to be performed based on the values stored in the cells. Any formula must be prefixed by the '=' sign e.g. if you were to add the contents of the two cells B3 and C4 together, the formula would be entered as **=B3+C4**. Excel provides some standard formulae e.g. **SUM, AVERAGE, STDEV**, etc. called **functions** which are entered using menus and Wizards (see later, page 14, for instructions on how to use them). When a formula or function is entered in a cell, the result of the calculation is displayed on the sheet, while the formula itself is displayed in the **Formula Bar**.

To enter data, first select the appropriate cell (using the mouse or arrow keys), and type the data. Then press the **ENTER** ↵ key, or any arrow key (to move to a new column or row), or click on the Enter icon  in the **Formula Bar** (which appears once you start typing into a cell).



Note: Numbers will appear to the right of a cell and text to the left. If the text is longer than the cell width, just keep on typing. If nothing is entered in the next cell to the right, the text will appear over it.

Moving about a Spreadsheet

When a new spreadsheet is opened, the active cell will be cell A1. The main ways to move about a spreadsheet are to use the mouse or the arrow keys on the keyboard. When using the mouse, the **scroll bars** may be used – these bars are displayed along the right hand side and the bottom of the worksheet. Simply click on the arrows at the end of the bars or move the grey bar by clicking and dragging.

Useful keyboard commands to move around the worksheet include:

Arrow keys – move one cell in a given direction

Page Up and **Page Down** – move one screen up or down

ALT + Page Up and **ALT + Page Down** – move one screen to the left or right

Home – move to the start of the current row

Ctrl + Home and **Ctrl + End** – move to the start or the end of data within the sheet

Ctrl + arrow keys – move to the end of the current row or column

Entering Data

Inserting and editing data

Data can be inserted by clicking on, or moving to, the appropriate cell and typing the data. To edit existing data go in the cell by double clicking on it or click in the Formula Bar to edit as appropriate.



Task 1


Enter the following data into a new spreadsheet:

	A	B	C	D	E	F
1	Sales Figures (June)					
2						
3	Week No	1	2	3	4	
4	Smith J	9.2	7.5	6.3	7	
5	Brown H	2.5	3.2	4	3.5	
6	Thomas T	7.5	6.8	8	5.6	
7	Jones A	6.5	6.3	6.5	6.1	
8						

Practice moving about the spreadsheet using the mouse and keyboard.

Use the **Help** facility to see what other keyboard commands can be used to move about a spreadsheet.

Saving a Spreadsheet

To save a spreadsheet, click on the **File** tab and choose **Save** or click on the **Save** command  from the **Quick Access Toolbar**. When saving a spreadsheet for the first time, a file name and location (i.e. the drive and folder) must be given. Further saves will use the same file name and overwrite the previously saved version. The **Save As..** command allows the file to be saved with a different name, different location or type, leaving the original unchanged. This is useful for keeping different versions of a file.



Note: Excel automatically adds a **.xlsx** suffix to the file name. It is important to get into the habit of saving work every few minutes.

Closing a Spreadsheet

After saving a spreadsheet, it will still be displayed on the screen. To close it select **File** and choose **Close** or click on the close icon .

Opening a Spreadsheet

To open a previously saved spreadsheet, select the **File** tab and choose **Open**. The Open options will be displayed. Navigate to the spreadsheet you wish to open and either double click on the name to open it, or single click on the name and click on the **Open** button at the bottom of the dialogue box.



Task 2


Save the spreadsheet to your user workspace (H: drive) calling it **SALES**.

Close the **SALES** spreadsheet.

Editing and Formatting

The contents or the appearance of a spreadsheet can be changed very easily using a few simple commands.

Inserting rows and columns

A new blank row or column can be inserted by selecting the row/column (by clicking on its header number/letter) after the position where you want the new one to appear and clicking on the **Insert** icon  (not on the downward arrow ▼ under it) on the **Home** tab, **Cells** group. New columns will be inserted to the left of the selected column; new rows will be inserted above the selected row. If you want to have better control you can click at the downward arrow ▼ at the bottom of the **Insert** icon and a drop-down menu will appear with more options.



Task 3

Open **SALES** spreadsheet.

Insert a blank row under the **Week No** heading and a blank column after the sales persons' names (in Column B).

Add the following data to the spreadsheet beneath the existing data, (as shown below):

McBride J 4.5 5.6 4.8 6.5


Andrews M 6.5 6.9 5.8 6

The spreadsheet should now look like this:

	A	B	C	D	E	F	G
1	Sales Figures (June)						
2							
3	Week No		1	2	3	4	
4							
5	Smith J		9.2	7.5	6.3	7	
6	Brown H		2.5	3.2	4	3.5	
7	Thomas T		7.5	6.8	8	5.6	
8	Jones A		6.5	6.3	6.5	6.1	
9	McBride J		4.5	5.6	4.8	6.5	
10	Andrews M		6.5	6.9	5.8	6	
11							

Changing column width and row height

Columns, by default, can display approximately 9 characters (if using font size 11). To widen a column to display more characters, firstly click anywhere within the column you want to modify

and then click on the **Format** icon  from the **Home** tab, **Cells** group. From the drop-down menu choose **Column Width** and enter an appropriate width or choose **AutoFit Selection** to adjust the width automatically to fit the data displayed.

