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Logical Nested Functions – Part 2

Let's go to the next example now. Go to the next tab which is a pricing table. This is a little more of a financially related example. Let's say if you're wanting to calculate what your pricing would be. You've got 63 items and if they purchase up to 5 items, it costs \$15. If it's between 6 and 50 items, it's \$12 and if it's 51 to 150 items it's \$10.50 each. There's a few ways of doing this. If you have lots of tiers in a table you might consider using a VLOOKUP or something a little bit trickier. We're going to do a simple nested IF statement exactly like what we just did with our temperature example. A little bit more practice. Just pause for a minute and have a go at doing it by yourself before we move on.

Let's do it together. So IF, this cell here is less than or equal to a 5, the value of true will be \$15 otherwise it will be \$12. That will be the value of false, close bracket. That will handle the first two. If it's less than or equal to 5 the price will be \$15. If it's less than or equal to 50, the price will be \$12. We now need to worry about the next bit which is if the number of items that we purchased is less than or equal to 50 it's \$12 and if it's 51 or greater, it'll be \$10.50. Let's use that same technique and do that formula in the next cell below.

We'll say IF, this one here is less than or equal to 50, the value will be \$12 and then if it doesn't fit into either of those two ranges, by default it will be \$10.50, close bracket. So it's either going to be \$15, \$12 or \$10.50. We'll use exactly the same technique here and copy, escape out of it and it's this last section here, the value of false, highlight that section and Ctrl V. We're now doing a nested formula. Enter and get rid of that because we don't need it anymore.

You've now created a fairly complicated nested IF statement. Let's test that. We can see here that it's 63 items, so we know it's going to fall within the \$10.50 range. Let's say it's 9 items and you can see here that it's working and it becomes \$12. What if it was 4 items? You

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can see that the price has gone up to \$15. Let's turn it back to the way it was, now that we know it is working. It's always a good idea to test, especially with a long complicated formula like that, you need to make sure that it's working correctly. That multiplied by the number of items and that becomes a dynamic, working financial model. You can change the inputs and the pricing calculation will automatically calculate.

What I'd like to talk about now are a couple more logical functions, the OR statement and the AND statement. Let's go over to the next tab looking at OR. This is an example of a conversation I was having with a client the other day. We had some financial statements and they were subject to transfer pricing. Some of these accounts needed to be excluded under particular scenarios and sometimes it needed to be included just for these particular account codes that were included in their transfer pricing scenarios. Let's do an example like that.

We've got a list of account codes and pricings. There are three account codes that are subject to transfer pricing that we want to identify separately. We want to test using an OR. First of all we're just testing if they're equal to each other and then we'll do an OR. If that account code there is equal to that account code there. The answer to that there is false. That cell is equal to that cell and it's not equal. I've just put in my absolute referencing and copied that down and you can see there that there's one case in which it is true. I can use my OR and say OR, the first section, if I go into my formula wizard you can see it easily, so there are multiple things that you can test, so if either of those is true the answer of the OR will be true. Let's test the next one. If that one there is equal to storage, F4 and lastly if that one there is equal to depreciation, F4. There we go. You're testing three different account codes. Is either of those equal to the account code in column A. Copy that down again and you can see that there are three of those that have popped up as true. This true and false is very useful in Excel. Excel uses true and false quite a lot. Remember that false is a 0 and true is a 1, so we use this a lot in flags for lots of different purposes in financial modelling.

I'm going to nest that OR now. Basically the result is a false. What I want to do here is say, IF it's true or alternatively I can just go multiplied by that there because remember a false is a 0 and a true is a 1, so you can just multiple it like that and that will only pick up the ones

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there. That's one way of doing it or you can say IF, OR, OR, OR, OR, OR, value of true, value of false but I think the first way is a much simpler method of doing it. That's using an OR statement, another kind of logical function here. The way that we've built this, if any of those inputs change, then my formulas will automatically calculate and give me the correct result.

Lastly let's take a look at the AND statement. This is an example with some dates. It is something that we do a lot of in modelling. If it's greater than this date or less than this date. Let's start with the financial year start. This is an example of a lot of capital expenditure items. There's a start date and an end date for a financial year so we often find financial years can often cause quite a bit of trouble. We always have to find out which date does it fall in. What I want to do here is only pick up the costings if they fall within a particular financial year.

What I'm going to do here is say IF this date here is equal to the start date and it's false. It does not equal that. What about if it's greater than or equal to the start date and you can see there by copying it down, some of those are true and some false. Let's try now with an AND. We can put in the end date with that. We could say AND comma, this date is less than or equal to the end date, close brackets and I'll just go to back in and F4 that one there and copy it down. What I've done here is to put in two conditions or two things that I'm testing. I'm saying if the spend date is greater than or equal to the beginning of the financial year AND less than or equal to the end of the financial year. What I'm testing is the dates that I've spent this capital item, do they fall within the financial year. If they do, then I want to pick up the amount and if they don't then it will be a 0. Again, you could do an IF statement so IF both of those are true, then it will give you a value otherwise a 0 or bit of a cheat's way you can go in and multiply it by the cost. That is only going to pick up the costings that fall within that financial year.

These logical functions using the IF statement, the AND and the OR and nesting those together are something that we do a lot of in financial modelling and we find them very useful throughout all of your financial models.