DAT225x

Developing an Analysis Services Tabular Model

Lab 01 | Getting Started

Estimated time to complete this lab is 60 minutes

Overview

In this lab, you will provision a Microsoft Azure Virtual Machine (VM) that will be used by all labs in this course. Once the VM is provisioned, you will complete the setup required to support the labs.

The labs in this course are accumulative. You cannot complete the following labs if this lab has not been successfully completed.

What You'll Need

To complete this lab, you will need the following:

- High-speed and reliable internet connectivity (for remote connections to the VM)
- A second monitor is recommended (for the Remote Desktop connection)
- A Microsoft account (such as one used for outlook.com, Hotmail, or other Microsoft services)
- A Microsoft Azure subscription
- The lab files for this course (available for download from GitHub, as described in this lab)

Creating a Free Trial Azure Subscription

If you already have an Azure subscription, you can skip this section. Otherwise, follow these steps to create a free trial subscription. You will need to provide a valid credit card number for verification, but you will not be charged for Azure services—for more information, refer to https://aka.ms/dat225xaz. Note that the free trial is not available in all regions.

If you already have a Microsoft account that has not already been used to sign up for a free Microsoft Azure trial subscription, you're ready to get started. If not, don't worry—just create a new Microsoft account at https://signup.live.com.

After you've created a Microsoft account, browse to https://aka.ms/dat225xaz and then click the **Start Free** link. Then follow the instructions to sign up for a free trial subscription to

Microsoft Azure. You'll need to sign in with your Microsoft account if you're not already signed in. Then you'll need to:

- Enter your cellphone number and have Microsoft send you a text message to verify your identity
- Enter the verification code sent to you
- Provide valid payment details—don't worry, your credit card won't be charged for any services you use during the trial period, and the account is automatically deactivated at the end of the trial period, unless you expressly decide to keep it active.

Exercise 1: Provisioning an Azure VM

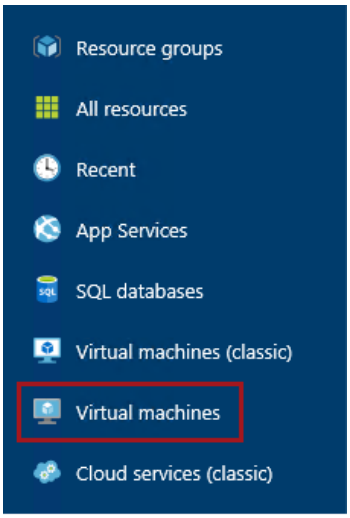
In this exercise, having signed in to the Azure Portal by using your Azure subscription, you will provision an Azure VM to support all labs for this course.

The Azure VM should be stopped when you have completed a lab so that your subscription is not charged (for free trial subscriptions, this will ensure you will have sufficient credits left to complete the labs over the duration of the course).

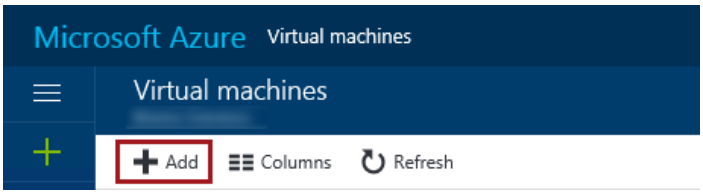
Provisioning an Azure VM

In this task, you will sign in to the Azure Portal, and then provision an Azure VM.

1. Sign in to the **Azure Portal** by using your subscription.
2. In the left pane, select **Virtual Machines**—do not select **Virtual Machines (Classic)**.

