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SPEAKERS

Robert McKeown

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Hello, and welcome. This is the part of the module where you get to work with statistics yourself. And the tool that we're going to use is Excel. And the reason why we're using Excel is because it's so popular in the workplace. And it's a real workhorse when it comes to really collecting data. And we can also use it for data analysis, which this module, this part of the module, I should say, and the next few videos are going to really bring home to you. So I hope you have a copy of Excel, if you don't have a copy of Excel, you can use another spreadsheet program, Google Sheets, for example, is freely available. And there are other similar spreadsheet programs that are also freely available. Again, this is a chance for you to work with the statistics. And really to bring it alive in a way that's very difficult. When we're just learning equations and working on pieces of paper, computer software calculates enormous amounts, while makes enormous numbers of calculations so quickly, that it really frees up your mind to focus on the analysis. And what we're doing. We're going to start off by building a graph of a stem and leaf plot. This might seem very simple and straightforward thing to do. But actually Excel doesn't have, at least to the best of my knowledge does not have a built in function to do this. So we're going to learn a lot about Excel. As we build this stem and leaf diagram together, we're going to call on a number of different and but useful functions that Excel has to help us. So if you're ready, I'm ready. And let's get started. We have a number of questions that we're going to try and answer or instructions that we're going to try and follow questions one to seven. We have some data, we have the age of Canadian Prime Ministers when they took office. So how old were they on day one of being the Prime Minister of Canada. And we have two columns of information. We have one column with names. Canada's first Prime Minister was John A Macdonald. And he was 52 years of age when he became prime minister. Similarly, Justin Trudeau, the Prime Minister of Canada, and the beginning of 2022, he was 44 years of age when he first became prime minister in 2015. Notice that the Prime Minister's are listed in order of date or chronological order. Looking at question one, we're being asked to create a stem and leaf plot. This is going to be a little bit of a challenge because there is no built in feature in Excel to create a stem and leaf plot. So we're going to have to call on a number of other functions in Excel to create the stem and leaf plot. And so let's go ahead and do that. And hopefully along the way, you'll learn some interesting things about how Excel operates, and also some useful functions that will help you in your future career. In case you've forgotten, this is what a stem and leaf plot looks like. You can see that there's the stem, so we've got zero. In

this case, each of these sevens here represents \$700,000. And similarly, here, we've got a three, that's 3 million. And so we've got a 3.5 million and a 3.8 million there. So we want to create this stem and leaf plot. using Excel. To get started, I'm going to create a column called stem. And I'm going to create a column called leaf. And what we're going to do is we're going to split these numbers into a stem and a leaf. And to do that, we're going to call first our function called value. The function value in Excel tells Excel that the key the character we're pulling out is a number. That's a value and we want to use the command left, and that command left is going to start reading the characters in the cell C 14, it's going to read them from left to right. And it's going to, we're going to draw just one character so that the first character on the left, and then add, you can see in the formula bar, what I've done, if I hit Enter, and I do it properly add in the codes and the brackets in the right place, we're going to draw a five, the five out of the age 52. If I click this little button in the bottom right corner of cell D 14, and I drag it all the way down, it's going to populate these, the cells for me. And so you can see we've pulled the first character in the age, there happens to be a number, numeric value. And we let Excel know that it is in fact, a value. With this command with the value function command. Now I got a little bit ahead of myself, one thing you'll remember about a stem and leaf plot is the numbers at the top of the diagram are smaller than the numbers at the bottom. So we're going to want to sort our data not chronologically. In the order, the Prime Ministers were prime minister, and historically, we're gonna want to sort this data from smallest to largest. And so to do that, I'm gonna highlight the ages of the prime ministers, just the just the age, nothing more. And I'm going to go to home. And I'm going to go to sort and filter. And I'm going to choose sort smallest to largest. And I want to expand the selection, because I want to bring the stem and the names of the prime ministers, I want to resort those columns to. Now we can see, it didn't exactly do what I wanted it to do, it pulled some things away, so the stem and the leaf, and it put the title at the bottom, which I didn't want. So I'm going to highlight this row, and I'm going to press Ctrl X. So I'm going to cut that information, and then I'm going to drop it back up at the top where it was supposed to be. And this is also a title, and we can put that somewhere safe. And here is where the data came from. And we can Ctrl X cut that and move it up here, make sure that it's out of the way. And then I'm going to add in some rows, I'm going to highlight row nine and 10. And I'm going to right click on that highlight. And then I'm going to click this Insert button. And that's going to give me to clean fresh rows, just so we have some space between the questions and the data where we're working. Now we're ready to create the leaf. And maybe I will put this, these columns in bold, I just press Ctrl B to make them bold, so that they're the titles are distinguished from the data. And to get the leaf we're going to do something very similar, we're going to hit, we're going to select the cell E 12, we're going to hit the equal sign, I'm going to type in value again, because I want to make sure that Excel understands I'm drawing on a value. And instead of left we're gonna use right. And we're gonna select the age of the youngest Prime Minister in Canadian history, Joe Clark. And we're going to scope so Excel is reading from right to left this time, and we want it to draw just the very first character. And if I've done that correctly, it should draw the zero from the age of 44, Prime Minister Clark. And if we populate these cells, we can verify with our eyes that indeed Excel is drawing the correct value out of the age. Now things are going to get a little trickier. So we want to count how many how many leaves there are for each stem, each value in the stem. And you can look and see with your eyes here that we've got nine prime ministers who were in their 40s When they were first or they first took office. And so how are we going to To how are we going to create the stem and leaf plot? Well, we got to let Excel know how many how many leaves there are for each of these STEM values. And so I'm going to use the count F command. And that's going to count for us. And I think this is a really great command, because we're going to do something really smart here. And we're going to get Excel to count or return to count each of the identical values within a range. And the way that we're going to do that is we're going to you can see here it's asking us for the range and the criteria. So the range is

