

# Tips for making tables & relationships in SSMS GUI

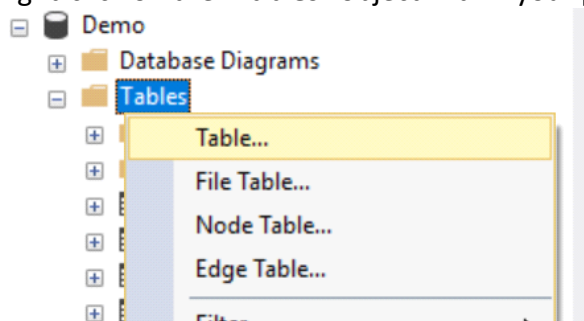
Tuesday, October 8, 2019 7:35 PM

## **IMPORTANT LIMITATIONS:**

- These tips focus on the **mechanics** of creating tables and relationships within Microsoft SQL Server **GUI**. This means it will cover "how to add a primary key," but it will **not define** concepts like "what is a primary key.") Also, since these tips focus on the **GUI**, they do not discuss the syntax for building tables and relationships (ex - "CREATE TABLE", etc.) For this information, please review the book, the PowerPoint slides, or your class notes.
- These instructions **will not work on all versions of SSMS**. They are designed to work with the CIS282 lab machines as of Fall Term 2019. If you have a different version installed on your personal machine, the GUI may be different.
- These are tips, **not a guide**. This means they are **not comprehensive**. They are meant to familiarize you with some of the menus and options that exist while creating these objects in SSMS, so you can **practice on your own**. If, for example, you want to delete a Primary Key, this was not covered in class and, likewise, it is not listed here. However, if you return to the menus discussed below, you will start to see the relevant actions in these same menus (ex - you will find a choice labeled "Remove Primary Key").

## **How do I create a table?**

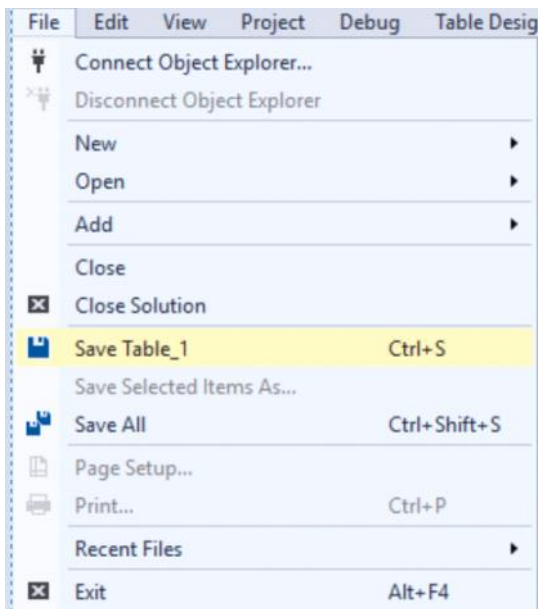
1. Right-click on the "**Tables**" object within your personal database. A menu will appear. Click on "**Table...**"



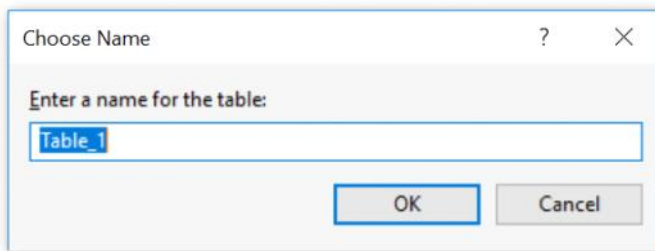
2. The table "**Design**" window will now appear. You can now type column names, specify column data type, and choose whether NULL is allowed for the column.

Column Name	Data Type	Allow Nulls
▶	nchar(10)	<input checked="" type="checkbox"/>
		<input type="checkbox"/>

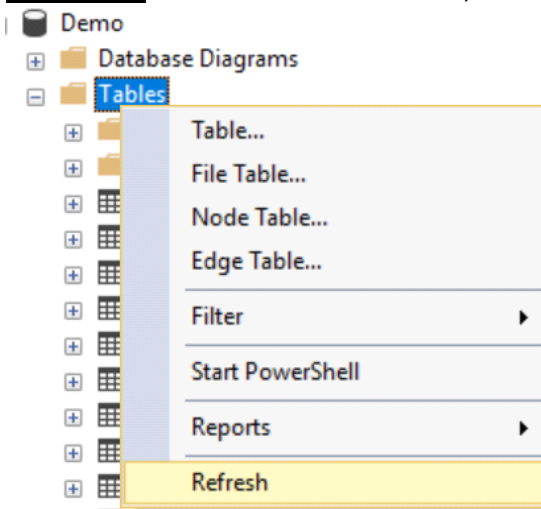
3. When you are done, you can save your table by either choosing to "**Save Table**" from the File menu or by pressing **Ctrl + S**.



