Transcript for: Apache Spark Python - Spark Metastore - Creating Temporary Views

[Music] so far we spoke about public meta store tables now let's understand how to create temporary views using your data frame we can create temporary view for the data frame using create temp view or create a replace stamp view create a replace temp view will replace existing view if it already exists if you use create tempo and if the view already exists then it will just fail saying that view already exists that is the difference between create temp view and create a replay stamp view while tables in meta store are permanent views are temporary once the application exists temporary views will be deleted or flushed out if you want to use the queries on top of data again once you get into another session you have to create temporary view then you can run queries using that view now let's run this piece of code to take care of spark session object then let's set spark.sql.shuffle.persons2 so that we don't use unnecessarily too many resources to actually process the data when we run code snippets in this notebook then let's run this to create an object called as username it will contain the user that i have used to log in which is nothing but itversed now i am setting the current session to use the id university underscore airlines by running this piece of code i hope the database exists you can confirm whether we are attached to the database or not by using current database like this you can see that i am attached to itunes underscore airlines let's run spark.catalog.listtables to list the tables you can see that there is a table by name airport underscore codes when it comes to each temporary for this table it is false which means this is a permanent table you should be able to run queries on top of this table in process of processing the data now let me create an object by name airport underscore codes and score path it contains string which is nothing but location in which we have the airport codes na.txt file once you create this variable or object you should be able to pass it to spark.tree.csv like this the data is tab delimited that's why i'm using sep equal to tab it have header that's why i'm saying header equal to true i want to infer column names using the header and also data types based upon the values and hence i'm setting info schema to true so it will take care of using the header as column names and also based upon the values it will be able to infer the data types of the columns now let's run this it will take care of creating the data frame by name airport codes df you should be able to save print schema to preview the schema and also you should be able to preview the data by using show now let's scroll down here if you want to run queries to process the data in the data frame one of the way is to create temporary view like this so in this case i have specified the data frame name then dot then create temp view then the view name this is the view name which we can use now we should be able to run this it will take care of creating a view in this session now let's run this you can see the list of tables as well as views you can see there is a table by name airport underscore course and also it says a table but it's actually a temporary view when it comes to spark technology the name is nothing but airport underscore codes and score v if you look at each temporary for this it is saying true which means it is a template table and also table type is temporary to understand the purpose of the view let's read the data from view and get number of airports by state this is not the appropriate way of reading the data from view the whole purpose of creating the view is primarily to actually run queries against the data instead of using data from aps like this if you are comfortable with queries or sql you should be able to use sql style syntax and you should be able to process the data in the data frame once the temporary view is created however if you want to read the data using view you can still use spark.table like this it will create a data frame and you should be able to get count of airports by state using data frame approach like this let's run this and also run this you can see the count for each state here however if you want to use sql style syntax to run queries against views this is how it will look like this is the view name you can see that we are grouping by state we are getting the count for each state and then we are actually sorting the data in descending order by airport count you should be able to run this and you can see the output this is how you should be able to use sql style syntax to process the data in the data frame leveraging the views that are created on top of data frame this is how you should be able to use the temporary views on top of data frames and write queries using those temp reviews in the pursuit of processing the data using sql style approach [Music]

Transcript for: How to COMBINE DATA with MERGE and APPEND in Power BI

think of these cubes as data tables they have the same shape however different colors and we can place them right on top of each other and that's basically abandoned now over here we also have cylinders different shape but we can match it with the cubes on the basis of the color that's emerging now let's see how it's done in power bi when you combine data in power bi you basically have two options you can either ban data or merge data now let's first explain what the difference is between the two and then go over all of the things that you might run into while using them just imagine the following situation we have salary data for different employees and that we break down this data into separate tabs inside of Excel and one tab for each department so here we have one for finance one for marketing and one for HR and we're gonna connect to these tabs inside of power bi now here we are in the power query editor and we have the HR table the finance table and the marketing table and I would like to combine all three of them into one table now you see that they have the same columns and so here we have HR you in a finance uef marketing and if you want to combine data like this that's a similar structure then you do that using appending okay so you can simply go to the Home tab then here almost all the way on the right we have merge cream ISM band queries now we are gonna use a bank query so that basically means you take one dataset put other dataset underneath it and then the third dataset let me that one okay so you're there's a drop down so we can say append queries or append queries as new now which one to choose append queries is no jet this basically means you leave the other three intact as they are and you're gonna create a new one that combines all three of them if you would just click on append queries then we're going to append the other datasets to the one that's currently selected here you have the choice to choose either two tables or three or more take now here I basically always switch to three or more tables even if I just append two tables but because the interface is just a little bit nicer and here on the left-hand side you see all of the tables that you can choose from you're on the right-hand side you see the ones that you're gonna bend so if we want to Pat here finance and I just select finance on the left hand side and add it to the right-hand side and then the same for marketing and John and once all three of them are here on the right-hand side and you can also change the order simply by using the arrow keys okay so once you have all three of them there simply click on OK and now a new query pops up here and one which we can rename of course so let's call this one later if you append queries then also always double check if it actually worked by counting the number of rows and to see if it corresponds to before and what you're expecting now here it's kind of easy and so we have nine rows and so it works however if you have working with larger data sets you have to go here to transform count the rows and then it will tell you how many rows you have then you have to double check if that corresponds to what it should be now then you can delete that step and then continue all right so this is what abandoned us so let's also have a look then and what merging does now here we have another data set where we are showing the bonus amounts for the different employees for q1 2020 now let's have a look inside of RBI now here we have the same table inside of power bi and what we got to do is we wanted to take that data and match it with the other data that we just appended okay so we have over here the bonus table and then here we have the employee and you might notice that they are having a different structure okay so here I have the part in position name salary and here I have name period bonus okay so what we want to do here is not put these data stands underneath each other but we want to match the day let's do this I'm gonna go over here to the Home tab then above append queries we have merge queries and also here we can either choose merge queries of merge squeezes no so let's go for merge Queens as new as we want to leave the initial queries as they are so let's click on it and here we have at the top the first table so you can either choose the bonus table or we choose the employee table okay and over here let's then choose the other one so that's bonus in my case and then there is also the join times which plays wrong when there's not a perfect

match between the two tables that we are emerging okay let's get back to this later because here we actually do have a perfect match and you see already here at the bottom that the selection matches nine of nine rows from the first table and now at this point you're not done yet you see here on the left side we have merged one and here we have everything from the first dataset that was at the top so that is our employee table and then we have this one extra column the bonus column which contains basically nested tables and when you click on the empty space right next to table then here at the button it gives you the matched rows from the other table the bonus table in our case okay and then we still have to say which ones do we actually want to bring over which ones do we want to join okay so that we can do by going here to expand button okay so here in the header of the bonus column let's click on it now here you can then say which fields you want to bring over so all of them and here also if you want to use a prefix or not let's leave everything standard let's click on OK and you see that it brings over all of the columns from the other data set and also has this prefix which probably you don't want to have in this case so let's go back click on the gear icon and then get rid of this bonus prefix and you see that we have also over here the name which we already have in that data sets that doesn't make sense to bring that one over that's okay and there you go we have no your period and the bonus matched from the bonus table okay so what we have over here is now basically totally flat table that contains all of the information from all of the data sets first by appending it and then merging the data from the bonus information so now that you familiar with the two concepts of appending and merging let's go over some of the details all right let's start off with appending now usually when you use a pen name you do not want to load individual tables that you combined but only the combined result itself not to disable the loads to the data model you just go over here to your queries finance in our case disable the Lord you do the same for marketing and the same for HR okay so now these tables will not be loaded okay you can also see that because they are cursive okay and then usually I would take all three of them right click move to a new group and for example call this one input employee table now another question that you might have is if the data sets need to be structured exactly in the same way and this is not the case now let me show you what happens when they are not ok so I'm gonna go over here to my age our input table and let's say that the order of the columns is different okay so maybe here we have to name so we have to begin now that I have changed the order of the columns let's go to the employee table and you see it's still exactly the same we have nine rows four columns now the order of these columns is determined by the first table that you use for appending okay so if you go to the source tab and then here you see the finance table is at the top so it means it takes over here the finance stay with this order as the order for the final table we have over here okay so if I put named here also at the beginning and go back then we have my name here also as the first now what happens if you have columns that are not inside of the other input tables that you are appending well let's have a look so I'm gonna take the name column let's rename this to full name okay then I go back to the employee table and you see that we now have notes because the full name column doesn't show up in the other input tables and effort creates new one fills the rest up with notes and over here we have the name column where we now have knows because in the HR table we now don't have anymore the name come on another topic that might be on your mind is what happens if you have same columns that you have pending but the data types are different okay so let's take the HR table again it's an example go to the salary common I'm gonna change from hole number into text okay now then I switch here to the employee table and you see now we don't have whole numbers anymore but we have undefined on ABC one two three and so here we basically have the whole numbers and then we switched to text for the HR department okay so it doesn't assign the data type and therefore we have to assign a datatype here in the append query another thing that might happen is that some crucial information is actually missing from the data set so here for example we broke it down by different departments and what if there is no department column and then you combine the data well here you see that we have a combined data set but without the department and now you don't know which employee belongs to which department okay now let's go to the HR input sheet okay so you see we only have now named position salary and what you need to do in this situation is that you add another column that returns the department name but you can simply do by going here to add column custom column and then call this one and it's important that when you do it for the other queries that you don't make a typo because then it doesn't match the different columns okay and here we can then use quotation marks and in between these quotation marks we're gonna put a charm and then we're gonna do the same for finance and marketing so now that we have added the different Department columns and

we go back to their uncle Year table and now here in the combined data set we have the department column and we can see which employee belongs to which department and what to do if you have data sets that have a similar structure and you want to burn them however the data sets are split over multiple files that are being dropped in a folder somewhere for example maybe have the new actual data coming in for every month or in our case we're gonna bone us information that is being dropped into a folder every quarter and we want to append that with the previous quarter's okay so at the future data sets they are not there yet so we cannot just connect to the next quarter data set now what you do in these situations is that you can connect to a folder and then event all of these files that are inside of that folder now let's have a look this is done you can go here to get data and then choose the folder connector and then just browse to the folder now here we have our data sets which are stored in the folder called bonus just gonna copy the file path from here ctrl-c ctrl-v now here it's very tempting to click on the combine buttons or combined and transform data and actually it would work in this case because the data sets are exactly the same and we only have the files in this folder then we want to combine however if there are different files in the same folder thing you might have a problem and therefore I always go not here to combine a transform data however to transform data and this gives you a view of all the different files that are inside of this folder in which you can combine so here you see we have four files one for each quarter in the 20 and to combine them you can simply go here to the content column and then there's a combined files button let's click on it so here you have to choose the sample file which can be any file in the folder but by default is been first one that it finds and it takes that structure of this first file and it looks for the same structure in the other ones okay so it's not as flexible it's what we have seen before when we use the normal append feature okay so here I'm connecting to that excel file then I'm gonna connect here either to the table or to the sheet and it's important that that name of the table or the name of the sheet is also indeed other ones and so here I'm gonna connect let's say to scene one then she won't also needs to be in the other excel files now the preview looks fine then also here you can say skip files with arrows now if you have this one jacked then even if it finds and say a data set that has totally different structure may might fail then it still continues for the other fans that are in the same folder okay now if you don't have this one checked it just stops okay so usually I would actually have this one select it now let's click on OK just like magic we have mounted combined data set you see we have Q 1 Q 2 Q 3 Q 4 no its first column over here with the source name might not show up for you in case if it doesn't just go here to remove other column step click on the gear icon and then you can bring it back okay now let me go to the last step again now you see here on the left hand side we have one new folder now this folder contains basically all the stuff that is necessary to do that pending all right so you have the parameter sample file a transform file you can just ignore it now if you go back to the query now also here on the right hand side we have new steps that were added that basically not power bi to this end result all right now also here always double check if the Panda actually worked now for us it's kind of easy to see now but that we have thirty-six rows and so it's just small data set now in reality you need would need to go to the transform and then count the rows and see if this meets the expectations okay now then you can delete that step and continue now I'm gonna go to one of my Excel files and let's say somebody would not have called this Siwon but she - okay I'm gonna say that go back to power bi refresh the preview and you see we now have Q 1 data Q 3 Q 4 Q 2 data is missing however 2 Q 3 Q 4 data is still there and that is because I said skip files with powers if that would not have been the case and it would have stopped with Q 1 okay so that's why I make sure that I select that checkbox now what would you do if there are also other files in the same folder well then you need to go back to the source tab and in our example I had it over here who ran the file into the folder okay so yeah let's go random fun and you also see it here inside of power bi now then we can just simply filter it out before we actually combine the files alright and that's also the reason why I always go to edit first before I combine so I go here to the name column and then I can put a tax filter where I say it contains and that's inserted stuff because we know what we're doing here so keep rows where the name contains and then let's say that we have only the files that contain a name bonus click on OK and no story continues just like before all right so you just filter out the files that you don't need and this can also happen when you have maybe word fats PowerPoint presentations or CSV files in the same folder then just put in a filter here on the extension color so also here go to the drop-down tax filter equals and now it would only combine excel files that contain bonus in their name but this way you make your solution a little bit more future proof another thing that you might wonder about is what happens if you have subfolders well basically it

