



Transcript for Session 015

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Transcript:

Hey there, what's up everybody? Welcome to chandoo.org podcast. This is session 15 and to celebrate the successful completion of 15 episodes of our podcast, we will do something different today. Today we are going to have the very first **'Ask Chandoo' podcast**. I will take up some of your questions and answer them in the podcast. Around last week, I published an article on chandoo.org blog inviting many of our readers and podcast listeners to send in their questions and more than 150 questions came in for this session! Unfortunately, we won't have time to answer 150 questions because if I do that, I'll probably have a podcast episode that is several hours long and it would be really boring for most of you! So, I picked about 15 questions and will answer them during this episode. Although some of these questions are very specific to a particular work scenario, I tried to keep the questions generic and spread across various topics of Excel so that you can get a little bit of 'this and that'. I hope you will enjoy this episode style.

The very first question comes from Roxanne. Let's listen to it.

Roxanne: Dear Chandoo, my name is Roxanne and I have a desperate need for copying down rows. For example, I often receive data that's about 500 rows deep and sometimes I have to insert rows and then I'm left with maybe something like this - rows 1, 2 and 3 are all the same, row 4 is blank, row 5 picks up again with new items, and I need to copy row 3 into row 4. Currently, I just select it all and copy down. But, that takes an awful lot of time whereas I would just like to create a VBA formula or something to just say 'select all, if you find a blank row, copy the row above it and fill in the information'. I need that often. The document changes, but the need never changes! I hope I explained myself. Thank you.

Chandoo: Okay. This is the scenario that I call **'fill down blanks with above row'**. That's the scenario that Roxanne is facing and many of us face this situation. When you are importing data from an external system or when you are copying and pasting data from a website or a .csv or text file, you will often have blank rows which are just meant to be a repetition of the data above. Rows 1, 2 and 3 contain data and row 4 is empty. We want to fill up row 4 with the data in row 3. This is the same situation that Roxanne is facing. There are many ways to do this. The most obvious way is to do it manually. Each time that you want to fill up the data, you go to the row with the data and select it, and then paste it into the next row. But, this can be quite tedious especially when you have hundreds of rows of data and you just want to fill this down. You would get tired very quickly and you would also make some mistakes. Often, you might over-write existing data and create an extra headache for yourself!

Another option is to write a simple macro that would automate this process. Technically, the macro would scan through the data, and each time that it encounters a blank row, it would go to the row



above it and take the data and paste it below. This won't be a very complex macro. It would be a 5-10 lines macro and you could easily conceive that kind of macro with a little bit of help, if you are familiar with VBA. But, I think, using a macro is also a little bit of overkill here.

The most obvious and easiest solution to me for this scenario is to use excel features. Excel has a ton of useful features. If we don't know them well enough, we might end up wasting a lot of time or figuring out a macro-based solution. I will explain this, but I will also leave a link to a detailed explanation of this solution (along with screenshots) in the show notes. Please visit <http://chandoo.org/session15/> to access the show notes.

Let's talk about the solution. Select the entire data, including the blank rows. Let's say your data is in 4 columns and 500 rows; select the entire area. Once you've done this, press F5. This will open up the 'Go to' dialog box. 'Go to' is an excel feature which can be used to select or go to a particular cell. We don't want to go to a cell, but we want to go to all the cells which are blank. Essentially, if a cell is blank, we want to fill it up with the value above. After pressing F5, you will see a 'Special' button in the 'Go to' box. Click on it and it will open the '**Go to special**' dialog box. The general 'Go to' box is there for you to type a cell address and jump there. 'Go to special' is a special dialog box or feature in Excel that can let you access specific type of cells. For example, you can access all the cells that contain formulas or all the cells that contain number values or errors by using the 'Go to special' dialog box. This is a very powerful feature.