The height of rows can similarly be adjusted by choosing **Row Height** from the drop-down menu.



Task 4


Use **Help** to find out alternative ways (using the mouse) to widen columns and heighten rows.


Tip: try typing '**widening columns**' in the Help search box.

Using either the menus or the mouse method, reduce the width of blank Column B, and increase the width of Column A so that all names fit in this column.

Deleting data

Excel makes a distinction between clearing and deleting data from cells. **Clearing** removes the current contents but a blank cell(s) remains as part of the spreadsheet. **Deleting** removes a cell(s) from the spreadsheet so that it no longer forms part of the spreadsheet and moves surrounding data to replace the deleted cells.

To clear the contents of a cell or cells, firstly select the cells then press the **Delete** key on the keyboard. Or, from the **Home** tab, **Editing** group, click on the **Clear** icon . A drop-down

menu will appear with options to clear all, contents, formats or comments in the selected cell. You would normally clear a cell if more data had to be entered into it to replace what was already there. Otherwise you could delete the entire cell or group of cells from the spreadsheet by clicking on the **Delete** icon  from the **Home** tab, **Cells** group. Doing this will move up all the cells below the ones deleted in the same column. If you click on the downward arrow ▼ under the **Delete** icon a drop-down menu will appear with options to delete just the cell/cells or the whole column, row or the entire sheet. If you choose to delete a cell/cells from this menu, additional **Delete** options (to shift cells left, to shift cells up, to delete entire row or to delete entire column) will appear.



Note: If you are deleting more than one cell and you click on the top half of the **Delete** icon from the **Home** tab, depending on which cells you have selected, Excel will choose to shift cells up or left. We therefore recommend that you use the drop-down menu by clicking on the bottom half of the **Delete** icon and then choose yourself how you want the cells shifted.

To change the entire content of a cell, there is no need to clear its contents first, instead simply go to it and start typing. Excel overwrites by default the contents of the cells if you type in it, so you have to be careful in case you would like to keep the original content of the cell.

If you only need to modify the content of a cell, but not overwrite all the original content, for example, if you want to delete only a character or two from a cell, firstly go to the cell, then double-click on the cell, or click in the Formula Bar to select the data. The **Delete** or **Backspace** ← keys can then be used to delete the desired characters.



Task 5

Ensure that the **SALES** spreadsheet is open and make the following changes to it:



Jones A should read **Jones B**


Figures for **Smith J** in week 2 should be **7.8**

Figures for **Andrews M** in week 3 should be **6.2**

Delete all data for **Thomas T** and move the data up from the rows below.

Moving or copying data

Data can be moved by removing (or cutting) it from one area and inserting (or pasting) it into another. This is a 2-stage operation known as **cut and paste**. To move data, firstly select it, and then click on the **Cut** icon  in the **Home** tab, **Clipboard** group. A broken border will appear around the selected area. To paste the data, click where it has to be inserted and click on the **Paste** icon  from the **Home** tab, **Clipboard** group. If you click instead on the downward arrow ▼ below the **Paste** icon, a drop-down menu will appear giving you more paste options.

Similarly, to copy data follow the above icon but instead of **Cut** click on **Copy** icon , then **Paste**

the data. Press the **Esc** key to get rid of the broken border.



Note: When selecting a block of cells, they will appear with a darker background indicating that they are selected. The top left cell will not appear to have a darker background but it is still selected as part of the block!



Task 6

Insert a blank row under **Jones B**. Then move all the data for **Brown H** to this blank row. Delete the blank row this leaves.

Copy the data for **Smith J** to the end of the spreadsheet (to the row beneath **Andrews M**) and change it to: **Smith M** with the sales figures of: **4.3, 4.5, 4.4, 5**






Save the spreadsheet to your user workspace (H: drive).


Your spreadsheet should now look like this:

	A	B	C	D	E	F	G
1	Sales Figures (June)						
2							
3	Week No		1	2	3	4	
4							
5	Smith J		9.2	7.8	6.3	7	
6	Jones B		6.5	6.3	6.5	6.1	
7	Brown H		2.5	3.2	4	3.5	
8	McBride J		4.5	5.6	4.8	6.5	
9	Andrews M		6.5	6.9	6.2	6	
10	Smith M		4.3	4.5	4.4	5	
11							

Formatting data

Formatting data includes the use of **bold**, *italics* and underline as well as changing the size and type of data displayed e.g. to display a £ sign or % sign or the number of decimal places. To format data, it must firstly be selected and then:

- To use bold, italics or underline, click on the appropriate icon **B** *I* U from the **Font** group in the **Home** tab.
- To change the size and font of text, use the options available from the **Font** group in the **Home** tab (similar to Microsoft Word).
- To change the appearance of cells to display currency, percentage data or to change its comma style, click on the appropriate icons    from the **Number** group in the **Home** tab.
- To increase or decrease the number of decimal places displayed, click on the appropriate icon   from the **Number** group in the **Home** tab.

