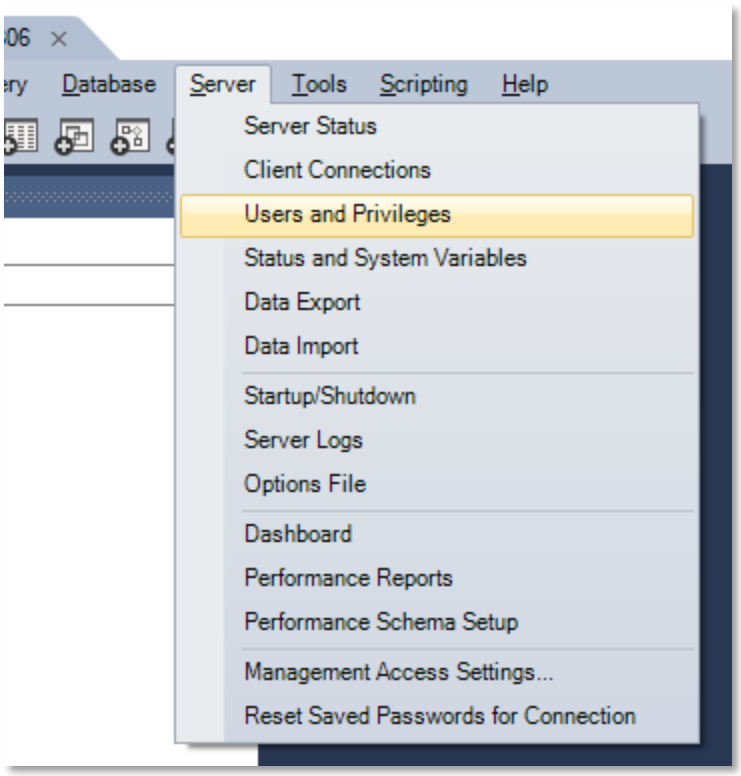
Use Case: Writing SQL in Excel

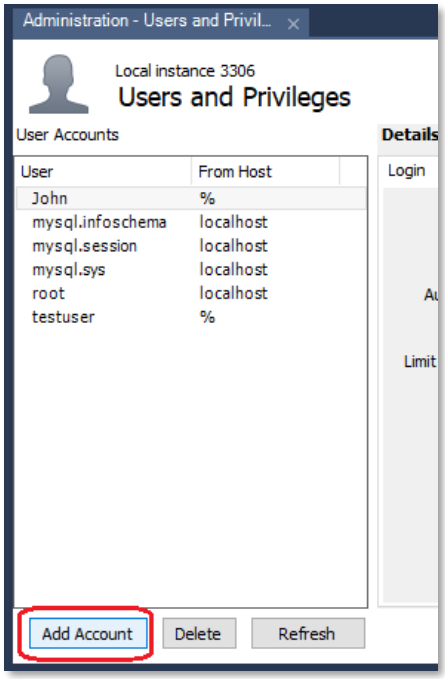
This is the Microsoft Excel SQL Use Case assignment option for CSIS-1550. Follow the instructions in Canvas to prepare for this assignment option and then carefully follow the instructions listed below. There are two screen captures for you to capture while you work through these instructions that you will submit for your assignment (pages 11 and 20 in these instructions).

Scenario: In this walk-through we will learn how to connect to MySQL from Excel so that we can write a query inside of Excel to extract data from the database for display and manipulation inside of Excel.

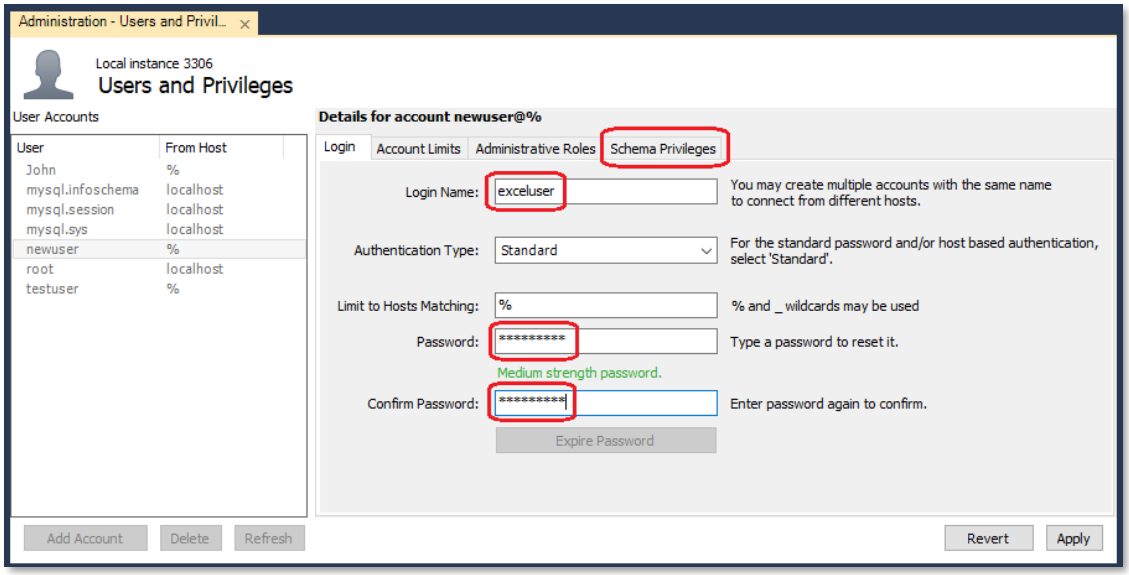
- You will need Microsoft Excel on the computer where you have MySQL and MySQL Workbench installed. If you do not have Excel, as a SLCC student, you can install it from here: http://www.slcc.edu/Office365 at no cost. Once you have opened that page in a browser, click the Install Office button at the top-right of that page.
- Next, open MySQL Workbench and open your local instance connection.
- Database software, such as MySQL, includes security to restrict access to the data. When an external application needs to connect to a database we often create a specific login into the database for that application so that we can control and monitor its use. We will do that here to demonstrate how database administrators set this up.
- In Workbench click the Server menu option and then Users and Privileges.



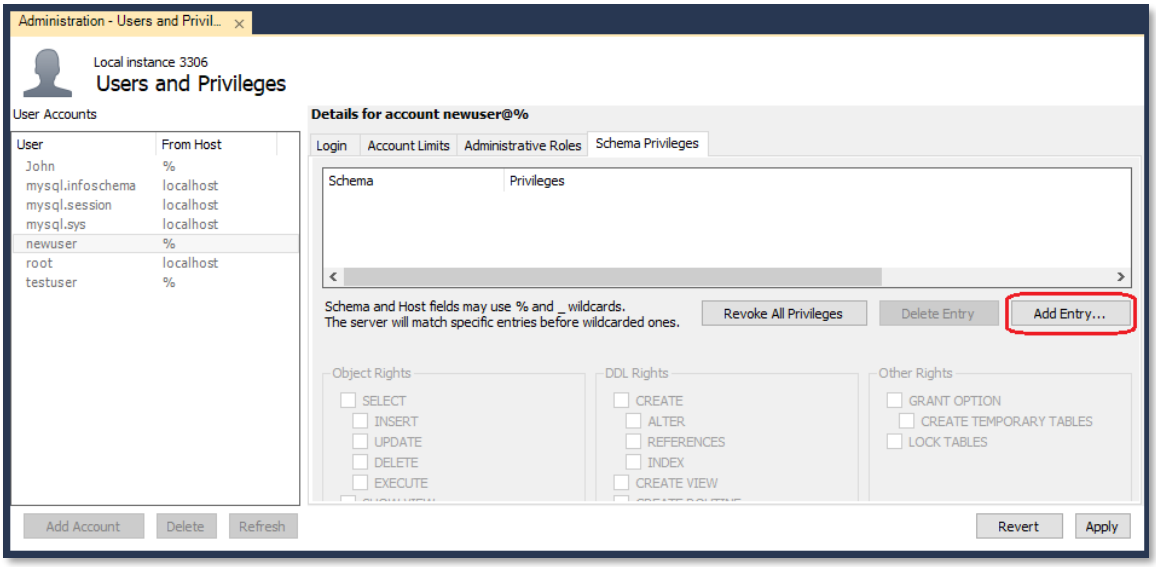
- The Users and Privileges tab will open.
- Click the Add Account button.