'Go to special' contains a feature called 'blanks'. What we really want to do is select the 'blanks' in the 'go to special' dialog box. When you click OK, Excel will select all the blank cells within the selected range. Initially we selected 4 columns and 500 rows of data. After the 'go to special' step, it will only select a subset of cells. They could be anywhere - row 4, row 17, row 212 etc. It will select all the blank rows. Once all the rows are selected, while keeping the selection there, just type '=' and press the 'up arrow'. By doing this we are saying that from any cell (it doesn't matter what cell it is) from within the selected blank cells, we are asking Excel to insert a formula that equals the cell above it ('=' and 'up arrow'). This is really the same as saying - 'get the value from the above cell'. Once you do this, Excel will add in the formula.

Hypothetically, let's say that when you finished the 'go to special' step, it selected rows 4, 17 and 212, and when you press '=' and the 'up arrow', the formula will most likely be written in column A of row 4. So, in cell A4, it will write a formula: =A3, because you've done that by pressing the 'up arrow' and the cell above A4 is A3. So, that's what appears there. We have written only one formula, but we have probably 20 or 30 blank rows each of which contain 4 columns, so we really wanted to write more than a hundred formulas but we wrote only one formula. No worries. After writing this, instead of pressing 'Enter', if you press 'Ctrl-Enter', Excel will automatically apply the same formula to all the other cells and adjust their references.

Essentially, what really happens in this process is that Excel copies the cells from above and pastes them below wherever there is a blank row. In my opinion, this is the simplest way in which you can copy the value from the cell above and paste it below into a blank cell. I hope you enjoy this particular solution, Roxanne. I am going to include a detailed explanation and link to an article that I already wrote a while back in the show notes. Please visit <http://chandoo.org/session15/> for that.

This is our first question and its solution.



The second question is also an audio question and comes from Verner. Let's listen to his question.

Verner: I use a lot of big data at work. Is it possible to take large XML files and format them into Excel?

Chandoo: Verner says that he **wants to access big data, especially XML files, and handle them in Excel.** There were a few more questions with similar themes from various readers. For example, Ron Wallis asked - '**how can I use Excel to access the big data of Twitter?**' Twitter is the social network where you can post short messages and share them with the world. Likewise, many people asked how to use big data with Excel, how to work with PowerPivot, and how to use PowerPivot to analyze and visualize data. All these belong to a similar class of questions and so I'm going to give a generic answer here.

Let's talk about XML data which is what our question from Verner is about. When you want to handle XML data, I think it is recommended that you use either PowerQuery or PowerPivot because both of these have the capability to handle XML data sources and XML-based data schemas to import data. So, use them. If you are not able to use these add-ins, another solution is to process the XML data outside Excel (even though technically you can process XML data within Excel) and bring only the necessary stuff into Excel. Instead of importing the raw XML file into Excel, use a very simple program based on Java Script, PHP or Python (whatever you are comfortable with). Take the raw XML data and convert it into a bunch of columns essentially like in a .csv or text format and then bring that into Excel so that you can work with the format that Excel is comfortable with. But, the best way is to use one of the add-ins - either PowerQuery or PowerPivot - both of them are capable of handling XML data.

Once the data is in Excel, you could really do anything that Excel does well, like calculate summaries, sort or filter the data, pivot the data or visualize it. All of that works beautifully. The thing that we need to understand, especially as Analysts, is that Excel is a powerful tool but we need to remember the proverb - 'for anybody with a hammer in hand everything looks like a nail.' Especially if you are learning Excel and you are excited about what Excel can do, often we get into a scenario where we think that Excel can do everything and we try to nudge and push Excel into each and every corner of our work. But that's not how you should approach it. You should use Excel a little more calmly and intelligently. Use it where it works really well but don't strive too hard. Instead, use an add-in or other software that can work natively with other types of data before you deploy Excel. That's that.