4. You will be asked to save your table with a new name.

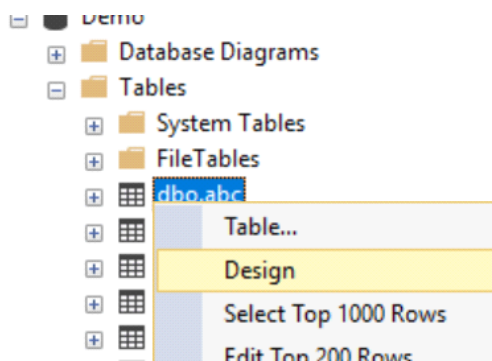


5. Sometimes, even after you create your table, it will not appear in your list of table objects. To make this table appear, **right-click** on your database's **Tables** object folder and choose **Refresh**. It is important to specifically refresh the tables folder, or else your table may still not show up.



## How do I edit the table structure after I've created it? (Add columns, change data types, etc.)

1. **Right-click** on the table that you want to edit. A menu will appear. Click on "**Design**," and the table **Design window** will appear.



2. Once you are done, save your changes (see above, "How do I create a table?"). **Before** you save the table, you will see an asterisk (\*) at the end of your table's name. **After** you save, this asterisk will be gone:

**Unsaved:**

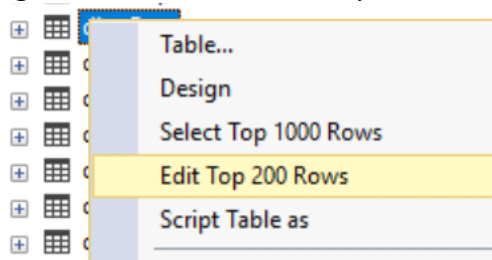
4\SQLLEX...tin - dbo.Customer\*

**Saved:**

4\SQLLEX...tin - dbo.Customer

### How do I add or edit data in a table I've created? (Add records, rows, etc.)

1. **Right-click** on the table that you want to edit. A menu will appear. Click on "Edit Top 200 Rows."

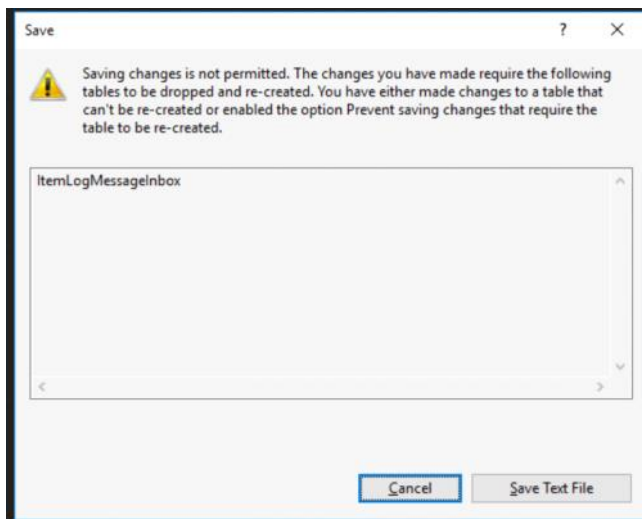


2. A new window will open where **you can add data** to your table. Be **careful** that you do not need to choose Save in the menu or Ctrl + S to save new records. If you delete records, edit record values, etc., these changes save on their own.

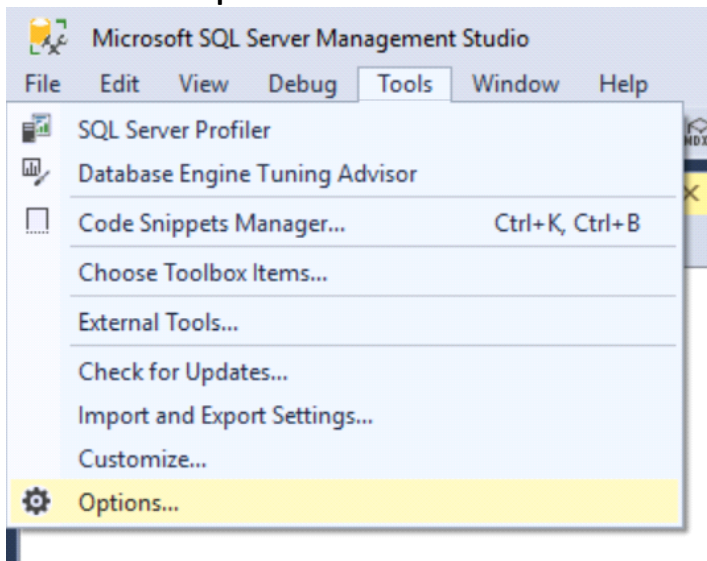
	Name
	My test name 1
	My test name 2
	NULL