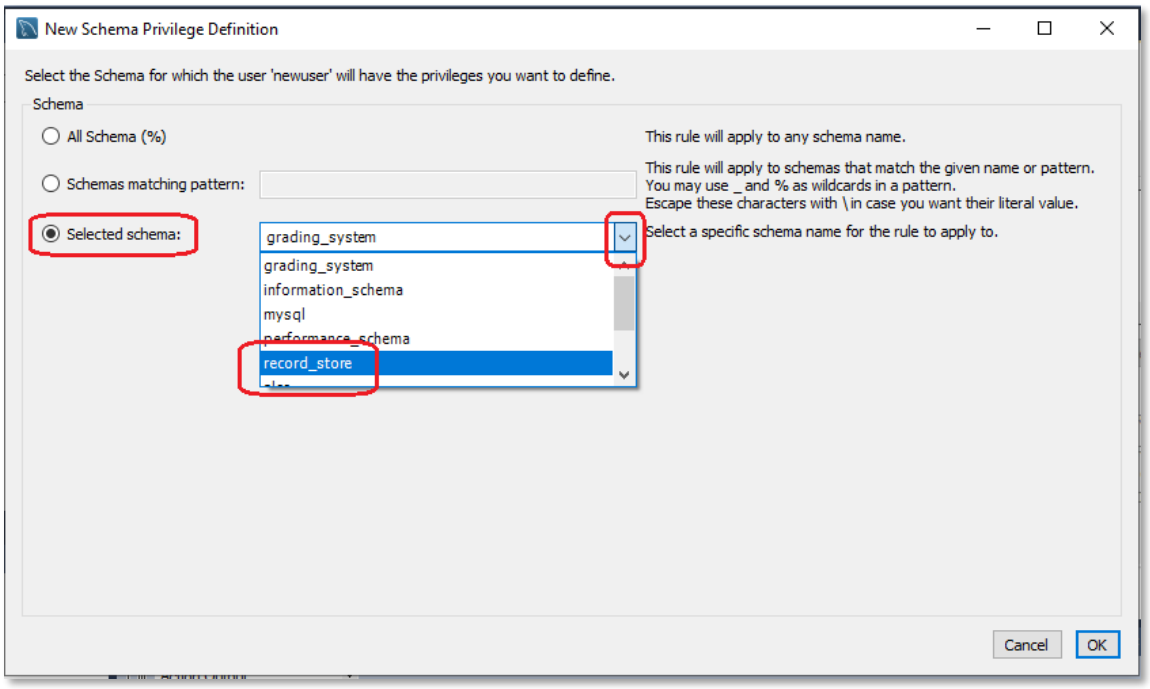
- As shown on the screen capture below, in the Details for account newuser@% area change newuser to a different user name, for this example I used exceluser. And then enter a Password and Confirm Password (the two must match).



- And then click the Schema Privileges tab.
- Click the Add Entry … button.

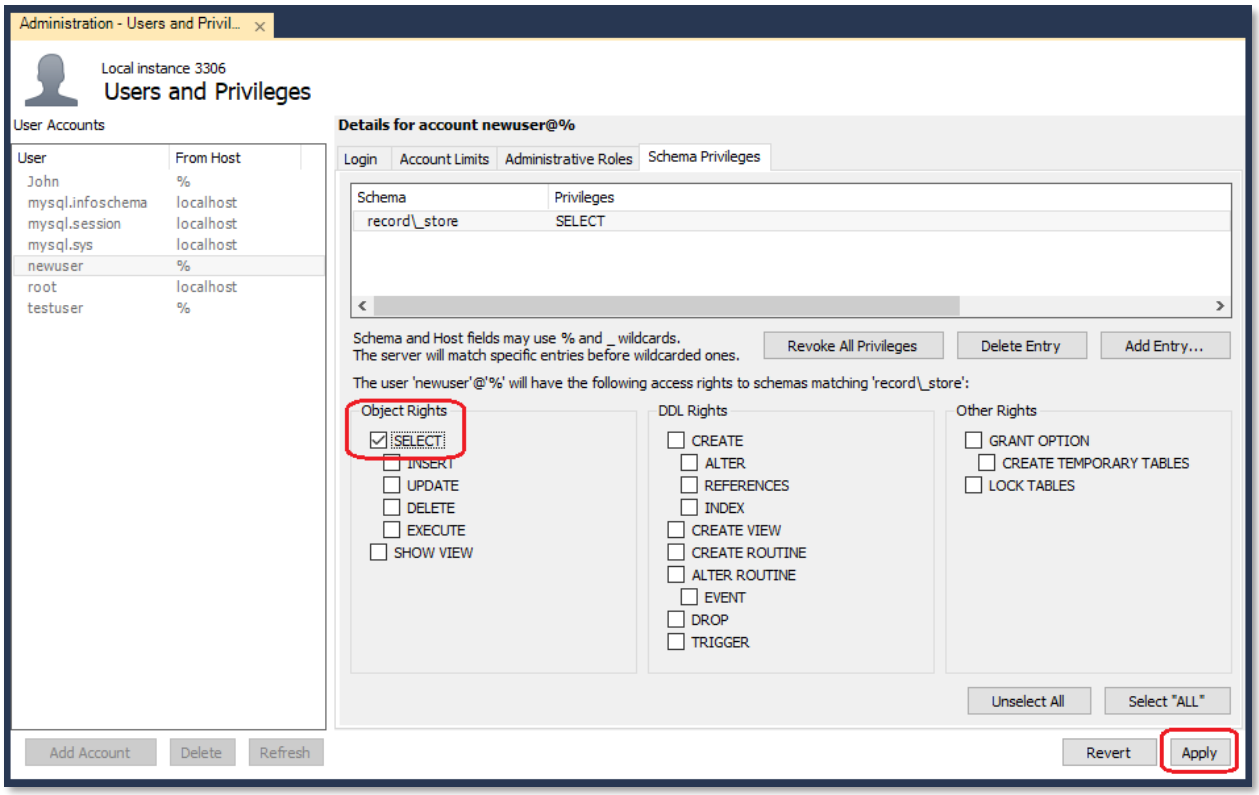


- On the next dialog select the Selected Schema button, then click the down arrow to drop down the list of schemas, select the record_store schema and then click Ok.

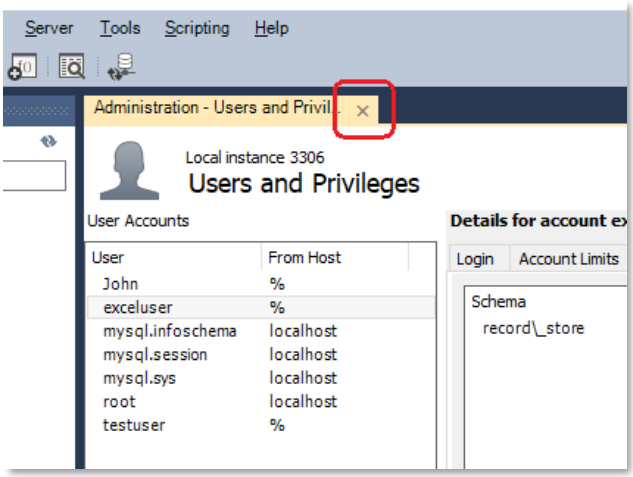


- The next dialog is where we set the specific privileges for access to the database for this new user.
- For this use case of accessing the database from Excel, in production systems, for the purposes of running a SELECT statement to visualize the data, we would restrict access to SELECT only. This protects the database from possible changes from this user.
- So, on that next dialog we would click SELECT under Object Rights and then the Apply button (see the screen capture below).

- Notice also on this dialog that we can set very specific access rights for a user and that the access parallels the different types of commands we've learned (DQL, DDL, etc.).



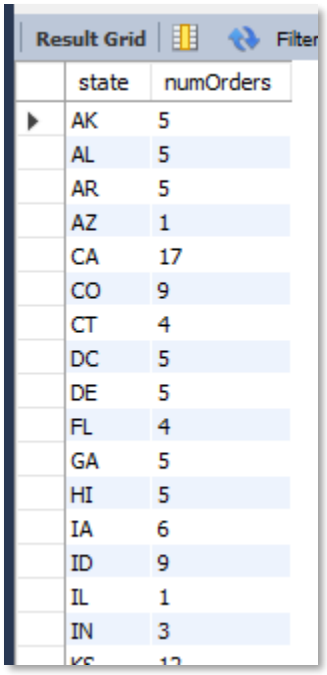
- We will use this new user login from inside of Excel to connect to our database.
- You can close the Administration – Users and Privileges tab now.



- Next, let's write a query and test it so we know what we want to see in Excel.
- MySQL Workbench open a new SQL tab.
- Write (or Copy) the following SQL code and paste it into the new SQL tab in Workbench.

