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Aggregation Functions

Let's talk now about the functions and formulas that are commonly used in financial modelling.

We will start out looking at aggregation functions. What I mean by that are functions/formulas that you can use for summarising. We will look at COUNTIF and SUMIF as well.

If you could go to the Excel file that I've given you called Aggregation. I have got a list of sales here of three different products; CDs, DVDs and books. I would like you to tell me first of all in column B, how many sales have we made? Count the number of sales and then in column C I would like you to aggregate how much we've made for each of the three products. I would like you to follow best practice by using absolute referencing, getting dollar signs right and copy all the way down the three cells for COUNTIF and the same for SUMIF. Let's have a look at it and do it together.

With the COUNTIF; say equals, COUNTIF, open bracket. Because I know I am going to use the COUNTIF formula, I am going to type out the formula, open bracket and then Ctrl A which is the shortcut that brings up the Function Wizard. I recommend using the Function Wizard. It is going to make it a lot easier, particularly if you are new to functions but even when you are not, it can be quite tricky knowing what goes where. I am going to use that here and say this is my range. I want to count how many we have of each of those. If I hit my F4 now, you can see it puts all the dollar signs in straight away and that is going to save you a huge amount of time. Let's see what happens, if I don't do that. If I highlight the range and hint on Criteria and then I try and come back and hit F4, you can see that I have to hit it

twice. It is much easier to highlight the range and hit F4 straight away. Tab forward to Criteria. I don't need to put dollar signs in this case because as I copy it down I want it to change from book, to CD and onto DVD. I copy it down to there. I am going to use my ALT equals to SUM it up. Do a sense check.

Let's go to the sales. I am going to add them up. SUMIF and open bracket; if you have multiple criteria, you'd use SUMIFS. In this case I've only got a single criteria so I am going to use a SUMIF. I am going to use my range which is here, my products. In fact, let me go into Function Wizard, that is going to be a lot easier. Hit F4, my criteria is the word "book" and I don't need to worry about any dollar signs again. MY SUM range is going to be here. I will F4 again and okay. That looks fine. I am going to copy it down and press ALT equals again. There we go.

Can you see what I have done wrong? Can you see I have got the wrong numbers there? This is a really common mistake in modelling. Any good financial modeller is always looking for opportunities to error check but you don't even need an error check to see there that I have done something wrong. If something doesn't look quite right, go to the formula and hit F2 and you can see that my ranges are mis-matching. This is a really common problem with a SUMIF. It didn't warn me. It didn't tell me that it was a problem. You know when you get those Excel errors when you see a #NA or #REF or one of those. I know they are really horrible but I love seeing those. I would much rather see an Excel error than see something like this, where you see a number that looks like it's right when in fact it is completely wrong. That is quite dangerous in financial modelling. That's why we always try and put error checks right throughout our model.

You can see here that I've picked up the heading in my first row but not in my second row. What is has done, is its matching product against the $410. DVD against the $810 and so one. The ranges are mismatching and it's picking up the wrong calculation. All I need to do is to grab that and move it down, a simple fix and then copy it down so it's all consistent. We're following best practice of course by having exactly the same formula all the way down the block.

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Now I can do a very simple error check; that cell there minus that cell there. Some very simple aggregation functions using a COUNTIF and a SUMIF formula.

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