### What do I do if I see an error like this, and I cannot save my table?

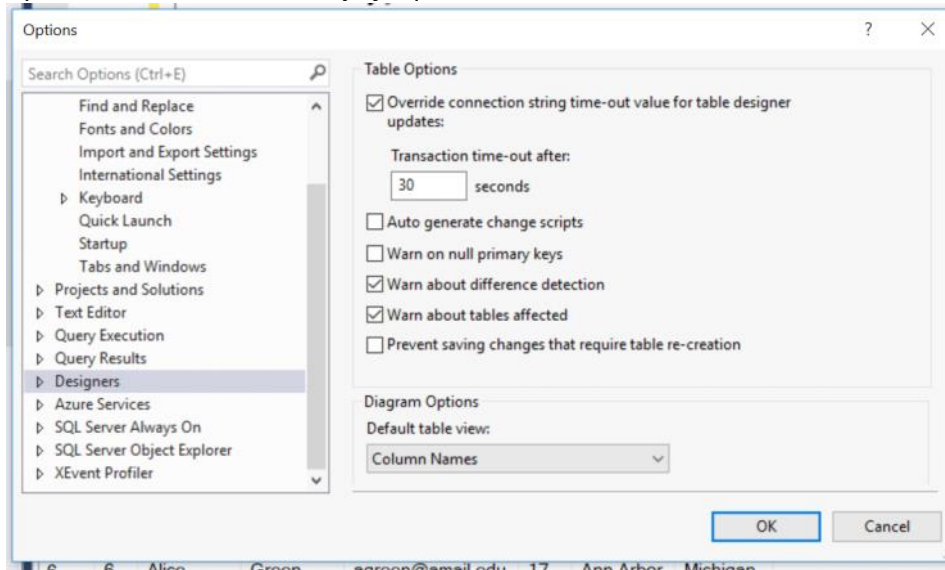
(Warning: You may lose your current table edits, but changing this setting should help you next time.)



1. Go to **Tools** -> **Options**.

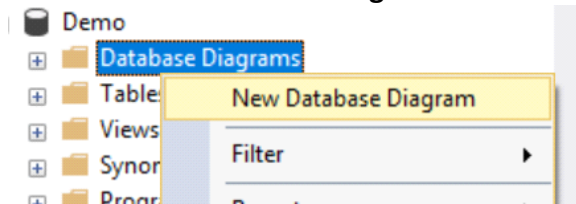


2. Choose **Designers** option. **Uncheck** the **Prevent saving changes that require table re-creation** box. That option should have an **empty** square next to it, as seen below.



## How do I make a Database Diagram?

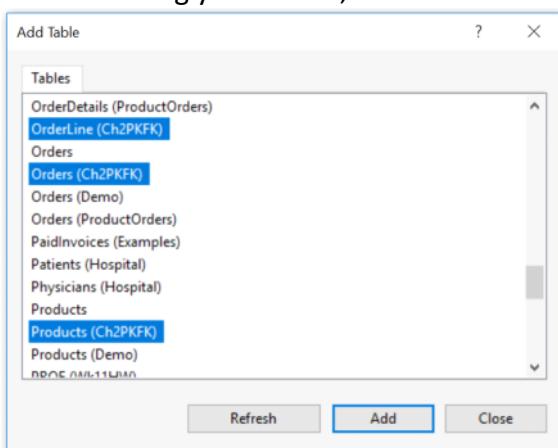
1. Right click on the "Database Diagrams" object folder within your personal database. A menu will appear. Click on "**New Database Diagram.**"



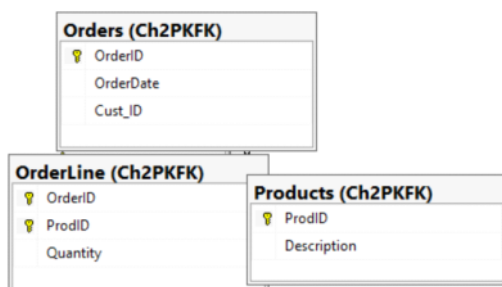
2. If this is the first time you've used Database Diagrams, you may get this message. If so, do not worry. Just be sure to click "**Yes.**"



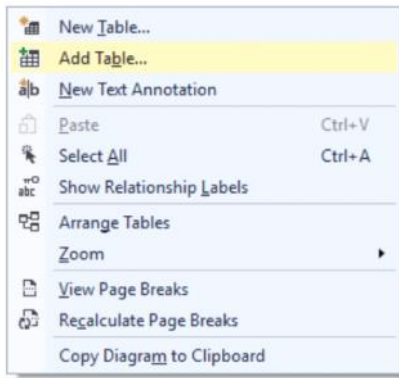
3. The **Add Table** window will appear, asking which tables you want to add. Hold the **CTRL** button and left-click on the tables that you want to add. They will **highlight** once you have selected them. Once you are done choosing your tables, click "**Add.**"



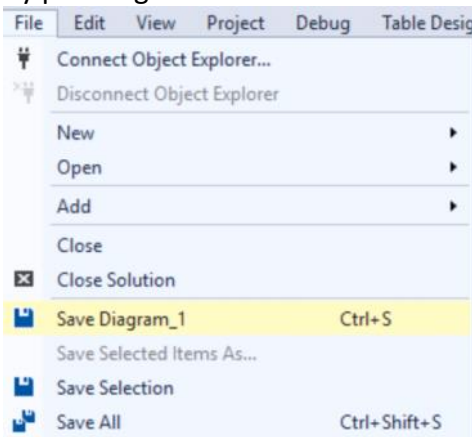
4. A new window will appear, showing your **tables**.



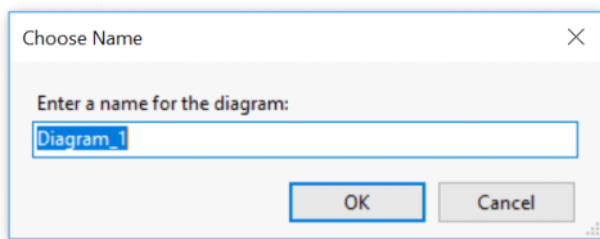
5. If you want to add more tables later on, **right-click** in the whitespace around the diagram and choose to "**Add Table...**"



6. When you are done, you can save your table by either choosing to **"Save Diagram"** from the File menu or by pressing **Ctrl + S**.