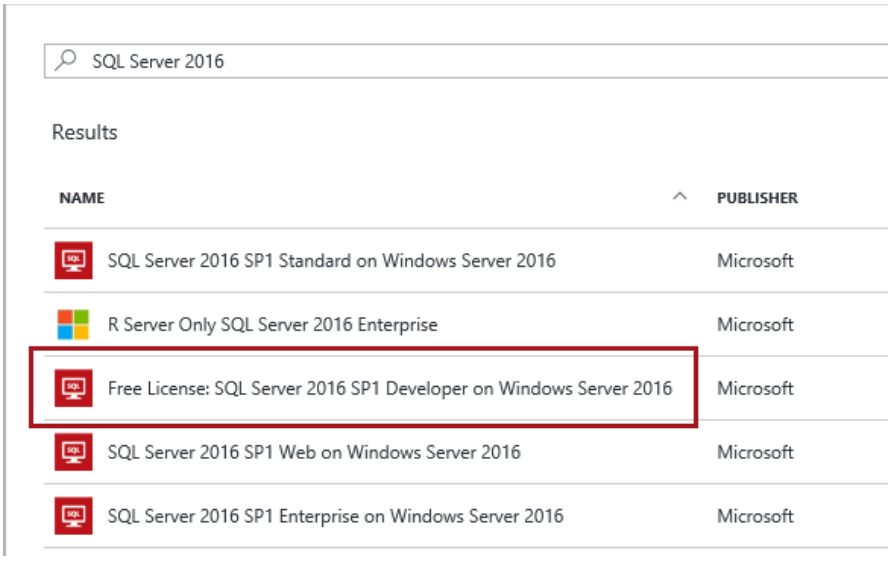


3. In the **Virtual Machines** blade, click **Add**.



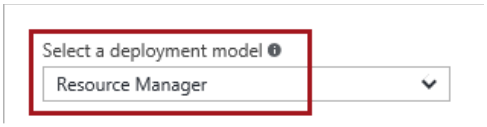
4. In the **Virtual Machines** blade, in the search box, enter **SQL Server 2016**, and then press **Enter**.

5. Select the **Free License: SQL Server 2016 SP1 Developer on Windows Server 2016** image.



6. In the image blade, review the text that describes the virtual machine setup.

7. In the lower section of the blade, in the **Select a Deployment Model** dropdown list, ensure that **Resource Manager** is selected.



8. To provision the virtual machine, click **Create**.

9. Notice that the **Create Virtual Machine** blade opens, and that also the **Basics** blade (step 1) opens.

10. In the **Name** box, enter a name for the virtual machine (this will become the name of the machine).

11. In the **VM Disk Type** dropdown list, select **HDD**.

12. In the **User Name** box and **Password** boxes, enter appropriate values (this will become the machine administrator account).

    The password must be at least 12 characters in length, and must have three of the following: one lower case character, one upper case character, one number, or one special character.

    Be sure to securely record these credentials, as you will be required to use them to sign in every time you will connect to the VM.

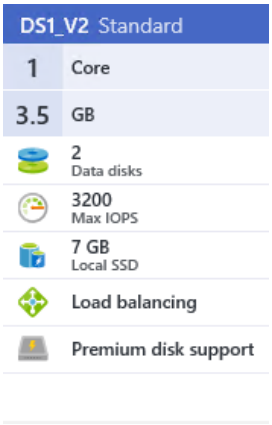
13. In the **Resource Group** box, enter **Lab**.

14. In the **Location** box, select a data center that is near you.

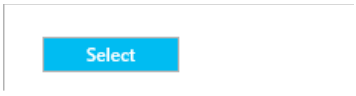
15. Click **OK**.

16. In the **Choose a Size** blade, scroll down to locate and select the **DS1_V2** size.

    The labs in this course will not require excessive storage, memory or processing. Also, you will be prompted to deallocate your VM between labs, and so the monthly cost will only apply when the VM is running.



17. Click **Select**.



18. In the **Settings** blade, to accept the default settings, click **OK**.

19. In the **SQL Server Settings** blade, to accept the default settings, click **OK**.

20. In the **Summary** blade, click **OK**.

21. On the **Azure Portal** dashboard, notice the tile displaying the status of the deployment process.

The deployment usually takes 15-20 minutes to complete, and this time depends largely on the VM size selected. The VM blade will open when the deployment completes.

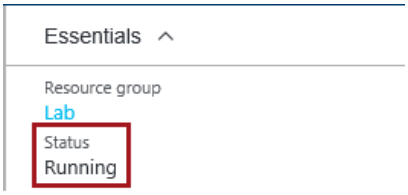
You cannot proceed to the next task until the deployment completes.

22. Leave the **Azure Portal** dashboard page open.

Connecting to the VM

In this task, once the VM has successfully deployed, you will connect to the VM.

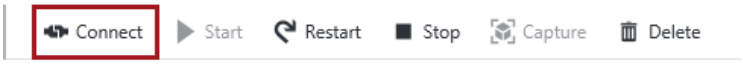
1. In the VM blade, notice that the VM blade automatically opens, and that the VM status is **Running**.