Alternatively, you can change a cell's format by right clicking on the cell and from the menu that appears choose the **Format Cells...** option. Or click the cell and the **Format** icon  from the **Cells** group in the **Home** tab. A drop-down menu appears, choose the **Format Cells...** option. The **Format Cells** dialogue box which contains the formatting options will open allowing you to select cell properties.



Task 7

Ensure **SALES.xlsx** file is open. Change the main heading (SALES FIGURES (June)) to Times New Roman font, size 14 and bold.

Centre the week number headings and change them to bold.

Display all sales figures with 2 decimal places.

Save the spreadsheet to your user workspace (H: drive).

Naming sheets

Sheets are named by default as *Sheet1*, *Sheet2*, etc. To change the name of a sheet, simply double-click on the Sheet reference tab at the bottom of the screen (it should appear highlighted) and then type a new name.



Task 8

Change the name of **Sheet1** to **June Sales**.

Add your name a few rows below the data in the spreadsheet (e.g. in Cell A14).


Save the spreadsheet to your user workspace (H: drive).

Printing a Spreadsheet

Excel gives the option of printing the entire spreadsheet, or just a section of a sheet. To print an entire sheet, from the **File** tab, choose **Print**. The print options will open and you can select the options required for printing e.g. which pages to print, number of copies.

To print only a section of a spreadsheet, firstly highlight the section by selecting the required cells. Then from the **File** tab, choose **Print**, the print options will open and in the **Settings** section change the default Print area from **Print Active Sheets** to **Print Selection** (a drop-down menu will be displaying once you click on it).

You can see the **Print Preview** shown on the screen as you select your print settings. Click on the

Back Arrow icon  at the top left hand corner of the screen to get back to your spreadsheet.



Note: Once you have seen the Print Preview, the spreadsheet will display dashed lines to indicate where the page boundaries are, according to your current print settings.

Printing gridlines

Gridlines are the lines which separate the rows and columns on a spreadsheet. Normally when you print out your spreadsheet it will not be printed with the gridlines shown. To make the gridlines appear on your printed document go to the **Page Layout** tab, **Sheet Options** group and check the **Print** option (put a ✓ in the box) to have the gridlines showing when printed. When the

document is printed the data will be contained within gridlines.



Task 9

Print Preview the **SALES** spreadsheet with the gridlines displayed.

Save the spreadsheet.

Entering Formulae

The real power of a spreadsheet is in being able to enter formulae to perform calculations on numeric data. Calculations can include simply adding 2 cells together, adding all the numbers in a row or column, multiplying 2 or more cells together, dividing, subtracting and working out percentages etc. As a rule, cell references should be used when entering formulae so that if you change the contents of a cell, the result of the formula will automatically be recalculated.

Formulae always start with an '=' sign. This is to distinguish a formula from ordinary text. Note that when a formula is entered, the result of the calculation is displayed in the cell. The actual formula can be seen in the Formula Bar at the top of the spreadsheet.

Some simple formulae include:

=D2+C2 (addition)

=B3*B4 (multiplication)

=B4/A3 (division)

=C6-D10 (subtraction)

=B9*10% (10% of cell B9)

=(B3*B4)/D10 (the contents of the brackets are calculated first)



Note: When you start to type a formula as you type = and then the letter of the reference of the cell Excel will give you a list of integrated functions (which are explained in detail later) starting with the same letter. If you do not want to use any of the suggested functions just keep on typing and ignore the suggested functions.



Task 10

At the end of the spreadsheet data (for example in cell F14), enter a formula to subtract the sales of **Andrews M** from **Jones B** for week 2. Type some text in the adjacent cell to label this appropriately.

Save the spreadsheet to your user workspace (H: drive). Close the **SALES** spreadsheet.



SUM formula (function)

A common formula used in spreadsheets is the **SUM** formula which adds rows or columns of numbers. Since this formula is used often, Excel displays an icon Σ AutoSum ∇ for it in the **Editing** group of the **Home** tab. To add the contents of a number of cells together in a row or column, firstly move the cursor to the cell which will contain the result of the addition, then click on the Σ

icon. Excel will suggest which cells have to be added together, a broken border will appear around the selection. If this is correct, press **ENTER** ↵, otherwise type in the correct cell range separated by a colon e.g. A5:A10 or B10:F10, or select the range using the mouse. The SUM formula will look something like **=SUM(A5:A10)** – adds together the content of all cells between A5 and A10 (inclusive of A5 and A10).

Copying formulae

Any formula, once entered, can be copied to other cells. Copying a basic formula, such as **SUM**, results in the row or column reference(s) within the formula being changed to correspond with the new row(s) or column(s).