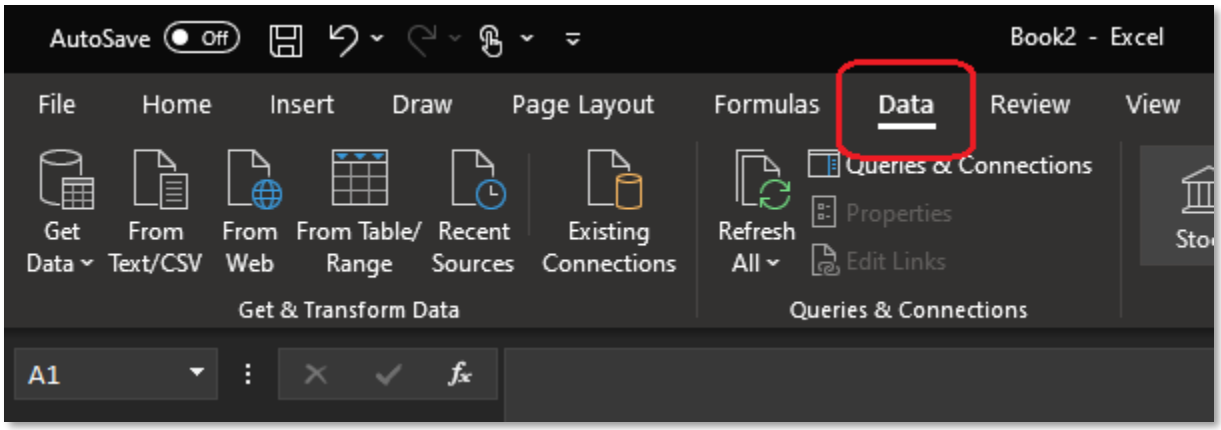
```
SELECT c.state, COUNT(o.order_id) AS numOrders
FROM customers c
INNER JOIN orders o ON c.customer_id = o.customer_id
WHERE country = "US"
GROUP BY c.state
ORDER BY c.state;
```

- Run the query in Workbench.
- What does this query show us? Review the query results in Workbench (see the screen capture below).

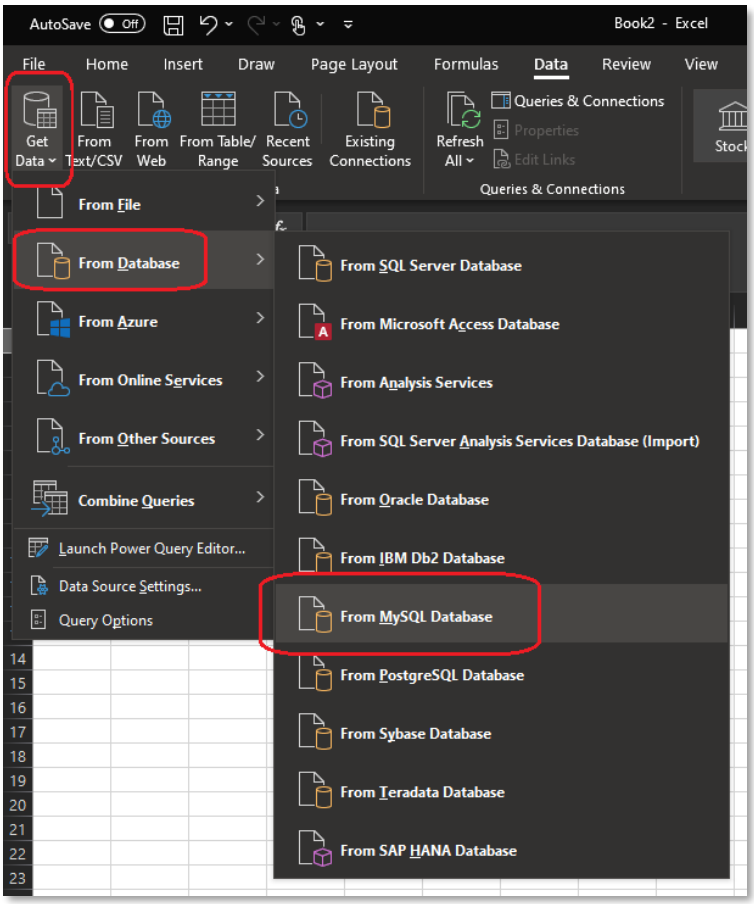


state	numOrders
AK	5
AL	5
AR	5
AZ	1
CA	17
CO	9
CT	4
DC	5
DE	5
FL	4
GA	5
HI	5
IA	6
ID	9
IL	1
IN	3
KS	12

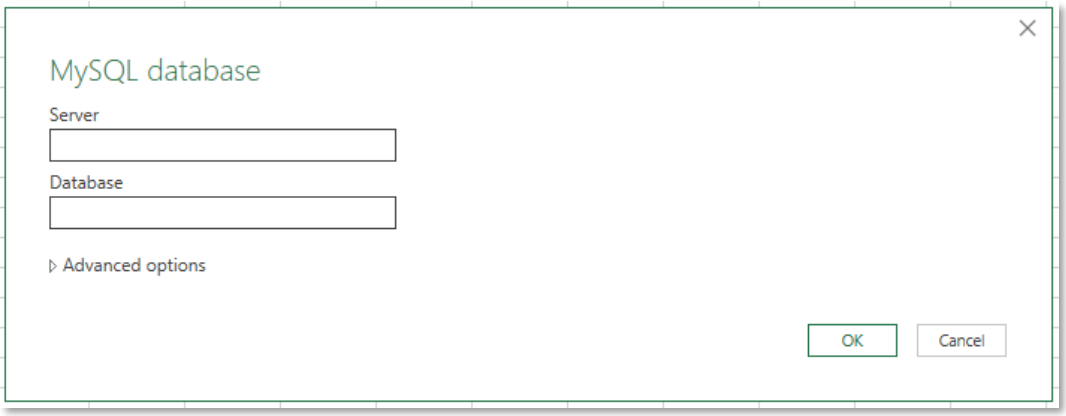
- The query provides a summary list of the number of orders by state.
- Let's say we want to see this result set in a chart in Excel. We could copy the data from here and paste it into an Excel worksheet and chart it.
- However, orders are placed on a continuous basis so we don't want to have to copy and paste this every day. So instead we will make a database connection inside of Excel and write this query in Excel.
- That connection will be persistent so any time we want to see the orders by state list, we can simply refresh the Excel worksheet and see the new summary of our orders in our chart in Excel.
- Next, we're going to set up Excel to be able to connect to MySQL and work with MySQL data.
- In Excel, open a new worksheet.
- Click the Data menu option.



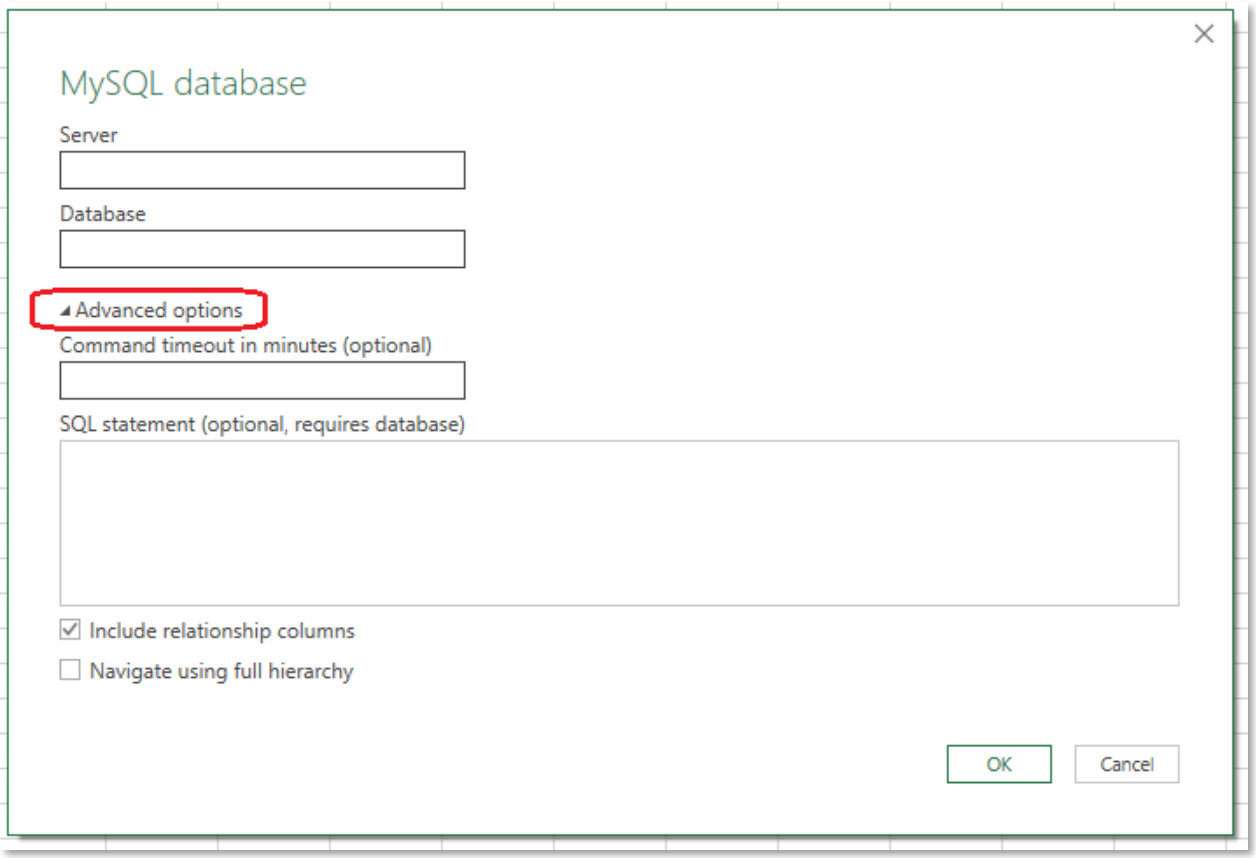
- Next click Get Data, a dropdown menu will appear.
- On the dropdown menu hover your mouse over From Database, another submenu will appear.
- Click on From MySQL Database, as shown here >>>



