DEVELOPING A BUSINESS DECISION SUPPORT SYSTEM

A spreadsheet is simply a computerised version of what accountants have used for years: columns and rows of figures. The advantage of an electronic spreadsheet is the ability to redo the figures quickly and easily. Spreadsheets can also be used to simulate business decisions, for example: if costs increase by 8.5%, this can be input into the spreadsheet to see immediately what effect it has on the bottom line and the manager can consider what business decisions need to be made.

Case Study: Hammer Wines P/L

Hammer Wines P/L is run by Marilyn and Colin Hammer and is situated in suburban Melbourne. It is an importer and distributor of wines, spirits, beer and ready to drink beverages from a number of different countries throughout the world. It has been successfully operating for 20 years.

Hammer Wines P/L employs 17 people and distribute their products nationally. They have an exclusive import arrangement with manufacturers out of SE Asia and various other countries. They also have some distribution rights for ready to drink beverages (RTDs). Sales turnover is split between beer 35%, wine 35%, RTDs 17% and the balance in spirits. With a turnover of approximately $14 million, Victoria and New South Wales represent approximately 65% of sales, QLD, SA and WA the majority of the balance. Hammer Wines P/L distributes 35% to hotels, clubs, restaurants; 40% to supermarket chains and the balance through other retail liquor stores. Their retail customer base, like the majority of the liquor wholesale industry is concentrated between Woolworths, Coles and the independent retailers.

Excel will be used as a tool to analyze both the level and the type of sales, to produce reports as required and to aid in the performance management of the sales representatives. It can also be used to assist in strategic planning and decision-making by all the senior management staff. The major purpose of these Decision Support Systems is the creation of a viable sales and product analysis system.

The Hammers needs to know:

- Total Sales for each sales representative, each product and each region as well as the quantity sold
- The % sales per sales representative
- Whether sales representatives have achieved their sales targets
- Commission earned by sales representatives

Business solutions: Developing a business information system using MS Excel

We will design a basic spreadsheet model to calculate total sales per product and per sales representative.

This model will be reusable. Colin and Marilyn will be able to change any sales data and the model will automatically re-calculate the commission earned. This information will help them to make decisions about the direction of the sales and product mix going forward.

Tasks

1. Activity 1: formatting to make the spreadsheet more readable and attractive. Keep it simple.
2. Activity 2: using Excel functions to perform calculations on provided data to produce desired outputs
3. Activity 3: using Excel functions to generate visual information (e.g. charts, pivot charts) and automate some Excel tasks (i.e. Macro)

Guidance

- A raw datasheet is provided
- Follow instructions to convert the raw datasheet to a more useful, complete business solution to Hammer Wines
- Try to resolve the problems yourself before asking for assistance
- Practice all activities to be ready for the Excel test

Activity 1 – Formatting

- Open the raw datasheet file provided by the lab instructor: **HammerWines-Activity 1-HP.xlsx**
- Look closely and you will see that the following worksheets in this file:
    1. IPO
    2. Wholesale Price List
    3. Raw Sales
    4. Sheet 1
    5. Commission
    6. Sales Target

- Open the **Wholesale Price List** worksheet
- Complete the following tasks to reformat the Wholesale Price List worksheet

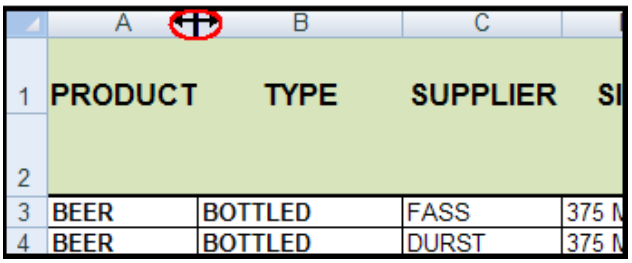
1. **Borders**
    - Add borders to highlight each product (similar to SPIRITS and WINE)
    - Highlight each product type (e.g Product Beer, select the cells A2:E22, then use **Home, *Font, Borders, All Borders.*** Still with cells A2:E22 highlighted, repeat with **Home, *Font, Borders, Thick Outside Borders***. Repeat for product RTDs.
    - For the headings select cells A1:E1 and only use **Home, *Font, Borders, Thick Outside Border.***
2. **Fonts and Text Size**
    - Highlight **A1** and changes fonts and text size as follows: ***font***: Arial, ***size***: 12, bold, ***Align***: centre and middle
    - Change the ***Background Colour*** for the headings. Select **A1**, **Home** tab, **Font** section, **Fill Color (**second last icon in the font toolbar). To apply a different colour click on the drop down arrow to the immediate right.
    - Make the background colour Olive Green, Accent 3, Lighter 60%. Rest the cursor on any colored box and a text box will appear with the color specifications.
3. **Format Painter**: a quick way to copy format across cells is using the format painter
    - Click on **A1**, double click on the format painter icon (under **Home** tab, **Clipboard** section, **Format Painter** 

). (Note: *A single click allows the format to be painted only once, whilst a double click paints the format any number of times*.)
    - Highlight headings on B1:E1 and release the mouse to copy format
    - Press ***ESC*** to turn the format painter off.
4. **Wrap Text**: this feature is used to keep headings in a compact cell. It is often used in conjunction with altering the width and height of the cell.
    - Click in cell **E1**
    - **Home** tab, **Alignment** section – **Wrap Text**

	A	B	C	D	E
1	PRODUCTS	TYPE	SUPPLIER	SIZE	WHOLES SALE PRICE PER CARTON

5. **Change Column/Row Width and Height**: to fit text into a cell
    - Move your mouse between the A and B column headings until you get the double headed arrow double click (see Figure 1) – and double click to automatically widen

the column to accommodate the cell with the largest entry.

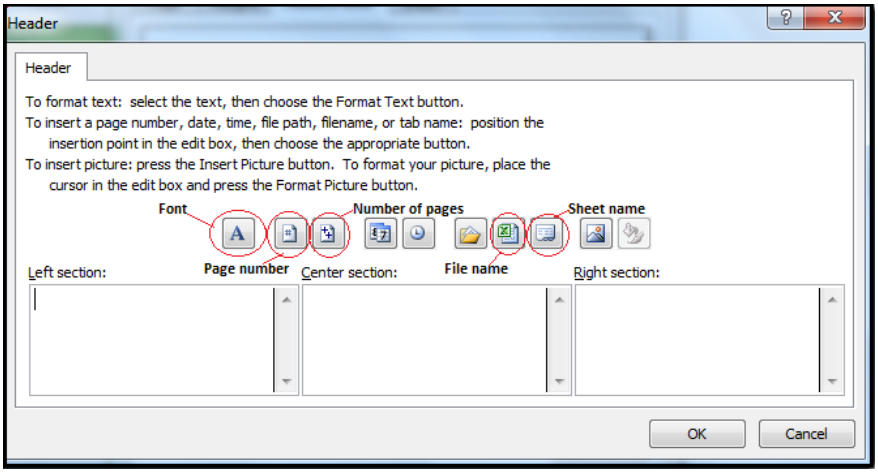


	A	B	C	
1	PRODUCT	TYPE	SUPPLIER	SI
2				
3	BEER	BOTTLED	FASS	375 M
4	BEER	BOTTLED	DURST	375 M

Figure 1: Changing column width

- OR use **Home** tab, **Cells** section, **Format**, **AutoFit Column width**
- You can also automatically widen multiple columns to fit the text. Highlight column B, C and D, move your mouse between the B and C column headings until you get the double headed arrow double click (see Figure 1) – and double click to automatically widen the column to accommodate all the highlighted cells with the largest entry.

6. **Currency ($):** format numbers to currency format
   - Format wholesale prices of all products to currency format (e.g. SPIRITS and WINE)
   - Highlight wholesale price of **beer and RTDs**, under **Home** tab, **Numbers** section, choose **$**
7. **Page set up for printing**: This dialog box allows you to make a number of changes as to how your worksheet will be printed.
   - Click on **File – Print – Page Setup**
   - ***Page*** - The default is to print all worksheets as portrait, but with some of the sheet you will complete later you may find it easier to fit everything on the one page by printing the worksheet landscape. Sometimes you may need to adjust the scaling to fit data on one page. You need to become familiar with features in this part of the dialog box. Make some changes; see the impact it has on your worksheet by clicking on **OK**. (Remember to change back to the original presentation when you have finished).
   - ***Header and Footer*** – insert header and/or footer to a current worksheet. Header and footer display the same content for all pages when printing. In the **header**, add the **file name** and the **sheet name**, whilst the **footer** will contain **your name** and **student ID** in the left hand corner and the **page number** in the bottom right hand corner.
     - Click on the ***custom header*** button. The following toolbar should appear:



- Click on the fourth icon from the end of the toolbar. This will insert the **file name**. Click **space** then click on the third icon from the end of the toolbar. This will insert the sheet name. You can change the font by clicking on the **A** in the header/footer toolbar. Click on **OK**
- Click on the ***customer footer*** button. A similar dialogue box to the header box will appear. In the left section, type your name and student ID
- To ***insert a page number*** in the right section, type the following '**Page** ' and click on the page number (hash) icon **&page** should appear. For ***multiple pages***, type '**of** ' click on the Number of pages icon, followed by typing 'Pages'.
- Click **OK** to return to print preview and view the changes you have made.