Coming to the question about Twitter data from Ron Wallis - again, handling Twitter data used to be easier because they had different API's a while ago. I think, in 2008, 2009 and 2010 [if I'm not wrong], they had an API called 'Restful API' which essentially gives data in XML format so that it can be processed using a bit of VBA and then brought into Excel. Since then they have changed the authorization protocol to 'OAuth' which is open authorization. This is a little technical and implementing such an authorization from Excel can be done but I find it to be too tedious for the simple analytical needs of Excel. There are many ways to collect this data. I think [if I am not wrong] PowerQuery and PowerPivot support some sort of social networking integration. PowerQuery especially has a mechanism to bring Facebook social graph data to Excel. So, I am sure that someone who has worked on PowerQuery might have figured out a way to get similar data from Twitter. Search around and use one of these add-ins to handle such data because essentially the data that comes from these kinds of social interaction platforms, especially from Twitter, tends to be really big. It is big data with millions of rows and lots of values. If you try to put all of them into Excel and crunch that, you would pretty much crash Excel! So, it's better to use a specialized tool like PowerQuery or PowerPivot to handle the data and only import the results or summary calculations into Excel for further massaging. That's a little rant or



information on big data and how to use PowerQuery and PowerPivot.

The next question that I have here is from Alex. Alex asks - **"What are your recommendations for tools or process flows for combining multiple data sources especially when you have lots of data and you need a repeatable process? Where is the point where you need to throw up your hands and invest in a hosted SQL server type of solution?"**

He gives some more details, but the essential question is about how do you take data from different data sources and combine them in Excel and at what point do you stop doing this work in Excel and migrate to a SQL based solution.

The easiest method to combine data from multiple sources into Excel [that I have found so far] is to use PowerQuery. PowerQuery is not available with all versions of Excel; it is available with Excel 2010 and Excel 2013. If you are running one of these versions of Excel, don't even think about writing your macros or anything. Just go and use PowerQuery! It has many built-in features to handle these kinds of scenarios - combining data from multiple sources, pre-processing data from multiple sources before it comes into Excel, and lots of other things. I will probably record another podcast or write about PowerQuery on the blog sometime soon. I have been meaning to do that and I will certainly talk more about it in the next few months.

Assuming that you can't use PowerQuery and PowerPivot because you have some limitations, then the next option would be to figure out some sort of manual solution. Manual here means that you either do it every time or that you write a macro. The first time you'd do it manually. Once you've understood the process of combining data, you'd use a VBA macro to automate it. This is the next best option. With a macro-based solution, you also reduce the chance of errors because you don't have to repeat the steps every now and then and forget one or two steps which in turn would create a lot of problems. None of those things would be there if you use a macro. You do it once and you record a macro or write a bunch of code, so that every time you need to get the data and combine it, the macro would do the work. If you are going all the way to the step where you are writing the macro, then the next logical step is to move the macro from within your workbook to outside it. This way what happens is that any data processing work like collection of data and cleaning of data happens outside Excel. When it happens outside Excel, you could use a database or a programming language to handle this. That would be the next logical step.

And the final step, which is really the holy grail, is to use a SQL server [or something like that] which would collect all the data and batch process it and then generate a .csv or text file for you to import into Excel and work on the analytical part. This is the logical progression.

At what point should you throw up your hands and move out of Excel? This is a personal preference. Obviously, there are some technical limitations. Excel can only handle data up to a million rows, so anytime that your data is more than a million rows, you need to move out of Excel. That's the technical limit. The practical limit would be something like 200,000 rows. Anytime you have more than that much data, Excel tends to take forever to calculate even a simple SUM or COUNT formula. So you are better off doing the data crunching outside Excel and bringing only the necessary numbers back into Excel for further processing. This is a bit of personal preference. Also, if you have access to tools like SQL server or any other type of personal database solutions like MySQL or something like that, why not spend an hour



or two to learn about it? Especially like a simple database like MySQL or SQL server. I know they are very complicated and it can take ages to master them. But, from an Analyst point of view, to learn the basics and appreciate what they can do for you, it will not take more than a week or two. So, get a good book or visit some internet websites and learn the basics of how to navigate these softwares and how to use SQL and you're all set.

That's the answer to my question from Alex.