To copy a formula, click on the cell containing the formula, then click on the **Copy** icon  from the **Home** tab, **Clipboard** group. Next click on the cell(s) the formula has to be copied into and press **ENTER** ↵ or click on the **Paste** icon  from the **Home** tab, **Clipboard** group. Remember to press **ESC** to get rid of the broken border. The formula will be copied and cell references changed to correspond with the appropriate rows or columns.

Alternatively, a quick way to copy a formula (or any other cell contents) that will be placed immediately adjacent to the original is to grab the square at the bottom right hand side of the cell and drag to the new cells as shown in Figure 4 below.

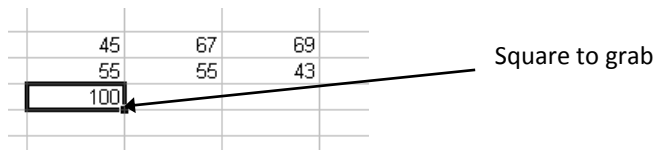


Figure 4: Copying formulae



Note: When copying a formula always check if the pasted formula has the correct cell references.



Task 11

In the **SALES.xlsx** file, type the text **TOTAL** in cells G3 and A11. Enter the SUM formula at the end of the row showing sales for Smith J (cell G5) to total the sales for this sales person. Copy this formula down the column for all other sales persons.



Enter the SUM formula at the bottom of the Week 1 column (cell C11) to total sales for Week 1. Copy this formula across for all other weeks.

Note how the row and column addresses in the formula change when the formula has been copied into other cells.

Functions

Excel has a number of built-in functions to allow more complex operations to be carried out on data. Functions allow you to apply different operations to the data within a spreadsheet. They

include a wide range of mathematical and statistical functions for automatically inserting data such as the date and time. They are sub-grouped into categories (for example **Date & Time**, **Logical**, **Financial** etc.).

To access Functions go to the **Formulas** tab, **Function Library** group and click on the **Insert Function** icon  or click on the **Insert Function** icon  at the beginning of the Formula Bar. The **Insert Function** dialogue box will open as shown in Figure 5. You can then either search for a function by entering descriptive text in the **Search for a function:** field or select the appropriate category from the drop-down list. The **Most Recently Used** category is always displayed initially, and the functions in this category are displayed in alphabetical order beneath. If the function you want is already in this list you can select it from there, or you can choose another category from the drop-down list and then select the function you want from the list displayed. For example, to insert today's date and time into a spreadsheet, choose the function category of **Date & Time** from the drop-down list. Then select the function named **Now** and click **OK**.

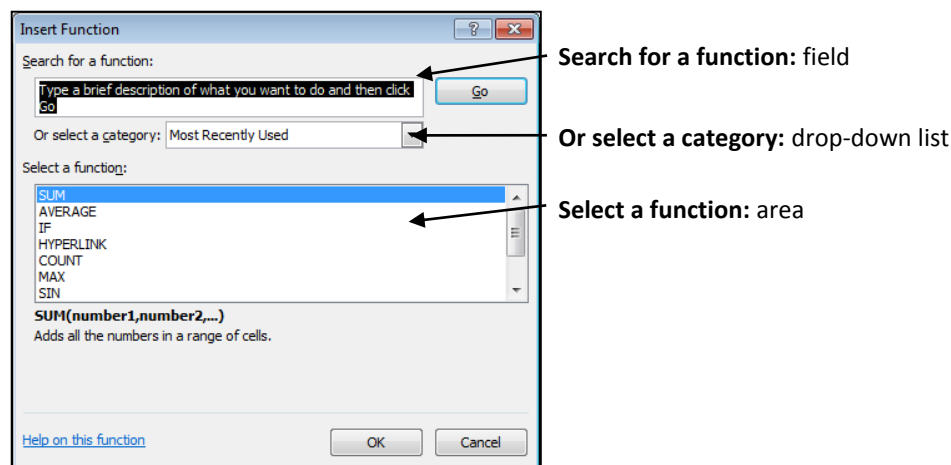


Figure 5: Insert Function dialogue box

The use of some of the functions is outlined in the Excel Advanced notes, but is not covered in these notes. Refer to these notes or **Help** for further instructions on how to use any other functions.




Task 12

Insert today's date at the top of the **SALES** spreadsheet using the **TODAY** function.

Sorting data

Data in rows or columns can be sorted either alphabetically or numerically, in ascending or descending order. To sort data, firstly select all cells that contain the data to be sorted (not just the column or the row data has to be ordered by), then go to the **Data** tab, **Sort & Filter** group and click on the appropriate icon to sort the data. For advanced sorting options click on the **Sort**

icon  the **Sort** dialogue box will open with further options to sort by. Remember when sorting to select all data to be sorted – for example if you have a list of names in column A with the

number of hours each has worked in column B, and you want to sort this list alphabetically, both columns need to be selected, and the sort carried out on column A. This way the correct number of hours worked will stay with the correct name.

Remember if the data has not been sorted correctly, you can use the **Undo** option to get the data back to its original form, and try again.



