**Conditional Statements Practice Opportunity Solution**

[00:00:00.00] [AUDIO LOGO]

[00:00:08.15] RYAN AHMED: Hello, everyone, and welcome to this practice opportunity solution lecture. I hope you have been able to solve this practice opportunity. So let me walk you through the question first. Consider a company XYZ, Inc, whose stock is currently trading at $64 per share.

[00:00:25.61] The company requires a 14% minimum rate of return. And that is going to be the variable r. And the company also pays a dividend of $2 per share this year. That will be the dividend 0 or D note. And this dividend is expected to increase by 10% annually. And this is simply going to be the g, or the growth simply, in my dividend.

[00:00:50.55] What I ask you to do is to, first, review the dividend discount model and write down the formula. And then I want you to calculate the intrinsic value, P, of XYZ, Inc. stock using that formula. And then I want you to assume that you are evaluating whether to invest in XYZ, Inc. or not.

[00:01:09.96] And I want you to write a Python code that compares the current intrinsic value to the current stock trading price and print out one of the following recommendations-- it's either overvalued, undervalued, or fairly valued. And please note, because right now we are creating some sort of decision, right now, we need to use if-then statement to print out whether that stock is overvalued, undervalued, or fairly valued as an example. That's where the if-then statement comes into play.

[00:01:42.44] And then finally, I want you to extend the code so users can enter the current stock price, minimum rate of return, dividend, and annual growth, and print out the company value and the recommendation as well to the screen. This is simply going to be my sample code. I included a sample for you here. I'm going to ask the user to enter the dividend per share this year. Let's say $2 as an example.

[00:02:07.30] And then I'm asking the user to enter the company's expected dividend growth, maybe 0.1, and then company's cost of equity, 0.14. And then the user will enter as well the current stock trading price, and that would be $64. And then I'm going to simply print out to the user these two messages to the screen. I'm going to say, well, the company value based on the dividend discount model is going to be, let's say, $55. And then I'm going to say, well, the stock is overvalued. You should not invest in this company's stock as an example.

[00:02:39.99] OK, so let me go ahead and show you the solution. So first, I wanted to show you the review of the dividend discount model. So the dividend discount model is used to predict the price of a company stock. And the model simply assume that today's price of a given company's stock is worth the sum of all its future dividend payments when discounted to today, when discounted to the present value.

[00:03:08.53] This is the formula. You just say the price of the stock, it's going to be equal to. And then you say D1, and D1 is the value of next year's dividend. You divide that by r, which is the cost of equity, minus g, and g is the constant growth rate in perpetuity. And if you do not know the dividend value that is going to be paid next year, what you do then, you calculate it from the current year's dividend.

[00:03:41.47] So you say, well, D1 could be replaced with D note-- that is going to be the dividend that is being paid-- times 1 plus the growth rate, 1 plus g. And this is simply the formula that we are going to use in our code right now. So let's go ahead and show you how we can write code to solve this problem.

[00:04:04.07] So what I'm going to do, first, is I need to define all the different variables. So first, I'm going to say my current market price for my stock is going to be equal to $64. And that was actually given here. So the given here is $64 per share. What I wanted to do next is I wanted to define dividend at time 0 right now this year. So I'm going to say the dividend-- so here, I'm going to call in dividend\_0 equals 2. And it's actually paying $2 per share.

[00:04:40.72] Next, I wanted to define the growth. So next, I'm going to say the growth is going to be equal to, and the growth or g was 0.1. And then I'm going to define as well cost of equity, the cost of equity. And all of these are inputs that I got from the problem statement. So the cost of equity is going to be equals to .14 as an example. So let's run the cell, Shift-Enter, Shift-Enter. Here we go.

[00:05:07.09] Next, what I could do is I can go ahead and calculate the company valuation just using the simple formula. So what I'm going to do is-- actually, let's go ahead first and calculate dividend next year. So if I say dividend of 1, that will be dividend next year equals to simply, it's going to be dividend of 0. If you press Tab, that is going to autocomplete for you.

[00:05:33.13] Multiply it times 1 plus the growth. So if you say 1 plus growth-- again, Tab should autocomplete for you-- that is going to calculate the dividend next year. So if I say dividend of 1, press Shift-Enter, here we go. So if the current year's dividend was $2 per share, next year is going to be 2.2, pretty simple.

[00:05:55.54] Alright so what we can do next, is we can go ahead and calculate the stock intrinsic value using the dividend discount model, so if you recall, here is the Dividend Discount Model. Simply, the stock price equals to dividend in the next year or D1 divided by r minus g (r-g) and r is the cost of equity minus g which is the constant growth rate in perpetuity.

[00:06:24.00] So, we have all these parameters right now so what I could do, what I could do right now is I can simply substitute in this equation. I can just say stock underscore valuation equals to and then I’m going to say dividend one (again if you press tab that is going to autocomplete for you) divided by and then I’m going to say the cost of equity minus the growth. So, I’m going to open parenthesis and then I’m going to say cost of equity (again tab, that is going to autocomplete) minus the growth, and I already have the growth value here.

[00:06:59.00] This is just going to say growth, here we go! And now I can go ahead and just say could you please show me what is in stock valuation and then if you press Shift and Enter, here we go, so simply based on the dividend discount model, the stock is valued at $54.99. Around $54 dollars approximately. So, the question is based on the current market price which is $64 dollars right now, should I invest in that stock or not? So simply what I wanted to do next was I wanted to go ahead use the ifel statement to create some logic in my code. Let me show you

[00:07:40.00] What I’m going to do here is I’m going to simply compare the stock valuation which is the value that has been calculated here using the Dividend Discount Model. I’m going to compare it to the current market price which is $64 dollars right now.