Now let's talk about a question from Utkarsh. Utkarsh is asking me a personal question and I wanted to include one or two personal questions in this episode, so that you could also get a glimpse of my personal life and how I run my chandoo.org business. So, here goes Utkarsh's question, **"Chandoo, have you planned your life after retirement? Do you think sometimes that your decision of leaving your job is right? I am just asking because I always think of leaving my job and starting a small business to earn money. But, I am always afraid to do so, even though I have read many successful stories and get inspired every time (including your story). Still, it's not been enough to dare."**

He follows up with some additional personal questions but essentially the theme is how do I feel about my decision of leaving a comfortable technology job to work on chandoo.org full time and what are my thoughts after 4 years of doing this. So, for those of you who have joined our podcasts a little late or are new to chandoo.org, I will give a brief introduction here. I work on chandoo.org as a full time job. I don't have any other job. This is what I do. I quit my job as a Business Analyst in the year 2010 to work full time on chandoo.org. Ever since that happened in April 2010, I have had an excellent journey so far.

Going back to Utkarsh's question about whether I have planned my life after retirement - well, when I quit my job in 2010, I didn't consider it as retirement. I considered it more as moving into my own employment. At that stage, I really did not have the financial assets or luxury to even consider myself as a retired person. We had some money but most of that money was buffer money because when you leave your job, everything that comes with the job also goes. So there is no steady salary at the end of the month, there are no health care benefits and lots of other things. I had to take care of my family and our future. Whatever money I had at that time was not a lot; it was less than 50,000 dollars. We considered that not as retirement money but more as a security buffer. We used it to project our months and see how long we would last if we had to spend that money. Fortunately, we never ran out of that money. But, it was more of buffer money.

So, when I started, it was not retirement. It was just a move from working for somebody else to working for myself. There was a little bit of apprehension, doubt and concern when I did that. But, I felt that it was the right thing to do and I wouldn't know what would come next unless I left. So, I took that step and that was the starting stage. But, soon after [probably within 6 months to 1 year], I realized that the money that I was able to generate by working for myself was good enough that I would eventually come to a stage where I would be retired. Technically, if you are working as an employee, your retirement happens at the age of 55 or 60 or maybe 65. Whereas, when I started working for myself, I was about 29 years old, so I wasn't really planning retirement or anything like that. But, within 6 months to 1 year, I realized that eventually after about 3-4 years, I will come to stage where I will have to retire. Not retiring in the sense of stopping work forever, but retiring in the sense of stopping to worry about money altogether. That stage happened eventually sometime last year or so.



I started diversifying my interests and planning my time better so that I don't feel bored or tired by doing the same chandoo.org work over and over again. I started investing in my personal health and spending a lot of time with my family, bringing up the kids and growing my interests by reading a lot of books for example. This is how I keep myself really occupied and also feel complete and fulfilled throughout my day. This is a little bit about how I am planning my life. So far, I don't consider myself as a retired person but at the same time, I never feel the stress to work for a certain outcome. If I feel like doing a particular article, I'll do it. If I feel like recording a particular podcast, I'll do it. It's more like going after whatever my mind tells me or whatever I feel is right. That's the kind of mind-set I'm in right now.

And, obviously, I consider my decision to leave a full-time job to work for myself as the best decision of my life apart from a few other things! It is a really good decision. Anybody who is considering it, and does not have a lot of financial burdens, I highly encourage them to do this because it is like a gift to yourself. You might fail or you might succeed and even that might take a lot of time to show up. But, it is the least you can do for yourself. If you have some sort of desire to start a business and offer a service or help to others, please do it by all means. The worst that can happen is that you will fail. And, if that happens, you will come out stronger and you will learn that there are some mistakes that you have made. But, that is the kind of learning that no job can give you. So, if you have a plan, set aside some money from early on, so that you have some buffer and you can take that leap.

That's my answer to Utkarsh's question. It's a good question and I thought it gives me a chance to expose a little bit about my personal life to you and share some of my thoughts on that.

The next question comes from Trisha. She says, **"I would like to potentially create a stand-alone Excel product, from the spreadsheets that I have designed, for others to use. How do I do that?"**

Trisha is not the only one who asked this question. There were a few others who had similar questions like **'how do I protect my workbooks'**, **'how do I write a macro so that the file gets deleted after some time'** etc.

I think that the most important thing to understand is that Excel is not a safe deposit locker or a bank. I am saying this in the sense that if somebody wants to break your Excel file, they will eventually find a way to break it. No matter how much protection you use or how sophisticated your solution is, if somebody really wants to break it or destroy your file and figure out the logic behind it, they can do it. That's the nature of Excel because it is not meant for high-security things.