8. **Save: s**ave your work from this activity.
   - **File** tab - **Save**

- Open **Raw Sales worksheet**, complete the following tasks

9. Insert new rows

- Insert 2 new rows above the current row 1: highlight row 1 and row 2 → right mouse click → a shortcut list should appear and select **Insert** to insert 2 new rows.
- In **A1** enter the following title, **SALES REPRESENTATIVES FIGURES FOR YEAR ENDING JUNE 2007**

10. Merge between cells

- Highlight from **A1:N1** and center the heading across the selected cells using the ***Merge and Centre*** icon found in the **Home** tab, ***Alignment*** section.

11. Insert Data Validation: is used when you want to limit/restrict the entries in a cell. In this case, we want to create a list box so the user can simply choose the state for each sales representative. The first step is to create the list.

- In cell D2: type in REGION. Each sales representative has a designated region and the sales representatives can be relocated to different regions over the years (see Table 1 below for list of states and sales representatives).
- In cells **S3:S7**, enter the following options into this VIC, NSW, QLD, WA & SA, TAS
- To create the list box first select the cell that you want to restrict – select cell E2
- Select the **Data** tab, ***Data Tools*** section, ***Data Validation*** – the following dialog box should appear:

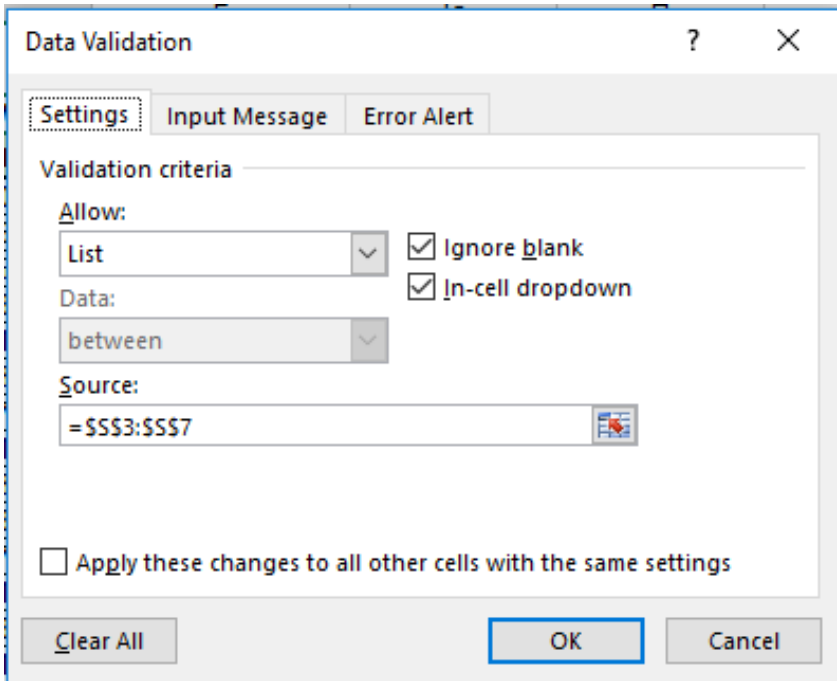
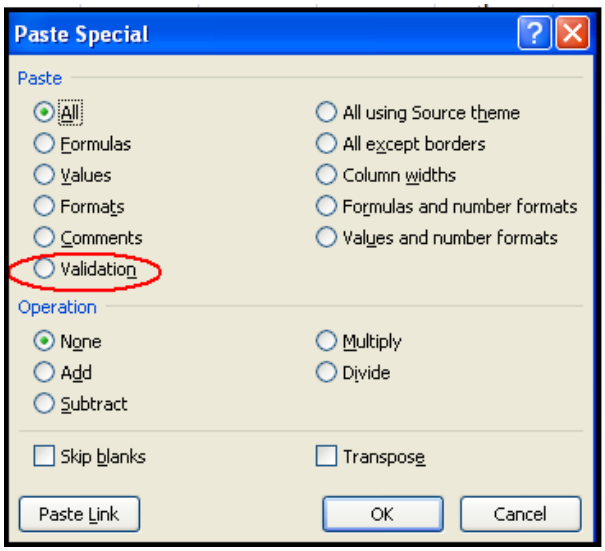


Figure 2: Data Validation

- In the ***Allow*** box, use the drop list to select List.
- Click in the ***Source*** box – highlight range **S3:S7**, click **OK**. Accept all other defaults.
- We want to copy this to the rest of the Sales Representatives. Select **E2** and copy (Ctrl + C).
- Select adjacent cells **F2:L2**. Use ***Paste Special*** with the ***Validation*** option selected. See the Figure below. ***Paste Special*** allows the user to attach the same characteristics of one cell to another. Click **OK.**



12. Update Region for each sales staff as shown in the table below.

Table 1: List of sales representatives and regions

Region	Sales Representative
NSW	Oliver, D
QLD	Zhang, D
VIC	Kewell, O
WA & SA	Gregson, G
NSW	Takalua, J
QLD	White, G
WA & SA	Cohen, S
TAS	Jedd, D

- **Save** your work as ***HammerWines-yourname-Activity 2.xlsx***

Skills Developed

Well done, you are now able to:

- ✓ Enter data into a worksheet
- ✓ Distinguish between labels and values
- ✓ Change font type and size, text and background colour
- ✓ Use wrap text and center & merge headings
- ✓ Format a worksheet using format painter
- ✓ Insert rows, columns, and change width/height of rows and columns
- ✓ Use page setup to alter orientation, margins, insert headers & footers
- ✓ Use Data Validation to create a list box

Activity 2 – Calculations

- Continue with the saved file **in Activity 1** or open the provided **HammerWines-Activity 2-HP.xlsx**.
- Look closely and you will see that the following worksheets in this file:
  - IPO
  - Wholesale Price List
  - Raw Sales
  - Sheet 1
  - Commission
  - Sales Target

Business Purpose 1: Marilyn and Colin need to calculate the total sales per sales representative and per product; and the quantity sold.

- Open the **Raw Sales** worksheet
- Complete the following tasks.

13. Calculating Total Sales of each product

- Add the following heading to column M – Total Sales in **M3**
- In **M4**, click on the ***Autosum button*** **(∑)** in the **Formulas** tab. Excel should highlight **E4:L4**. The formula, in the formula bar should be: **=SUM(E4:L4)** click **Enter**
- Using the fill handle (see Figure 2 below) – found in the bottom right hand corner of the cell, drag this formula down to **M62**
- A series of #### may appear in some cells, this is because the result is too large given the cell width.
- Use the Autosum to create the Total Sales in **M63**
- Widen the columns: select all using Ctrl +A to highlight the table. Then use **Home** tab, ***Cells, Format, AutoFit Column width*** to remove ##### and to widen all rows

14. Calculating Total Sales of each Sales Representative

- In **E63**, click on the ***Autosum*** button **(∑)** in the **Formulas** tab. Excel should highlight **E4:E62**. The formula, in the formula bar should be: **=SUM(E4:E62)** click **Enter**
- Using the fill handle (see Figure 2 below) – found in the bottom right hand corner of the cell, drag this formula across to **L63**

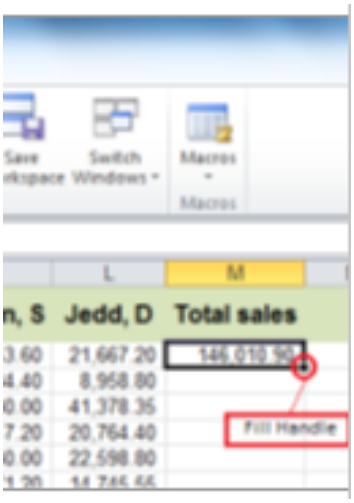


Figure 3 - Fill Handle

Calculating Total Sales of Products (or all Sales Representatives)