7. You will be asked to save your diagram with a new name.



## How do I add a Primary Key?

### A: Using the "Design" window

(To learn about the Design window, see above: "How do I edit the table structure after I've created it?")

1. Open the table where you want to add the **Primary Key** in the **"Design"** window.

CIS282-2014\SQLLEX...tin - dbo.Customer - X CIS282-2014\SQLLEX...

Column Name	Data Type	Allow Nulls
Cust_ID	int	<input type="checkbox"/>
Name	nvarchar(20)	<input checked="" type="checkbox"/>
City	nvarchar(20)	<input checked="" type="checkbox"/>

2. **Left-click** the column name where you want to add the primary key. (TIP: Click the whitespace to the **left** of the column name to avoid accidentally editing the column name.) Check that the column name

**highlights** to show it is selected.

	Column Name	Data Type	Allow Nulls
▶	Cust_ID	int	<input type="checkbox"/>
	Name	nvarchar(20)	<input checked="" type="checkbox"/>

**\*NOTE:** If you want to add a **Composite** Primary Key, hold **CTRL** and **left-click** the whitespace to the left of any column names that make up the Composite Primary Key. Once the columns you want **highlight** to show they are selected, continue. The remaining instructions are the same.

	Column Name	Data Type	Allow Nulls
▶	OrderID	int	<input type="checkbox"/>
	ProdID	int	<input type="checkbox"/>
	Quantity	int	<input type="checkbox"/>

3. **Right-click** the same area and choose the option "**Set Primary Key.**"

	Column Name	Data Type	Allow Nulls
▶	Cust_ID	int	<input type="checkbox"/>
⚙			<input checked="" type="checkbox"/>
			<input checked="" type="checkbox"/>
			<input type="checkbox"/>

Set Primary Key  
 Insert Column  
 Delete Column  
 Relationships...

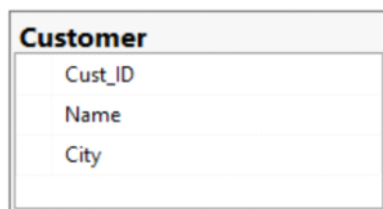
4. After you do this, you will now see a **small key** appear to the left of the column name to show that you have made it a Primary Key. Be sure to **save**. (See above: "How do I edit the table structure after I've created it?")

	Column Name
▶🔑	Cust_ID
	Name

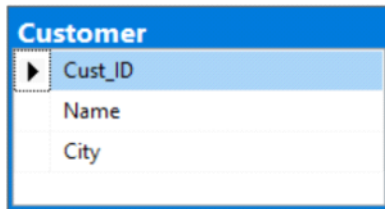
## B: Using the "Database Diagram"

(See above: "How do I make a database diagram?")

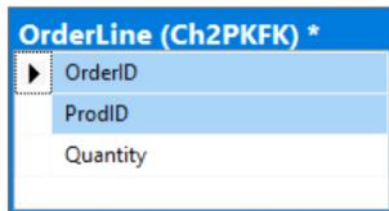
1. Open up a database diagram that shows the **table** where you want to create a **Primary Key** or create a **new** diagram.



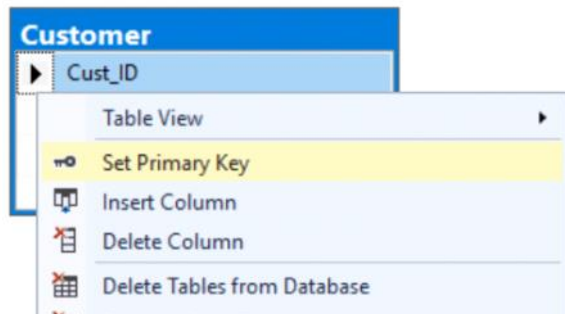
2. In the table where you want to add the Primary Key, **left-click** the column name where you want to add the **Primary Key**. (TIP: Click the whitespace to the **left** of the column name to avoid accidentally editing the column name.) Check that the column name **highlights** to show it is selected.



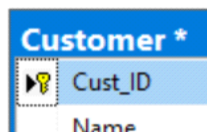
\*NOTE: If you want to add a **Composite** Primary Key, hold **CTRL** and **left-click** the whitespace to the left of any column names that make up the Composite Primary Key. Once the columns you want **highlight** to show they are selected, continue. The remaining instructions are the same.



3. **Right-click** the same area and choose the option "**Set Primary Key**."



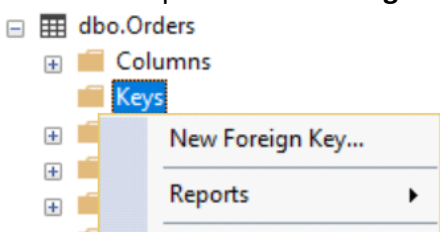
4. After you do this, you will now see a **small key** appear to the left of the column name to show that you have made it a Primary Key. Be sure to **save**. (See above: "How do I make a Database Diagram?")