doesn't matter it picks up everything in all of the subfolders so if you want to have a nice organize let's say by year 2018 19 20 then it goes through all of the subfolders and all the files and subfolders you will also see now let's also concentrate now on merging data now before we had a perfect match between our employee data set and the bonus data set however in reality it might be that some employees only showing up in the employee table and not in the bonus table and the other way around and then it matters of which type of join you choose so let's have a closer look at the different joint types now here we have the same employee table as before however it took one person out from the finance department and here in the bonus table I added two new people and let's see how that influences the merge so I'm gonna go here to merge queries as new we're gonna have our employee table we're gonna match this one on the basis of the name we have the bonus table okay now before when we didn't change anything for the joint kind we have nine out of nine rows that match now in this case we only have eight of nine rolls that one match now let's go over the difference joint guides okay so starting with the left order which is the default okay but basically means you keep everything from the left table and match whatever you can match from the right table now here there's no left and right however the one that is on the top that's the left table and one that's at the bottom that's the right table okay so let's see what this returns I'm gonna click again here expand and you see everything was matched however we have known for this person over here marketing analyst Rico eunsuh which is only showing up inside of that employee table but not inside of the bonus data okay and that's why we have over here no now let's change left altitude right now you see here at the bottom the selection match is now eight of ten rows from the second time so it takes the second table and tries to match everything that it can match from the employee table so this means that two employees they are showing up in the bonus table but not in the employee table so maybe our employee table is outdated okay now let's click on OK to see what happens ok so here you see we have notes for Christina Lafleur and we have over here notes for Tony Smith ok so these two employees they don't show up over here in the employees let's now switch them to an inner join now that we switch to an inner join you can see here that the selection matches 8 of 9 rows from the first table and 8 of 10 rows from the second table ok now let's click on OK and then expand it again you see we have no notes anywhere we only have the rows where there was a match ok so that's why we only have eight rows in this case then let's switch to an outer join now you see that we have 11 rows so more than the first day but more than the second table and alter joint keeps all of the information that there is so that's why we have here nose for Christina a flat nose for Tony Smith and then also notes for your cleanser and because they show up in one data set but not the other ok so with the full outer join you keep all of the information that is in both of the data sets now let's then also have a look at the last two which are left ante and right and so when you do left ante click on OK you see only one that is not appearing in the second table so that is Beyonce okay now let's do that then also for the right ante okay and here you see Christina Leffler Tony Smith don'ts two employees that I'm not showing up in the other table now these are all of the different joint types that you can find in power behind now you might also have noticed that there is the option to do a fuzzy match across images something that you would use if there is no exact match match between the two tables on the basis of the names okay so the names might have been spelled a little bit differently but you still want to perform the match that's where fuzzy match comes in if you want to know more just click over here on the on the link another thing that you might run into is that you need to have the unique identifier based on multiple columns okay so in our example that could be the first name combined with the last name so here I split the first name and the last name column okay so what you do that and see you just click on the first name hold the ctrl key click on the last name so that they get concatenated and then you match it also over here on the first name and the last name in that order now let's go for an inner join and click OK then expand the bonus column and you see we have no first name last name period and the bonus column so everything nicely got matched not on the basis of this one column but the combination of two columns combining data through merging and depending these key tools in power behind that you really need to know give any specific questions about this topic just let us know in the comment section below and if you like to see more content on power bi consider subscribing to our Channel or give it a thumbs up thank you and see you in the next video

Transcript for: Building Your First Agentic AI- Financial Agent With Phidata

hello all my name is krishak and uh welcome to my YouTube channel so guys I am super excited now we are going to probably build lot of endtoend agentic AI applications with the help of different different Frameworks in this specific video uh we'll just get started to Showcase you like how do we specifically build agentic AI applications how do we build independent agents and how do we probably combine them uh to work in a specific complex work flow right and as I said I will be covering multiple Frameworks so in this particular video we are going to discuss about a framework which is called as F data so uh before I start ahead with respect to this particular video please make sure that you uh will keep a like Target to 1,000 only th000 and we keep a comment Target to 100 please make sure that you fulfill this Target because this will basically motivate me to upload more videos as quickly as possible so quickly let's go ahead and share my screen so here uh let me just quickly go ahead and open the documentation of f data right so this F data uh we are basically going to use it as a framework uh the best part about this is that it is an open- Source platform to build ship and monitor agentic systems okay so here you're just not building it but here you'll be able to monitor it you'll be able to deploy it each and everything you'll be able to do it right and it is completely open source with respect to the framework that you really want to use here you will be able to build AI agents you you you'll be able to build multimodel agents you'll be able to create agentic workflows more complex agentic workflows and all right so uh and this is super helpful if you just have some amount of domain knowledge you should be able to build it in an amazing way uh the best part about this is that you can choose any llm and turn any llm into an agent right because many people whenever I request them right they say that hey Kish instead of opening I you know you don't have an API ke try to use some open source models so here you'll be able to use G Gro you'll be able to use hugging face you'll be able to use AMA so I will just try to show you the most easiest way how you can probably integrate any open source llm models right then uh you'll be able to add knowledge provide domain specific information to solve your problems right and different different complex workflows also you'll be able to do it you just need to probably write some amount of code and writing this kind of code is also very simple uh which we will be probably seeing from the documentation now these are the basic information then you have this entire documentation where you can probably refer uh you can work with how many different kind of Agents you can specifically work with you can uh you can also go ahead and write your own prompts tools knowledge memory all this things are there right not only that if you probably go ahead and see you will also be able to integrate with different different models like open AI anthropic Cloud AWS Bedrock Azure what I'm actually going to do is that I will I will probably pick up some good open source and I'll also show you with respect to cloud like AWS Bedrock cloud and all I have that access Gemini Vortex AI also I'll try to show you hugging phas Gro uh if you want I can also show with Nvidia AMA I don't want to show you because see ama is just like uh the llm setup in your local right and I know you don't have very high full uh high high powered machines you know you don't have huge RAM so usually it becomes slow okay so let's start uh we will go uh step by step and uh what we basically going to do is that uh as we go ahead first of all I will show you how you can go ahead and set up the project and how you can go ahead and start so let's begin so guys now let's go ahead and start uh I will be building the project completely from Basics and uh scratch you know probably from a basic setup point of view so here is the folder location which I'm actually going to use from here I can just go ahead and open my vs code so once I open my vs code it will look something like this okay so here let me just go ahead and open my VSS code okay now once we open a vs code as you all know the first and the basic information or basic thing that we really need to probably go ahead and do is create our create our python environment right so here I'm going to go ahead and write so let me just go ahead and write my command prompt and the first thing that I'm actually going to go ahead and write cond create minus P V and V okay minus P basically means Within in the folder location uh it is just going to create this virtual environment so that I don't have to probably look at any other way right so Conta create minus PV andv python doual to 3.12 okay so once I probably go ahead and execute this It'll ask me for one more uh confirmation so I will just go ahead and give yes so again it depends on your internet speed how

much time it is basically going to take you know so quickly let me just go ahead and write Y and uh uh and the installation has started taking place right the next thing is that I will go ahead and create my requirements.txt okay and what all requirements I specifically require I'm just going to go ahead and write okay so some of the requirements uh that I'm actually going to use is something like this okay open AI open a will not require it so I will just remove it I'll require F data since we are using this particular framework called as F data then python. EnV then my finance Packaging Doug duug go search this is just like a tool you know uh this Tool uh will be specifically used by agent to do any kind of web search okay then you have this fast API uh internally uh when you probably want to run this in the cloud uh F data platform we will be requiring fast API as the uh you know front-end application in short then you have uvon and then since we are using Gro Gro has all the open source libraries uh hosted in and we'll be able to get the API also right so we will be using specifically Gro okay so these are some of the libraries that we are going to use in the requirement. txt Now quickly what I'm actually going to do is that I'll go ahead and write pip install well first of all I need to activate the environment so cond activate V andv okay once I specifically uh it says not a cond environment okay spelling V EnV okay V EnV so yes uh we have installed uh we have activated our cond environment then the next thing I will just go ahead and clear my screen uh what we have basically going to uh do over here is that I'll just go ahead and write python oh sorry now I have my V&V; environment the next thing that I'm going to write is PIP install minus r requirement. dxt okay so once I'm going to probably do the installation of all the libraries the next step is that we can probably go ahead and start now since we are uh also installing python EnV so for this we also require one EnV file okay now inside this EnV file I will be requiring two important information one is f data key and the second one is my grock API key okay now how do you get your grock API API key and F data key I will just go ahead and explain you but before that let me just go ahead and copy this particular grock API key grock API keys I hope everybody knows it we can specifically get it from the grock platform so quickly I will go to my grock platform okay so here I will go ahead and write grock com okay now if you know about Gro uh it is the fast AI inferencing it provides you good open source libraries you can see all these open source libraries it will be able to provide you so you can specifically use for some number of request which is completely for free okay then uh I will just go ahead and click on dev console so let me just go ahead and click on dev console now once I go to the dev console I have already logged in over here if you not logged in I would suggest please go ahead and log in then here you can probably go ahead and see API Keys I've created a lot of API Keys over here so uh you can just go ahead and click on create write the API key name and you can get the API right it will basically start from GSK okay so once you have this particular API key all you have to do is that just go ahead and update this okay grock API key now this API key that you are able to see is my five data API key because whenever I run my application local it should be able to run it over here so what you have to do is that just go ahead and logging in F data and this will basically be your dashboard okay so dashboard looks like this you can go ahead and click on API key and you can just copy this okay so copy this API key and keep it ready okay so two important keys that you specifically require one is the f f Fiore API key I'll just go ahead and write it down like this okay and then you have your Gro API key this two keys we will specifically require okay perfect uh I'm just keeping it for my purpose you know whenever I specifically require it I will be able to use it okay now to start with uh the most easiest way how you can probably just go ahead and write something and you can probably go ahead and start you know uh I will just start with a simple uh project which will be uh like uh a financial analyst you can probably consider okay so here I will just go ahead and create my file and I'll write Financial agent. py okay now with respect to financial agent. py okay I have to probably change the environment okay now I have changed the environment now first thing first uh with respect to the financial agent you know uh here what we are basically going to do is that I will create uh a application okay in terms internally it will have multiple agents okay one agent like let's say that if I go ahead and probably ask a question hey can you summarize and recommend uh about the stock of Nvidia right so if this is my question now as soon as I put this particular question how my chatbot should interact just imagine in this okay my chatbot should probably go ahead and contact agents right the first agent will be the person or I'll not say person the first agent will be my AI agent autonomous AI agent which will be doing all the interaction to get the details of the stock okay so that will be my first AI agent the second AI agent will be that it will also try to probably get some information from the news right from web search What new information you specifically have once we combine all them all of those information then they should probably interact with my llm model and come to a conclusion you