- In **M63**, click on the ***Autosum*** button **(∑)** in the **Formulas** tab

15. Calculating Quantity of each product

- Add another heading to column N – Quantity in cell **N3**
- Quantity = Total sales divided by Wholesale price of each product. This will be linked from the **Wholesale Price List** sheet (*Note: refer to IPO worksheet to see the steps for planning this calculation*)
- In the **Raw Sales worksheet** cell **N4**, type **=** then click on **M4** (the total sales figure for the first product), type **/** then click on the **Wholesale Price List** sheet- **E2** to pick up the price of Fass 375ml bottled beer and press **enter** to return to the **Raw Sales** worksheet
- The formula bar should read **=M4/'Wholesale Price List '!E2**
- Copy this formula down to **N62** using either dragging or double clicking the fill handle

Business Purpose 2: Marilyn and Colin need an analysis of the annual sales data in order to determine the commission earned by each sales representative. The commission is based on their performance. The following calculations will be needed:

- Comparing actual sales to set targets for each sales representative and the % variance for each
- Determining the value of sales commission payable per sales representative
- Determining the sales $ by geographic region

16. Naming Worksheets

- The reason for naming a worksheet is to more accurately reflect the data contained within the worksheet.
- Click on **Sheet 1**, click on the **Home** tab, **Cells** section, **Format, Rename Sheet** – type **Sales Analysis or Right Mouse Click** on the Sheet 1 tab to bring up the shortcut options, select Rename – type **Sales Analysis**
- The following tasks will be performed in **Sales Analysis** worksheet

17. **Linking data from one sheet to another:** One of the design features is the importance of designing a worksheet that can be reused multiple times with minimal changes by the end user. Marilyn and Colin want to be able to copy the raw sales data over the top of the old data and the analysis to occur automatically with minimal need to alter formulae next time round.
    - Highlight/Select all the Sales representatives names (**E3:L3)** on the **Raw Sales** sheet, select copy via either the **Home** tab icon, by using the right mouse shortcut menu or Ctrl+C
    - Click on the **Sales Analysis** worksheet in cell **B1** and select the **Home** tab, **Paste Special, Paste Link** to create a dynamic link between the two worksheets (**OR** *Right Mouse Click* - Paste Special, Paste Link)
        - Now click in cell **I1** and note the entry in the formula bar. It should be **='Raw Sales'!L3**
    - Go to the **Raw Sales** worksheet and change the name of the last sales representative to ***your name***, e.g. Jedd, D becomes Tolson, J – this should be your name NOT mine!!!
    - Go to the **Sales Analysis** worksheet and your name should be the last in the list!!
    - To automatically widen all the columns, select a row of cells, **Home** tab, **Cells** section, **Format**, **AutoFit Column Width**

Following tasks are done in **Sales Analysis** worksheet.

18. **Total sales of each sales representative**
    - Use linking data feature above to copy Total Sales for each sales representative **(E63:L63)**
19. **Sales Target**
    - Enter the Sales Target figures for each sales representative as shown in **Sales Target** sheet
20. **Sales Variance**: To calculate the variance between Total Sales and Sales Target
    - Sales Variance = Total Sales – Sales Target.
    - In **B4** enter the following formula = **B2-B3**
    - Now drag to copy this formula across to **I4**.
    - Format as currency $, 2 decimal places
21. **% Sales Variance:** The % variance indicates the extent to which a salesperson has under or over achieved his/her sales target for a defined period.
    - In **B5** should read **= B4/B3**
    - Select the **Home** tab, **Number** section to format for % to 2 decimal places,
    - Alternatively right click, select **Format Cells** to bring up the Format Cells dialogue box below to provide many different formatting options.

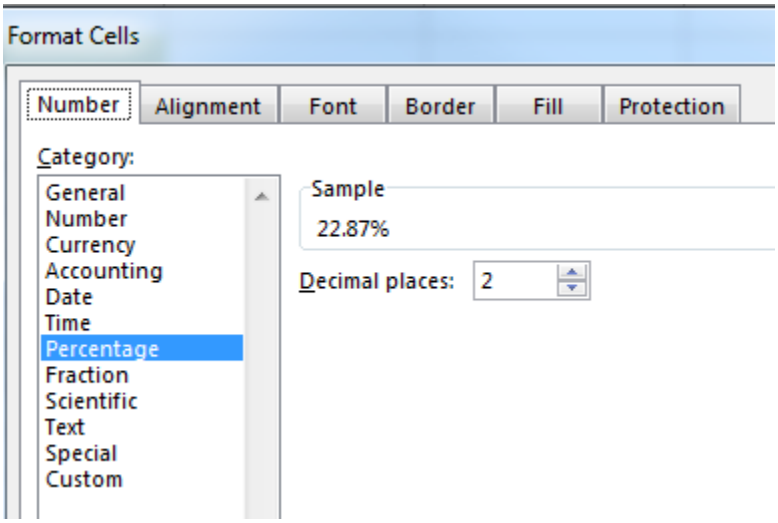


Figure 4: Format Cells

    - Drag to copy this formula across to **I5**

22. **Comment – If:** Marilyn and Colin want to produce a statement as to whether the sales representatives have achieved their targets. To do this, we will use the IF function. An IF statement can also be used to provide a message. If the logic test is true, a message such as "achieved target" or if false "under target" will appear.
    - Click on  button to find the **IF** function and bring up the IF dialog box:

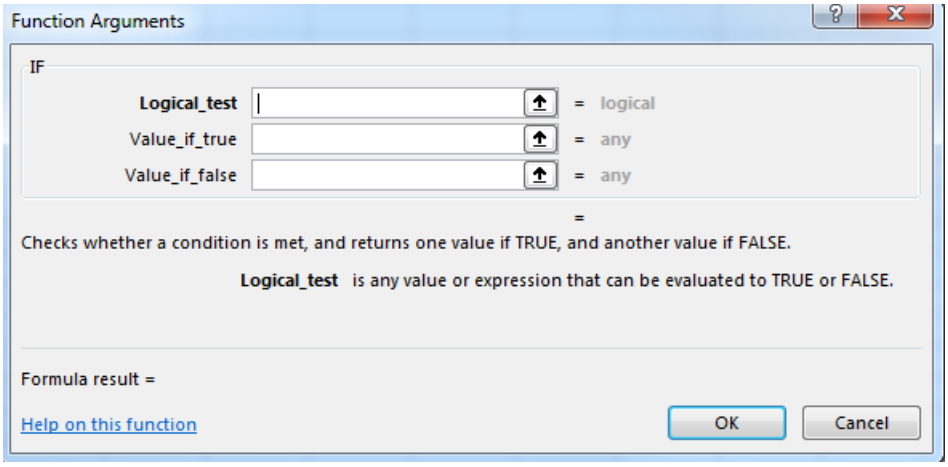


Figure 5 - IF Function Dialog Box

Argument	Explanation	Hammer Wines
Logical_test	Compares 2 cells or 1 cell against a fixed entry (e.g. B2>30).	If the total sales is greater than the target eg.B2>B3
Value_if_true	What happens if the test is true. This can be either a calculation or a message.	Achieved Target
Value_if_false	What happens if the test is false. This can also be either a calculation or a message.	Under Target

- In the **logical_test** section click on the appropriate cells to reflect the explanation above
- In the **Value_if_true** section enter the message "Achieved Target". Text messages must appear between double quotes
- In the **Value_if_false** section enter the message "Under Target". Sometimes you may want nothing to appear in which case type a set of double quotes with nothing between them (e.g. " ")
- The formula should read as follows: **= IF(B2>B3,"Achieved Target", "Under Target")**. Click **OK** to accept the formula
- Fill this formula across to **I6**

23. **Creating Range Names:**
    - In **B7**, **Total Sales** of all sales representatives is divided by the individual sale figure for each representative. However before doing so we are going to create a **range name**.
    - To make formulas easier to read **range names** are often used. A range name can refer to a single cell or a group of cells. A range name must not have a space. Therefore we will use a range name to refer to the Total Sales. Go to **Raw Sales** sheet, click on M63 and type **TSales** into the name box (see Figure 3) to change **M63** to TSales. Press Enter key to finish your range name.
    - Double check your entry by clicking elsewhere in the **Raw Sales** worksheet and again returning to **M63** – the Name box should read TSales

Figure 6: Range name

- Complete the formula in **B7** which should read **=B2/TSales**
- Format this cell to % and 2 decimal places
- Copy this formula by dragging across to **I7**, note the format is also be copied

24. **Commission Earnt for each Sales Presentative:** As Marilyn and Colin reward their employees based on performance, they have asked that the worksheet should calculate the commission earned by each sales representative.
    - At B8, **Commission Earnt = Sales Variance X Commission Rate**
    - **Sales Variance** is already calculated above. The commission rate for each sales representative is based on their % sales variance. The **Commission** worksheet contains the **Commission Rate table** that shows the commission rate applied for each % sales variance. Notice that the % sales variances in column 1 are listed from **lowest to highest (i.e ascending order).**
    - **vlookup** function will be used to retrieve the commission rate from the Commission Rate table.
    - Use the  in the formula bar to find the **vlookup** function – hint type an =sign, look in the name box area and click the drop down arrow. This will hold the most recently used functions. It may be there or select the more functions option.
    - There are **3 arguments** associated with this function (see Figure below); the fourth argument is optional and not required, at this stage.