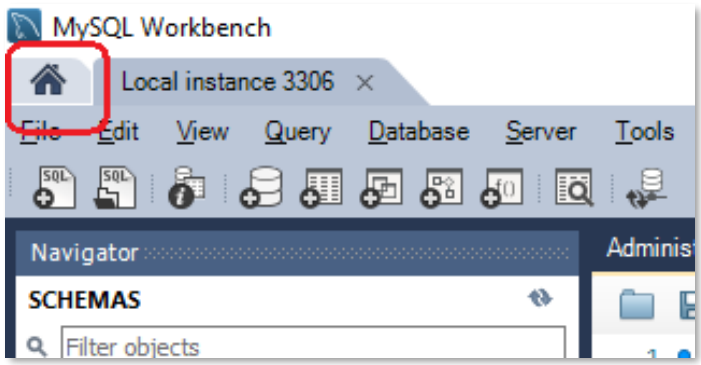
- The MySQL Database connection dialog will appear:



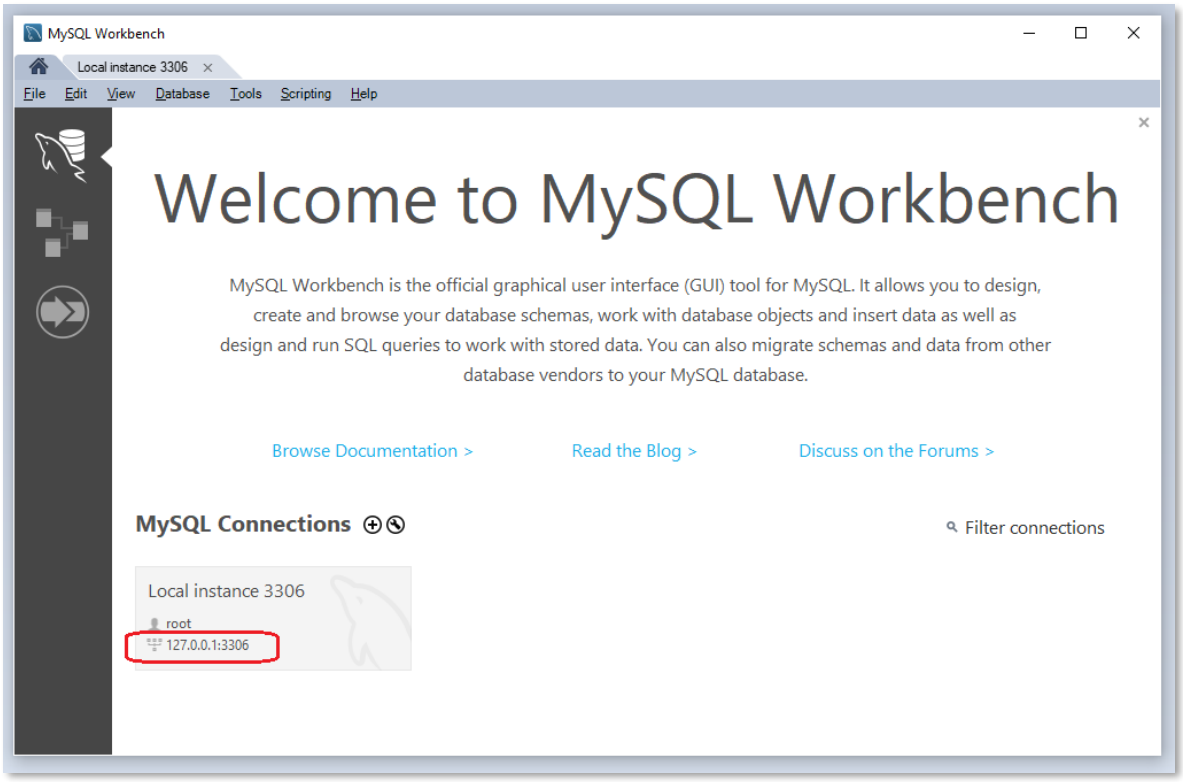
- Click the Advanced option arrow to see the full dialog:



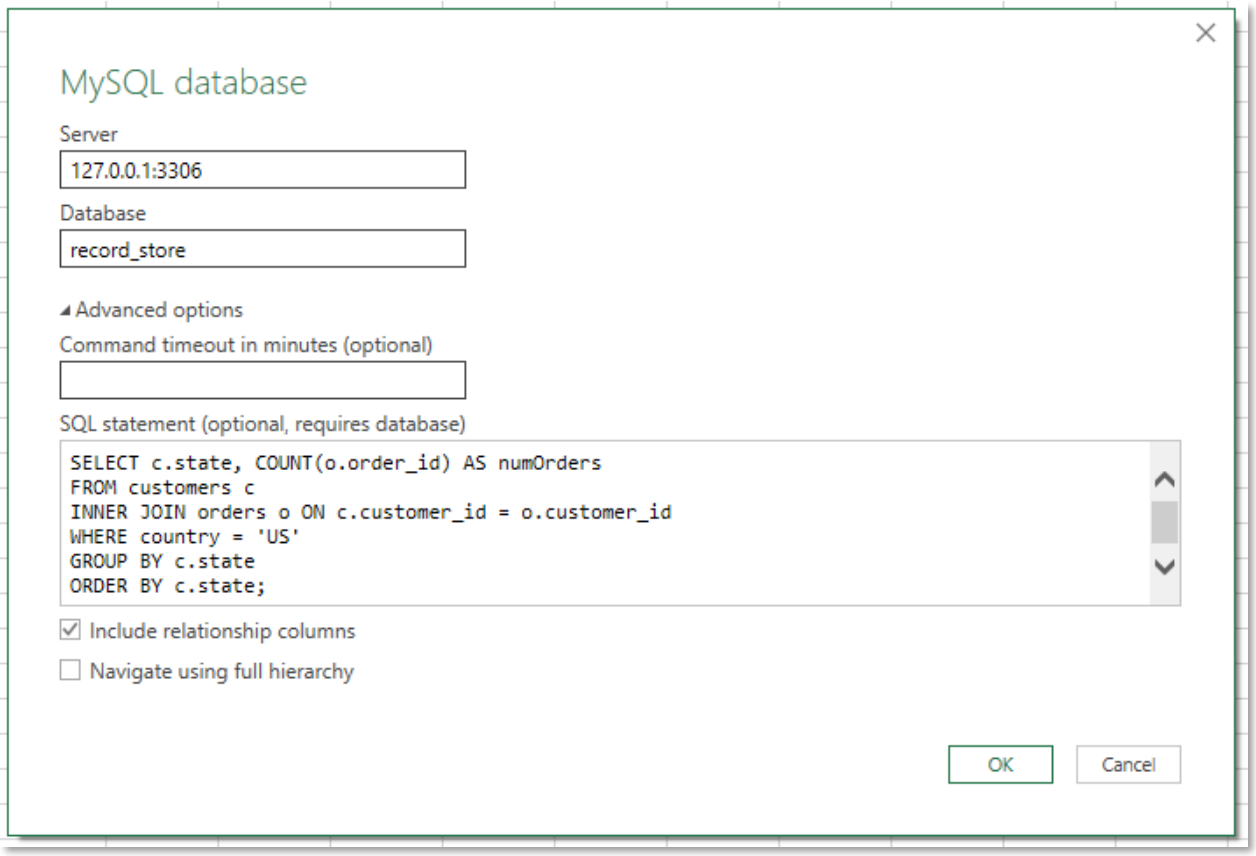
- Next we will fill in the connection information and load the query that we wrote in MySQL Workbench.
- First, we need the server information. To get this information go back to MySQL Workbench and click the Home tab located at the top-left of Workbench:



- On the Workbench Home tab we need the server address, which is shown at the bottom-left of that page. This information can be different on each person's computer. In my case, mine looks the following screen capture. The server address that we need is circled in red (127.0.0.1:3306):

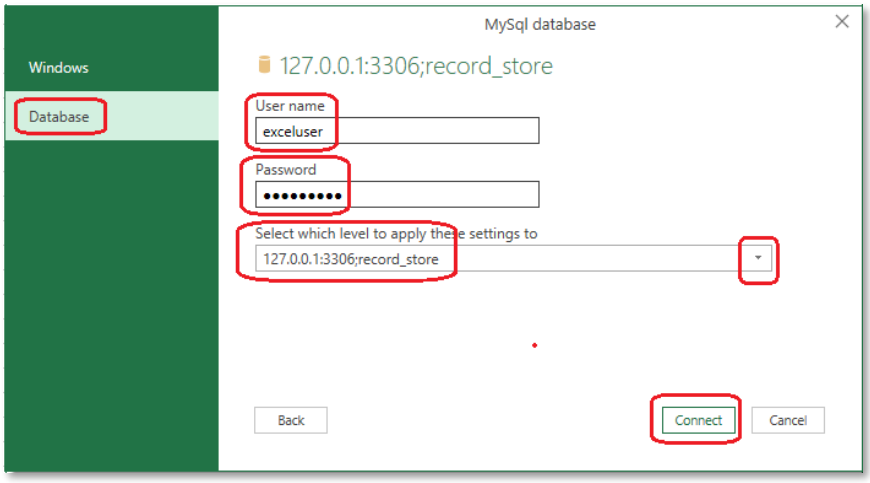


- So, back in Excel, we enter the server address in the Server box. The numbers and punctuation must be exact.
- For the Database box, we will use our MySQL record_store database, so we enter that database name.
- Next, go to MySQL Workbench and copy the query we wrote to create the list of states and order counts. Paste that query into the SQL statement box.
- Leave everything else on the dialog as is.
- When you have done all of the above, the dialog should look like this (although your server address may be different):

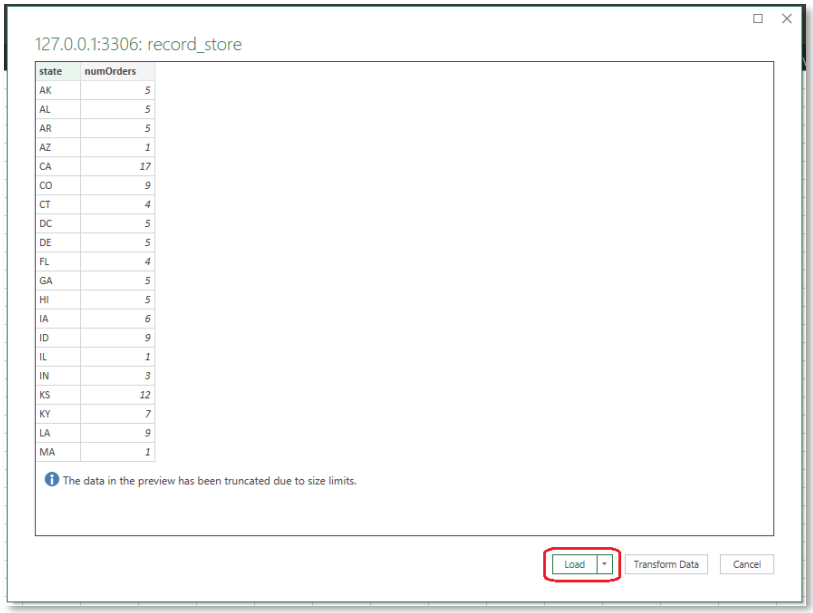


- **Make a screen capture of this dialog in your Excel to submit for your assignment in Canvas.**
- Next click the Ok button.
- Next you will see another dialog that we use to authenticate our connection to the database. We will use the user account we created in MySQL Workbench as our login information. In my example it is exceluser and the password I created in MySQL Workbench.
- First, click Database on the left side. This instructs Excel to use a database login instead of your operating system login information.
- Then enter the User name and Password.

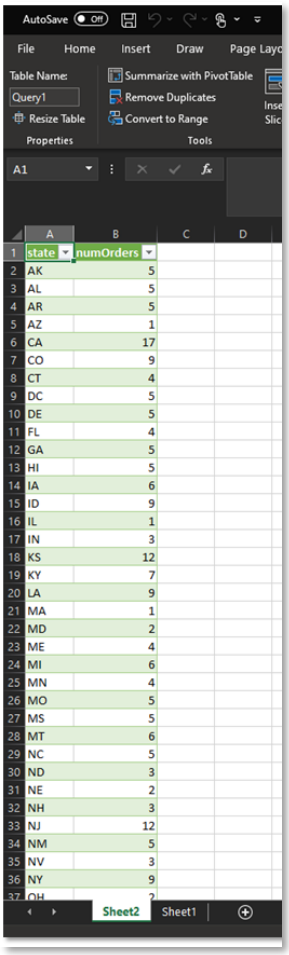
- Next use the drop-down arrow to list all of the possible connections, on the screen capture below you can see that I selected my server (127.0.0.1:3306) and the database (record_store) from the list.
- Then click the Connect button.



- If your connection works correctly you'll see the next screen below. This shows a preview of the data (notice it is the result of our query).
- If your connection failed, check that your user name and password match what you created in MySQL Workbench and that your server information in the drop down is correct.
- Next, click the Load button.



- When the data loads in Excel, you will see the results of our query in the first two columns of the worksheet as shown here >>>
- This data is directly from the database.
- Also, our connection is persistent, which means that as long as the connection information remains the same and the database is accessible over the network or on the computer, as we use this spreadsheet the connection remains active.
- So, as data in the database changes, we can see those updates in our spreadsheet without having to reconnect or re-running our query manually.



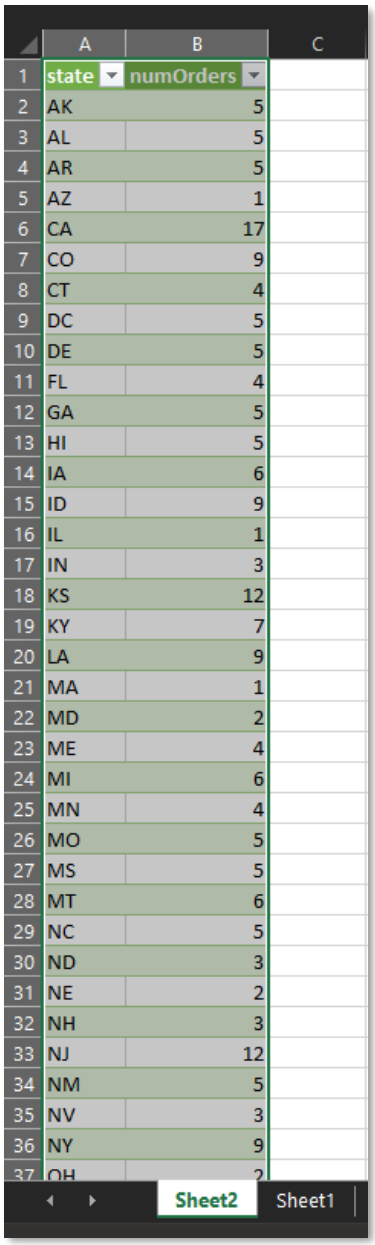
- Next we will create a chart in Excel that will visualize our sales by state.

- In Excel, select (highlight) all of our data rows. You can do this by clicking cell A1, scrolling down to the bottom of the data and then holding down Shift and clicking cell B52.

- Or you can click cell A1 and drag the mouse over to B1, and down to B52.