*You are charged when the VM status is **Running**, but you are not charged—except for a relatively smaller storage cost—when the VM status is **Stopped (Deallocated)**.*

Each lab will include steps to remind you to stop and optionally deallocate the VM between labs. You should consider doing this if you choose to commence the next lab at a much later time.

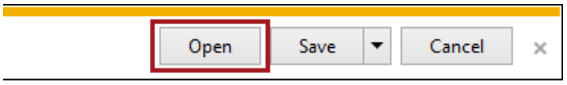
2. To connect to the VM, click **Connect**.



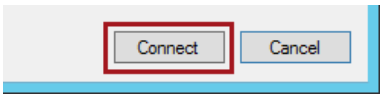
A Remote Desktop File (.rdp) file is downloaded to the desktop.

This file can be used to reconnect to the remote desktop session, but note that if you deallocate the VM and later re-start the VM, it will be likely that a different IP address will be assigned.

3. When prompted by the web browser to open the Remote Desktop File, click **Open**.

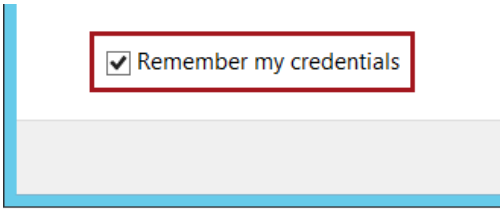


4. If prompted to connect to the unknown publisher, click **Connect**.

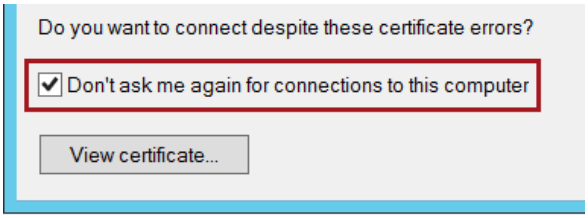


*To enter your credentials, you may need to select **More Choices**, and then select **Use a Different Account**.*

5. In the **Windows Security** window, enter the credentials you created for your VM.
6. Check the **Remember My Credentials** checkbox.



7. Click **OK**.
8. In the **Remote Desktop Connection** window, check the **Don't Ask Me Again for Connections to This Computer** checkbox.



9. Click **Yes**.
10. If you have a second monitor, maximize the Remote Desktop window inside a single monitor.

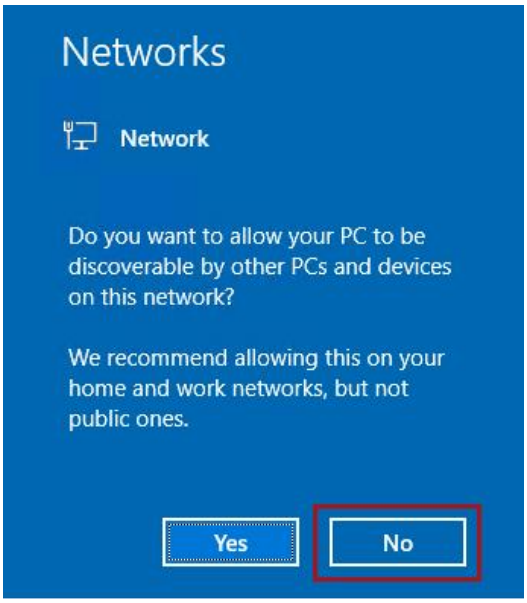
Exercise 2: Setting Up the Azure VM

In this exercise, you will complete several VM setup tasks.

Configuring the Server

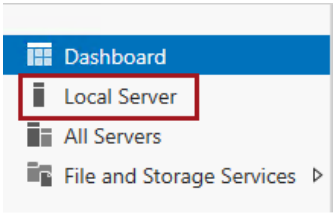
In this task, you will configure the server to support the lab experience.

1. In the Remote Desktop window, when the **Networks** panel opens at the right, to ensure that the machine is not discoverable by other machines, click **No**.