Task 13

Sort the data alphabetically in ascending order (remember to highlight all data to be sorted, i.e. sales persons and their associated sales, and use Undo if necessary!).

Save the spreadsheet to your user workspace (H: drive). Close the **SALES** spreadsheet.

Charts and Graphs

A chart is a visual depiction of information. Excel contains easy-to-use tools for creating charts which allows you to display data contained within a spreadsheet as a chart or graph. There are many different types of charts and graphs including line charts, pie charts, column charts and bar charts. Displaying raw Excel data in a well-constructed chart can make the data more understandable, meaningful and can be useful for summarising data and spotting trends.

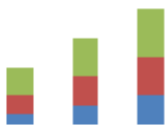
Chart Types and Uses

There are many different types of charts and graphs including line graphs, pie charts, column charts and scatter charts, and it is vitally important that the correct chart type is chosen.



Note: Choosing the wrong chart type can lead to the data being misinterpreted.

Column/Bar Charts



These are probably the most common chart types and are used for comparing data. A column chart displays vertical columns, where each column represents one of the values/categories being compared. A sub type of the column chart is the stacked column chart and the main difference is that a stacked column chart shows the amount each category contributes to the total, as in the diagram. The bar chart is the same but instead of vertical columns it shows horizontal bars.

Line Charts



Line charts are most commonly used to display trends in data, and show continuous data over a set time period. This chart displays each value/category as a point, the points are connected by lines.

Pie Charts



Pie charts are often used to show values/categories as a percentage of the total. A pie chart is displayed as a circle which is broken into segments, the size of each segment is determined by its percentage of the total. You can determine the most important “value” within a data set using a pie chart.

XY Scatter Charts



XY scatter charts can be used to plot workbook data showing relationships/comparisons between the data values. An XY scatter chart can be used to display comparisons or relationships between two data values.

Creating a Chart

Constructing a chart or graph involves 4 steps:

1. Choose the data range (data to be charted). To select the data range, use the mouse to highlight *all* of the data you want to appear on the chart i.e. the names *and* numbers, as in Figure 6. If you want to select two non-adjacent rows or columns, hold down the **CTRL** key when selecting the data
2. Go to the **Insert** tab and then to **Charts** group. Click on the icon corresponding to the type of chart/graph required. A drop-down menu will appear showing you the available sub-types of this chart. Click on the sub-type you want. Excel will generate the basic chart for you as shown in Figure 6.
3. Add titles on the axes (for column, bar, line or scatter charts) or data labels (for pie charts) to make sure that the chart is self-explanatory. You can do that by either:
 - Clicking on the chart and then going to the **Chart Tools - Design** tab. Click on the more button ∇ next to the **Quick Layout** icon in the **Chart Layouts** group to see all chart layouts. Click on the Layout you want (make sure it has Chart title, Data labels for pie charts and Axis Titles for most other types of charts). Excel will now change the layout of the chart and will put the default titles.



Note: When changing the layout of a pie chart, make sure that the layout you choose will put labels on the sections of the pie (like Layout 1 for example).

Or

- Clicking on the chart. Then click on the **Chart Elements** icon \oplus to the top right hand side of the chart and choose each element you want to add to your chart, i.e. Axis Titles, Chart Title, Data Labels, etc.
4. Now click on the new elements that you added, i.e. chart title, axis titles, etc. and type an appropriate text for you chart in the Formula Bar.