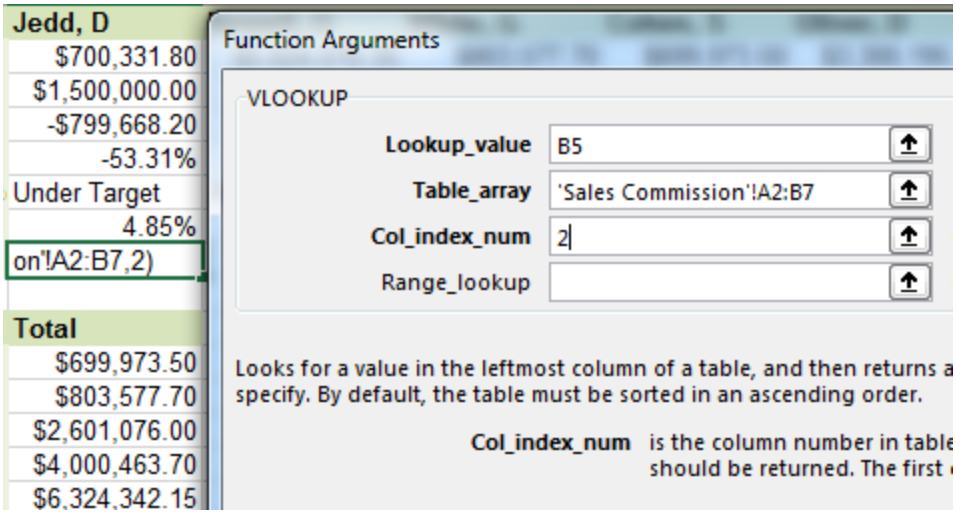


Figure 7 - Vlookup Function Arguments

Argument	Explanation	Hammer Wines
Lookup_value	What you want to lookup	% Sales Variance
Table_array	The table you want to lookup	Commission Rate table in **Commission** sheet
Col_index_num	The column number in the table_array from which the matching value should be returned	Column number 2, as it contains the commission rate required
Range_lookup	A logical value: TRUE or omitted (to find closest match in the first column (sorted in ascending order); FALSE: to find an exact match (no order required)	

- **Copy** this formula across a couple of cells; you will get the #N/A error message. **Why???**
- Let's compare the formulae in B8 and C8

B8	= VLOOKUP(**B**5, 'Sales Commission'!**A2:B7**,2)
C8	= VLOOKUP(**C**5, 'Sales Commission'!**B2:C7**,2)

- The table_array (or the Commission Rate table) has changed when being copied to other cells. This table address should be fixed.

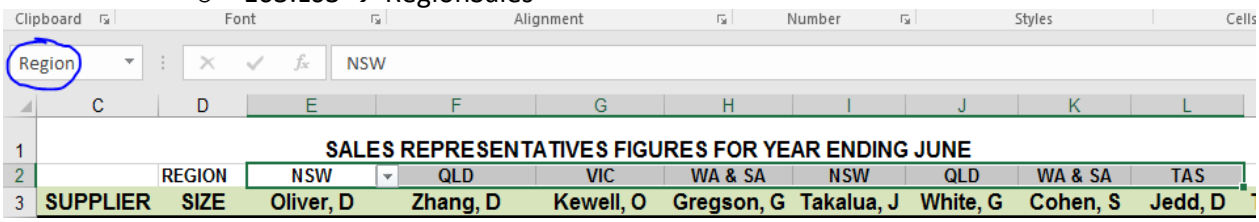
25. **Absolute and Relative Cell Addressing**: Excel uses **relative cell addressing** when copying formulae. To overcome this, you need to understand **absolute cell addressing**. Excel can fix parts of a cell reference so that it will always refer to a particular column, row or both.

Cell Reference	When copied what changes	Fixed component
B4	Everything changes – a relative cell address	None
$B$4	Always refers to B4	Both
B$4	Always refers to row 4, the column can change	Row
$B4	Always refers to column B, the row can change	Column

- Fixing the Commission Rate table address in B8 = VLOOKUP(**B5**, 'Sales Commission'!**$A$2:$B$7**,2)
  (*Note: use the function key F4 (found on your keyboard) to insert the $ signs. As you tap F4, it will go through the different combinations of relative and absolute cell addressing)*.
- Another solution is to give the commission rate table a **range name**, Commission. Highlight the table from **A2:B7** give this group of cells a **range name** - ***Commission***.
- Back in **B8**, edit the formula to read **=VLOOKUP(B5,Commission,2) *B4**
- Copy the formula across to **I8**

Business Purpose 3: Marilyn and Colin would like to know the Sales figure per Region.

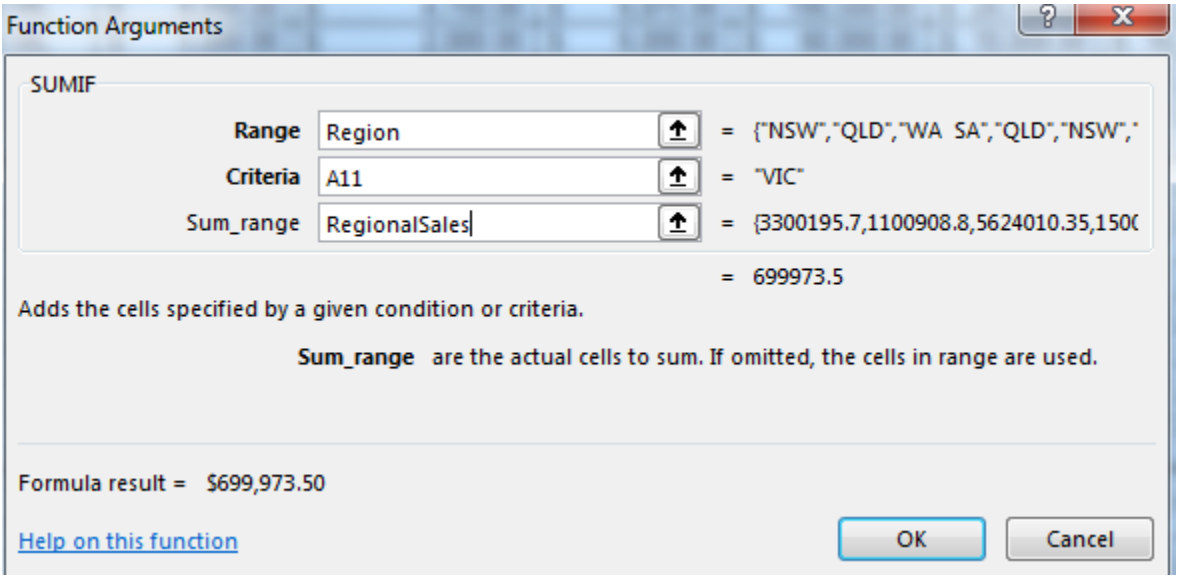
26. **SUMIF**: use this formulae to calculate the total sales of each region
    - Starting in **A10** in the **Sales Analysis** worksheet, type the heading "Sales Region"
    - Enter the regions as follows: NSW, VIC, QLD, WA & SA, TAS in **A11:A15**
    - In the **Raw Sales** worksheet create the following range names for the following cells
      - Highlight E2:L2 → type in Region as shown below
      - E63:L63 → RegionSales



- Go back to the Sales Analysis worksheet add the "Total" heading in B10
- Select cell **B11**
- Go to the **SUMIF** function dialog box. This function is used to sum the regional sales figures for each region. See Figure 5 below.