[00:07:56.00] And then I’m going to display or print different messages to the screen, we can just say if the stock is overvalued, if the stock is undervalued, or if the stock is fairly valued. So, let me show you, so what I am going to do first is I’m going to say, well if you are find the current market price is greater than the stock valuation which is what we just calculated. If we add colon this is simply the case that mean the stock is overvalued and you should not invest in that stock. So, I’m going to print the message to the screen then I’m going to say, well the stock is overvalued you should not invest in this stock. Okay. Looks good.

[00:08:48.00] Next, I’m going to say, well, elif and then I’m going to add another condition. Then I’m going to say well, if you find the current market price (again tab should autocomplete) if you find that is less than the stock valuation. If that’s the case then print for me a message that states the following.

[00:09:06:00] The stock is undervalued, undervalued you should invest in this stock. Okay looks great. And then, finally, if these two conditions are not satisfied well, that means the stock is fairly valued. So, else colon and then I’m going to say print for me please that the stock is fairly valued. Okay. Alright.

[00:09:27.00} Let’s go ahead and test it out. If you press Shift and Enter, here we go! What you would see right now is that the stock is overvalued, you should not invest in this stock. And this is simply the case because the current market price is higher than the stock valuation. The current market price is $64 dollars; however, based on the Dividend Discount Model we have be able to obtain a value of $55 dollars approximately. And that’s why we have been able to simply state that the stock is overvalued. So, what I wanted to do next is I wanted to simply expand that code to get user data.

[00:10:18.00] So, simply what we have done so far is we have been able to review the dividend discount model. We calculate the intrinsic value (P) of the stock. And then we have been able to compare the value of the stock to the current market price, and we stated whether the stock is overvalued, undervalued, or fairly valued. Now I simply wanted to finish step number four and I wanted to expand the codes so the user can enter the current stock price, minimum rate of return, current dividend, annual growth and print out the current recommendations to the screen.

[00:10:55.00] Alright, so what I am going to do right now is obtain this data from the user. So instead of defining these values, the current market price, the dividend, the growth, the cost of equity. Instead of defining these values beforehand, now I’m going to obtain them from the user. And because the user could have or enter values that have decimal points, then I’m going to cast the input in a float data type.

[00:11:25.00] So, let me show you what I’m going to do right now. I’m going to say current market price. I’m going to remove the six value here. Then I’m going to say float open parenthesis input, open parenthesis, I’m going to add quotation marks then I’m going to ask the user to enter the current stock price. Enter the current stock price, and add colon and add space afterwards.

[00:11:49.00] Well, instead of dividend zero again I’m going to cast the input in a float data type. I’m going to open parenthesis, and then I’m going to say input and open parenthesis again, add quotation marks and then I’m going to ask the user to enter this year’s dividend value. So, I’m going to say enter this year’s dividend value; again, add colon and add space afterwards.

[00:12:17.00] And then I’m going to ask the user to enter the growth, the company expected dividend growth. So, I’m going to say float open parenthesis, and then I’m going to add the input parenthesis again. Add quotation marks, and then I’m going to say enter the company’s expected dividend growth rate.

[00:12:44.00] So, expected dividend growth. Dividend growth; again, add colon then add space afterwards. Finally, I need to add or get the cost of equity; again, I’m going to say equal float open parenthesis and then I’m going to say the input, open parenthesis again, add quotation marks. Then, I’m going to say please enter the cost of equity. Enter the cost of equity, okay. Alright, looks good. Let’s go ahead and test it out.

[00:13:17.00] So if you press Shift and Enter what I’m going to do is, I’m going to say well, enter the current stock price. So, I’m going to say the current stock price right now, it stands at $64. Then if you press Enter, enter this year’s dividend values so the dividend is two dollars. Let’s press Enter. Enter the company’s expected dividend growth, so the growth here is 10%. I’m going to say point one. And then I’m going to say enter the cost of equity. And the cost of equity is 14%, so I’m going to say point one four.

[00:13:52.00] And then if you press Enter right now, here we go! And what you get is, we get a stock overvalued you should not invest in this stock. This is exactly what we got here before. The only difference that we need to add, is that we need to add a print statement that simply print out the stock value based on the dividend discount model.

[00:14:14.00] So, let me go ahead and add that and test it one more time. So, here after I calculate the stock valuation, I just need to print it or display the information to the screen. So, I’m going to say print, add quotation marks, and then I’m going to say, The stock value based on the dividend, dividend discount model. Then I’m going to say, equals to, then I’m going to add a dollar sign. Then I’m going to add curly braces, if you recall we have done that so many times in the past when we use a format method. So, can I say a dot format, open parenthesis, then I need to simply pass along my stock valuation.

[00:15:02:00] Again, if you press tab, that is going to autocomplete. Let’s go ahead and test it out, so if you press Shift and Enter again. Enter the current stock price, it was $64, you press enter. Enter the year’s dividend value which is $2. Enter the company’s expected dividend growth. And the dividend growth was 10% so I’m going to say point one. Enter the cost of equity, 14%, point one four—and here we go! Well, you can see that the stock value based on the Dividend Discount Model is $54, and the stock is overvalued, you should not invest in this stock. That’s it, that’s all I had in this lesson, I hope you enjoyed it, and see you in the next lesson.

[00:15:40.13] [AUDIO LOGO]