know saying that hey what all recommendations specifically have for that stock so I hope you're able to understand so that is why I've written this financial agent. py so let me quickly go ahead and import some libraries so I'll write from f. agent import agent okay import agent capital letter from f. agent import agent okay okay then from F do model dot open AI sorry I'll not use open AI instead what I can also use is uh I will be using some tools specifically like why finance and all okay so let me quickly go ahead and write it down I'll just keep my face hidden so that you focus on the entire coding that we are specifically doing okay so let me just zoom in so from first of all I will be importing from F data f. agent then you have this F model do for y Finance or um let me do one thing let me also use something called as grock okay grock import grock okay so I'm going to also use this grock because this will basically be my model and here also what I can do is that I can use Capital Croc yeah okay this is done uh I'm going to specifically use grock I'm going to use agents now as I said that I'm also going to use a specific tool tool so F do tools do tools. y Finance okay y finance and then I'm going to go ahead and UT y Finance tool now why how do you think that I've come up with this you know so the best part about F data is that it has lot of integration with various tools let's say if I go ahead and click the specific tool there is something called as dugdug go search there is something called as why Finance why Finance is also there there is YouTube there is zoom Twitter so many different different things are there so you can probably integrate all the specific tools right so for this what you need to do is that you need to install y Finance so I will just go ahead and see that whether I have installed it or not so in the requirement. txt we have installed Finance why finance and then uh you'll be able to see that I just need to import it in the way along with the agent right and then I will be able to call this tools inside any agent okay inside any agent and I can probably give some parameters like analyze recommendation and all see there are lot of different different things analyze recommendation company news technical indicators historical prices we can just keep it that that as a Boolean value okay so that is how we basically call this okay so we will I'll show you how once I start using this okay so this is my uh why Finance tool now another tool that I'm actually going to use as I said that I also want to do my web search right so I will be using this dougd go search Okay Doug dougd Doo and I will just import my dugdug go so this is my another tool so if you probably go ahead and see this is my dugdug go and this enables an AI agent to search the web for information because if I'm probably able to search some information from the internet it'll be amazing right so here what I'm going to do is that I'll just go ahead and install this libraries now let's see whether that library is also available or not so that is also available I've already installed it okay perfect now um uh the next thing that I will do I'll write from five dot f. model dot uh I have imported Gro also okay I think this is good enough now let's go ahead and let's uh start our first work okay now the first thing that I'll do is that I will go ahead and create my web search agent so now with respect to different different task I have to probably go ahead and create my different different agents so my first agent will be nothing but web search agent now in order to create an agent I'll be using this agent itself right I'll be using this agent and I'll go ahead and give some name so first thing is that I will say hey web search agent okay so this is the first information that I'm giving about the agent okay the second thing is that I will go ahead and write some role see all the parameters that you'll be able to see over here role uh agent ID uh so many different different parameters are there right so we you can probably refer the documentation but here I will just give you the minimalistic parameters that we have I'll say hey search the web for the in information search the web for the information the next thing that I'm actually going to do is that I'm going to call my model now which model this web agent is basically going to use see every tools that we are going to create every agents we are going to create the backbone there will be an llm model right uh that llm model uh will be provided some data from the tools that we are going to use in this particular case we're going to use the dug du go search tool right so here I will just go ahead and call my model let's say I'm going to use my grock model and from this Gro let's assume that which libraries we are going to specifically use okay we can use any library right uh 3.3 7B spec specs deck uh if you want we can also use this preview this this whatever libraries you specifically want you can use it right so in this our scenario what I'm actually going to use I'm going to use one Library which is called as uh preview okay so here uh I will just go ahead and write my ID is equal to this particular Library okay Lama 3 grock 70 billion 8 B it's up to you whatever my library you basically want to use you can actually use it okay then uh I have my next thing that is called as tools now inside my tools I'm am going to use you can use multiple tools also right now in my example I'll just go use a dog Doug go I'll just go ahead and initialize this okay so this is the tool now what is basically going to happen is that this agent is whenever a query is basically done right first of all it is

just going to go ahead and hit this particular tool for that query it is going to get the response and it is basically going to this use this particular model with this particular prompt and it is going going to give us the info right the output response then I have my instructions this is my another parameter I'll say hey always include sources so I'm saying that hey uh whenever you are doing the search with respect to the dugdug go right you should also provide me the Source from where you're getting the information okay then I will show showcore toolor calls is equal to True okay and then I will also try to convert this into markdown so I'll make it as true so uh you may be thinking chrish from where are you getting this parameter just go ahead and check out the documentation guys only this many specific set of parameters will be used in which you can probably use it for your purpose okay now understand here I have created one basic agent right so this is my uh if I go ahead and write my comment this is my web search agent right like similarly you can create any number of Agents you want okay now let's go ahead and create my uh Financial agent right because this financial agent is also going to do a web search it just like guys I gave a person a task let's say there is a domain expert in finance I said that hey just try to explore about Nvidia now the person what is doing is that uh he's just going and doing an internet search he's getting the information with respect to all the information that he already have he'll combine them and he'll give us a perfect response okay now uh let's go ahead and create my next financial agent now inside this financial agent I will just go ahead and write Finance uncore agent is equal to agent again I'll initialize my another agent uh let's say the name I'm going to go ahead and write Finance AI agent okay then you have this model grock ID is is equal to let's say the same model we going to use over here also because this is a financial agent okay but understand what this Finance agent is basically going to do it is going to interact with another tool right and one of the tool that we have specifically use is YT Finance right sorry y Finance tool now though this particular y Finance tool has all the information regarding the stock it'll it'll probably this agent is just like integrating with an API to get the information about any stocks anything over there in the market right so now here I'm going to basically use a tool now inside this tool I will just go ahead and write okay my y Finance tool is over here um let's say I will copy it from here itself uh where is my y Finance y Finance why y finance and let's say this is my tool I will just go ahead and copy this entire thing okay so I don't have to probably worry about anything okay so I will remove this I don't want this list I don't want this okay now this is my analyst recommendation stock fundamentals true this this let's say that I want some more things I want technical indicators or company news okay I can also set this parameter as company News company news and I'll set it to is equal to True okay perfect right so this is the tool that we are specifically going to use it then here also I have to probably provide my instructions I like these are some basic instructions that we have to probably make sure uh to have it you know so instruction and I'll say hey uh let's go ahead and use tables to display the data okay so this is my another instruction that I'm trying to give this person okay um instruction is basically there now what I will do along with this I will just go ahead and write showcore tools show underscore tools underscore calls right I'll set this to True okay showcore tools uncore and here also I'll set it to markdown is equal to True okay perfect uh these are all the parameters we can specifically use uh this showcore tools underscore calls equal to basically means that it'll just show us like what all tools are basically there I'll just make sure to have this right spelling okay now this is perfect uh now I I have created two independent agents one is the web search agent one is the financial agent now whenever we Define a workflow uh now this if I combine both of this particular agent it becomes a multimodel agents right so here I will just go ahead and create a variable multi aore agent okay is equal to agent and here I'm just going to use team team is equal to web underscore web _ search _ agent comma Finance _ agent and then I have my instructions always include sources okay and here I will also combine both these instructions right over here then use table to display the data the same thing whatever we have actually done it is over there okay now I will be having showcore tool underscore calls is equal to true and then I have my markdown is equal to True okay perfect now this is my multi- a agent which is combining both of them see here we have used the first parameter as team which is combining both this agents then we have the instruction then we have showcore tools showcore tools uncore calls equal to true then I also have this markdown is equal to true now to initiate this it is nothing but multi AI agent. print response I can just write my query over here later on if you're creating the chatbot we can write our query over here and automatically this multi agent can also work so summarize analist recommendation and share the latest news let's say this is my question for NV nvdia is nothing but nvda okay nvda and here I'm going to basically use stream is equal to True okay perfect so this is my query I think you should be able to see it print response this

this this stream is equal to True okay I'm just asking hey summarize analyst recommendation share the latest news for NVIDIA okay now this is done I will just go ahead and run this and show you whether everything should work fine because it should work fine I guess so now if I go ahead and write python financial agent. [Music] py and here we go open not installed pip install open where is open AI being used let's see have I used open somewhere okay let's do one thing let's let's quickly install this also I think some of the other libraries that may be using so there is some error we'll try to solve it clear pip install minus r requirement. txt requirement. txt okay so once this installation happens now we are good to go ahead and run it okay python Financial agent. py now you can see again I'm getting an error so guys here you can see that I'm still getting an error even though I've installed openi but I think opening is not required in this particular scenario so what we can basically do is that as you all know that we have already imported our Gro API key but we have not passed it right so I'll copy this and uh what I'm actually uh going to do with respect to Gro is that uh in Windows you know whenever we talk about Windows uh what the first thing that we really need to do is that I will just go ahead and clear my screen I'll go ahead and write set X okay and we will set the gro API key API uncore key is equal to and I'll just give the API key over here please make sure that you have to write this in your terminal set grock API key and your API key name okay or whatever the API key is there and once I press enter and then what it will happen is that it will probably go ahead and save this okay now the next step will be that I will just go ahead and run this okay python Financial agent. py uh so after this here you can see still it is asking me open AI API key now my suggestion would be that guys here we are not specifically using any open API key but uh since it is asking for what you can basically do is that you you can use an open API key I know uh you know there there won't be any charges as such but you can just go ahead and go ahead and create your API key itself and uh from the open a website and you can just add it over here okay so in order to add it I will just go ahead and use this over here let me quickly do one thing let me quickly import uh open open a and after importing open AI I'll just go ahead and write open ai. API key is equal to os. get EnV get En EnV and here you have your open now you may be thinking Krish uh do we definitely require this or not I will just check you know from the documentation still I'll TR to explore why this is not coming you know uh even though we are not using open API key because see if I'm importing it we are not using openi anywhere right but it is asking for this specific key you know now this environment variable I have to create it over here so quickly I what I will do is that I will just go ahead and put my open API key over here I hope everybody knows how to probably go ahead and get your open API key so this is mine don't use this but anyhow you'll not be able to use it also because after the video I'll just try to delete it you know then uh after doing this I will quickly go ahead and load so from EnV import import load. EnV now here you can see that uh internally I don't know where it is basically being used probably in this specific thing it is being used I don't know you know I'll just go ahead and check out the documentation but I'm not specifically using open anywhere okay so now let's see it should work now finally it should work and we should be able to get the response uh the API client pass option must be set by passing API key to the client okay and where is is the client let's see s it is saying open AI key not set okay no worries uh what we can basically do is that I can go ahead and set something like this I can also go ahead and set it like this so I'll write opencore API key and I will just remove this and we'll set it in this way so I will copy this totally and let me paste it over here let me press enter now I think it should work now after calling this load uh. EnV let me just go ahead and initialize this load. EnV okay and then I think it should be able to call this keys so I'll just check guys again uh why open AI key it is requiring it should not require it anyhow but I don't know well I'll just check out from the documentation Financial agent. py now I think it should definitely work now see you can see summarized analyst recommendation and share the latest news for nvda and then here you'll be able to see this all task is being running transfer task to finance AI here is the latest information about this and all the news are over here Strong by it is saying this byy 48 so it has has a good uh information saying that hey it's probably doing really well and you can also see the latest news AI stock trade in 2025 there is an expected growth in AI enthusiasm in 2025 analy reports and the latest news article related to nvda right this OB ref the current market sentiments development related to this one and all right so it's it's able to give me a good information over here right and uh these were the errors that we were getting because of that openi key but I still don't understand where openi may be used probably it may be used in this particular multi agent uh when we are trying to combine this uh let's let's check or if you have any comments please do let me know with respect to this okay but uh still I feel that uh here we are getting all the information in the terminal you know probably I want to display in