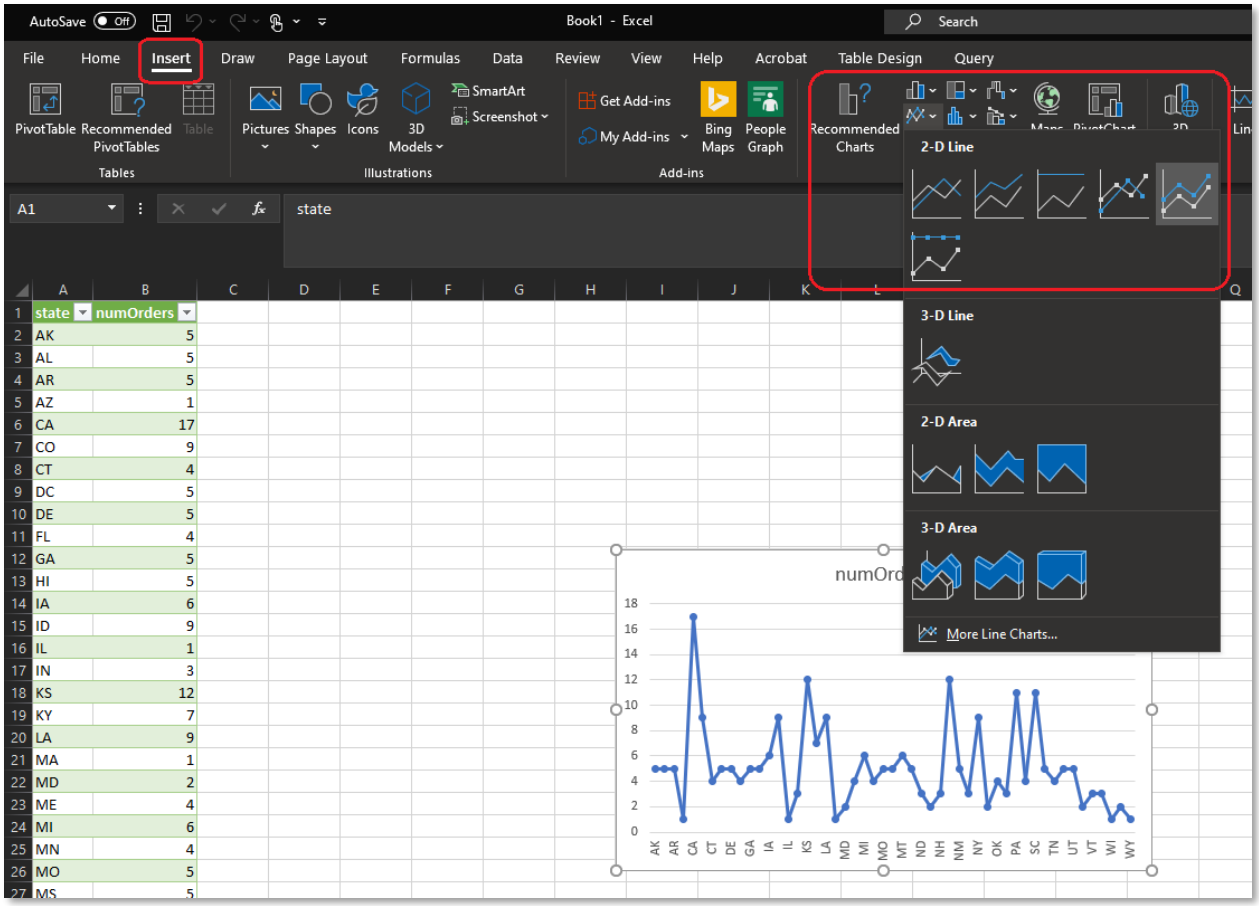
- Once all of the data is selected click the Insert menu option as shown on the screen capture below.

- On the Insert options ribbon, choose a chart type. This can be any that you prefer. As you look at different options you'll see the chart appear on your worksheet.



	A	B	C
1	state	numOrders	
2	AK	5	
3	AL	5	
4	AR	5	
5	AZ	1	
6	CA	17	
7	CO	9	
8	CT	4	
9	DC	5	
10	DE	5	
11	FL	4	
12	GA	5	
13	HI	5	
14	IA	6	
15	ID	9	
16	IL	1	
17	IN	3	
18	KS	12	
19	KY	7	
20	LA	9	
21	MA	1	
22	MD	2	
23	ME	4	
24	MI	6	
25	MN	4	
26	MO	5	
27	MS	5	
28	MT	6	
29	NC	5	
30	ND	3	
31	NE	2	
32	NH	3	
33	NJ	12	
34	NM	5	
35	NV	3	
36	NY	9	
37	OH	2	

Sheet2 Sheet1



state	numOrders
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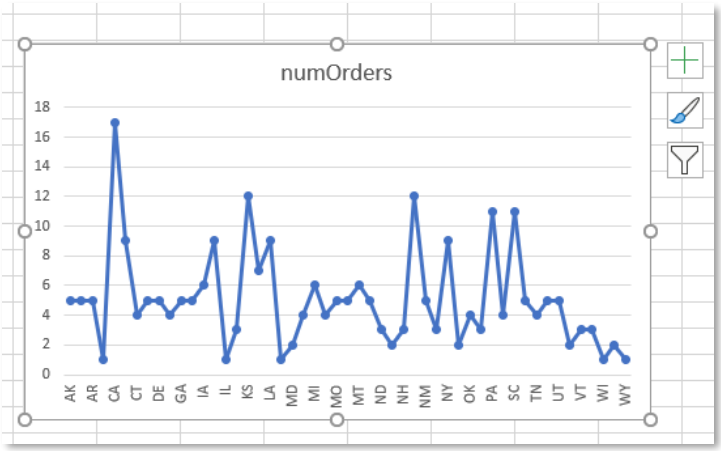
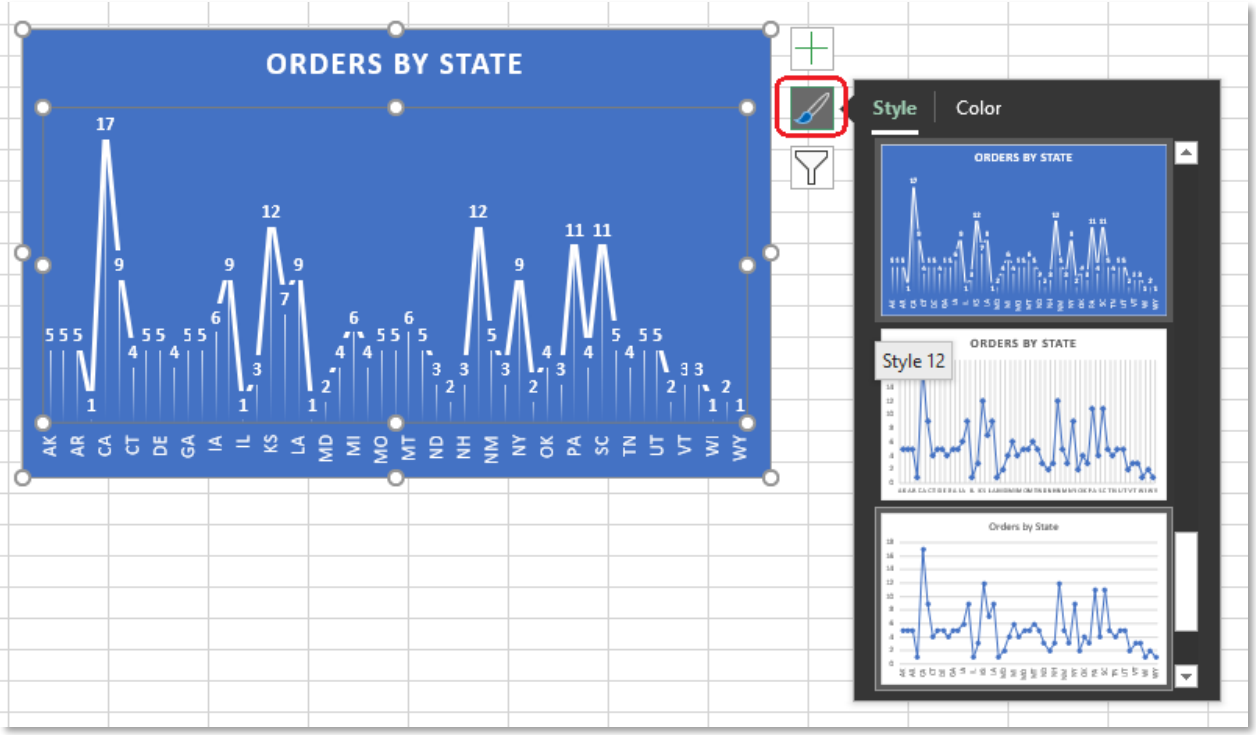
CT	4
DC	5
DE	5
FL	4
GA	5
HI	5
IA	6
ID	9
IL	1
IN	3
KS	12
KY	7
LA	9
MA	1
MD	2
ME	4
MI	6
MN	4
MO	5
MS	5

- In my example I chose a line graph.