The other important thing to worry about, especially if you want to protect a bunch of files or macros or code that you have created, and sell it as a product or offer it as a solution to your customer, is how do you get the customers. That's the only thing that matters for any business. Once you figure out the logic behind how to get customers (once you crack that code!), everything else is a smaller problem. If you don't have customers, then there is no point worrying about how to protect your work. That comes much later in your professional or business cycle. As a first point, if you have some customers, give them your file. The other thing that you need to keep in mind is that if you have customers, why not trust them? This is the same kind of philosophy that we apply at chandoo.org. We try to trust our customers as much as possible. In fact, our de facto policy is to trust the customers 100%. About 99.5% of the time, we don't question the customer. If the customer says that they lost the file or they misplaced the zip file, we always send them a fresh copy. No questions asked. No worries about the licensing or anything like



that. You can also use this approach. If you trust your customers, then there is no point in worrying about the security because most people [this applies for 99% of the people] are out there to use your solution and not abuse it. They are there to benefit from your solution and enjoy your work, and they are happy to pay you. So, why bother with these extra steps of packaging it, protecting it and securing it?

Coming to the aspect of how to actually package it, the easiest thing would be to create your Excel file and just send it. That's the easiest thing. If you want to use some protection, Excel offers various levels of protection. They are not fool-proof, but they are good enough to use for most practical scenarios. You can set up passwords on worksheets so that the customers cannot examine your code or formulas. You can protect your VBA code with a password. You can hide worksheets that contain important calculations. Again, most people will not bother with un-hiding and unprotecting stuff as long as the file works. These are the basic ways to do it. For more details, I suggest that you spend time exploring various websites that sell Excel-based softwares or tools, and see how they are doing it and try to apply those ideas.

The next question comes from Sam. Sam asks, **"In terms of volume of data, at what point does it make better sense to abandon Excel for a database program?"**

This question is similar to the question from Alex on SQL server which we have answered earlier. Again, there are some technical limits to what Excel can handle. It can handle up to a million rows, so anytime your data is more than a million rows; it is not even feasible to save the data in Excel in one place. You can technically put it in multiple sheets, but for practical reasons, it's not going to work.

The second thing is that, for most practical scenarios, if the data has more than 200,000 or 300,000 rows, it is going to slow down Excel drastically.

These are the kind of benchmarks you can rely on. If your data is crossing 300,000 rows, it is time to abandon Excel and move to a database. With the advent of Excel 2013, some of the capabilities of databases are now part of Excel. For example, you can now connect multiple tables of data in Excel in the same way as you can set up a 'primary key-foreign key' relationship in a database. You can do the same in Excel as long as the relationships are 'one-to-one' or 'one-to-many'. So, you can do these kinds of things.

Many of the other things that databases offer - security, consistency, and back-ups - are not offered by Excel. If it is for a simple solution for your warehouse or shop, you could technically use Excel. But, if you are going all the way to purchase Excel, chances are that your license includes MS Access. If not, you could add that for \$50-100. Maybe use MS Access if your data gets too complicated or if there are too many relationships. Or, you could use a free database solution like MySQL and deploy it in your small company or personal system so that you could handle many of the database things there.

That's my answer for Sam.

Next comes an interesting question from Charles, **"Hi, for a model railroad layout, I want to be able to use Excel to send instructions to relays or opto-isolators to turn on and off lights without having to use micro-processors with relays. How do I do this?"**



Well, I don't really know the answer to Charles's question, but I wanted to feature it because it is quite interesting and sounds like a fun project to do with Excel. I remember building a traffic light control system and a stepper motor control system using micro-processors back in my college days. This is part of the standard micro-processor course that most people who have done either computer engineering, electronics or electrical engineering go through. You learn how to use a micro-processor, how to use some sort of assembly line coding so that you can tell the micro-processor to send a certain signal and use that signal to turn on or turn off a traffic light or control a motor or something like that. I did this way back in 2002 or somewhere around that time. It was fun doing it. Later on, we learnt how to do a similar thing using C-programming language. In the earlier days we used assembly language, but later on I learnt how C-language can be used to do similar assembly line processing.