some kind of chatbot form you know and uh we'll try to probably have a look over here so what I'm actually going to do is that I'll just go ahead and create my new file let's say I will go ahead and write playground. py okay now inside this playground. py I will probably do almost same thing you know whatever uh things I actually uh used over there you know with respect to the Keys and all right so first of all let me just go ahead and import all these things again I don't know why open a is basically being used uh I will just go ahead and probably raise a support ticket for this particular platform to just understand where specifically it is being used then um these are some of the basic libraries why Finance tool Doug duug go and agent and I'm also going to use this f. API so that it converts this entire platform into API then I'm also going to import this three important libraries okay one is playground and surf playground app now here is where your fast API will be specifically used now let me just go ahead and write f. AP okay API is equal to uh os. getv okay and here I'm going to basically use this same EnV which I have actually created for my f API right so here is my f API key and I will just go ahead and paste it over here so we want the F API key itself because we will create this as a custom chatbot in the F data platform okay then uh my web search agent and this will be almost same so I will copy this entirely till here okay and here you'll be able to see that I'm pasting it okay uh it still require grocs uh grock so let's import this particular grock so where is the grock I'll be using this I'll be pasting it over here okay so this is my grock uh and grock is basically used over here this is perfect uh my finance agent and this now I'm going to go go ahead and create my playground so I'll write app is equal to playground okay and here I'm going to combine my agent agents is equal to find Finance _ agent comma web search web search uncore agent okay and then I will go ahead and write dot get underscore app right so this is the entire thing what I'm doing right if you really want to get into an playground instead of creating this multi- agent now like how we did it in the previous uh PR uh step we are just going to create this particular playground so what F data basically does is inside this platform it provides you a playground where you can probably combine all the agents and you can basically see it okay then we will just go ahead and start if uncore name uh underscore uncore uncore uncore double equal toore maincore uncore then we are just going to go ahead and write serve playground app and here I'm just going to give my play colon app Now understand playground is my file name okay and this app is nothing but from where my program is basically starting right and here I will just say reload is equal to true it is just like debug is equal to true so if I make any changes this is just going to start right uh if I don't want to go like this I can also go ahead and run this particular code over here right directly so now I think it looks good let's now run it okay see uh now the best part will be that if I run this file right so this is my entire recommendation I'll clear the screen if I write python playground. py now this is basically going to run okay and it is going to run in one Local Host 777 but if I just go ahead and hit this URL it will not work like that so what I have to do I have to probably log in into my five data dashboard okay I will just go ahead and click on playground okay it'll sa me to select an endo so here Local Host end. 777 will be there by default okay so I'll just go ahead and click this now here you can see it is green color it is showing green color that basically means my Endo over here is running right at this particular Port so this is also running so what I'm actually going to do now I have connected to my endpoint and this is my entire playground how you can specifically use okay so now if I just go ahead and write what is your special skill I stock analyst I can fetch the latest information on the stocks and companies I can provide current stock prices company fundamentals analyst recommendation latest know which stock are you interested in I'll say I am interested uh in Tesla okay so specify for what looking for example so you could specify what kind of information you're looking about Tesla for example stock price fundamentals and all so what I will do is that I will write the same statement what we had actually given in the financial agent I'll say hey summarize and latest news on Tesla right so I'll just copy this for Tesla okay summarize analyst recommendations share the latest news for Tesla by this there they see very nicely step by step all the specific information is basically getting displayed and that is the beautiness about this right so here you'll be able to see that here are the latest news this this this this a stock goes this okay so this is what it is okay and here I can also write compare Tesla and Nvidia and provide anist recommendation right so if I uh you'll be able to see that all the information Tesla this this based on Nvidia has a much stronger buy recommendation compared to Tesla can and you can probably go ahead and interact this now it is just like I'm interacting with a stock broker over here or financial analys who can probably provide me more information and this is quite amazing I know you should not probably use this uh I'm not 100% sure whether it is just going to give you the profit but here we have defined a amazing complex workflow and we have implemented it completely end to end so

this is your financial analysis uh again as we go ahead more complex workflows we'll try to Define but I hope you were able to understand this uh please create a workflow to get started docs so you can also see that we can also go ahead and create our workflow like this and uh we'll be seeing more about it as we go ahead right but this particular tool is quite amazing to get you get started with amazing things over here uh but I hope you were able to understand this uh see Financial AI agent over here grock Lama 3 is basically being used so yes this was it from my side uh I hope you like this particular session this was quite a big session but there are more more things that we are going to come up uh this was it from my side I hope you like this particular video I'll see you in the next video thank you take care bye

Transcript for: Simple Excel Trick to Conditionally Format Your Bar Charts

In today's video, let's take a look at an Excel chart trick. Let's create a bar chart that automatically shows negative values in a different color to positive values. What I'm also going to do is to show you how you can conditionally format the bar chart to highlight the bar with the highest value. Now the trick that you see here is something that you can apply to any chart that you want to conditionally format. Let's check it out. (upbeat music) I have a list of products and the sales value for actual and budget. What I'd like to do is create a bar chart for the actual sales, but I'd also like to show the deviation to budget. So it's going to be two bar charts that are grouped as one visualization. So let's start off with a simple part first. So select a product, select actual, go to insert, go to the bar chart area here and select 2-D bar. Now let's quickly update the formatting of this. I'm going to remove the vertical grid lines here. Let's also remove the label axis. Let's right mouse click and add the labels directly to the bars. Let's also update the product names by making them stand out a bit more. So I'm going to go with bold and make them bigger. Another thing that I usually prefer to do in bar charts is to reduce the gap width between the bars. So select a series and press Control+1 to bring up the series options, or you can also double click on the bars to bring this up. For gap width, let's go with 80%. With a series selected, let's also quickly adjust the shape fill. Okay, so so far so good. I'll just make this a bit thinner. Now just be careful about your labels here. So there are two things you can control. This is the chart area and this here is the plot area. So just make sure that there is enough breathing space for the labels. I'll make this even thinner. Now you might have noticed the order of the products is different to the order of the products in the table. It's the other way round. If you'd like them to be in the same order, you can directly adjust this in the chart. So click on the axis, go go to series options. Under axis options, place a check mark for categories in reverse order. Now we have the same order as our table. Another thing I'm going to add to this is the horizontal grid lines. Because I'm planning to add a second bar chart on the side that shows the deviation, it's going to to make it easier to read if I have horizontal grid lines in there. So let's go and place a check mark for the grid lines. But by default, it puts the vertical ones. I want the major horizontal ones. So let's place a check mark here, and let's also make it even lighter. So far so good. I'm going to remove the border of the chart. So let's go to format, shape outline, no outline. Okay so the first chart is done. Now let's add the deviation to budget. For that, I first need to calculate my values. So I'm going to add a data preparation area on the side here. This is going to be the difference and the formula is simple. It's just actual minus budget. Okay so let's just pull this down. I want to plot this in a separate bar chart. So let's highlight our products first. Hold down Control, highlight the difference column, go to insert, and go back and select the bar chart. Now I'd like to have this formatted in a similar way to my original bar chart. Now here's the trick, click on the original bar chart and press Control+C. Now select the new chart, go to home, under paste, go to paste special. And so like formats. This is going to copy the format from the first chart and bring it over to the second chart. One thing I don't want to have on the second chart, though, are the labels. So I'm going to click on the labels here. If I press delete, it's going to delete the labels, but it's also going to delete my axis. So I want to keep the axis, but just hide the labels. With the axis selected,

go to series options. Under labels for label position, instead of next to axis, select none. That keeps your line, but hides the labels. Now this is going to be in front of this one here. Let's just move this. To be able to properly see the chart that's behind this, let's take away the white fill color of this new chart. So let's go to format, shape fill, and select no fill. Hence now they are right beside each other. Now the one thing you need to be careful is that these series don't overlap. So the plot area of this one and the plot area of this one don't overlap. So I'm just going to move this slightly to the side as well. Okay so, so far so good. Now let's get to our conditional formatting. I want to have a different color for negative values. Select a series, go to fill options. Here's the setting you need, invert if negative. Take a look at the color here. I just currently have the choice to select one color. But the moment I place a check mark for invert if negative, I get a second color. This color here, the first one is the color I want to have for positive values. I'm just going to go with a light green. And the second color is what I want to have for negative values. I'll just go with orange. It's that easy to conditionally format this chart. Let's just make sure that it's dynamic. So for product B, I'm currently having minus 10 as my difference. Let's change that to 1,265 and I have plus five. Let's press Control+Z to go back. Now as a bonus tip, I want to show you how you can conditionally format any series in a chart based on any type of logic. As long as you can write a formula for that logic, you can do conditional formatting in the chart. So let's say for actuals, I want to highlight dynamically the product that had the highest sales, right? So I don't want to fix it. I don't want to go and select specifically this one and color it because that's going to fix that color to this position right here. I want it to be dynamic. The trick is to add a new series for whatever you want to conditionally format. So I'm going to call this max condition. This series is only going to have one number. That number is the max value, and this max value has to be in the correct position. Let me show you what I mean. The formula I need here is to say if, this value here, if this happens to be the max of my range, so I'm going to highlight this and press F4 to fix it because I'm planning to pull this down. So if it happens to be the max, then I want to see this value. Otherwise I want to see nothing or zero. So close the bracket, press enter, and let's pull this down. So right now I should just see one value. Whenever it comes across the max, it's going to show it on this side. The next step is to bring this inside the chart. So let's go to the chart, right mouse click, select data. Let's add a new series. The series name is my max condition, and the series values are all these, right? So you have to be consistent. The starting point is from product A to product E, and click on okay and okay. so now I have my second series in there. And by default, what Excel does is it plots it right beside it. But there is a setting that we can tweak, so it actually plots it over the original series. And that's called series overlap. So instead of 0%, we want to increase this to 100%. Now all we have to do for this entire series, we can adjust the color. Let's go with a blue color. Now the advantage of doing this this way is that it's dynamic. So let's say now we have product B going up to 1,360. This gets updated automatically. And so does our difference on this side. Okay so this is the trick for doing any type of conditional formatting in a chart. If you're dealing with negative values though, you don't need to bother an add another series. You can use invert if negative. Now there is one thing we can do here because our title disappeared. I'm just going to bring this to the side, and actually let's just connect this to this. And let's also group these two charts together, so we can move them as one. So hold and control, select both, right mouse click, group, and group these together. So now I can move them around as one visualization. I hope you enjoyed this Excel chart trick. Hit that thumbs up if you did, and subscribe before you leave in case you aren't subscribed yet. And I'm going to see you in the next video. (upbeat music)

Transcript for: How to Migrate Data from MSSQL Server to Snowflake using Airflow!

hey y'all data guy here and today we have another viewer request video uh this is a week of your requests I guess where I'm going to show you how you can write a dag that will migrate your tables from an MS SQL database into a snowflake database and I will be honest Ms SQL is the biggest

headache to work with of all time but it can be done and I have a previous video that I will put a link to in the description if you want to see all the different setup processes you need to go through to actually have MS SQL work you can go refer to that to actually get the connection set up but because it's such a long process I'm not going to go through it again in the this video today even though give me some juicy juicy watch time so please go check that video out if you need to go to the nitty-gritty I'll go high level what you need to do but really just going to focus on the process of actually you know building a extraction to bring all of our data from an MS SQL database into a snowflake database and how we're going to use dynamically we're going to do it dynamically so we're actually going to be using the MS SQL operator kind of so because Ms SQL is so weird you can't really actually use the MS SQL operator as far as I can tell what you have to do is actually use an odbc hook into it so what you'll see here is you have the odbc hook here to use it you'll need to import you know the ODB silk from airflow providers pip install it or add it to your requirements file in your Astro local or airflow local installation and install it that way and so we'll be using this and then the Astro SDK merge function so what this will allow us to do is instead of needing to transfer the data into intermediary location a staging database before we upload it into snowflake this will allow us to directly transfer um our data from that SQL database directly into a snowflake database so super useful function here that just you know eliminates the kind of need to Middle around x-coms and all that um and just do the natural thing which is just transfer directly into our database so we'll do now is switch over into the code View and I'll show you how to build this um so before we actually get started building our dag you're going to have a lot of things you're going to need to install and some of them might not be that intuitive so number one you will need your odbc driver you'll need to have the snowflake provider installed the Astro SDK as well so we'll add that as here and then I'm running this locally using the Astro CLI don't have to be all this is open source but one thing that you will likely need to use is an older version of airflow to actually be able to run Ms SQL I've noticed with the more recent versions because the version of python has been upgraded um it no longer really works however you can set the python version for your airflow environment if you're using Astro by just going you know python 3.8 and setting it that way because I already have this set up to work and it is incredibly finicky I'm just going to use the environment I already have built but that's how you'd want to do it if you're doing it yourself and then again you can go through it's on my GitHub as well astronaut Yates where you can download this command but we're basically installing a bunch of different packages from Microsoft directly because they aren't accessible otherwise again connecting to Ms SQL is like a exercise in just pain um but you have to install a bunch of different uh software you can obviously just exec into your containers well and install these but we're going to curl just a bun uh Debian odbc drivers everything will need to actually connect to an odbc database you can see pip install I have a SQL via here so that's why it's not or I'd never my requirements file and then you're also going to install the odbc drivers which you're doing there Ms SQL importing the MS SQL operator so this means that we're not actually need to add in a requirements file we're going to just add it via the stock file and yeah I know it's unintuitive but it's just kind of what you need to do it's I hate it as much as you do I promise you and so here in our packet or in our package Imports and our deck so just create a fresh dag file migration dag you'll also need to import the odbc driver so I forgot to add these um oh actually no I did add these okay cool yeah sorry I don't know having a little flash there uh so you'll need to import obviously snowflake operator table emerge from your Aster SDK uh pendulum daytime just for proper daytime and then obviously dag as well hitting your limited times in there twice I'm getting sloppy today I guess so after that we're going to do and this is kind of what I did that was a little funky so you might if you don't want to if you're having issues with the odbc connection um you don't need to do this step you'll just need to manually create your tables within snowflake but what I did here was add a step that I thought might be useful for migration where it's instead of you needing to actually create all those within Snowflake and then point um you know it's just double work basically we're creating all the corresponding tables within from Ms SQL into snowflake so what I thought would be helpful is if hey why don't we have a task that dynamically reads in all the tables within your Ms SQL environment then creates tables within them in Snowflake and so you can see here that's what we're using the odbc hook to do so we're using our MS SQL connection we're using our odbc hook here to get records um figure out where columns are there uh you know Chase take all the rows so select column name data type from all uh from that schema of the table which we'll I'll show you how we're feeding in in a second and then return a create statement that will create a table within snowflake um that corresponds in terms of schema to Ms SQL so just a neat little thing there you

