MODULE 4 UNIT 2
Video 1 Part 1 Transcript

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HANS-JÖRG VON METTENHEIM: Hello, and welcome back to this short video that will actually demonstrate the development of a very compact algorithmic trading strategy. So again, keep in mind the disclaimer: this is not investment advice, and if you try it at home, use proper risk management. And with that being said, let's dive straight in.

So, who says "algorithmic trading" will often think of complex software programs, expensive hardware to deploy. And that is, of course, true to some extent. Nevertheless, today I want to demonstrate how with just a simple spreadsheet program, you can already develop trading strategies that could produce better, or even good, risk-adjusted returns than just using buy and hold.

So, essentially our topic today is a cryptocurrency, so, bitcoin. Whenever you will be looking at this video, of course, I cannot tell you where bitcoin will be standing. Will it be standing at 60K? Will it be standing at 10K? So, currently it's around 35K.

And if you've followed a little bit the world of cryptocurrencies, you will have noticed there's a huge amount of volatility. But also a huge amount of trends that develop. And the question is, can we catch these trends with a very simple moving average system in order to improve our risk-adjusted returns? And the answer is, essentially, we can. And this is what I want to demonstrate over the next couple of minutes.

So, if we look at building an algorithmic trading system, of course, a very important part is the input data. And here we have prepared a spreadsheet for you to follow along. So, this spreadsheet is already done with all the results, but I want to walk you through this spreadsheet step by step so that everybody can follow along and get an idea of what's happening here.

So, I have told you, we want to use bitcoin as an example. That means firstly, we need to retrieve some bitcoin data. So. That is very straightforward data set to retrieve. There are different sources you can use, for example, Quandl, for example, CoinMarketCap, or for example, yahoo! finance. So, you might be able to download this data from any of a number of sources and what you will get is essentially what we find in the Columns A and in the Columns B.

So, here I have downloaded data for approximately the past five years. And what we will use is just the close data of the day. So, depending on your data source, you might find open high and low data. So, this data, for now, you can discard it. And we will just look at the column with the close. So, for example, we see that on the 1st of July 2016, bitcoin has closed at around 676.

All this data is perhaps not very useful for us, because in order to compute our profit or loss, it will be much easier to use returns. So, that is essentially what is happening here in Column C. So, if you look at the formula in this cell, it's very straightforward: We just take the price today divided by the price yesterday and subtract 1. And essentially this will give us percentage returns or what you might just call simple returns.

And overall, we can already see here that this is quite a volatile asset, right? So, on the first day of our sample, it does plus 4%, then losing 6% on the day after that, then again

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making 3.8%. So, really quite a bit of volatility and that is, let's say, not the worst that we have seen.

So, in the next step, we will compute a simple moving average. So, the moving average is essentially just what the name implies. So, you might have heard of it if you have been doing a little bit of technical analysis, but the formula is really very straightforward. If you look at our first cell here, Cell D6, you will see, we just take the average of the past five prices. So, essentially what we are computing here is a five-day simple moving average.

Of course, this is a little bit randomly chosen – five days. You might use 10 days, perhaps, or only four days. And this is something you can also optimise. And, what we might say, you could also curve-fit it. So, for now we will just take a five-day moving average. And the idea of a moving average trading system essentially is that we will buy the asset if the price is above the moving average and we will sell it again if the price falls below the moving average.

So, essentially that is what you will find in Column E. Column E will just check whether the price today is above the moving average or below. And if it's above, we will get a signal of plus one. For example, what you see in this cell, in Cell E13. And otherwise, we will get a signal of zero.

And now, what we have to do in Column F, which is called the Trade column, is quite straightforward. We need to take the signal and to multiply it with the return. So, just be careful not to introduce a lookahead bias here. So, for example, what we see in Cell F14 is essentially that we take yesterday's signal, which was plus one and multiply it with today's return. So, of course, we cannot take today's signal and today's return, because this return will only be realised at the close of the day. So, this is what we get in Column F, which shows all our trades.

And now, let's go a little bit to the right on the spreadsheet and do a first evaluation of our results.

SPEAKER: If you would like to review any of these sections, please click on the relevant button.

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