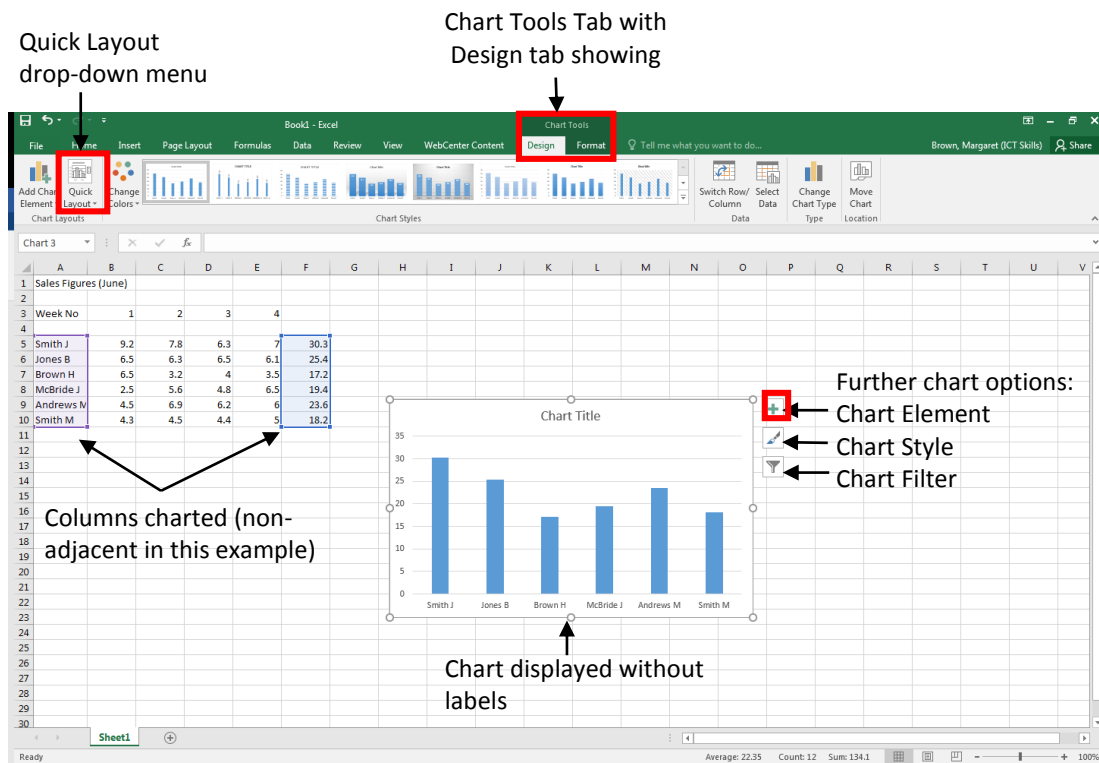



Figure 6: Chart contained within Spreadsheet

You can modify the properties of the chart by using the **Chart Tools** tabs. From the **Chart Tools - Design** tab you can change the style of the chart, its position (on the same sheet as the data or in a separate sheet) as well as changing the chart type.

 **Task 14**

Open the **SALES** spreadsheet. Create a simple chart (select an appropriate type) displaying the sales persons' names and total sales figures.

Tip: you will need to press and hold the Ctrl key while selecting the salespersons' names and the total sales with the mouse.

Title and label it appropriately and display on the *June Sales* sheet (i.e. the same sheet as the data).

Save the spreadsheet to your user workspace (H: drive). Close the **SALES** spreadsheet.

Moving and Resizing a Chart

When your chart is created and inserted into the current worksheet sometimes it covers the data. If this happens you can move the chart to an empty area on the worksheet. To do this, move the cursor to the chart, when the cursor changes to a four headed arrow, click on the white area within the chart and hold and drag the chart to the new location.



Task 15

Drag the chart below the data in the spreadsheet.

Sometimes when a chart is inserted into a worksheet not all of the data can be seen. If this happens the chart can be resized. The sizing handles of the chart can be found at the borders of the chart and are shown with dots. To resize the chart, move the mouse to the edges. When you do this the cursor will change to a double headed arrow. Click, hold and drag the chart frame resizing handles to the size required.

The elements of the chart can also be resized. Click any of the elements i.e. the title box, the legend box or the chart itself and drag to the required size. All element can also be formatted, i.e. changing the font, font size, colour, etc., by clicking on the relevant element and then selecting the new formatting options from the **Home** tab.



Task 16

Resize the chart to ensure all of the data is showing. Increase the font size of the Legend and resize the box if needed to ensure the Legend is showing all the text.

Sometimes it is easier to operate with the chart if it is in a separate sheet in your workbook. You can move your chart to a new sheet by clicking on the **Move Chart** command in the **Chart Tools – Design** tab, **Location** group. Use the same command to move it back from a separate sheet to the sheet where the data is taken from. When you click on the Move Chart command a dialogue box will be displayed Figure 7. Choose the appropriate option and click **OK** to move the chart to the location specified.

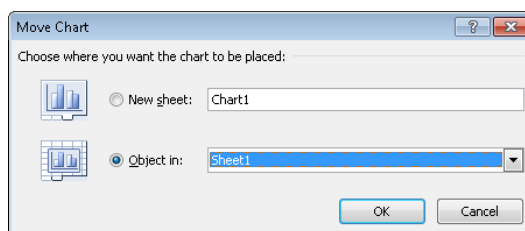


Figure 7: Move Chart dialogue box




Task 17

Move the chart to a new sheet in the workbook and rename the sheet Sales Chart.

More Data on One Chart

Quite often the information that needs to be presented in a chart will come in more than one set/series. For example, the data that you have in your spreadsheets is for sales figures for 4 consecutive weeks. If you need to show this information in chart, it will have 4 separate values to


be presented against each person, i.e. 4 series of data.



Task 18

Go to the June Sales sheet in the workbook and create a column chart showing all sales figures for everybody for all 4 weeks (without the total sales).

Modifying a Series Title

Click on the chart and from the **Chart Tools – Design** tab choose the **Select Data** command  , or right click over the white space in the chart and choose **Select Data** option from the pop-up menu.

The **Select Data Source** dialogue box will be displayed, Figure 8.