don't have to do that but I thought it would be useful then here we have tables so just a list of whatever tables you're going to be transferring between the two databases default args so owner start date just to keep them separate and then we'll create a dag so msql snowflake uh default RX default RX schedule interval equals none because you're probably going to use this once right you're not going to be constantly migrating data unless maybe you want to in which case schedule two every day the choice is all yours um so now that we've got our dag object we'll do another thing that's fun which is use Dynamic task groups so here for every table and tables we are going to and this is going to have the effect of looping creating tasks dynamically for us so here we have create tables so here task ID F create table and snowflake snowflake operator and here we're referencing that create table python function feeding at the table from our Loop for all of our tables in this array and then using that to create a corresponding table within snowflake relative to the one within Ms SQL so this is just a step I came up with to hopefully save you some time you don't need it at all if you wanted to cut it out you could just you know remove this step and just only use this task Loop in which the only Next Step we'll really need to do is is just the AQL merge function so the Astro SDK is compatible with Ms SQL and MySQL so you should be able to use this I test this which is the local installation so that might remove a lot of the barriers but it works and so here we have a source table where we're connecting to our SQL Server database Ms SQL and then we are setting a destination table which is our snowflake database you'll set your snowflake connection via the UI and then what we'll do in upload is just set a use the Astro SDK merge function to merge The Source table and the destination table and what the merge function does we'll just bring in any data data from The Source table into the destination table and if there's any duplicates it'll just overwrite those but you can change that behavior via flag on that so you're not restricted to just the overwrite behavior using the merge function and then if you don't want to use the Astro SDK for whatever reason there is another way you could kind of do this so here what you would do is instead of using this kind of fancy I got a little fun with it because I thought this might be interesting way to do it but you could also do it a little bit more boring where what you can do here is just use the MS SQL operator and so the reason I use the odbc hook is because the MSC cooperator is incredibly hard to get Cooperative it just like doesn't take connection strings properly so the odbc hook is a little more reliable it's just generic but what you can do here is similarly for every table extract select all using Ms SQL operator and then reference your but you could just reference to create a table that it's extracted from a SQL create a table within Snowflake and this is where you might need to just create a list of tables so by default this is just going to cycle through the list and just create empty tables they don't have any schema so you could theoret in like this obviously isn't best practices but you know if you upload data into a snowflake table it doesn't have a schema or columns defined you can Define it to actually read that in interpret the columns on creation so you don't have to define the schema manually so here you just create table table and then insert into table values from and then here you could right let's say extract um and yeah this is where you could you know basically use x-coms to pass data directly from the extract and that SQL task into your snowflake operator and so in terms of other things you need to do to actually have this run you'll just need to have a snowflake connection so here snowflake I call it snowflake default and then you just need your uh whatever schema you're using so public uh login password your account name and make sure you do or so you now have to do org account name for this and then you'll put in your database DB um and then your region is no longer necessary but your role is more necessary in my in my experience um so just something to note it snowflake I guess kind of changed it up and then so in terms of connecting the reason I brought this up uh instead of actually the airflow connection screen is just so I can kind of explain what you need here what you might not um so your host you're definitely going to need your schema even though this is optional you're definitely going to need it doesn't really infer schema well for Ms SQL login name password acquired Port definitely required you're probably going to need some extra parameters and so if you go on my and so if the MS SQL route doesn't work for you another option is swapping out the parts that use it to just use a direct piodbc connection where you just read in your uh information dynamically so here you know you have to set your username password so you can see it set it like that and then generate them at runtime because again the msql actual like default connection is incredibly finicky doesn't work and so here you just replace so in my migration dag um you would replace this odbc hook um and instead just hooking using piodbc uh and then execute a query uh basically just kind of wrap this in a query format and have it be two lines and then you would just probably see connect to Ms SQL here instead of using it from the UI and so yeah right instead of here and yeah that is all I have for

you today so please go check it out I hope this helped the user that actually requested this if anything's include if you're any issues please hit me up and let's forward some of the other if you have any other examples or use cases you'd like me to go through hit me up and I will add it to schedule so have a good one data guy out

Transcript for: Microsoft Fabric in Hindi- Notebooks: Essential Functions for Analysis| Describe, join, groupBy

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Transcript for: Interview Fails: "What is SQL?"

the number one thing not to say during your data engineering interview I don't know SQL SQL is the backbone of data engineering saying that you don't know SQL is like saying that a chef doesn't know how to use a knife even if you're not an expert show that you're willing to learn and improve mention any projects that you're working on to enhance your SQL skills

Transcript for: Microsoft Azure Weekly Update - 7th November 2021 - IGNITE FALL 2021 Edition

hey everyone welcome to this week's azure infrastructure update it is the 7th of november and it's the week after ignite so this week i'm going to try and cover all of the key ignite announcements related a lot around the azure infrastructure kind of space there is the ignite book of news that goes into all of the details and links to fantastic blogs so i've got that in the description below as always this is useful a like subscribe comment and share really is appreciated and please hit that bell icon to get notified of new updates now before i get into that i wanted to just say thank you because we hit 80 000 subscribers so that's obviously a huge thing and i really really appreciate all the support um for helping me kind of get to that number i'm gonna do another ask me anything session that's gonna be on the 10th for november at 8 00 a.m so again if you're subscribed you can kind of go and see that and again the links here so you can go and join me um bring your questions just have some fun as always i've got the chapters to all the different updates we're going to cover kind of you can click on them right below there or they're in the description as well these are just kind of the high level ones because i just can't fit them all on the screen but again if there's particular things you're interested in you can jump to that you don't have to go and sit through the whole video so

new videos uh i did a near four hour a z 104 the azure administrator exam cram so i already go through all of the different content and to go with that i created a playlist that's built off of my azure master class but also added in some other videos to really fill out and give you as much information to help you take that certification so let's get to the new content so from a virtual machine perspective they announced some new v5 skus so this is both the dv5 and the ev5 so these are based on the latest generation intel z on the third gen and it's about a 15 increase on performance um up to 96 virtual cpus there's also a kind of d a and an e a which is built on the amd kind of epic processes again the third gen for both of those they have kind of um versions with and without um temporary storage remember the d series is kind of general purpose so a pretty even balance of cpu and memory the e is a more memory intensive so a bigger ratio of memory to those virtual cpus e is very good flight databases for example now when i think about databases they also announce this eb [Music] v5 and what's happening here is these new skews they're in preview so they're built on the same kind of third gen xeon processors but these are actually going to deliver kind of like a 300 increase of storage performance over kind of the ev4 so if you think ordinarily um about how we get different types of resource so ordinarily i could think hey if i had the idea of kind of cpu and memory and then storage iops and throughput that the line kind of goes like that what they're doing for these kind of eb series is the storage is going up much much bigger because if i have kind of database workloads hey sure i might need the e series for the higher memory to cpu but i actually need more storage throughput and iops than i get even with the e series so the whole point of these eb versions is they're going to have much higher iops and throughput you might say well there's the l series why don't you use that well the l series remember also has that local nvme storage maybe i don't want that i just want higher iops and throughput so the biggest eb5 is actually going to be able to go all the way up to like 88 000 iops and um i think is it two and a half thousand megabytes per second but that was i think the e32 they talked about but i think the very biggest size they're making available they've talked about 120 000 iops and 4 000 megabytes per second so just a single vm will be able to go up to that which actually is going to match the new ultradisc maximum throughput so huge huge iops and performance possible there they also announced the dc um v3 series so remember the d series is all about that confidential computing it has that intel sgx the software guard extensions that lets me write applications to hook into that secure enclave and the big deal with these v3 versions is that enclave page cache the epc is actually 1500 times bigger now so i can have applications with much bigger amounts of that secure enclave memory i think they're like 12 times the amount of regular memory up to 48 cores things like azure kubernetes service will also be able to leverage this there's a new vm selector so the vm selector is all about an experience where hey i can actually go in there's so many different vm skus well what one should i be using so now you can kind of go in and say okay i want to do it by workload type by os and software based on certain regions and then it's just going to ask you different questions you're going to go through this experience and it will help you pick the right type of virtual machine also so we now have the vmss flex has gone ga so remember the point about this is a virtual machine scale set is always about before it was uniform so the point of vmss is hey i have this virtual machine scale set and with the uniform option which is kind of what we were used to we had some kind of template we had some configuration and we could have kind of manual or auto scale and it would just kind of stamp those out well with the new flexibility this flex option what we now have is kind of some of the benefits of availability sets availability zones but i just go and create this flex and then what i can do is i then go and add vms into it now the benefit here is with the uniform model those vms are all the same the same skew the same template everything else with the flex model i can mix and match i could mix windows i can mix linux i could mix pay as you go i could mix spot virtual machines and because it's regular vms i can still get direct access to those individual vms i add into the flex but again i get some of those benefits around hey availability set maximizing over fault domains even long-term availability zones if i want this idea within of stamping out instances i can actually within my flex so i can mix it i can still create a vm profile so a vm profile can still be hey some template some configuration and it can then go and stamp those out as well combined with the vms i'm just kind of manually adding into it so this vmss flex option is really cool i'm now kind of getting some of the benefits and the best of both worlds so that is now generally available i go and pick the option i want hey do i want the uniform model we used to but they're all the same or i can now do the flex model where i can add vms into this set but still also i can have that profile if i want to automatic guest patching has gone ga so this is for windows and linux and it's built around critical and security classified patches it runs every couple of days it follows the normal availability first principles so if

i've got paired regions it's not going to do it at the same time if i have availability zones it's a z by a z and based on the region it's going to try and do it in off hours checking success rates etc etc but now if those windows and linux i can get a very easy guest patching experience and then trusted launch has gone generally available so if i think about windows i have that idea of hey measured boot signed boot etc well now it's bringing this to my azure virtual machines as well from the bootloader to the os kernel to drivers is kind of checking the signatures of all of those components now because i'm using that idea like measured boot that hooks into hardware it has to have a virtual tpm so i have to do this in a generation two azure virtual machine that gives me that uefi base and that virtual tpm but then at time of creation i can turn on trusted launch and get that validation of that entire process again this is i was talking about windows hey secure boot and measured boot but it does also apply to linux virtual machines and here it talks about the vms that are supported for this and the operating systems that are supported as well and i think it probably does talk about the virtual tpm and the gen 2. so there we go it mentions the whole idea of hey i have to have that gen 2 vm for this to work which is why it's only certain virtual machine skus kind of the newer ones that have that uefi base option so we can actually leverage it so trusted launch now ga and azure auto manage has a number of improvements so this is that idea that hey it's iaz but i almost want that paz like experience in terms of me having to do things to the operating system so what they're really building is there's all these different services in azure like the patching like backup light configuration so it's really building on those so i have now things like hey for those virtual machines and auto manager on azure hot patch that ability now to reduce the number of times i have to reboot i can just apply the patches and hop patchy into the os so i can apply them quicker because i don't have to find a time i can reboot things like for secure file access is smb over quick quic so quick provides an alternative to tcp it basically creates this encrypted tunnel over udp 443 which is very nice over the internet so now i can do smb over untrusted networks there was things like um preserve on-premises ip address this uses kind of these windows server 2019 instances on-prem and in the azure v-net that creates this bi-directional vxlan tunnel that now lets me take my p addresses and have that same space defined in a virtual network and i can kind of bridge that gap so a whole bunch of nice improvements there aks now has nat gateway integration remember that gateway is all about that outbound traffic and doing that snapping it has lots of ip address we don't get pull exhaustion well now as part of my aks provisioning i can also provision and configure nat gateway that can really be useful if i was using like a standard load balancer for my ingress well by default if i don't do outbound rules i can't get to the internet well now i could use a standard load balancer for my ingress and define a nat gateway for that internet based egress saves me having to configure it manually azure service operator v2 has gone ga so when we think about pay azure resources aks is obviously kubernetes it's great for having my deployment yaml file to deploy things into my kubernetes environment but often there are azure things as well i want to complete the solution so what this azure service operator does is let me actually create azure resources via my yaml deployment file that i send to kubernetes so it gives me a really nice seamless provisioning experience so what this v2 has it has improvements around faster support of new resource types that get added to arm i can view the state of resources in azure i get a nicer view of the resource state new dedicated storage versions and a bunch of other stuff but really this is all about letting me create azure resources through the deployment yaml files i send to aks also when i talk about this azure service operator it's now super simple to deploy via vs code there's essentially now this extension that i can use in bs code i give it the service principle and i can get that deployed out i can now stop and start node pools so aks has had that ability to stop and start the cluster now i can actually do it for individual node pulls in the past what we would do with node pools is i would scale it to zero but then i've kind of lost the configuration i had like how many instances there were with this i can stop it and then when i start that node pull again it's back to where it was before i performed the stop so i'm not losing any kind of configuration or status and this is by the az aks node pull stop start command today dapper extensions are in preview so i'm actually going to talk about more about daphra in a second so dakota is this super interesting thing really when i'm designing microservices and when i design microservices there are things i want um secrets a stateful store service discovery network features traffic splitting there's all these different things that maybe as the app developer i don't really that's not my expertise so dapper brings this great portability and abstraction for me i can have different parts of my micro service written in different languages it abstracts it all the way to a set of standard http grpc remote procedure calls but a new modern very high performant version dapper does all that for me so now through this extension i