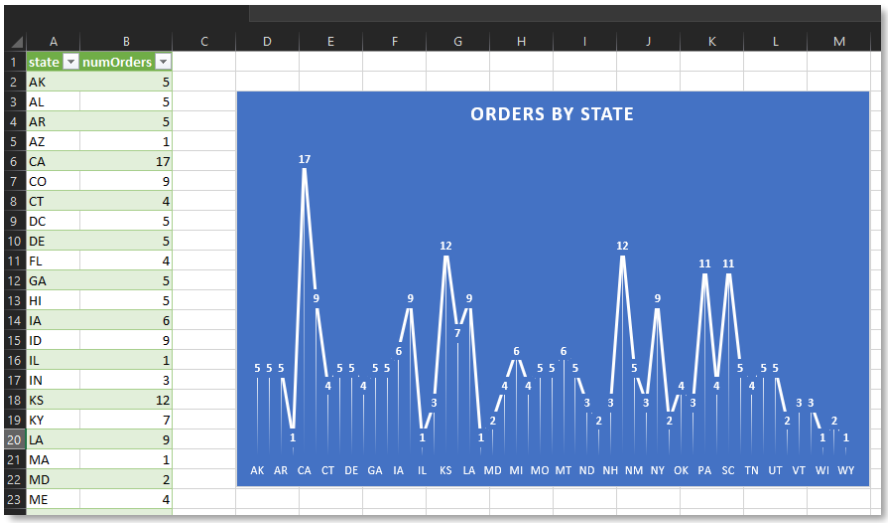
- Next, I double-clicked the title (which defaulted to numOrders) and changed it to Orders by State.



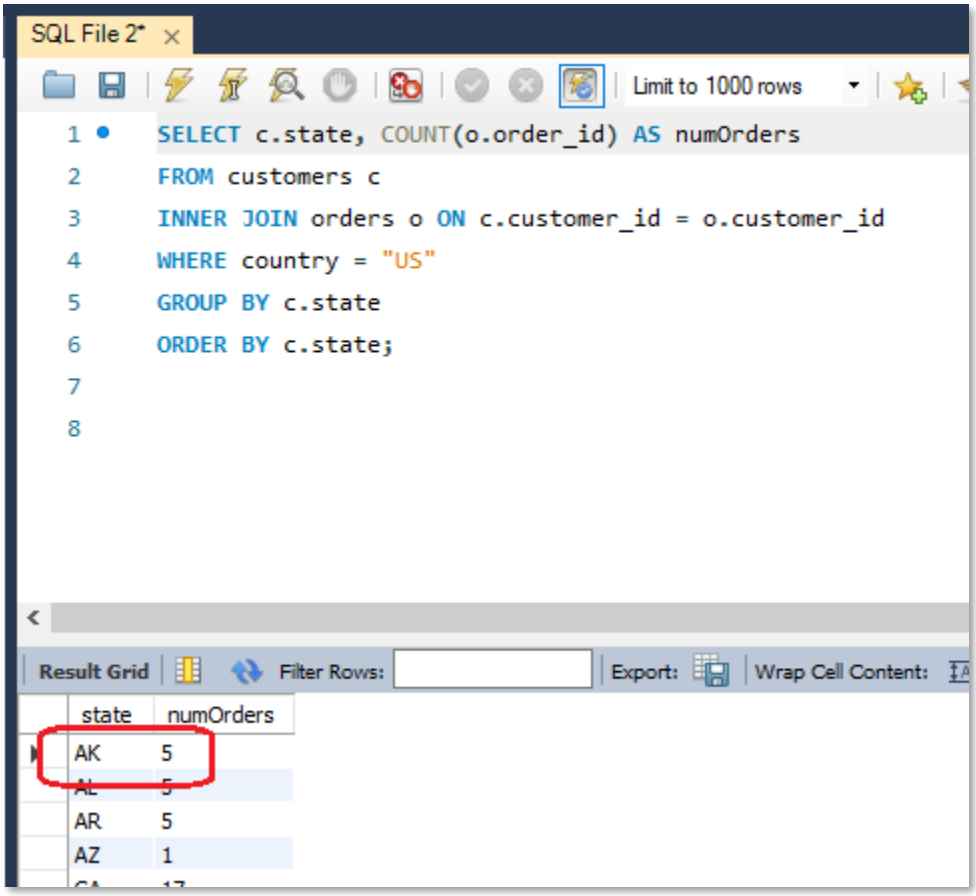
- And I clicked the paint brush tool and changed the appearance of my graph as well.



- Now that I have set up my chart, I move it next to my worksheet data by dragging it over.
- Now I can check that my connection is persistent and that I can get updates from the database as its data changes.



- Go back to MySQL Workbench and re-run our summary query.

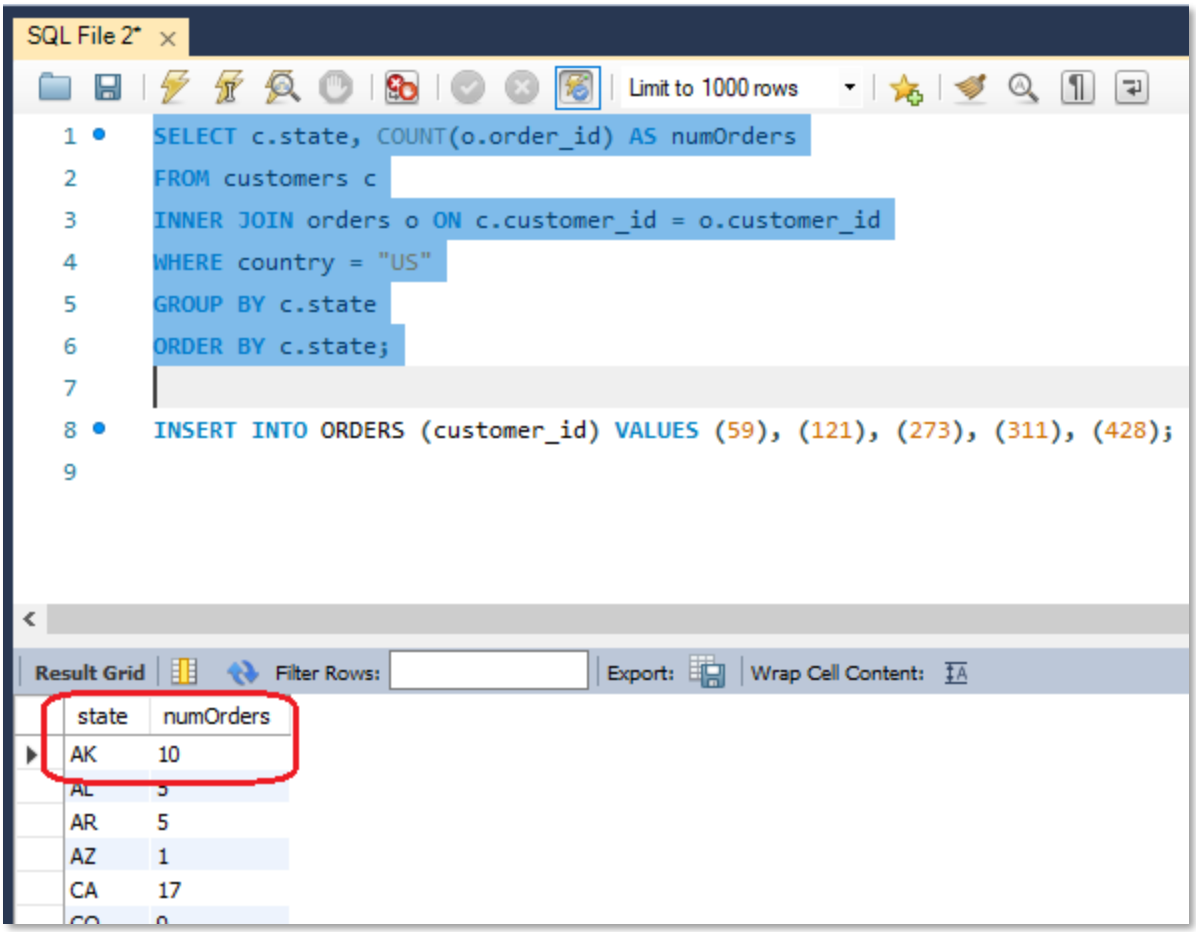


- And note that Arkansas (AK) has 5 total orders. And take a look at the chart in Excel, we see that AK's number matches.
- Next, run the following INSERT statement in Workbench which will create some new order records for existing customers.

```
INSERT INTO ORDERS (customer_id) VALUES (59), (121), (273), (311), (428);
```