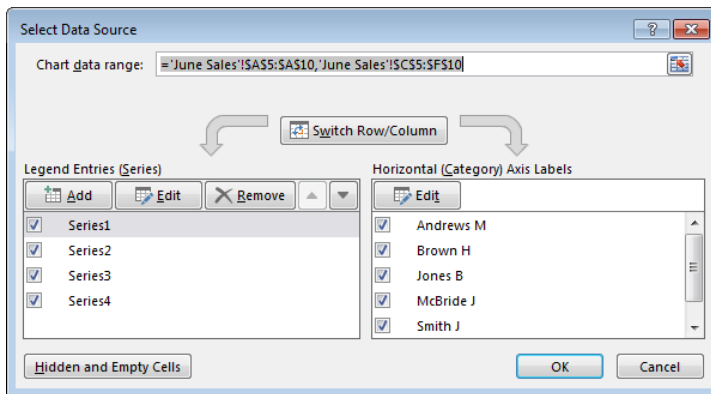


Figure 8: The Select Data Source dialogue box

To modify the Series name, click on the Series name in the **Legend Entries (Series)** section of the dialogue box. Then click on the **Edit** button in that section.

The **Edit Series** dialogue box will then be displayed, Figure 9 In the **Series name:** field type the name you wish for your Series and click **OK**. The dialogue box will close and the name will be changed in the **Select Data Source** dialogue box.

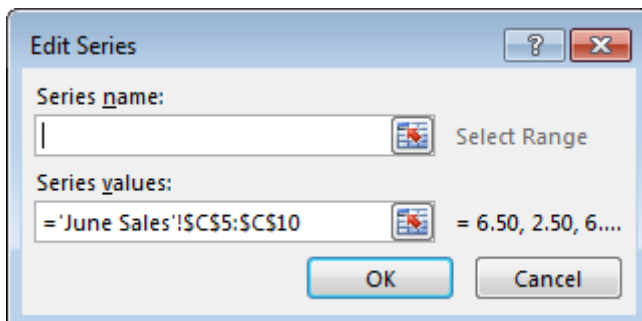


Figure 9: Edit Series dialogue box

Once you have made all of the amendments to your series names click on the **OK** button in the **Select Data Source** dialogue box. The chart will now be displayed with the modified series names.



Task 19

Modify the Series labels of your chart to the corresponding week numbers.

Modifying Axis Labels

To modify the chart axis labels individually click on the **Select Data** command, when the **Select Data Source** dialogue box is displayed, click on the **Axis** label that you would like to change from the **Horizontal (Category) Axis Labels** section of the **Select Data Source** dialogue box. Then click on the **Edit** button the **Axis Labels** dialogue box will open (see Figure 10). Change the label in the Axis label range field and click **OK**. Close the **Select Data Source** dialogue box once you have made all of your changes. The chart will now show the data with the labels that you have modified.

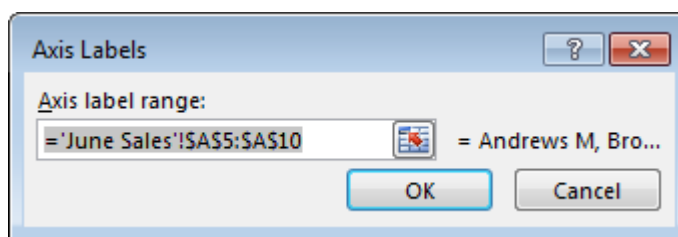


Figure 10: Axis Labels dialogue box

Modifying Charts

The functionality within Excel allows you to customise the appearance of the chart, and to ensure the display is appealing and appropriate to the audience it is aimed at.

If you have created a chart and then feel that you have chosen, the wrong chart type you can change it. To do this, ensure your chart is selected by clicking on it. The **Chart Tools** contextual tabs will be displayed, click on the **Chart Tools - Design** tab, **Type** group and **Change Chart Type** command (see Figure 11 below).

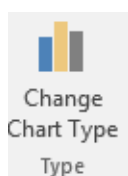


Figure 11: Chart Type commands

The **Change Chart Type** dialogue box will appear with all of the chart options (see Figure 12 below). Click on the chart type you would like and click **OK**.

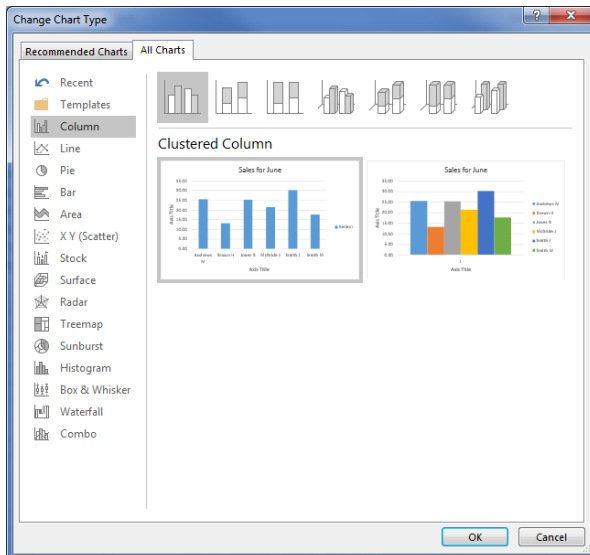


Figure 12: Change Chart Type dialogue box



Task 20

Change the chart type to one of the ones listed. Note how it changes, decide if it works with the data you have chosen. If not, cancel the change.