## How do I add a Foreign key relationship?

### A: Using the "New Foreign Key" dialog

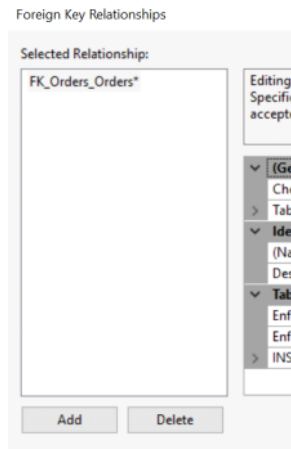
1. Expand the table where you want to add the Foreign Key and **right-click** on the "**Keys**" object folder. Choose the option "**New Foreign Key...**"



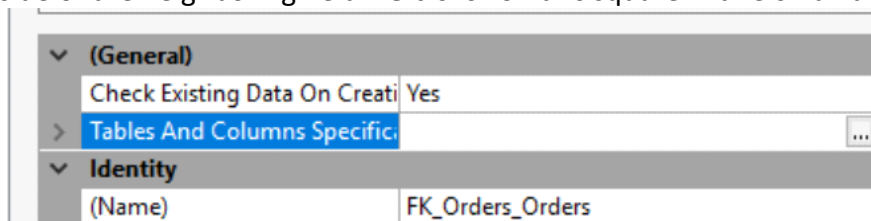
2. A new window will appear called "**Foreign Key Relationships**." Note that an unpaired (meaningless) key has already been created in the "**Selected Relationship**" section. If you started to make this key by



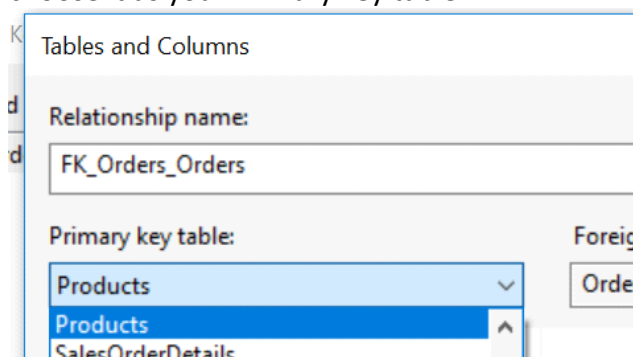
mistake and want to cancel, you must press the button to **"Delete"** it before closing.



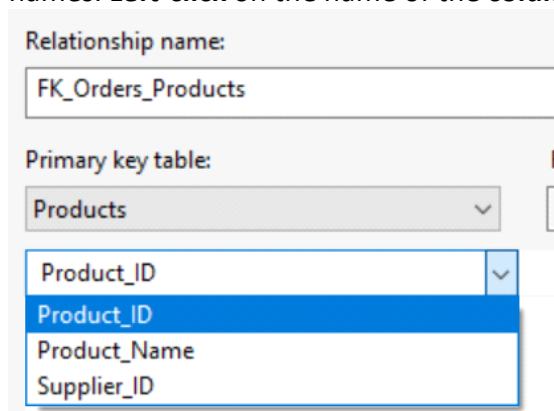
- To define the relationship, **left-click** on the **"Tables and Columns Specification"** label under the **"(General)"** heading. You will see it highlight, and a **square with 3 small dots** will appear at the far right-side of the neighboring field. **Left-click** on this square with 3 small dots to open a new window.



- In the new **"Tables and Columns"** window, click on the down-pointing arrow under **"Primary key table"** to show a list of available tables. **Left-click** on the name of the table that **holds the primary key** to choose it as your Primary key table.



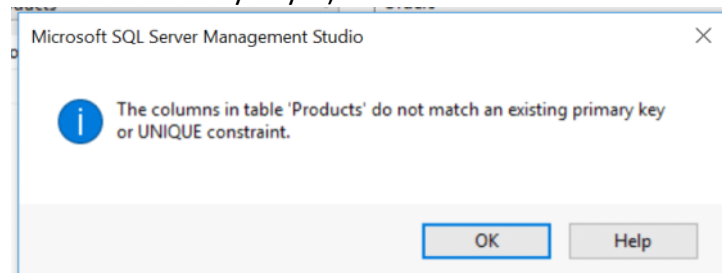
- Left-click** on the whitespace **beneath** the Primary key table name to show you a list of available column names. **Left-click** on the name of the **column** of the **Primary Key** that pairs with your new Foreign Key.



6. Now looking at the right-side of the window, you will see your "**Foreign key table.**" You should not need to change this if, in the first step, you already chose to add the key to your Foreign Key Table. **Left-click** on the whitespace beneath this Foreign Key table name to show you a list of available column names. **Left-click** on the name of the **column** that will become your **Foreign Key**.