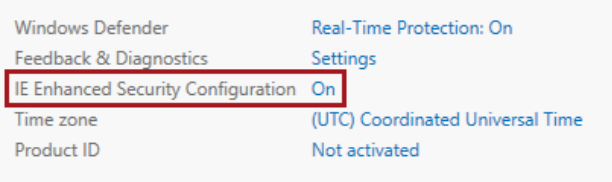


2. Wait until **Server Manager** opens (it is set to open automatically).

3. In **Server Manager**, in the left pane, select **Local Server**.

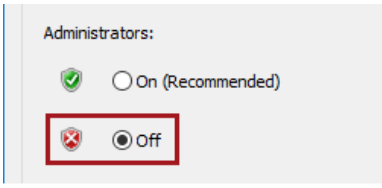


4. In the **Properties** pane, notice that **IE Enhanced Security Configuration** is set to **On**.



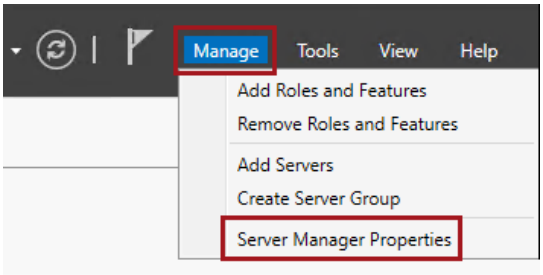
5. Click the **On** link.

6. In the window, for **Administrators**, select the **Off** option.

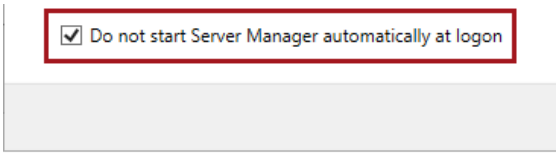


7. Click **OK**.

8. Located at the top-right corner, select **Manage**, and then select **Server Manager Properties**.

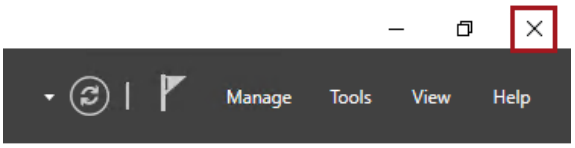


9. In the window, check the **Do Not Start Server Manager Automatically at Logon**.



10. Click **OK**.

11. To close Server Manager, located at the top-right corner, click **X**.



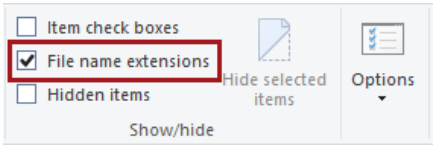
Installing Analysis Services

In this task, you will install a Tabular instance of Analysis Services.

The Azure VM has Analysis Services already installed, however it is a Multidimensional mode instance.

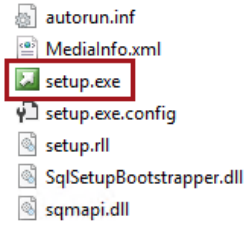
1. To open File Explorer, on the taskbar, click the **File Explorer** shortcut.

2. In the File Explorer window, on the **View** ribbon, check **File Name Extensions**.

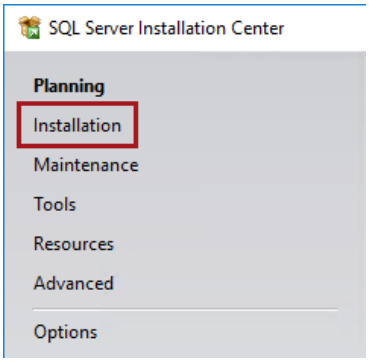


3. Navigate to **C:\SQLServer_13.0_Full**.

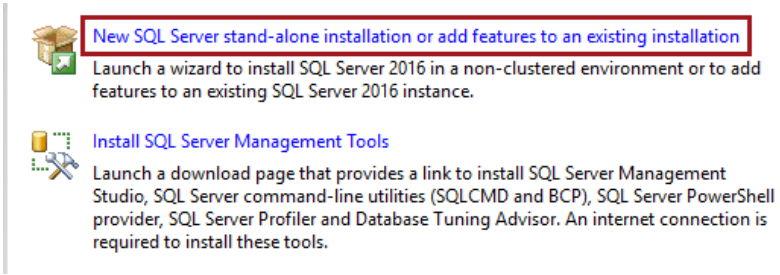
4. To launch SQL Server 2016 Setup, double-click the **setup.exe** file.