going to start with the stem. And we're going to have it sum up from D 12. To D 12. Why are we going to do that? Well watch this if I had n dollar signs, so that the first D 12 is stuck, it's pinned in place. And I want it to look for the number stem the four. And I close bracket, it says that well in this array right here, which is only D 12. There's one instance of a four. Now look what happens if I copy and paste or copy and paste, or you could just drag the F 12 cell down like so now accounts that there's two and you can see that our array here, these, these cell positions in Excel are changing. But our starting position is fixed. And if we just keep populating the cell all the way down, you can see that it's actually counting how many how many leaves there are in a stem with a value of four, and it's nine. And what happens if we go down to the next stem where STEM is value is equal to five, got a one. And so Excel is counting how many leaves there are in each stem, we'll call that we'll call it position. And now we can see that, for Joe Clark, he's 40 years old, that means the stem is going to be a four, the leaf is zero, and that zero is going to be the first value in the values within the leaf. And Justin Trudeau who was the second youngest Prime Minister, when he took office at 44. He's got the same stamas Four, but his leaf is four. And he's going to appear the second number from the left in our stem and leaf plot. So let's take a look and see what this is going to look like how are we going to create the diagram in Excel? Well, we're going to create a scatterplot. Now I'm going to move my cursor to a nice open space, then I'm going to go up to the toolbar and choose Insert. And then I'm going to choose a scatterplot. To choose one with dots, I don't want any lines connecting them. And I've got a nice scatterplot with nothing in it. And now we're going to add the data. And if we right click on the middle, there's going to be this option here. Among all our options, one called select data. I'm going to add a series What's the series name? Well, we can call it stem. And I'll have to do is click where I want the or where the name is, what are the series X values while the X values are going to be the position. So I want the excise to be the position. And we want the Y series to be the stem like so. And I'm going to click OK. OK again, and now we've got something close to a stem and leaf plot. Although we still have some work to do. Next, we're going to try to use the Excel chart features to make the scatterplot into a stem and leaf diagram. And there's a few ways or I should say there's a few things that we need to do to make that happen. The first thing I'm going to do is I'm just going to get rid of this x axis and all I have to do is highlight it and press. Let me see if the options there, I don't see Delete. But if I highlight it like so and I press the delete button on my keyboard, it's gone. So we don't need, we don't need any identifier on the x axis. Next, let's turn our attention to the Y axis. Notice that the highest value is at the top and the lowest value is at the bottom. That's the opposite of a stem and leaf diagram, stem and leaf diagram has the highest values at the bottom. So we're going to highlight the y axis, I'm going to right click on it, and I'm going to choose Make sure I did it right I'm going to choose Format Axis. Now a few things that we can do here looking to the right where it says Format Axis, this menu is appeared the minimum, we could try four as the minimum, since we don't have any prime ministers less than 40 years old. But that puts some of our observations very close to the edge. So maybe we'll go with five and the maximum, we could choose eight, so that'll give us a little bit of buffer at the top and then at the bottom. And we don't want any we don't need any half's that's not how the stem and leaf diagram works, not the way that we want it to look. And so we'll just get rid of the half. So at the tick mark, a major unit is going to be labeled every 10 years. So we've got a four here that represents Prime Ministers in their 40s, five represented Prime Minister's in their 50s, and so on. Now we've got the y axis from highest at the top to lowest at the bottom, we want to reverse that. And there's a button to do that right here. And when I check mark values in reverse order, it does exactly that. And now we've got eight at the bottom. And let me see if I can make this look bigger. So you can see the numbers. Now we've got eight at the bottom, and three at the top. So we're getting there, it's starting to look more and more like a stem and leaf plot. There are still some other things we could do, we want to get rid of these gridlines. So let's format the gridlines. And let's just take them out so that there's no line here, we don't, we