You can also change the layout of your chart. Ensure the chart is selected, and the **Chart Tools - Design** tab. Then from the **Chart Layouts** group choose the **Quick Layout** command, when the menu is displayed choose a different layout, by clicking on one of the options, (see Figure 13).

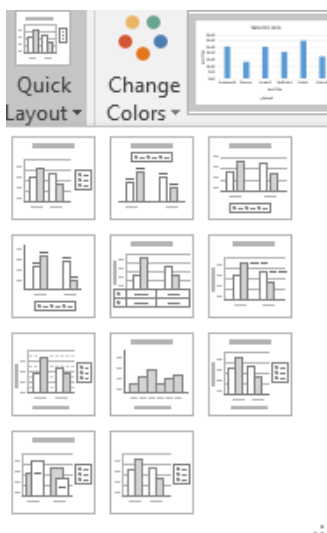


Figure 13: Chart Layouts



Task 21

Change the chart layout to one of the ones listed choosing an appropriate layout for the data. Note how it changes, decide if it works with the data you have chosen. If not, cancel the change.



Note: When you change a chart layout some of the titles may be deleted. Use Undo when this happens.


You can also change the style of your chart. To do this select the chart and from the **Chart Tools - Design** tab the Chart Styles group will be displayed. To see the full range of chart styles available click on the **More** button  at the bottom right hand side of the gallery. From the **Chart Styles** group choose a style that you would like (see Figure 14) and click on it to apply it.



Figure 14: Chart Styles group



Task 22

Change the chart style to one of the ones listed choosing an appropriate style for the data.. Note how it changes, decide if it works with the data you have chosen. If not cancel the change.

Formatting Charts

The chart can also be formatted by using the commands available within the **Chart Tools - Format** tab option (see Figure 15 below).

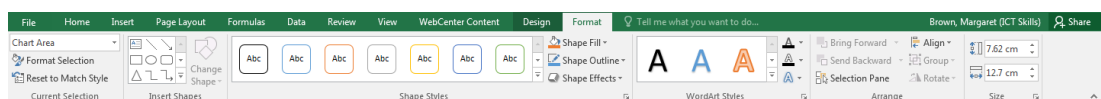


Figure 15: Chart Tools -Format tab

Chart elements can be formatted to give emphasis. To format an element select it, a box with sizing handles will appear around the chosen element. Choose one of the formatting options to apply, these range from changing colour to adding effects or inserting **WordArt** to give emphasis. For example, you may wish to choose different colours for bars in a bar chart or add WordArt to axis labels.



Task 23

Change the colours of the bars in your bar chart to give each salesman a different colour.

Supplementary Exercise

These exercises may be undertaken to extend your knowledge and understanding of Excel.



Supplementary Exercise 1

Open a new spreadsheet and enter the following data:

	A	B	C
1	Student Marks		
2			
3		Mark	
4	Name	out of 40	
5	Adams J	25	
6	Jacobson H	38	
7	Kennedy W	20	
8	King Y	35	
9	Young D	25	
10			

Add your name a few lines below the spreadsheet data.

Change all headings to bold and change the main heading (**Student Marks**) to font size 14.

Widen column A to a suitable size.

Right-align the **Mark out of 40** sub-heading.

Insert a blank row under the sub-headings.

Change **Kennedy W** to **Kennedy U** with a mark of **21**

Rename **Sheet1** calling it **Student**

Save the spreadsheet to your user workspace calling it **MARKS**

Close the file.



Supplementary Exercise 2

Open the **MARKS** spreadsheet. Add a sub-heading in the column to the right of the 'Marks out of 40' column and label it **Percentage**.

Add suitable formulae to calculate each student's percentage mark (Hint: divide the mark by 40 then display the result as a percentage using the percentage format icon).

Save the **MARKS** spreadsheet to your user workspace (H: drive) and close it.



Supplementary Exercise 3

Open the **MARKS** spreadsheet. Insert today's date at the top of the sheet.

At the bottom of the spreadsheet (for example after cell A15) enter suitable formulae (look at **Help** if you are unsure) to calculate:

the average mark out of 40

the average percentage mark.

maximum and minimum marks.

Tip: The formula should be in the format:

=AVERAGE(range)

=MIN(range)

=MAX(range)

(range = first cell address to last cell address, for example A5:A10)

Sort the data alphabetically in descending order. (Only include the students' names and their associated marks – do not include the average, maximum and minimum marks in the sort).

Save the spreadsheet to your user workspace (H: drive). Close the **MARKS** spreadsheet.



Supplementary Exercise 4

Using the **MARKS** spreadsheet, create a chart to display the students' names and their percentage marks. Label appropriately.

Save the spreadsheet to your user workspace (H: drive). Close the **MARKS** spreadsheet.