can get that provisioned onto my aks cluster super simply so now my developers can start building on top of dapper which is just runs as a side car on aks so it's another container in my pod and i can start using those standard means i don't have to worry about all the little implementation details and then the secret store csi driver has gone ga so that's the container storage interface to which i can create many many different types of interaction with this now my secrets my keys my certificates in azure key vault can be exposed to my kubernetes environment just like it's part the file system so again it abstracts me having to know about aks or how i interact i'm just viewing it like any other part of the file system which greatly simplifies all of my interactions open service mesh add-on went ga so open service mesh is built on kind of that cncf envoy solution so again that's another sidecar in my pods and actually dapper hooks into this as well and what i get is a lot of very powerful capabilities around my networking again if i think about microservices in my environment and needs i have i might want to encrypt the traffic between them i might want to change routing for a subset of the traffic maybe kind of like blue green or a b splitting i might want rate limiting i might want to allow traffic block traffic mirror traffic well i get all of that with this open service mesh in addition to great telemetry and actual insight into it so this gives me again another really easy way to get that deployed into my aks environment there were also updates around sort of j2e java enterprise edition on aks weblogic websphere liberty so you can go and check those things out as well so on to more general compute so cosmos db has a new connector for logic caps so with these connectors it makes it very very easy to do things like triggering so hey the cosmos db change log has something written to it i can go and trigger a logic app in addition to binding so i can perform other types of operation against it all of these are super super high performance and then they announced azure container apps so actually container apps is kind of a super interesting and this kind of brings a lot of that kind of dapper and other things together and i'm just going to talk about this in a little bit more detail than maybe some of the other things so if i was to think today about containers in azure so remember we have some idea of a registry so we have a container registry and we have some image now obviously i need to run that in something so at a very simple end we have things like azure container instances so i can create multiple azure container images that are going to run that image because an azure container instance is a instance of a container it's running in kind of this hidden managed vm it's kernel level abstraction but it's kind of dealing with them one at a time i could trade for them but i'm doing all of those actions kind of manually at the other end of the scale we have things like azure kubernetes service so we have this very powerful azure kubernetes service it has kind of that management control plane that's just done for us it has things like the api server and then what we have is a whole bunch of nodes so we have a whole bunch of nodes it has things like the cubelet that talks to that api server there's certain amounts of management and understanding i have to have with that now we get great features like the horizontal pod auto scaler so as pods maybe there's different types of triggers hey i can scale those things out i can also do a cluster auto scaler so i can modify the actual number of nodes i have but there's a certain amount of knowledge i need to have hey i can even actually use aci for a virtual cubelet but if i'm designing like microservices and i want like a serverless a true serverless but with some additional functionality well this is where this brand new we'll use the universe pen you know i say that for special occasions we have this new idea of these container apps oh that was weird let's get back to that so this new idea of my container applications so this is now all about hey i just have these micro service deployments i want so what i actually do with container apps is i have the idea of an environment now that environment deploys to a virtual network it has its own log analytics workspace and then within that i could absolutely just create regular containers i could absolutely just have the idea of hey i have some app revision and it has a certain number of instances of that container it has built in things like peta sakida is all about that hey i want to do these kind of auto scale type capabilities so i can think i've lost my board again so i can think about okay i want to do this event driven auto scaling it could be it's based on maybe a number of requests coming in i could think about it's an endpoint type service maybe it's an event driven service so hey i want to do it based on some kind of cue depth maybe it's just performing some background processing so it's based on some kind of resource so there's different ways i can scale but i can scale from zero i is it can scale to zero it's a true serverless option up to some maximum i specify so i could just take a container i can run it in this thing i could use cada it's optional for the scaling but if i think about hey i'm really creating this micro services solution remember i talked about all those challenges we faced so what we also get with container apps in addition to cada that kubernetes event driven auto scaling is we get dapper this distributed application runtime and that's what adds all these features

like the publish subscribe the secret store the persistent state management binding to other types of service storage out there help service to service communication i might have another part of my service kind of this app too that has its sets of things that are scaling independently well dapper makes it easy to talk between them to discover it will automatically encrypt between them i can do the traffic splitting and again i just have these standard http grpc based methods of communication that's just part of container apps it's built on kubernetes behind the scenes there's kubernetes but it's completely hidden it's abstracted away this is just now providing me this fantastic experience i'm just going to deploy revisions so i can have multiple revisions on different versions of the image maybe offering a change to my api spec multiple revisions running within here and i don't worry about kubernetes it's a complete serverless solution that has the great things like heder and dapper and on envoy just natively available to it so that is now obviously in preview you can go and start playing with that but i think this is going to be a huge thing and they did a really good article and i've got it linked below that kind of talk about hey aci versus container apps versus aks versus app service and kind of the benefits and where they really play and where i might want to use one and potentially over another so you can go and check that out but i think this is going to be huge when we think about all the micro service stuff we actually have uh happening right now um acr connected registry for iot edge so if you think about the azure container registry i just drew about images well iot is obviously really powerful that i have things maybe an on-premises somewhere else and i have things in that container registry yes they can be container images but there's other types of oci artifacts that i might have in there as well so this connected registry i can essentially synchronize down to a local registry so some ed registry that i can then use through the things in my edge environment so it's a great way to on some schedule to synchronize the objects that can then be used by my local iot edge resources for their deployments azure app service now has regular diagnostic settings so just like other services now app services i can easily send different types of log to storage accounts event hub log analytics etc acev3 now supports windows containers remember ace v3 is that dedicated deployment of an app service there's no shared components it goes into your virtual network the great thing about the v3s it's kind of this magical hidden network we don't see but it uses that for all of its management purposes so i can't break it anymore by adding udrs or nsgs the only thing going through my v-net is the actual application trafficking it performs faster they got rid of the stamp fee and now we have windows containers as well and then logic app enhancement so there are a whole bunch of changes there's an improved kind of design experience the flow the arrows have got kind of better information sql server is now a standard storage provider and there's a whole bunch of other features that you've probably seen across a variety of workloads where you kind of see this option to do a task if i quickly just jump over so if we just look at one of these things for a second uh if i just really pick anything if i look at i want to find a storage account actually if i quickly look at a storage account and i can't remember what the icon for storage account looks like getting old there we go storage account if i just go and look at a storage account for a second and that's taking its time to load then my other subscription will be faster so there's a storage account so often what you'll see is these tasks so you kind of see this tasks automation now the exact tasks gonna vary depending on the type of resource but this is essentially a logic app i don't know what's going on everything's going slow all of a sudden but for example here i could have things like hey delete old blobs and that's going to go and create that logic app for me so there's these built-in things now for logic apps to actually go and leverage let's see if one of these loads a bit quicker of course i'm trying to demo so if it's going super super slow but ordinarily you would see tasks i don't know what is happening there but it enables me to now go and easily create those kind of logic apps we actually have so you go i can do add task and it would show me the different types for those different types of resource but i'm not going sit and wait for that i have zero clue what's actually happening today knows i'm doing a demo so it's gonna try and mess me up completely thank you oh there we go so i can select a template and it would kind of carry on moving on um azure stack obviously azure stack has got a whole family of things you've got azure stack hub kind of the big turnkey appliances azure stack edge those kind of single unit things that have different characteristics some have gpus fpgas but it brings certain azure services to the edge it's on my premises hci where it's multiple boxes running special versions of windows server and hyper-v windows admin center storage space is direct so it's hyper converged using local storage and then hooked into a lot of azure services and then arc obviously bringing azure outside of azure so azure stack hci now has azure virtual desktop support in preview so now if i have my hci deployment i can actually get windows 10 windows 11 based azure virtual desktop

running on that environment and remember one of the unique things about azure virtual desktop is multi-session for the client os multiple people connecting to the same client instance i get that on this solution and then they announced kind of vsphere and azure stack hci arc integration for vm and i've got create delete but it's actually a lot more than that so i kind of talked about what brings azure outside azure so if i think for a second we talk about azure i'm going to use my universe pen for that if i think about azure what is azure well azure is really capacity and then on top of that capacity we bring various types of service that could be a vm it could be kubernetes it could be databases it could be machine learning it could be app services kind of the list goes on and when we think about azure well it has kind of that azure resource manager as that control plane and then what azure also brings is a whole set of kind of management capabilities i obviously get things like tagging i get inventory i get policy the list goes on backup config etc etc security services well now i could think well actually you mentioned the word capacity i have capacity on premises and maybe in there i've got vm so i've got os instances that's windows or linux or maybe i even have some other cloud and aws or google and it has capacity so the whole point of arc is well you have this idea of arc enabled kind of infrastructure so i can think about hey we have arc now that brings these capabilities hey into os instances also i could have some cncf compatible kubernetes or i can bring arc on top of that as well then i start bringing these azure capabilities like policy like the security service like the inventory like the tagging that single control plane now extends to my resources on premises in other clouds i get things like git ops hey i can point this to a git repo and as i make commits to yaml files it will pull it down and apply them but then what arc does is once i've got this kubernetes layer then we get arc enabled services so again this could be in other clouds it could be on-prem now i can get things like the database services machine learning app services layered on top of that again in any of these kind of locations so that's arc but what they're now adding is kind of this arc enabled virtualization so now i could think about the idea well actually i have that capacity is actually kind of v sphere or it's azure stack hci and what now arc is actually going to do is basically have this deployment into those environments talk to those apis so now it can actually talk to the hypervisors that virtualization layer and through azure these environments will show up as custom regions i will add so i can say hey in azure deploy a vm to vsphere in wherever my location is and that'll actually go and create the vm stop the vm start the vm delete the vm change the configuration of the vm that's now being brought actually to our environment in preview so that's kind of that big announcement there um arc kubernetes container insights is now ga so again bringing those curated sets of views around performance of the hosts the pods nodes all of those different things is now ga so i can bring all those great insights and visualizations and query capabilities to it and then hci arc enabled by default so i could think about hey if i have my azure stack hci arc is just now going to be enabled by default on my environment and arc machine learning inferencing is available so again all these great services on the networking side so announce this kind of gateway load balancer and i was like if you follow me at all you know i love the networking stuff so this is a super interesting solution to a problem that's been there for a really long time so if i think about network virtual appliances so we had this challenge so we had this idea that hey i have some workload that sat behind a load balancer and it's maybe my application well actually i want it to go via some virtual appliance so i would have my kind of nva and we want multiple of them so we're resilient well we would give that kind of the exterior facing but it would also need an interior load balancer to get return traffic and we had a lot of problems we got a lot of problems because it was different load balancers getting symmetric traffic flow iv traffic comes in well i can't have it going this way in and then that way out if they're stateful it wouldn't know it so we often had to kind of run this ugly active passive thing after a whole bunch of user-defined routes it was really not a pleasant experience so what they've done is now i have my load balancer with my app behind it just as we did before this can be external and what we're now going to actually do and i'm going to use my universe pen we're going to say we like this thing i create this new thing so this is now my gateway load balancer and behind that i'm going to have my nvas now i could have n number of these these can all be kind of active active active this could be built on vm scale sets it really doesn't matter i could think about this could be in a different subscription even a different tenant this is kind of the consumer of the service this is my provider of the service and what i'm going to do i'm going to chain this to this load balancer now i'm drawing this as a load balancer it could also be a public ip directly to some kind of vm but i'm performing a chain so now what's actually going to happen is really cool there's no udr's just this chain action the traffic is going to come in and this is kind of a true bump in the wire so this will send the traffic these mvas just have to understand vxlan so it's encapsulating it's doing a vxlan