Figure 8: Using SUMIF

- Click in the Range argument, Use the **Formulas** tab, **Defined Names**, **Use in Formula** and select **Region**
- Click in the **Criteria** argument, select **A11** (this should be the first region in the list)
- In the **Sum_range** argument, again go to Formulas and use the Defined **Names**, **Use in Formula, Paste** and select **RegionSales** – **enter** to accept these arguments

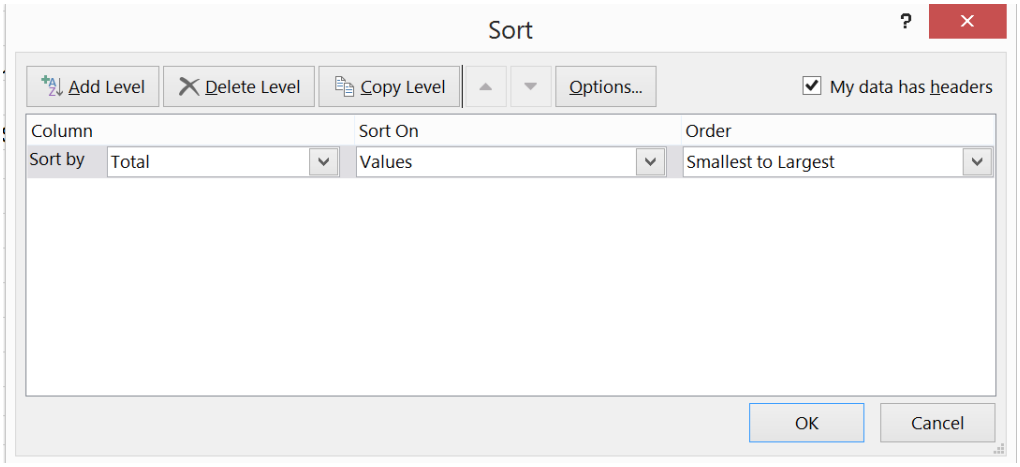


- Drag the formula down to complete this table.
- Check to verify that the correct values have been calculated by summing the total sales for the representatives and the total sales for the regions which should be the same. (see Figure 9 below)

	A	B	C	D	E	F	G	H	I
1	**Sales Representatives**	**Oliver, D**	**Zhang, D**	**Kewell, O**	**Gregson, G**	**Takalua, J**	**White, G**	**Cohen, S**	**Jedd, D**
2	Total Sales	$3,300,195.70	$1,100,908.80	$5,624,010.35	$1,500,167.20	$700,268.00	$803,577.70	$699,973.50	$700,331.80
3	Sales Target	$488,000.00	$1,830,000.00	$4,530,000.00	$2,600,000.00	$550,000.00	$732,000.00	$650,000.00	$1,500,000.00
4	Sales Variance	$2,812,195.70	-$729,091.20	$1,094,010.35	-$1,099,832.80	$150,268.00	$71,577.70	$49,973.50	-$799,668.20
5	% Sales Variance	576.27%	-39.84%	24.15%	-42.30%	27.32%	9.78%	7.69%	-53.31%
6	Comment on Performanc	Achieved Target	Under Target	Achieved Target	Under Target	Achieved Target	Achieved Target	Achieved Target	Under Target
7	% Sales	22.87%	7.63%	38.98%	10.40%	4.85%	5.57%	4.85%	4.85%
8	Commission Earned	$210,914.68	$0.00	$27,350.26	$0.00	$3,756.70	$357.89	$249.87	$0.00
9									
10	**Sales Region**	**Total**							
11	VIC	$5,624,010.35							
12	TAS	$700,331.80							
13	QLD	$1,904,486.50							
14	NSW	$4,000,463.70							
15	WA & SA	$2,200,140.70							
16		**$14,429,433.05**							

Figure 9: Sales Representatives

27. **Data Sorting: i**t is often useful to sort a list to make it easier and quick to find data. To sort the list of **Sales Regions** into ascending order (i.e lowest to highest total sales)
    - Highlight all sales regions and their equivalent total sales (i.e. A11:B15), **Data** tab, **Sort & Filter** section, **Custom Sort**
    - Follow the sorting option in Figure below



- **Save** your work as ***HammerWines-yourname-Activity 3.xlsx***

Skills Developed

You now know how to:

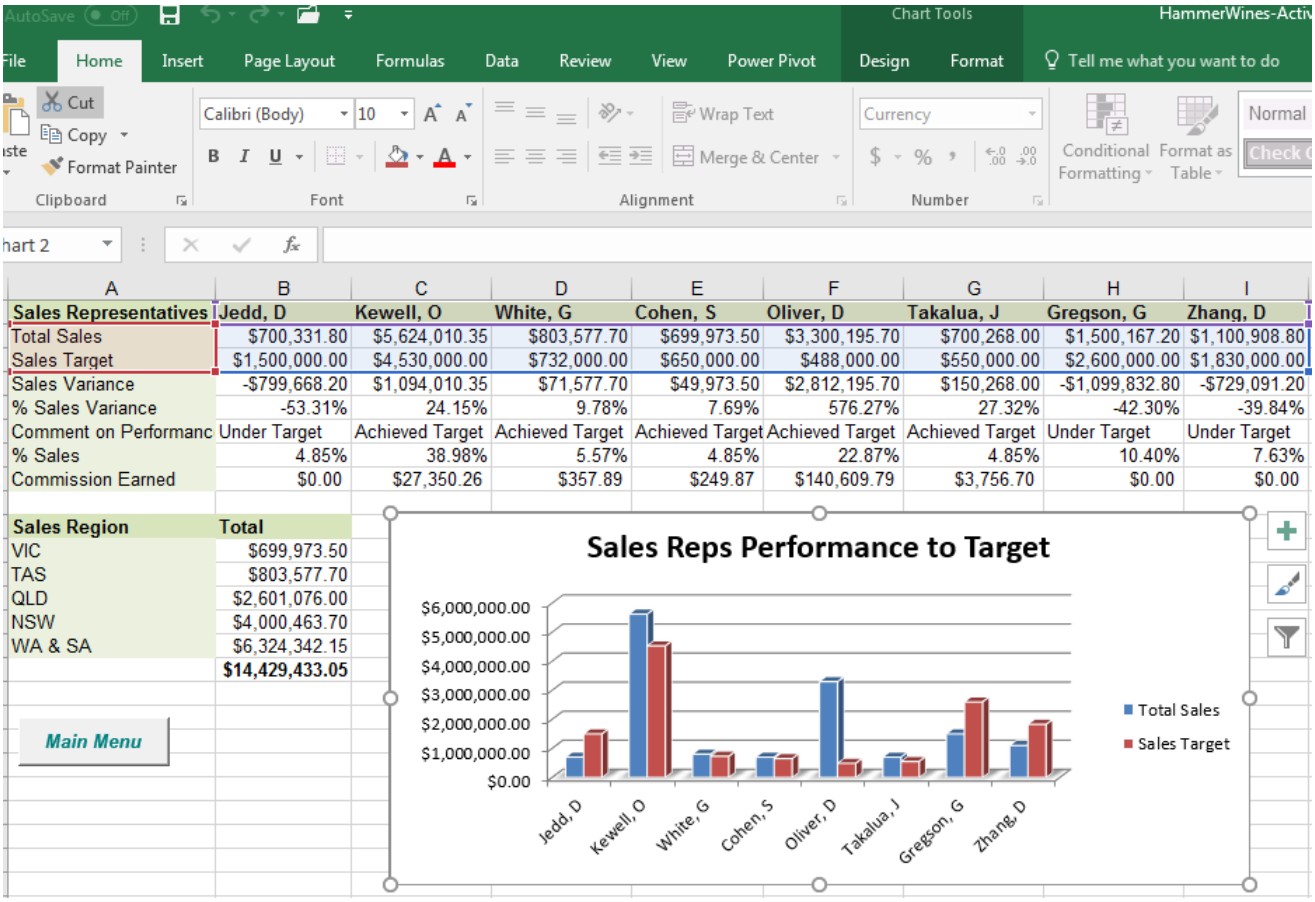
- ✓ Rename worksheets
- ✓ Use the Paste link feature to create a dynamic link between cells
- ✓ Use the autofill feature to copy cells down or across the page
- ✓ Use absolute and relative cell addressing
- ✓ Create range names and use them in a formula
- ✓ Use the following formula: SUM, SUMIF, IF, VLOOKUP
- ✓ Data sorting

Activity 3 – Charts, Pivot Table and Macro

Marilyn and Colin would like to be able to graph some of sales data and present it as part of their Sales Staff Training day.

- Continue with the saved file after **Activity 2** or open the provided **HammerWines-Activity 3-HP.xlsx**

28. **Charting:** Chart or graphs are an excellent way to quickly highlight the peaks and troughs via a visual image rather than a table.
    - On the **Sales Analysis** worksheet highlight A1:I3 to be charted: Sales Representatives, Total Sales and Sales Target
    - Click on Insert tab Charts section, select column, 3-D clustered column.
    - Select the Chart style from the Chart Tools, this is a personal choice
    - If the chart appears over the top of existing data, it can be moved by clicking just inside the chart and dragging to a more appropriate location
    - Use the little dotted sizing handles to resize the chart in order to clearly see all the sales representatives' names.
    - Use the various **Chart Tools** in **Design, Layout** and **Format** tabs as shown in Figure 10 below to customise your chart.