5. In the **SQL Server Installation Center** window, in the left pane, select the **Installation** page.

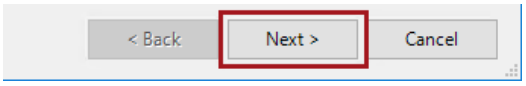


6. In the right pane, click the first link.

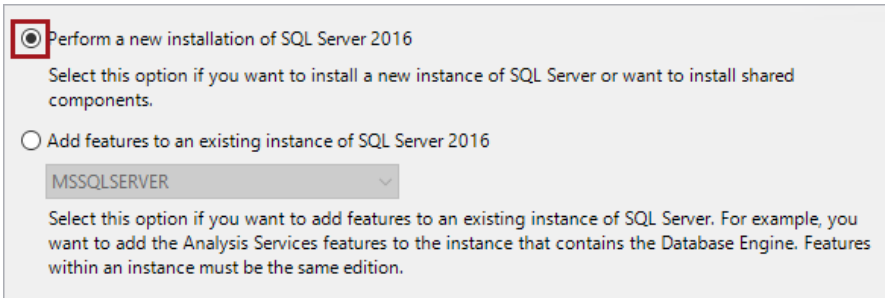


7. In the **SQL Server 2016 Setup** window, once the scanning process completes, click **Next**.

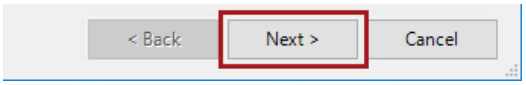
   The Windows Firewall warning can be ignored.



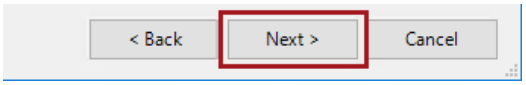
8. At the **Installation Type** step, notice that the **Performance a New Installation of SQL Server 2016** option is selected.



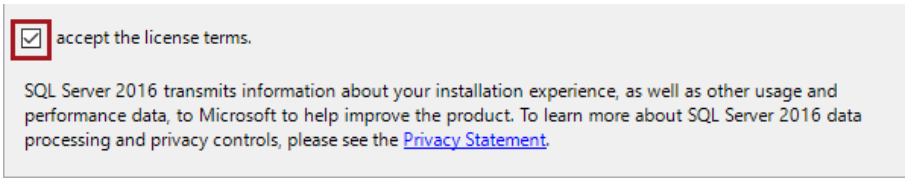
9. Click **Next**.



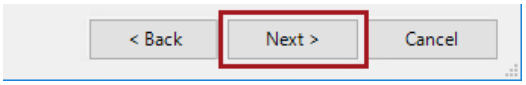
10. At the **Product Key** step, to accept the use of the **Developer** edition, click **Next**.



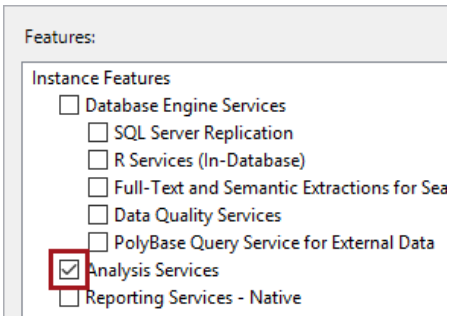
11. At the **License Terms** step, if you agree, check the **I Accept the License Terms** checkbox.



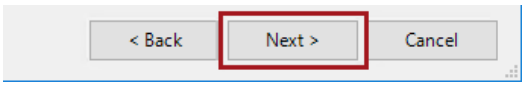
12. Click **Next**.



13. At the **Feature Selection** step, check the **Analysis Services** checkbox.



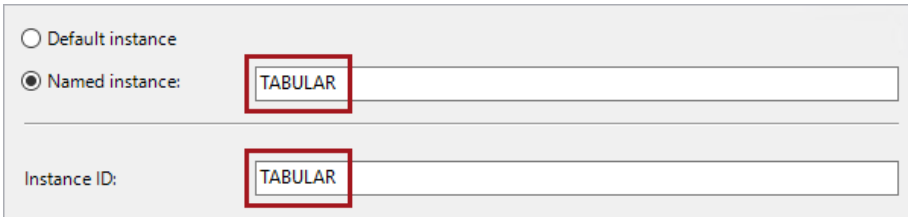
14. Click **Next**.



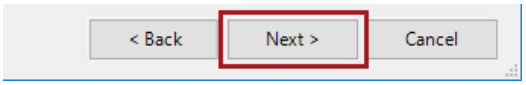
15. At the **Instance Configuration** step, in the **Named Instance** box, enter **TABULAR**.

16. In the **Instance ID** box, ensure that the text **TABULAR** has been added.

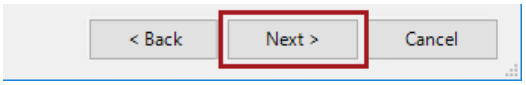
    As a setup script will be used to deploy a database to the Analysis Services instance, it is critical that you name the instance as follows.