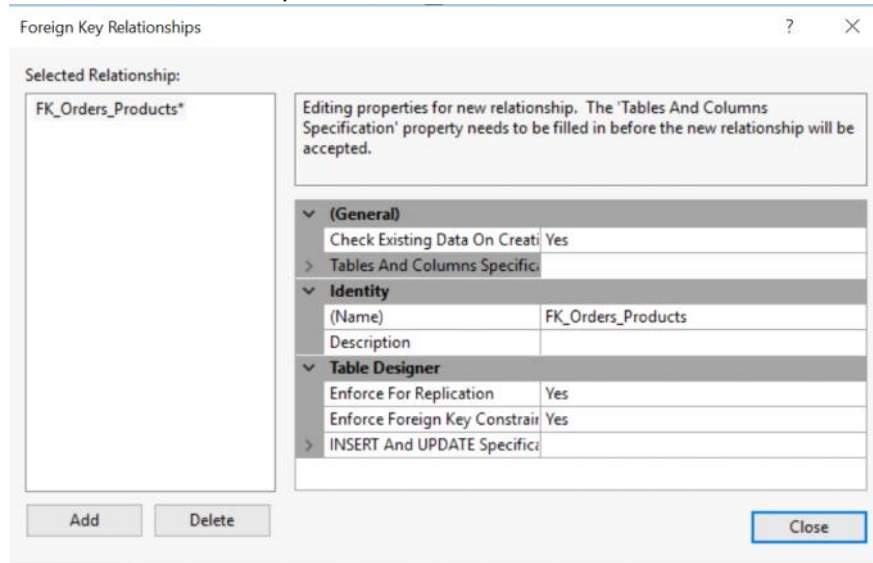
7. Once you have successfully defined your Primary Key table, Primary Key column, Foreign Key table, and Foreign Key column as described above, left-click **OK**.

**\*NOTE:** If you get an error like this, it means that you did **not** define the chosen column as a Primary Key in your Primary Key table. You will not be able to continue until you fix this. (See: "How do I add a Primary Key?")



8. You can now left-click "**Close**," but notice that there is an asterisk (\*) next to the relationship name under "**Selected Relationships**" and there will also be an asterisk (\*) next to the name of your Foreign Key table and Primary Key table after you click "Close." This means the relationship is not yet saved. Be sure to

**save** one of these tables to also save the relationship. (See above: "How do I edit the table structure after I've created it?")



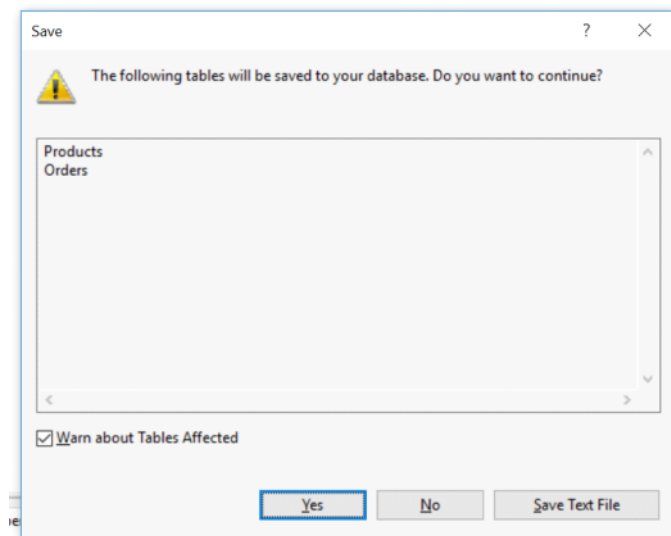
The Foreign Key table (\* = unsaved):

014\SQLEXP...ristin - dbo.Orders\* -> X

The Primary Key table (\* = unsaved):

014\SQLEXP...tin - dbo.Products\* -> X

9. Since a Foreign Key links tables, saving the change in the Foreign Key table means also saving changes in the Primary Key table. Since more than one table is now being saved, you may see a warning like this. Choose **"Yes."**



The Foreign Key table (no \* = saved):

014\SQLEXP...ristin - dbo.Orders -> X

The Primary Key table (no \* = saved):

014\SQLEXP...tin - dbo.Products -> X

## B: Using the "Database Diagram"

(See above: "How do I make a database diagram?")

1. Open up a database diagram that displays both your **Foreign Key table** and your **Primary Key table** or create a **new** diagram.

Orders	
Number	
Order_Date	
Cust_ID	
Product_ID	
Amount	

Products	
Product_ID	
Product_Name	
Supplier_ID	

2. In the table where you want to add the **Foreign** key, **left-click** the column name where you want to add the **Foreign** key. (TIP: Click the whitespace to the **left** of the column name to avoid accidentally editing the column name.) Check that the column name **highlights** to show it is selected.

Orders	
Number	
Order_Date	
Cust_ID	
Product_ID	
Amount	

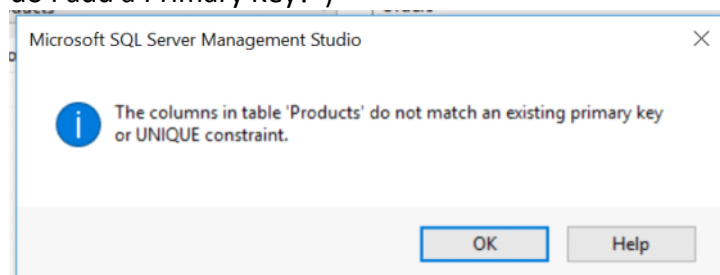
Products	
Product_ID	
Product_Name	
Supplier_ID	

3. **Do not release** the left-click. **Hold** the left mouse button down and **drag** toward the table containing the **Primary Key**. A dotted line will start to appear. Do not release the mouse button until the **dotted line is fully connected** with the Primary Key table.