tunnel it's encapsulating the traffic this just has to decapsulate it to look at the original source and destination ips do whatever it's going to do maybe it's inspecting it it might drop packets doesn't have to do anything else traffic will then just go back automatically there's no routing i'm doing and then it will go to some targets guaranteed symmetric flow and that's all i have to do there's nothing else like there's no udr i don't even have to have a peering this could be completely different v-net there's no peering between these virtual networks required it's all just going to be done by the chain so this is super super cool stuff and it's completely transparent like the source and the destination do not know this was in the network path it's a true bump in the wire so this solves all those challenges we had with network virtual appliances trying to make them highly available i did a whole video on highly available network virtual appliances this gateway load balancer is really a game changer and there's like 11 launch partners for this but you're not restricted to those you can absolutely as long as you have some appliance that understands vxlan go nuts that's really all that is required um network insights for vpn gateways and azure firewall went gas if i go to network insights i now get improved visibility into kind of um the flow of the resource topology there's pre-built workbooks there's direct links to documentation and troubleshooting just things to help you express route fast path has some improvements remember fast path is all about the idea that hey if i have express route gateway normally ingress goes via that gateway egress never goes by the gateway just goes straight to the microsoft enterprise edge at the meet me ingress goes by this gateway so it adds a little bit of latency so fast path bypasses that gateway so what's new is now traffic to peered networks also supports fastpath so even if the destination is in some spoke network i can still bypass the gateway now so i still get those improvements i talked about ipv6 private peering last week so i've already talked about that there's new ciphers and functionalities for mac sec from using direct port for that over the air at the meet me kind of encryption so there's some things around that as well express route private peering bgp community support so remember um a community is just a custom collection of ip addresses so what i can now do is i can create a custom community that represents my virtual network so i have these groupings of ip addresses i'm creating a community for the ip addressing of my virtual network and what's now going to happen is through the private peering to my on-premises my on-premises will now see that custom bgp community that i've specified for the v-net so we could use that for routing maybe for other types of filtering decisions there'll also be a regional um community added automatically based on the region of the virtual network but i can now specify when i create the v-net or to an existing a custom community and it will now be seen from the on-premises gateway and they can make various decisions on that bastion standard went ga this lets me do manual scaling i think from two to fifty um other things it gives you is an administration panel um i can enable disable certain features it supports rdp for linux it supports ssh for windows i can do custom inbound ports so there's some additional functionalities added there and azure virtual network manager has gone into preview so if i think about virtual networks with a virtual network often we talked about the idea i have multiple virtual networks well today i have to manually create peers between them i might have to have network security groups ie sets of rules to control the flow of traffic so what this new network manager does is actually a couple of different things for example i can now pick a connection topology so i have the idea let's say hey i have a whole bunch of virtual networks so what i can actually now do is it gives me the ability to create a network group so that network group could be based on i am manually adding them in or maybe it's based on some value of a tag some attribute so i can kind of create kind of a network group and i can target that network group i might say hey i want to deploy a mesh architecture so it would create peerings between every single one of them or i might say hey i want to deploy a hub spoke so it would kind of create those peerings i can even say hey i want a hub spoke and i want to be able to use the gateway so hey allow gateway transit use remote gateway but i also want to enable direct connectivity for these peers so they would actually go and create a kind of mesh relationship for those as well in addition to that we actually get the idea of admin rules so i can also create admin rules now these look a lot like network security groups so i could still have local kind of nsgs on these things but i can also now define these admin rules and apply them to that network group and these kind of apply first it's not an override but think of a a filter so these get applied first so if i was blocking traffic here or it's going to block it it won't go through but if i was for example blocking traffic at the nsg if i allow it at the admin voice still going to get blocked at the nsg so this is kind of a filter first and then it hits the filter of kind of the local nsgs so i could maybe have some admin rules set up high level don't allow offering port 80 out to the internet for example the other nice thing as well is so regular nsgs let me say like tcp

and udp these admin rules also let me say ah and esp so there's some additional protocol options i actually get with these admin rules but then again i can create these admin rules centrally and then target network groups so it's security and it's kind of helping me create all those peering relationships as well so that's the idea around the azure virtual network manager so that's in preview and you can go and try that out on the storage side so on demand disk bursting for large premium ssds amazon ga so smaller premium and standard ssgs have kind of a credit based bursting if i'm running below my provisioned iops and throughput i start to accrue credit that i can use for up to 30 minutes well now the discs that are larger than that let's say one terabyte and above i can pay a cost to turn on on-demand disk bursting and then i just pay for basically number of transactions i do beyond what's standard on the disk so i can use as much as i want because i'm going to pay for it i'm not time bombed it's not 30 minutes but it's not free i can now go and actually turn that on remember ultra disk i have dynamic ios throughput anyway so i don't need that also remember if it's going to be like a maybe a shorter term window with premium ssds i can also change the performance tier of the disk um separate from the capacity so we we actually have a number of different options now around our kind of iops and throughput that overall storage performance managed disks now have a live resize capability so now for a data disk i can actually make it bigger while it's connected to a vm and it's running now remember once i change the size of a disk i have to go into the os and then increase the size of the volume on that disk but hey i can add dynamically resize upwards you can't shrink disks i can only make them bigger cross region disk snapshot copy is now in preview so managed disks well they're lrs or zos they live within a certain region i can't do grs managed disks i an asynchronous replica to a paired region and snapshots live on the same storage as the disk so still not giving me a solution to get some sort of cross region capability what i can now do is i can create a job that will do a copy of a snapshot be an incremental snapshot it's only copying the changes to essentially a region of my choice so i pick the region and it's going to go and do that copy to that other region it does it as a copy start job and it's per snapshot so every time i create a snapshot i'd have to go and kick off this copy process i could write an automation to hey i see this has happened and let's go and trigger off a new copy start job to copy that to the other region but now i can get that kind of regional resiliency for my disc snapshots disk pool for abs has gone into preview i'm pretty sure i've talked about this before i don't think this really is new but this is the idea that i have my managed disks i have my azure vmware environment so remember that's running vsphere private clouds but in microsoft data centers well now i can take my managed disks i can expose them to those vmware environments what i essentially do is i group my disks into a pool there's now what is in previewer kind of these changes is i can have a higher availability iscsi target so the way vsphere uses this is it connects over iscsi which is exposed by the ball it's now support standard ssds before it was premium ssds and ultra only and there's a new pricing model as a new excuse me end-to-end portal experience essential key management for disks so if i was a bring your own key for the encryption of my managed disks well now i can actually have those keys in a central subscription a different subscription from the disks themselves so that's going to let me have a centralized subscription ease the management improve the security of the keys for those various disks i still have to have the key vault and the disk encryption set remember we apply the custom key to disk encryption set and then put disks in the disk encryption set start to be in the same region i i can't cross region for those things and it has to be the same azure ad tenant ultradiscs have a new 4000 megabyte per second um throughput ceiling so remember i talked about that new eb series vm the eb5 and its biggest sets of skus will support 4 000 megabytes per second well ultra discs can match it so i can now actually pump through 4 000 megabytes per second with those eb5s and the new ultradisc limit cosmos db indexing metrics so in addition to the existing query metrics i can now actually use these indexing metrics to optimize the performance so i could see both hey what indexes are being utilized but also i could see how these indexes are recommended so i could say hey this is how i can actually go and improve my performance i can now apply throughput spending limits so we have this whole idea of this provision throughput for cosmos db well now at time of creation or afterwards i can actually set a limit on what i want that throughput to actually be so if i was to jump over super quick if i go and look let's see if the performance improves for me here but if i just go home for a second and if i go look at my cosmos db and look at my little cosmos db here well one of the options we have remember is kind of cost management and what we'll now see is total throughput limit setting so we can actually say hey i want to limit it to a certain amount i can do no limit or hey what i'm actually doing is limiting it up to the three i'm using the free cosmos db account you get per

subscription so you select that and that's what applied that 1000. it's basically the same thing so it's limiting me now so i can really control what my possible spend could be so that's a really nice feature to control my spending it now has a partial document update if you think about cosmos db is consists of documents and ordinarily in the past if i was to update some part it would do a complete write of the entire document which obviously has a certain amount of time and overhead now if i'm only changing a certain part of the document well that's the only part that's specified in the update request it reduces my network throughput reduces the overall amount of work being done server side cassandra api retry so again we have the idea that i have a certain amount of provision throughput those request units well if i'm exceeding that what would happen in the past is it would just return a to nine hey you've exceeded it would fail what i can now do is on the server side instead of failing it'll wait a little bit of time and then retry the operation for me so now i don't have to do so much work it's essentially doing that retry for me rather than me kind of doing that in my code and there's now cost saving recommendations so as part of cosmos db it's going to look at different things like hey based on my usage patterns in the past it will recommend hey maybe enable auto scale if i'm using kind of just a provision throughput if i'm using auto scale hey maybe i should go to manual throughput instead because you pay different amounts for provision versus the auto scale so if i was super super consistent hey auto scale is probably not the best option just have this provision throughput instead regular database azure sql managed instance now has this link capability if i think about sql 2019 and sql 2022 i can actually now link it very easily to azure sql managed instance and what that gives me when i do that link it gives me this near synchronous replication and that goes into this kind of bi-directional replication capability and i did announce sql server 2022 as well but this link is super super powerful just for the replication but also for failover um capabilities azure sqmi has some performance boosts so it can use the new premium series hardware that third gen intel xeon i can get new memory per v core as a memory optimized solution for the hosting it supports 16 terabyte storage capacity now and i can also do windows authentication via azure ad integration so it gives me cloud support value to change my actual code azure managed instance for apache cassandra went ga so as the name suggests this is just a managed instance of um cassandra one of the nice things about this is it's running on top of vm scale sets it runs into my azure virtual network but if i have an existing cassandra ring i can actually add this to it to get a nice hybrid solution and flexible um my sequel should have wrote my there went ga so remember flexible these are the managed offerings that manage open source offerings in azure so before it was single server which is based on kind of this specialized container technology well flexible is actually built off of virtual machines it lets me use things like the b series so it can be burstable i can stop and start them it supports availability zones i can optionally had added high availability options so it has kind of an ongoing replica for an automated failover so really adds a lot of great capability there so now for my sql ga not postgresql yet azure backup it now has some metrics and metric alerts and metrics around backup successes metrics around backup failures and then obviously i can trigger alerts off of those by the standard kind of action groups we have with alerting but this multi-user authorization is super interesting this is really powerful if we think about ransomware hey we have backups well the bad actor comes in and stops our backup or deletes our backups so what we can now do with this is we create the concept of a resource guard now that resource guard can live somewhere else and it's going to have a completely different people who actually have rights over that resource guard so under no circumstance would my backup admins also own the resource guard but i'll create this resource card object um completely isolated different subscription it can even be a different tenant from where my backups are i'll give the backup admins read access to that resource guard and in the resource guard we can actually see this in the resource guide i can configure to what types of actions it will actually apply to so if i go in here super quickly and if i search for resource guard notice it's in preview so i could go and create a resource card and after i create that resource guard i can go and specify different things about exact actions it would apply to but once i've actually gone ahead and created it if i go and look at my recovery services vaults if i just pick one of these if i go to the properties if i could see it we actually have this option now of multi-user authorization and we can then link it to i don't have any but i could say hey i want to protect your resource guard and specify it so now what would happen if someone some bad actor came in and they managed to get a backup admins credential they couldn't stop the backup they couldn't delete the backup because they're protected by the resource guard to actually perform those types of operations i would have to get contributor rights to the resource guard so i might use privileged identity management but the