17. Click **Next**.

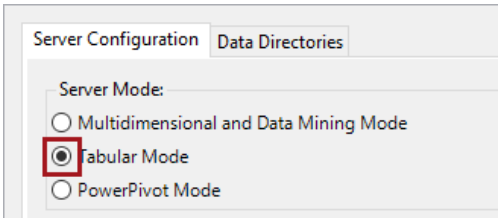


18. At the **Server Configuration** step, to accept the default service accounts, click **Next**.

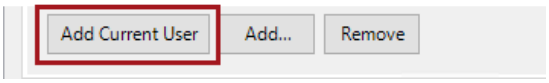


19. At the **Analysis Services Configuration** step, in the **Server Mode** group, select the **Tabular Mode** option.

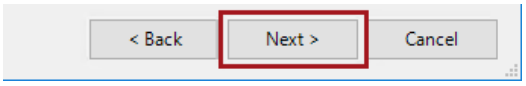
    It is important the you configure the server mode correctly, as it is not possible to change the mode once installed.



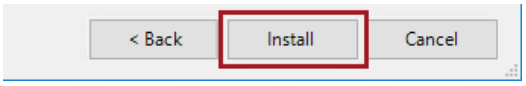
20. To add your account as a server administrator, click **Add Current User**.



21. Wait until the account has been added to the list, and then click **Next**.

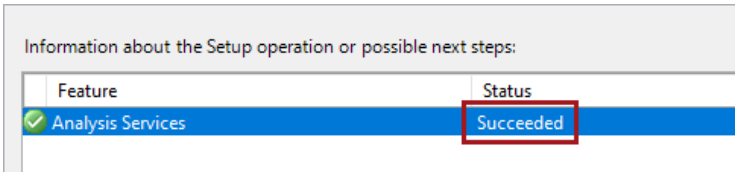


22. At the **Ready to Install** step, click **Install**.



    The installation takes approximate 3-4 minutes to complete. You cannot proceed to the next task until the deployment completes.

23. Verify that the installation succeeded.



24. Click **Close**.

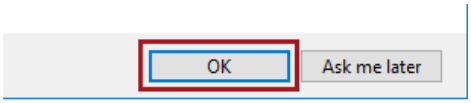
25. Close the **SQL Server Installation Center** window.

Installing the Lab Resources

In this task, you will download and extract the lab resources that support the labs.

1. To open Internet Explorer, on the taskbar, click the **Internet Explorer** shortcut.

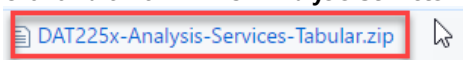
2. In the **Internet Explorer 11** window, to accept the recommended settings, click **OK**.



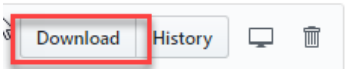
3. Maximize the Internet Explorer window.

4. In the Internet Explorer **URL** box, enter https://github.com/MicrosoftLearning/DAT225x-SSAS_Tabular

5. Click on the file **DAT225x-Analysis-Services-Tabular.zip**



6. To download the lab resources, click **Download**.



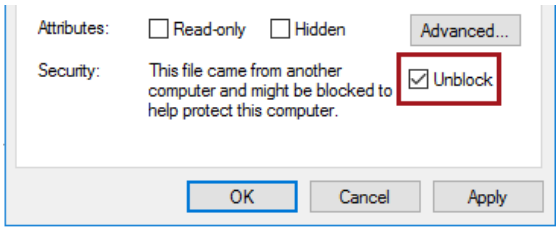
7. Download the file (**Save As**) to **F:**.

8. When downloaded, open File Explorer.

9. Navigate to **F:**.

10. Right-click the **DAT225x-Analysis-Services-Tabular.zip** file, and then select **Properties**.

11. In the window, check **Unblock**.

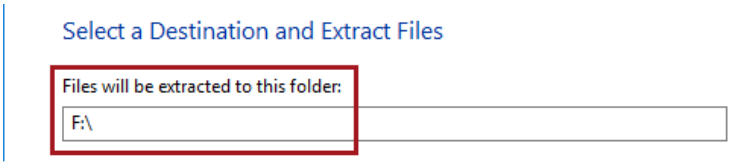


12. Click **OK**.

13. To extract the file content, right-click the **DAT225x-Analysis-Services-Tabular.zip** file, and then select **Extract All**.