These are some of the basic ways in which people do this. Essentially, if you are familiar with Excel and you want to do it with Excel, why not? Again, going back to our example of 'if you have a hammer in hand, everything looks like a nail', this could be a case of Excel being the hammer and you trying to hammer down the railroad solution with that! But, technically it can be done because Excel has its own programming language called VBA and we can use VBA in conjunction with Windows API's. Excel runs on Windows and it can also run on Mac. On Windows, you can talk to Windows API which is the underlying Windows core system and maybe [I am saying a lot of maybe's because I have never done this but it seems possible to me] control a USB port and send some data via the USB port so that a relay or isolator or traffic light can receive it at the other end and function.

But, if you want an easier route, why not use a simulator? I mean, if you are going all the way to Excel, it means there is a computer somewhere in your set up. So, you could use an assembly line simulator or something so that you can code that and send data on a port of your computer and connect that port to your isolators or relays so that they can operate. Again, all of this is with a lot of maybe's because I have never done this with Excel or any other desktop software. The only time I have done this is with a micro-processor simulator and assembly line language.

So that's the question from Charles.

Let's go to the next one. Here is a question from Teri, **"Hi Chandoo, happy to have this chance to ask about Excel. Related to one of the reports I am doing now, I would like to know how I can link a certain list of names or items to a pivot table. Then, I want to select a name from the list and the pivot table should be changed accordingly. This list can be controlled either through a list box, a combo box or a data validation list. Thanks and regards, Teri."**

This is also a very good question and again, there are many ways to do this. The easiest option would be to use a feature of Excel called slicers. Slicers are a powerful feature available in Excel 2010 and above and you can use them to refresh your pivot tables by selecting an item. For example, let us say that you are displaying a regional sales report. You are operating in five different regions, so the slicer would contain the region names and each one looks like a button. If I click on 'Region 2', the pivot table report would be generated for region 2. If I click on 'Region 4', the report gets generated for region 4. This is one of the easiest ways to do this.

If you don't want to use a slicer or if you have some limitation on slicers (for example if you are running



an older version of Excel where slicers are not available), you could use a feature called 'report features' in Excel pivot tables and link the report filter with the combo box. When you interact with the combo box, the report filter gets changed. The linking part will need to be established with a small VBA macro. Again, I will provide a link to a detailed tutorial in the show notes page because this is something that I have discussed on chandoo.org a while ago. Please visit <http://chandoo.org/session15/> to access the show notes.

The next question comes from Rob. Rob asks, **"Hi Chandoo, in the workplace, being awesome in Excel can really earn you credit and respect. But, what do your friends and family think about your Excel obsession? Do they think that you are a bit strange? Love the blog; give us more challenges to do! - Rob, Analyst from North London."**

Thanks, Rob, for this nice question. Some of my friends and sometimes even my wife Jo think that I am a little obsessed with Excel. But, for most of the part, they don't really view it as an obsession. They view it more as somebody who is very focused on what they want to do in their life. The same thing might happen to you. But again, personally, if I am learning Excel or if I am applying Excel, the way that I would split my time is that I would spend as little time in Excel as possible. For me, Excel is a vehicle. It is not the destination. It's like going and sitting in a car to go somewhere. You don't want to sit in the car; you want to go to that place. So for me, Excel is that car or the vehicle. You should also view Excel more as a means to an end. Here the end could be becoming a better Analyst, becoming a boss, becoming a business head, owning your business, leading a happy life or anything like that. Use Excel to that extent. As long as you are doing that, and if you only manage to spend 25% of your time in Excel but achieve great results, that itself is an incentive and nobody would think that you are obsessed with Excel. So that's that.

There were few more questions that I had selected but I think that we are running beyond the 40-minute mark on this podcast. So, I'll probably have to save them for the next episode.

I will take one last question. This is from Ashok. Let's listen to the question.