don't need gridlines for our stem and leaf plot. Notice that we have a little little line right here, we could make that maybe we can try and make that more pronounced. See right there. I'm going to select it, I'm going to or it looks like I'm selecting the Y axis. And over here where it says with 0.75. Why don't we try and make that two points. And you can see it got thicker. But it's also kind of a gray color. That doesn't look fantastic. So why don't we choose black, something that'll stand out. So now we've got kind of a line here, that's going to separate our stem from our leaf. Next, let's replace these dots with the value from the leaf. And so to do that, we're going to select the dot and we're going to right click on it. And then we're going to go to add data labels. And now these numbers have appeared beside our dots. That's getting us closer to what we want. But these notice these values are just representing the number, the stem number, the y value. So if I click on these numbers, and I right click on one of them, and I choose Format Data Labels, you can see from this menu over here, that we've got the Y values, and if I click that, they would disappear. Now we want to have values from cells. And if I click that box, this other box and it's window is going to pop up with a data label range and it wants me to select the data label range, and that's our leaf value. So I'm going to select cell E 12. And I'm going to drag all the way down to E 34. And click press OK. And now we've got two coordinates for Our labels or labels are going to be both the leaf value appearing first, and then the stem value. But we don't really want that either. In fact, we can get rid of the stem value, because we just want the leaf values appearing on this, this diagram. And so you can see we're getting even closer, we've got the dots, we don't need those dots, we're gonna get rid of them in a moment. But we've got the values. And if I want to make sure if I want the text to become larger, with these labels, I can click on Home, notice that I have the inner graph labeled. So there's kind of a frame out here with the title on and then there's an inner graph section. with Excel, I go to home and seem to be working so well, let's try and click the labels themselves and go to home. And then now I can change the size of the text. So I could just press this button and make it get bigger and bigger. And you can choose whatever size you want. I think this gives us a reasonably good size here. Now let's see if we can get rid of these little blue dots. To get rid of these dots, I'm going to click on one of them. And then I'm going to right click on it. And I'm going to choose Format Data Series. And I think the same format data series menu may have already been open. But it's here over on the right hand side, I'm going to choose different options. So the little bars, these are series options, we've got some effects that we haven't been using, and then there's fill in line, let's click on fill in line. And the default is to take us to the line. But of course, there is no line on this. This diagram, this scatterplot diagram. So let's choose marker. And it's on automatic. But let's let's make sure that it's marker options. Make sure the mark marker options are selected. And instead of having this blue dot here, let's go with none. And now notice that we've gotten rid of the blue dots. And we have a pretty well functioning stem and leaf plot where the first value here that's going to be 40 years of age than 44 years of age 45 years of age, and the oldest Prime Minister was 75 years of age. So there's more Prime Ministers in their 40s than there are in either their 50s or 60s or 70s. But there are more Prime Ministers in their 50s 60s and 70s than there are prime ministers in their 40s so you can get a sense of the age of Prime Ministers leaders in Canada