owner of the resource guard would have to grant me that and then revoke it after i've done that action so it's the ability now to really protect my backups from some bad actor who compromises the backup admin but again it's completely useless if you make your backup admins own the resource guard should be a separate set of people put it in a separate subscription and have a good process to actually grant that only when those different types of actions actually have to be performed miscellaneous so azure monitor action groups remember an action group is the thing i can call to some kind of event that happens a web hook an azure function a logic app email sms whatever well now i can also talk to event hub so pub sub other things might use that azure monitor now has a log analytics workspace data export in the portal so if we think about the whole point of that data export i can get this continuous data export a table level so there's no filtering it's just going to send everything and i can send that hourly to a storage account or near real time to an event hub well now through the portal i can actually see those different rules and gives me insight i can create edit whatever i want to do log analytics workspace insights went generally available so this is kind of insight into my insights so if i look for example at one of my log analytics workspaces just quickly kind of look at this so let's look at my workspaces so if i just pick i think easter s would be a good one if i scroll down i get my insights and what i get for the insights is you can see well great information about the workspace the volume ingestion over time what's actually happening who's using it and the different types of health the agents that it's talking to i apologize for my dog all of this kind of great information is now just available to me so that's there and available and that's ga open id connect azure ad and github action is in preview so before github actions is all about kind of hey i'm doing some things could be part of a pipeline but i can really trigger off many many things beyond just some commit action well if it wants to go and perform actions against azure resource manager i create things or modify things in azure before i'd actually have to have an azure credential stored as a secret in my github what this actually now lets me do is using the open id connect i can actually as the github i can create an azure ad app registration that represents the github actions and i don't have to store any credential so it gets rid of that secret i have to store in github but now i can go and integrate with azure resources through my github actions and azure automation manage identity went ga so about azure automation i can run powershell runbooks python we used to have the whole idea of these kind of run as accounts well now i can use managed identities if it's a cloud run book cloud job i can use both system assigned and user assigned if it's kind of a hybrid then i can only use a system assign managed identity but now within those run books i can say hey give me the identity and it can use that to go and talk to other things also powershell 7.1 latest and greatest is in preview for those runbooks um azure security center and azure defender have now been renamed microsoft defender for cloud there's a whole bunch of i think renames around this but now you'll kind of see that defender for the cloud and one of the big things they announced was this native aws support so now that whole cloud posture security management extends to aws i don't need agents it's going to use the aws native api to go and communicate there's like 160 out of the box recommendations across is and paths and different regulatory standards for aws so that will actually give me recommendations on that aws environment and things like the aws eks the aks equivalent um defender for servers i get all of those kind of capabilities available as well azure virtual desktop auto scale is in preview i definitely have talked about this in previous weeks but basically i can create this concept of a scaling plan the scaling plan consists of one or more schedules so different days of the week times i can have kind of a an off peak a ramp up peak ramp down behavior am i deploying things kind of brett fill them up or i want to kind of maximize usage of individual hosts i can set all of those different schedules as part of the scaling plan then link the scaling plan to a host group so that host pool will then get those schedules and apply them so again i can optimize my kind of resource spend for windows 365 remember that's that additional offerings just give me a cloud pc there's kind of the business for smaller environments and enterprises a whole video about this so the web client got enhanced faster load times higher performance i can bookmark cloud pcs local resource settings edit a whole bunch of different things enterprise now has native azure ad join so initially it had to be able to integrate virtual network and it had to be able to talk to domain controllers now i can just do azure id i don't require the virtual network i don't require domain controls i don't require kind of that azure stuff business had some updates as well um i can be a user a standard user or a local admin i can be windows 10 i can be windows 11 i can purchase and assign licenses and provision them all from kind of an end user portal and then obviously when i do use windows 11 i get all the windows 11 enhanced security the virtual tpm the secure boot the uefi there's a bunch of windows 11

marketplace images so all of that is there and there's a huge azure ad blog it's linked below i i cannot cover it all but the big thing was about resiliency so azure ad obviously they increased their sla to four nines they have this whole cell based architecture so azure id is now made up of 107 cells even the biggest cell only accounts for less than two percent of all azure ad traffic so with some failure it should only impact a very small amount of azure ad so that cell is rolled out it's there also backup authentication is being expanded so think of backup authentication as kind of the generate a backup generator for azure ad separate infrastructure it basically has stored some long-lived tokens so if azure id is down it can give out these long live tokens that it pre-caches by talking to azure id periodically and it was really based around sharepoint and exchange but they're extending it to things like webex so it's going to be able to use that backup authentication there were new conditional access features like device filters so i could target particular devices there were app filters so instead of having to specify apps in my rules i could tag an application and then if it has this tag apply these particular conditional access policies workload identities so i can actually now have conditional access for particular applications continual access evaluation continues to evolve that ability to not just pay a token's good for an hour there's nothing i can do i could actually say hey i want to register so if the user is d provisioned if their password changes tell me and i'll stop allowing that token if the user location changes hey i can kind of check in and know and not respect that token anymore so ability to make what it lets me do longer term is have longer-lived tokens so i have to talk to azure ad less normally but still react to things if they happen there were new identity protection checks things like hey token theft and non anomalous tokens and session cookies and i can export all those risk things by diagnostic settings and there are a whole bunch of other token changes and samoa supports and kind of checked the blogger article about that but that was it i know a lot of stuff uh trying to cover it kind of briefly as i can but still kind of make it useful what it's there for huge amount of work does go into kind of preparing these so please please um like and subscribe that's appreciated from me hope to see you at the ask me anything and until next time take care you

Transcript for: Working with Customers

As a customer wants several new features added to our product that require big changes to the database, but says he needs to know details of why the cost is what it is. How can I explain this to him without going into technical details? Oh, that's a great question. Um, so customers will ask me all the time, "Hey Brandt, I'm going to go deploy a new cluster. I'm going to go build new availability groups, high availability and disaster recovery. Can you quote me a price?" Sure, but we're going to have to work together for a couple of days to sketch out what your plan looks like to look at the existing environment before I can quote you a price. Some environments are really simple. They only have a database or two. The database doesn't change much. Nobody's put anything stupid into the system databases. Uh there aren't a lot of trace lags or linked servers. other environments are a hot hairy mess where they have all kinds of legacy stuff that they put in extended stored procedures. They're storing things in master that don't fail over. They have six gajillion agent jobs that nobody understands. So, the way that I explain that with customers is if you want an exact estimate, we're going to have to do a two-day review first, really digging into that environment and assessing the staff to see what parts they're going to be able to do out of the project versus what parts you want me to do. I would say the same thing with your customer. I'd say, look, off the top of my head, I'm worried that this is going to be really complex for me to give you specifics on exactly what it'll take me. It would probably take me a day or two, whatever your estimate is, in order to dig through the code, dig through the database, and make a list of the things that I would have to do. It may turn out to be really simple. I just don't know with any degree of confidence. Are you cool with me spending a day or two digging into this and documenting so that then we can meet up and discuss it? And most customers will understand where you're coming from there, that you're just not going to have those answers right off the top of your head. If you did, then it would be really easy. But sometimes even building the list of work like with what you're describing here is going to take

time. Somebody's going to ask how I handle that with customers in terms of billing. And it's flat out a billable charge for me to do that work with you. It is absolutely billable. That's not for free. Depending on how some customers do it, they'll say they'll give it as a or how some consultants do it. They'll say, say it costs $5,000. I'll give you that five grand back as a credit if you book the whole engagement with me after we've done our discovery. The way that I do it is I say, "Here's the price for those two days worth of labor." If at the end of the two days worth of labor, your staff believe that they can just run with the plan that we built together, great. Take that plan, run with it. Godspeed. You know, you've paid me. We've gotten the value out of this engagement. If you want to book me for the rest of the work, we'll have a detailed statement of work at that

Transcript for: Testing Concurrent Write on S3 Table Buckets: Can 10 Spark Writers MERGE INTO Different Partitions?

good morning everybody and once again welcome back to the channel in this particular video we are going to find out can Amazon H3 table buckets handle n spark writers each spark writer writing into a a a dedicated partition so for this particular test what we will be doing is we will have 10 spark jobs and then each spark job is going to do merge into a respective partition and we want to see at the end whether uh the data is able to make into uh those all the partitions right if all the spark jobs are running uh in parel we are going to find out so let's get started all right step one is we need an Amazon iory table buckets I already have provisioned it as you can see table buckets I have my table buckets over here so make sure you copy the Arn over here right so now the first step is we we need to create a a sample table right so what we will do I will show you the particular script and again you should be able to execute it locally so if you want to test it out go for it right try it out right so over here M the main function we're going to first create a spark session and then depending upon the parameter we're going to create an iceberg table uh copy on right right and then we're going to populate with the initial mock data so if you see create Iceberg table is a function uh there's a there's a there's a over here as you can see so we have ID site ID and message again the partition is going to be site ID and each spark job will write into its uh particular partition right it it's going to do the merge into right so first we just creating a table right now you will see I have set some parameters over here uh and these are important so for example commit retry uh commit. retry do number hyphen retries is set to 20 so whenever there are conflicts right I want them to retry right and I have also set up set up a parameter called commit. retry do Min hyphen weight hyphen millisecond is set to 30,000 so when conflict arise right I want to add that particular weight time so I have set that to 30,000 milliseconds of course and then again these are uh just basic parameters that I'm using so copy on right I set the compression to uh Z standard uh I'm using uh V2 version and the target file SI I've have set to that simple as that okay so what we will do uh first coming to my notes I'm going to run this uh python file create iceberg. py sl10 so this mean it will populate uh data initial data for 10 sites and it's going to create that Iceberg table for us on the table bucket so you will see that and again I'm running it locally I do not have an EMR so you should be able to run it you know so let's wait uh now it's writing the initial data as you can see over here if I can just zoom in 1 to 10 right and then you have site ID from 1 to 10 and you have some initial data right and if you go to the Amazon table buckets I come here we have a test table name space is default and that's the Arn so step one go ahead uh you know provision provision your Amazon S3 table buckets and create a mock table inside that now the next step is we need uh 10 spark jobs and what I have done is I have a very simple P spark job uh depending upon the parameter it basically will Loop uh uh for for the epoch that I pass in for example if the epoch is five it's going to say it's going to create a data frame first and then uh it's going to update the message to update one and the time stamp update two time stamp update three time stamp and so on right so if I show you this show you the script over here I take in the site ID remember uh if I go here right so each spark job has to write or do uh merge into its dedicated partition right so uh I I input the site ID because my table was Partition by site and then the epox right and then what this does is if I show you the merge query

here as you can see for EPO in range so whatever number of epoch I want to run this to right and uh for that particular site ID that I pass right it's going to do the merge into as you can see merge into manage Iceberg catalog this is a catalog name this is the name space default and this is a table name uh if I go here quickly over here right as you can see uh using right so I create that um you know input data that's coming in and then I'm going to join that on the ID and site ID if match update the message if not match insert it right simple as that and now I have a spark merge into. sh it's a shell file so what this will do is as you can see it will uh do a spark submit for uh uh you know uh it's going to create 10 spark jobs if I can again uh pull up the image so it's going to spin up 1 2 3 4 total 10 spark jobs because we have 10 sites right as you can see and uh then each site will basically run into Epoch right and for each Epoch it's going to update the message field right so yeah the looks looks good so now I think we are ready to fire this so CH mode CH mod plus x uh Spark merch dot uh not the this one I need to do the shell file okay cool uh clear the terminal do slash and now I'm going to start okay 3 2 1 and again you will see errors but again it's going to retry because of those configs right so so let's uh run this so I'm going to start this now uh all the spark jobs have started at this point uh and I have my Amazon has three table buckets here so we have done something like this right so each spark job will do a merge into a particular partition uh for the number of EPO that we gave right so so as you can see the jobs are running right all of them so let's wait and then we'll verify this by again uh reading the data from that particular table buckets okay meanwhile this is happening what I would like to do uh let me open up a a brand new terminal okay let this run on the background let me set my Java home and I want to read data from this okay while that's happening so as you can see the writers are still writing at this point right and now what I would like to do is I like to copy I like to first CD into this directory so the writers are still writing CD and I do three Python 3 I do read. py see writers are still writing but I'm also trying to read data from that right so I should be able to read right in theory let's let's verify whether it works so uh I should be seeing the data frame object on my console again as you can see over here right so uh all these sites have completed right as you can see these have also completed so site s and site one are the remaining one and I think they are being worked worked uh right now as you can see so I'm just going to wait for all these writers to complete my my my above terminal right once that is complete I'll again try to read data from it okay and two more OC 4 and now it should be complete hopefully there you go okay and now let's read and verify whether we are able to see all the data properly right want to make sure that all those updates uh came in right so probably I'm going to do a read uh over here now and let's see Perfect Look at that right so for each site we had the spark job which was doing updates in an Epoch as you can see update five update five update five and then the last Epoch uh time stamp right so what I'm trying to say is through this small exercise what we did we had all the spark writers which were doing merge into a dedicated partition on that particular Iceberg table and all those writers were able to update it of course there were conflict as you saw in the terminal right but uh it did read try uh because of those configuration that I that that that that we used uh of course this worked for merge on read as well I have tried it out so yeah I think this is a fun exercise I just wanted to share the details with you of course now go ahead I'll leave these codes in the description so you can run it locally you can try other things out uh you know increase the spark workers see the time how how long is it taking experiment with it right that's that's that's all I want to say with that being said keep smiling keep programming and I'll see you in the next next video