Ashok: "Hi Chandoo, I want to calculate the average of next four numbers in a series. Remember, these are not four consecutive numbers, but the next four numbers, like average of first four numbers, then average of next four numbers from 5-8, then average of next four numbers from 9-12 and like that. Could you please tell me the best formula that I can apply in my Excel sheet?"

Chandoo: What Ashok is asking is, "How do I calculate the average of four successive numbers?" Let's say that we have 20 numbers. We want to have 5 averages for these twenty numbers. One average for numbers 1 to 4, another average for numbers 5 to 8, and another average for numbers 9 to 12 and so on. We want to have five averages in this manner. This is not the same thing as moving average. With moving average, if the window is four, then essentially, you have one average for numbers 1 to 4, another average for numbers 2 to 5, and another average for numbers 3 to 6 and so on. In a moving average, the window of four is moving down.

Whereas what Ashok wants is something strange and different. He wants the average of four numbers at a time. There are two ways to do it. The way that I would prefer is to use a formula called **OFFSET**. Using the **OFFSET** formula, you could fetch any range from Excel.



For example, if I write:

```
=OFFSET(A1,0,0,1,5)
```

I will get a range of 1 row and 5 columns starting from cell A1. Visualizing what an OFFSET formula does and how it works in an audio podcast is very difficult. So, I will not mind if you don't understand the OFFSET function! But, by using the OFFSET function, we can achieve this result. I will provide an example workbook on the show notes page for this podcast episode. Please go to <http://chandoo.org/session15/> for it.

The first approach is to use the OFFSET formula as explained above. I will also provide an example in the show notes.

The second approach is to use a helper column. In your original data, you have these numbers in a range say from A1 to A20. In column B, just put running numbers, i.e. numbers 1,2,3,4,5 and so on till 20. In column C, write a formula to get the value divided by 4, i.e.:

```
=B1/4
```

You will see numbers like 0.25, 0.5, 0.75, 1, 1.25 and so on.

These numbers are fine, but what we are really looking for are rounded numbers. So, in column C we want the number 1 for the first four numbers, for the next four numbers we want the number 2, and for the third set of four numbers we want the number 3 and so on. For this, we just need to alter the formula in column C. The formula that should go there is:

```
=INT((B1-1)/4)
```

This will take the value in cell B1, subtract 1 from it, divide it by 4 and round it to an integer before it. So you will end up with 0,0,0,0,1,1,1,1,2,2,2,2 and so on. If I add 1 to this formula, we'll get a result of four 1's, four 2's, four 3's, and four 4's. Essentially, we took the running numbers and converted them to sets of 1's, 2's, 3's and 4's with each set containing 4 numbers.

Once we have these helper columns namely columns C and A, just add in the numbers 1,2,3,4 and 5 somewhere in your workbook because we want to calculate five averages. After you've done this, use the AVERAGEIF formula to calculate the average. So, we want to calculate the average IF the number is 1, IF the number is 2 etc. In this way we could get the four number averages very easily.

But, using the OFFSET formula would be a better solution because that way you have a lot more control on what you want to count and what you want to exclude and how big the window size should be etc. Check out the example on the show notes page at <http://chandoo.org/session15/>.

That's all the time we have for questions. I hope you have enjoyed these questions. Again, I am sorry that I could not answer all of the 150 questions that you sent me! But, I am going to save these questions on my computer (I am maintaining an Excel workbook with your questions) and I have tagged many of the questions for a post, so that I will use your question to write a future article on chandoo.org. I have even tagged a couple of questions for a future podcast discussion. And, I am going to take these questions up as and when my time permits and I will help you out as much as possible.

I hope you have enjoyed this episode of our podcast where there is no set topic but you get to experience and learn about a bunch of different things. If you like this episode please let me know in the



comments at <http://chandoo.org/session15/>.

Also, I would really appreciate if you can take a minute and visit our iTunes page to provide your feedback and reviews there - whatever you feel about this podcast, whether you like it or hate it and what you feel about it, and the things that you are learning from it. Please leave these reviews on the iTunes page so that it helps us reach out to more readers and listeners and make them awesome in Excel.

Thank you so much and stay awesome! Bye.