Sales Representatives	Jedd, D	Kewell, O	White, G	Cohen, S	Oliver, D	Takalua, J	Gregson, G	Zhang, D
Total Sales	$700,331.80	$5,624,010.35	$803,577.70	$699,973.50	$3,300,195.70	$700,268.00	$1,500,167.20	$1,100,908.80
Sales Target	$1,500,000.00	$4,530,000.00	$732,000.00	$650,000.00	$488,000.00	$550,000.00	$2,600,000.00	$1,830,000.00
Sales Variance	-$799,668.20	$1,094,010.35	$71,577.70	$49,973.50	$2,812,195.70	$150,268.00	-$1,099,832.80	-$729,091.20
% Sales Variance	-53.31%	24.15%	9.78%	7.69%	576.27%	27.32%	-42.30%	-39.84%
Comment on Performanc	Under Target	Achieved Target	Achieved Target	Achieved Target	Achieved Target	Achieved Target	Under Target	Under Target
% Sales	4.85%	38.98%	5.57%	4.85%	22.87%	4.85%	10.40%	7.63%
Commission Earned	$0.00	$27,350.26	$357.89	$249.87	$140,609.79	$3,756.70	$0.00	$0.00

Sales Region	Total
VIC	$699,973.50
TAS	$803,577.70
QLD	$2,601,076.00
NSW	$4,000,463.70
WA & SA	$6,324,342.15
	$14,429,433.05

Figure 10: Charts

- Click on the Layout tab Labels section Chart Title, Above Chart and add the title "Sales Reps Performance to Target"

- Complete the formatting of the Sales Analysis worksheet (see the Figure below).

Business function 5: Marilyn and Colin would like to have an analysis tool that allows drill-down analysis of various aspects of the product performance based product types, supplier, and size. In the following activity, you will learn how to use Pivot table to get more meaningful information from the data and to provide for more analysis.

29. Prepare the data for using Pivot table

- Create a new worksheet called **Pivot Data**
- Copy (using Copy Link feature) A3:D62 in the **Raw Sales** worksheet to A1 in the Pivot Data worksheet
- Copy (using Copy Link feature) M3:M62 in the **Raw Sales** worksheet to E1 in the Pivot Data worksheet
- In cell F1:H1, add the following headings:
  - **% Sales per Product (F1)**
  - **Product Profit (G1)**
  - **% Profit (H1)**
- Now create the simple calculations (*Note: use absolute cell referencing or range names where necessary*)
- **% Sales per product** → F2 =E2/TSales, copy this down to F60
- **Product Profit (G1):** see the table below for Profit Margin of each product (already stored in **Sales Commission** sheet).
  - Create the range name **PMargin** for cells **E2:F5** in **Sales Commission sheet**
  - Use Vlookup to find correct profit margin of each product (*Note: pay attention to Range_Lookup option-refer to task 24*)
  - Product Profit = Profit Margin of each product type X Total Sales of each product

Product Type	Profit Margin
WINE	0.21
SPIRITS	0.23
RTDs	0.28
BEER	0.35

- **% Profit (H1)= Profit of each product / Total Profit of all products**
  - Find total profit of all products: can you do that?
  - Copy down, using the fill handle, confirm your results via the table below

	A	B	C	D	E	F	G	H
1	PRODUCT	TYPE	SUPPLIER	SIZE	TOTAL SALES	% SALES PER PRODUCT	PRODUCT PROFIT	% PROFIT
2	BEER	BOTTLED	FASS	375 ML	$ 146,010.90	1.01%	$ 51,103.82	1.34%
3	BEER	BOTTLED	DURST	375 ML	$ 159,031.60	1.10%	$ 55,661.06	1.46%
4	BEER	BOTTLED	WEIZEN	375 ML	$ 746,524.80	5.17%	$ 261,283.68	6.86%
5	BEER	BOTTLED	HELLES	375 ML	$ 167,040.00	1.16%	$ 58,464.00	1.53%
6	BEER	BOTTLED	DUNKLES	375 ML	$ 198,028.80	1.37%	$ 69,310.08	1.82%
7	BEER	BOTTLED	PIJIU	375 ML	$ 107,000.00	0.74%	$ 37,450.00	0.98%
8	BEER	BOTTLED	KE TAO	375 ML	$ 1,346,034.10	9.33%	$ 471,111.94	12.36%
9	BEER	BOTTLED	FASS	750 ML	$ 73,516.50	0.51%	$ 25,730.78	0.68%
10	BEER	BOTTLED	DURST	750 ML	$ 130,020.60	0.90%	$ 45,507.21	1.19%
11	BEER	BOTTLED	WEIZEN	750 ML	$ 91,026.00	0.63%	$ 31,859.10	0.84%
12	BEER	BOTTLED	HELLES	750 ML	$ 126,021.60	0.87%	$ 44,107.56	1.16%
13	BEER	BOTTLED	DUNKLES	750 ML	$ 85,027.20	0.59%	$ 29,759.52	0.78%
14	BEER	BOTTLED	PIJIU	750 ML	$ 87,032.50	0.60%	$ 30,461.38	0.80%
15	BEER	BOTTLED	KE TAO	750 ML	$ 57,018.00	0.40%	$ 19,956.30	0.52%
16	BEER	KEG	FASS	50 LITRE	$ 30,049.20	0.21%	$ 10,517.22	0.28%
17	BEER	KEG	DURST	50 LITRE	$ 88,654.50	0.61%	$ 31,029.08	0.81%
18	BEER	KEG	WEIZEN	50 LITRE	$ 58,191.00	0.40%	$ 20,366.85	0.53%

30. Creating Pivot Tables

- Highlight the data in the **Pivot data** worksheet, including the headings (A1:H60) (***Note: Leave out the Totals figure***).
- Click on the **Insert tab, Pivot Tables** will be the first section, select Pivot Table. A dialog box should appear confirming the selected data to be analysed.
- Accept the defaults – OK

31. **Designing Pivot Tables**

- Using the **Pivot table Field List** shown on the right hand side of the screen in Figure 11 below
- Drag the fields into the following locations
  - Product, Supplier to **Row Labels**
  - Total Sales, % Sales per Product, Product Profit, % Profit to **Values**