Orders	
Number	
Order_Date	
Cust_ID	
Product_ID	
Amount	

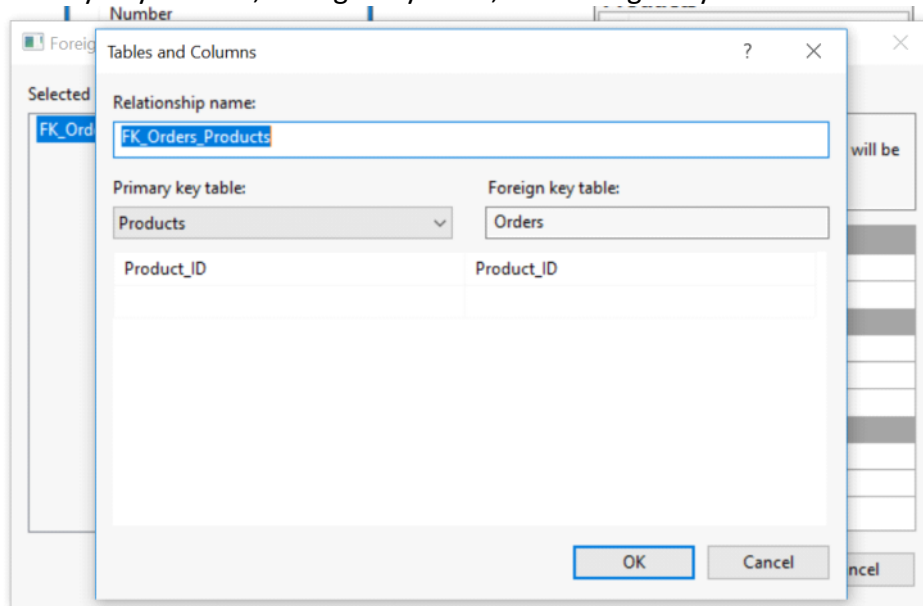
Products	
Product_ID	
Product_Name	
Supplier_ID	

**\*NOTE:** If you get an error like this, it means that you did **not** define the chosen column as a Primary Key in your Primary Key table. You will not be able to continue until you fix this. (See: "How do I add a Primary Key?")

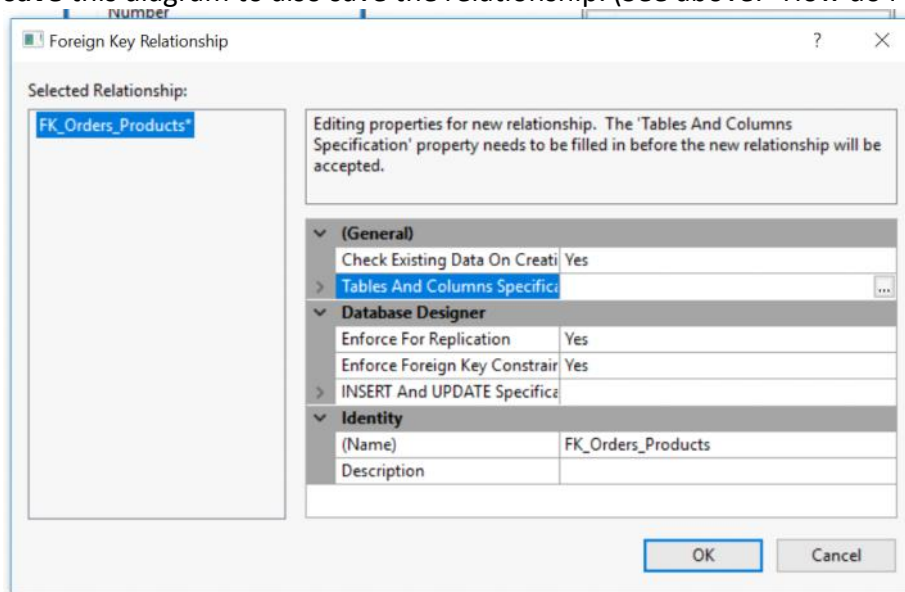


4. Once you **release** the mouse button, a new window will appear that defines your Primary Key table,

Primary Key column, Foreign Key table, and Foreign Key column. If these look correct, left-click **OK**.



5. You can now left-click "**OK**," but notice that there is an asterisk (\*) next to the relationship name under "**Selected Relationships**" and there will also be an asterisk (\*) next to the name of your Foreign Key table and Primary Key table after you click "Close." This means the relationship is not yet saved. Be sure to **save** this diagram to also save the relationship. (See above: "How do I make a Database Diagram?")