14. In the window, replace the folder path with **F:**.

*Be sure to extract the files to **F:**, otherwise later steps in this lab will fail.*



15. Click **Extract**.

16. Optionally, delete the **DAT225x-Analysis-Services-Tabular.zip** file.

17. Verify that you have the **F:\Labs** folder.

Installing the Sample Database

In this task, you will run a script to install a sample database and configure database permissions.

1. In File Explorer, navigate to the **F:\Labs\Lab01\Assets** folder.
2. Double-click the **Setup-Database.cmd** file.

   *The setup will restore the **AdventureWorksDW2016** database. The database has been modified from the original sample for the purposes of this course.*

3. When the script execution completes, press any key to close the console window.

Installing the Model

In this task, you will run a script to install the model preview.

1. In File Explorer, navigate to the **F:\Labs\Lab01\Assets** folder.
2. Right-click the **Setup-Model.ps1** file, and then select **Run with PowerShell**.

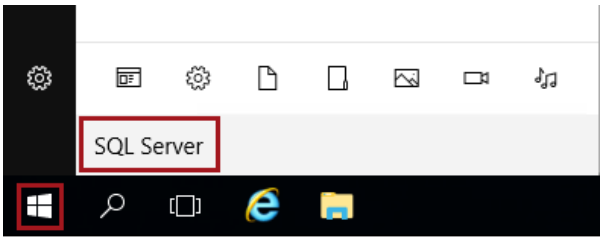
   *The setup will restore the **Reseller Sales** database. The database represents the final solution produced by the lab, and you will preview the model in this lab.*

3. When the script execution completes, press any key to close the PowerShell window.

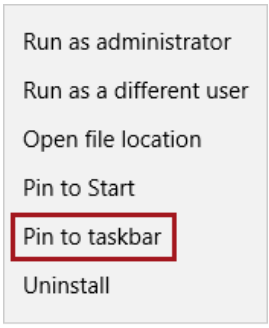
Configuring SQL Server Management Studio

In this task, you will configure SQL Server Management Studio (SSMS). This tool will be required to explore database, and to also execute scripts.

1. To add a shortcut to the taskbar, at the bottom-left corner, click the **Windows** icon, and then commence typing **SQL Server**.



2. In the **Apps** section, when the search result appears, right-click **Microsoft SQL Server Management Studio**, and then select **Pin to Taskbar**.



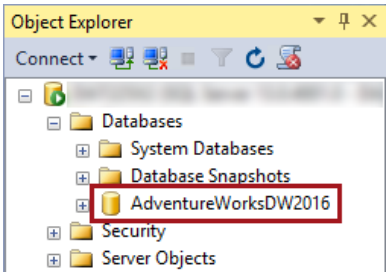
3. Return to the desktop, and then click the **SQL Server Management Studio** shortcut.

It may take 1-2 minutes for SSMS to setup.

4. In the **Connect to Server** window, click **Connect**.

5. To verify that the **AdventureWorksDW2016** database was restored, in **Object Explorer** (located at the left), expand the **Databases** folder.

6. Verify that the **AdventureWorksDW2016** database is listed.



7. To close SQL Server Management Studio, on the **File** menu, select **Exit**.

You may receive a popup notification from SSMS that a later version is available for download. There is no need to install a later version to complete the labs.

Installing SQL Server Data Tools

In this task, you will install SQL Server Data Tools (SSDT). This tool is required to develop an Analysis Services Tabular project.

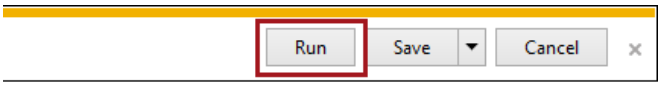
1. In Internet Explorer, navigate to https://aka.ms/dat225x-sql.

   Tip: You can copy-and-paste the URL into the Remote Desktop window.