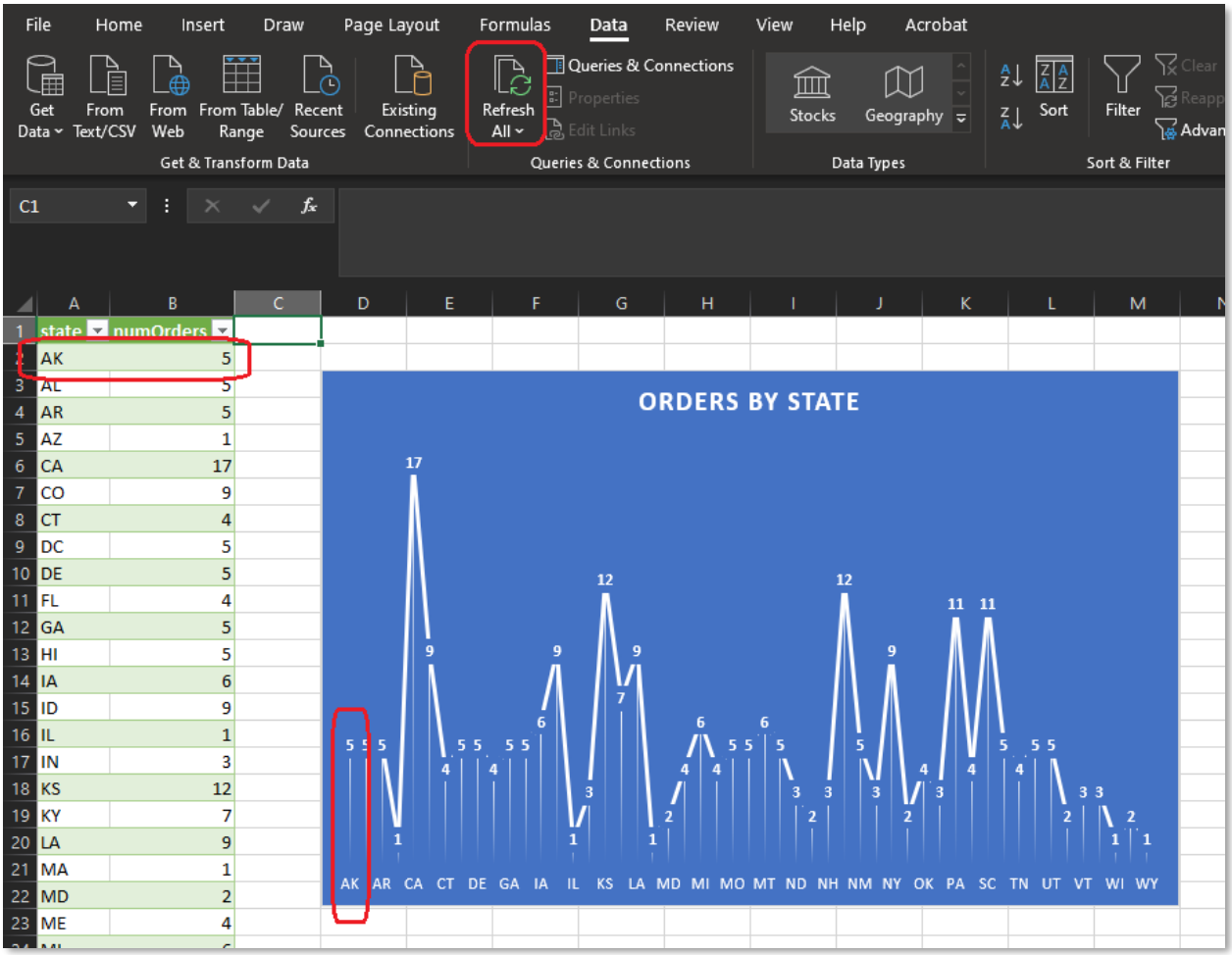
- Note that these are not complete records (no order date, etc.), but for demonstration purposes it's ok.

- And re-run the summary query, notice now we have 10 records in Arkansas. This simulates the database receiving new orders.

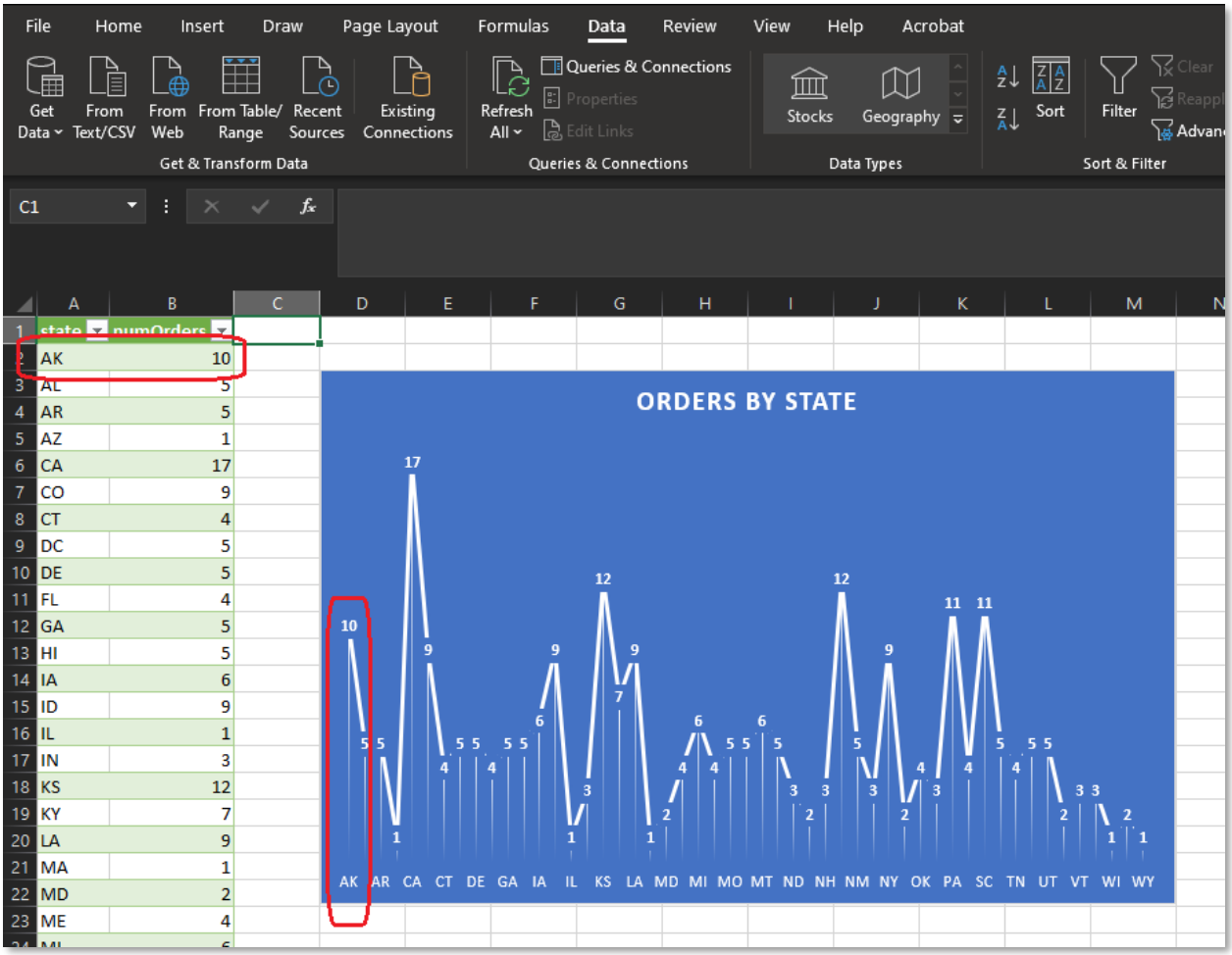


- Now return to Excel.

- In Excel note that our chart looks the same as it did before. Pay attention to the AK numOrders value both in the data (cell B2) and in the chart.
- Click the Refresh All button.



- And note that the AK numOrders value updates to 10 and the chart also updates as well (see screen capture below).



state	numOrders
AK	10
AL	5
AR	5
AZ	1
CA	17
CO	9
CT	4
DC	5
DE	5
FL	4
GA	5
HI	5
IA	6
ID	9
IL	1
IN	3
KS	12
KY	7
LA	9
MA	1
MD	2
ME	4

- **Make a screen capture of your Excel data and chart to submit for your assignment in Canvas.**