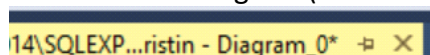
The Foreign Key table (\* = unsaved):



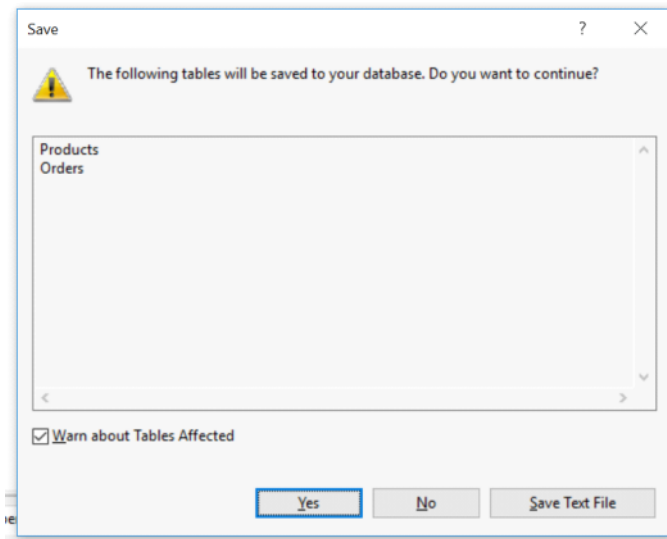
The Primary Key table (\* = unsaved):



The Database Diagram (\* = unsaved):



6. Since a Foreign Key links tables, saving the change in the Foreign Key table means also saving changes in the Primary Key table. Since more than one table is now being saved, you may see a warning like this. Choose "Yes."



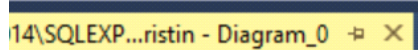
The Foreign Key table (no \* = saved):



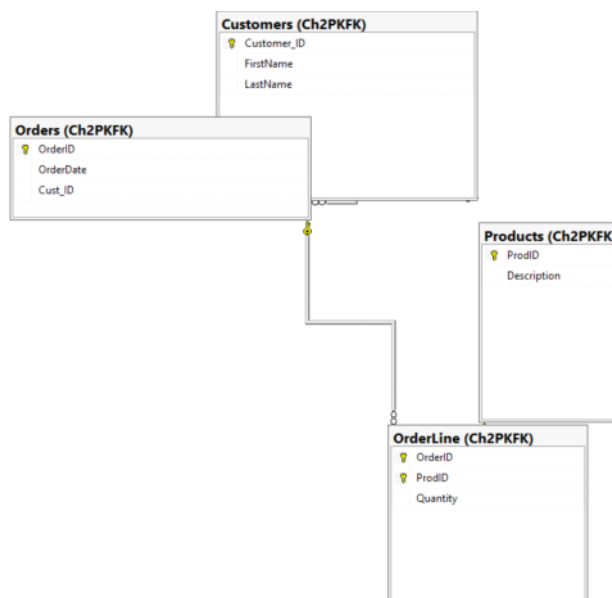
The Primary Key table (no \* = saved):



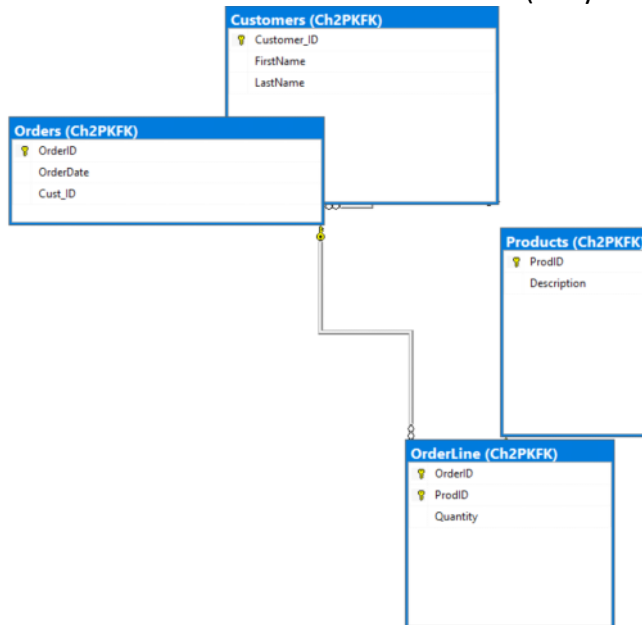
The Database Diagram (no \* = saved):



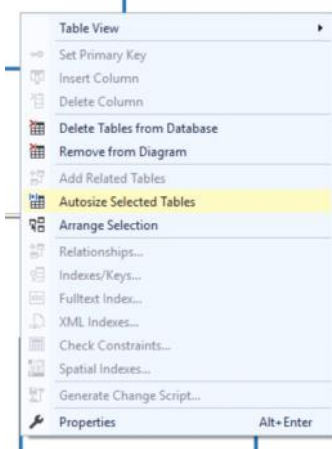
## How do I rearrange my tables in a messy Database Diagram?



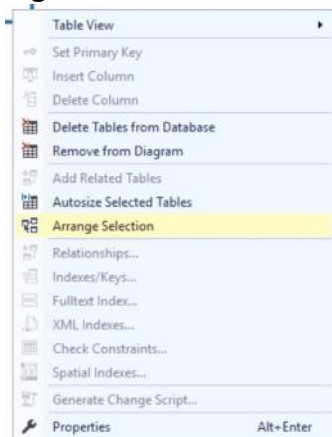
1. Press **CTRL + A** to select all of the tables. (They will **highlight**.)



2. **Right-click** on one of the **highlighted** tables. Choose **Autosize Selected Tables**.



3. **Right-click** on one of the **highlighted** tables. Choose **Arrange Selection**.



4. The tables will now be resized and in a better order.