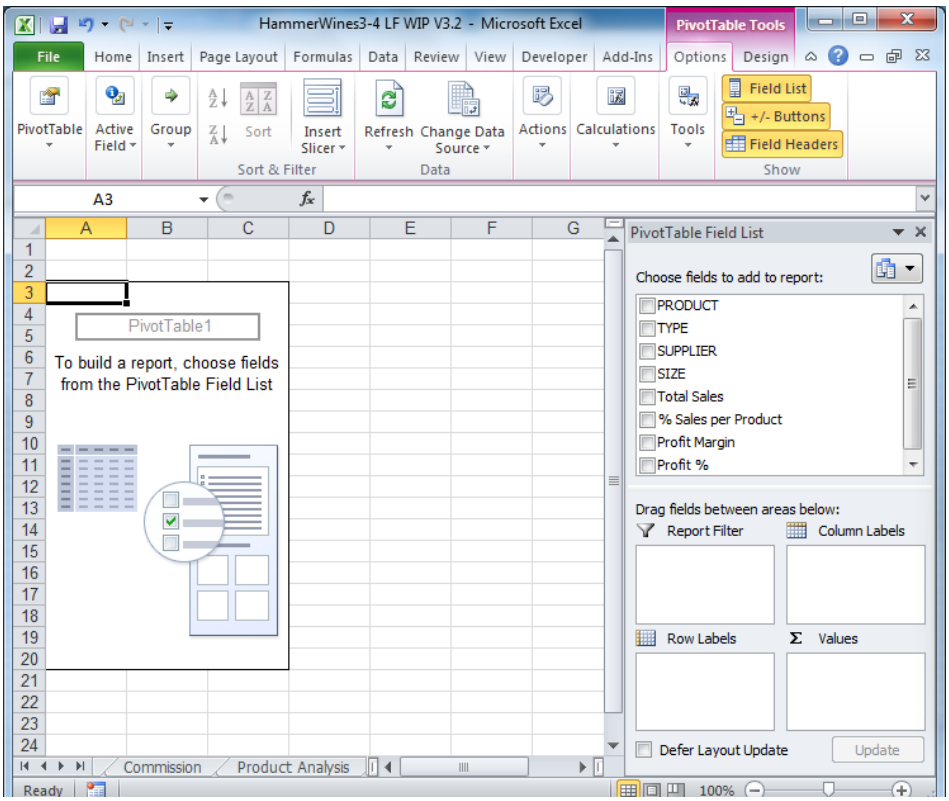
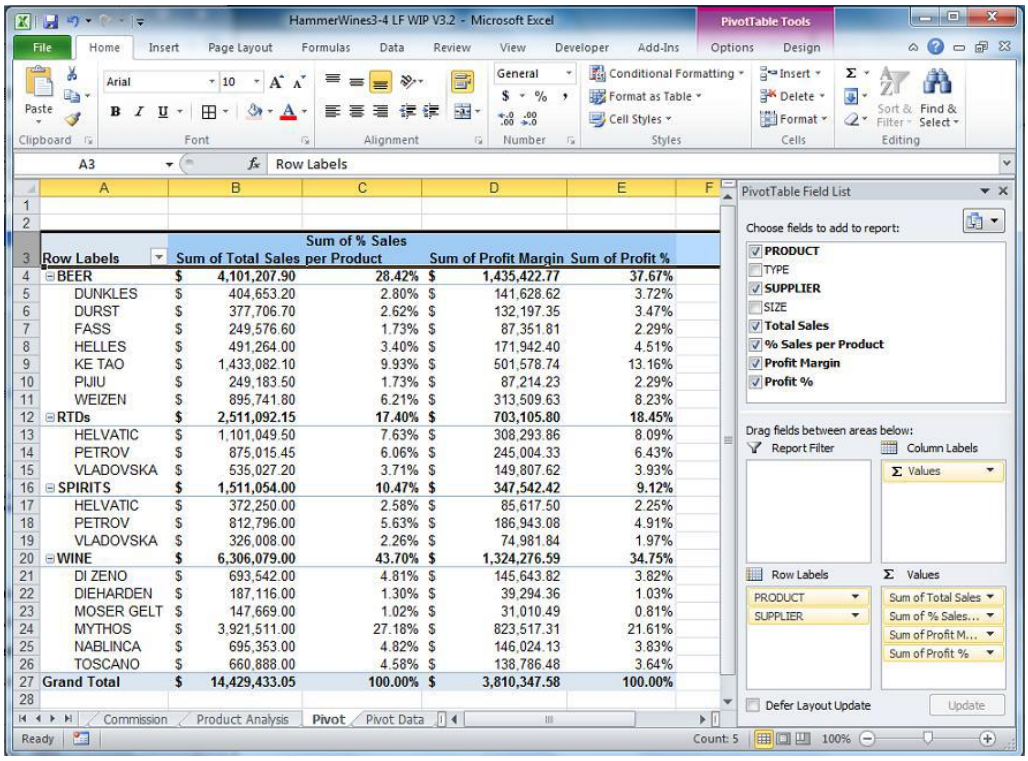


Figure 11: Pivot Table Field List

The table should be starting to take shape. Format it appropriately. It should resemble Figure 12 below.

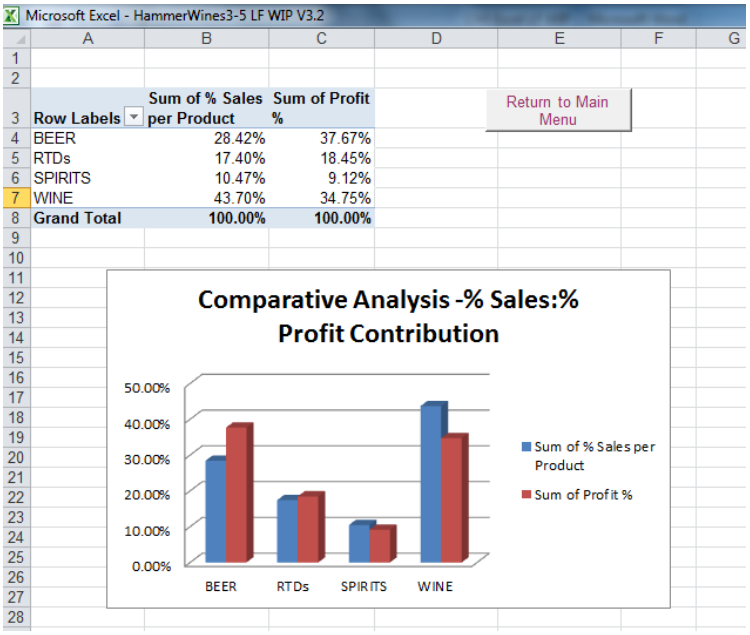


Row Labels	Sum of Total Sales per Product	Sum of % Sales per Product	Sum of Profit Margin	Sum of Profit %
BEER	$ 4,101,207.90	28.42%	$ 1,435,422.77	37.67%
DUNKLES	$ 404,653.20	2.80%	$ 141,628.62	3.72%
DURST	$ 377,706.70	2.62%	$ 132,197.35	3.47%
FASS	$ 249,576.60	1.73%	$ 87,351.81	2.29%
HELLES	$ 491,264.00	3.40%	$ 171,942.40	4.51%
KE TAO	$ 1,433,082.10	9.93%	$ 501,578.74	13.16%
PIJIU	$ 249,183.50	1.73%	$ 87,214.23	2.29%
WEIZEN	$ 895,741.80	6.21%	$ 313,509.63	8.23%
RTDs	$ 2,511,092.15	17.40%	$ 703,105.80	18.45%
HELVATIC	$ 1,101,049.50	7.63%	$ 308,293.86	8.09%
PETROV	$ 875,015.45	6.06%	$ 245,004.33	6.43%
VLADOVSKA	$ 535,027.20	3.71%	$ 149,807.62	3.93%
SPIRITS	$ 1,511,054.00	10.47%	$ 347,542.42	9.12%
HELVATIC	$ 372,250.00	2.58%	$ 85,617.50	2.25%
PETROV	$ 812,796.00	5.63%	$ 186,943.08	4.91%
VLADOVSKA	$ 326,008.00	2.26%	$ 74,981.84	1.97%
WINE	$ 6,306,079.00	43.70%	$ 1,324,276.59	34.75%
DI ZENO	$ 693,542.00	4.81%	$ 145,643.82	3.82%
DIEHARDEN	$ 187,116.00	1.30%	$ 39,294.36	1.03%
MOSER GELT	$ 147,669.00	1.02%	$ 31,010.49	0.81%
MYTHOS	$ 3,921,511.00	27.18%	$ 823,517.31	21.61%
NABLINCA	$ 695,353.00	4.82%	$ 146,024.13	3.83%
TOSCANO	$ 660,888.00	4.58%	$ 138,786.48	3.64%
Grand Total	$ 14,429,433.05	100.00%	$ 3,810,347.58	100.00%

Figure 12: Pivot Data Table

32. **Creating PivotChart**

- Experiment various charts for PivotTable you just created (Note: see the chart below for an example)

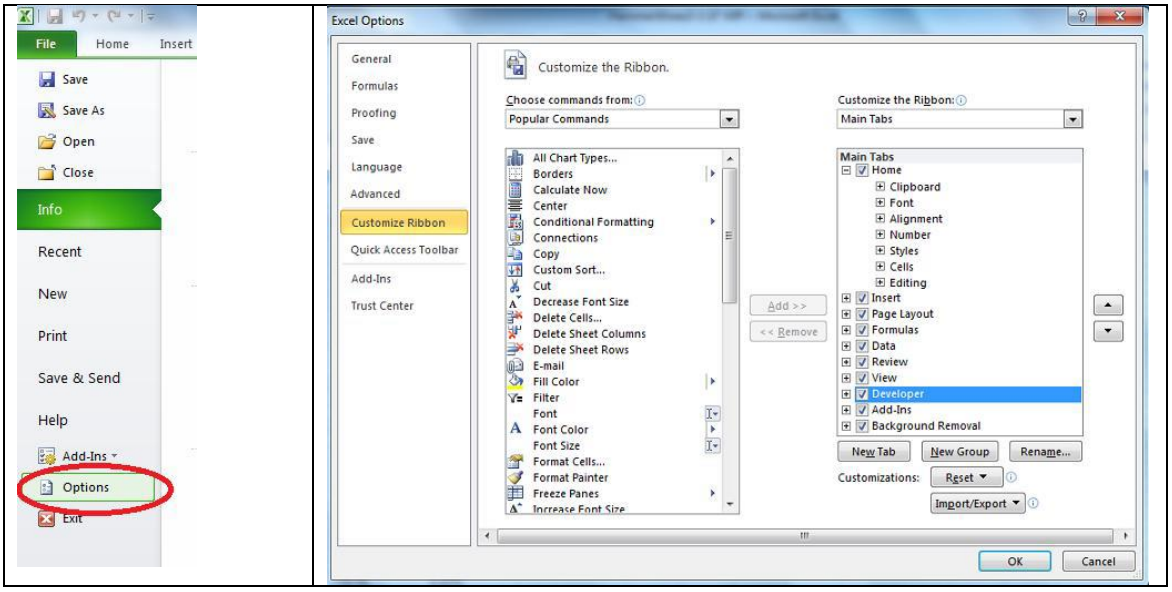


- **Pivot Table Exercise: Use Pivot Table developed above to answer the following questions**

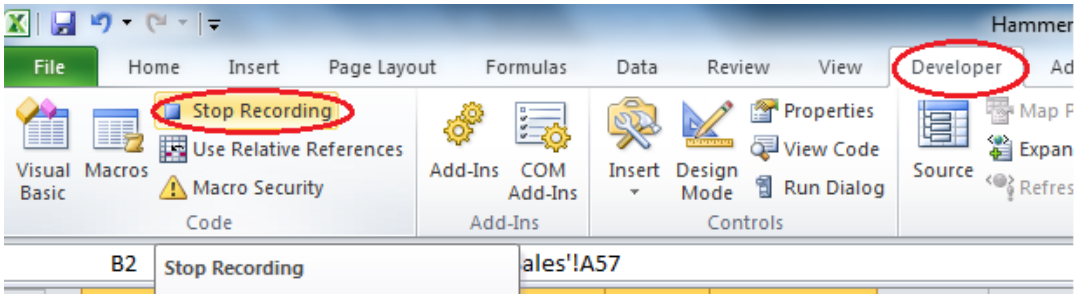
1. *Beer Product from which Supplier has the highest sales?*
2. *What are the total sales from each Supplier?*
3. *What is the % Profit for each Supplier?*
4. *Which Product Size from which Supplier generated the most sales?*
5. *Which Product generated the most sales? Did it generate the highest % Profit as well?*

Business function 6: Marilyn and Colin would like to have a Main Menu to move from one sheet to another at the click of a button.

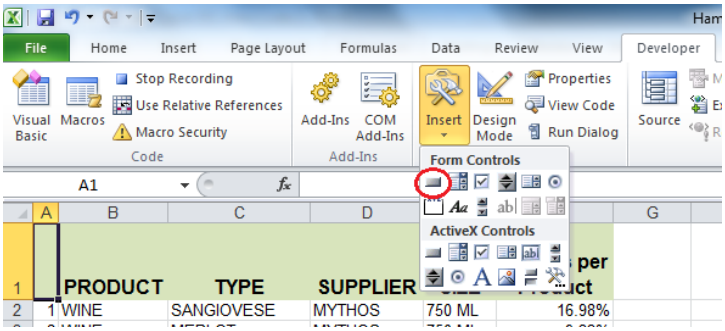
33. Adding a new worksheet and name **Main Menu**
34. **Go to the Main Menu sheet**
35. **Macros:** Macros are keystrokes or a series of mouse clicks that are repeated. A macro can be activated once a trigger is run.
    - First, Macro feature should be enabled within Excel. Follow the steps below to do that.



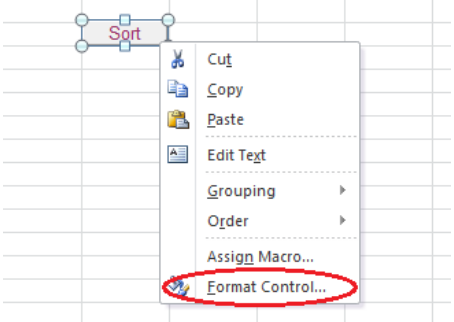
36. **Record a Macro** (to perform a particular function): to move from **Main Menu** worksheet to **Sales Analysis**
    - Select **Developer** tab, **Code** section, **Record Macro**
    - **Assign** the macro a name – GotoSalesAnalysis (no space in macro name), enter a description and click **OK**
    - Now click the Sales Analysis worksheet and rest the cursor on cell **A1**
    - Click the **Developer** tab, **Code** section, **Stop Recording** button (see Figure below).



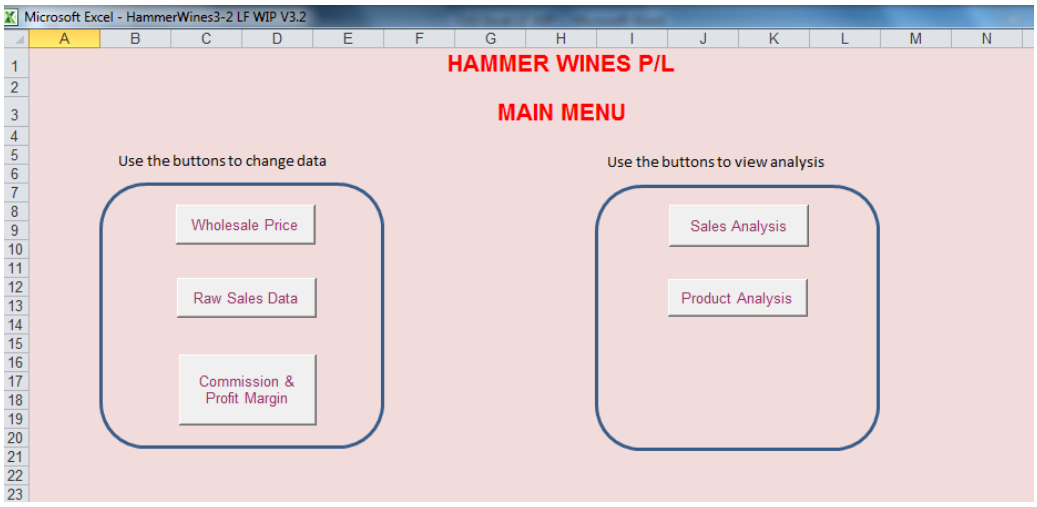
37. **Command Buttons:** you have created your first macro, now for the button to activate the macro.
    - Go back to Main Menu worksheet, go to **Developer** tab, in the **Controls** section, **Insert**. See Figure below for the tools that should appear.
    -



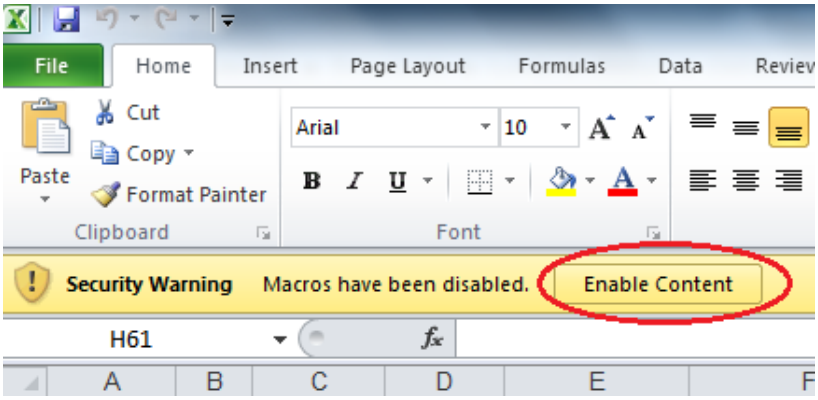
    - Select the **button** (**Form Control**) icon, circled above.
    - Draw an appropriate size button – use gridlines as a guide
    - Assign the **GotoSalesAnalysis** macro by clicking on it, then **OK**
    - **Button 1** should be highlighted**,** type **Sales Analysis** – this will give the button a more meaningful name.
    - Right click on the new **Sales Analysis** button, select **Format Control** and change the colour of the text to plum. If the right click does not bring up the options you are expecting, try right clicking closer to the edge of the selected shape.
    - If you make a mistake or forget to give the button a name, you can right mouse click the command button, **Edit Text** (see figure below).



38. **Duplicating Buttons:** There is still one macro and command button to create for the main menu. Each of our worksheets requires a button to take the user back to the Main Menu. You need only create one button and then copy it. Let's start by creating the Main Menu macro.
    - Right mouse click on a button, **copy**
    - **Select** another sheet and paste
    - Create other macros and buttons so that the final Main Menu looks like the figure below.



39. Save the spreadsheet as Macro enabled: In the **Save As** dialog box, underneath the file name, in the **save as type** drop box, select an Excel **macro enable worksheet.** The file name should now be **Hammerwines_yourname_Activity 4.xlsm**
40. When you open a macro enabled file the macros are disabled for security reasons. You must enable the content before you can use the macros.



Skills Developed

You now know how to:

- ✓ Create charts
- ✓ Create a pivot table, modify a pivot table
- ✓ Use a pivot table as the basis of a chart
- ✓ Create a macro, assign a macro to a command button, view the associated macro code

Congratulations!!

You have created a user-friendly business decision support system for Hammer Wines P/L!!!!