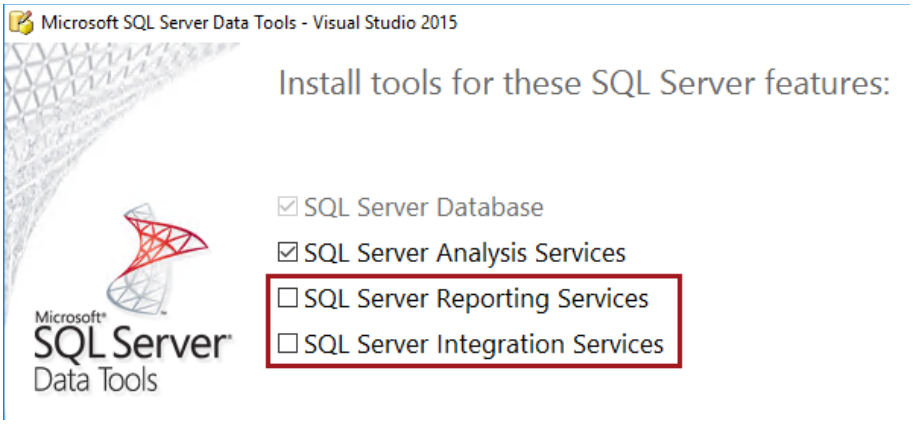
2. Click the **Download SQL Server Data Tools** link.

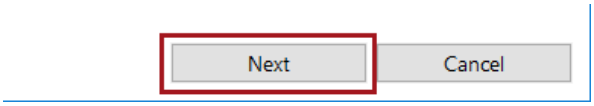
3. When prompted by Internet Explorer to run the **SSDTSetup.exe** file, click **Run**.

4. In the installation window, uncheck the **SQL Server Reporting Services** and **SQL Server Integration Services** checkboxes.

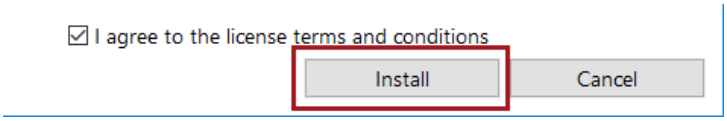
   

5. Click **Next**.

6. Read the license terms, and if you accept them, check the checkbox.

7. Click **Install**.



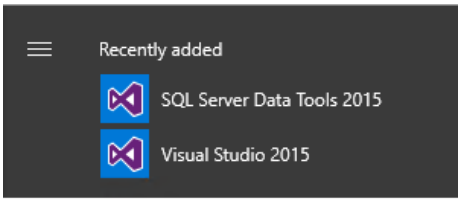
The installation usually takes 5-10 minutes to complete.

8. When the installation completes, click **Close**.

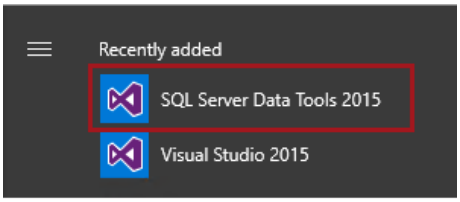
Configuring SQL Server Data Tools

In this task, you will configure SSDT.

1. To launch SSDT, at the bottom-left corner, click the **Windows** icon, and notice the items in the **Recently Added** section.

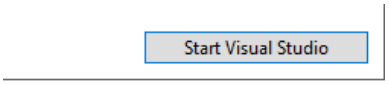


2. Select **SQL Server Data Tools 2015**.



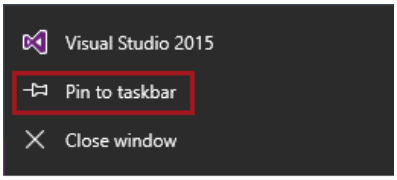
3. In the Visual Studio getting started window, in the **Development Settings** dropdown list, select **Business Intelligence Settings**.

4. Click **Start Visual Studio**.



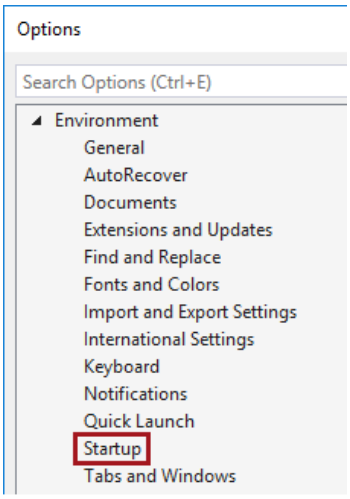
It may take 1-2 minutes for SSDT to setup.

5. To create a shortcut, on the taskbar, right-click the **Visual Studio 2015** icon, and then select **Pin to Taskbar**.



6. To configure the SSDT environment, on the **Tools** menu, select **Options**.

7. In the **Options** window, in the left pane, select the **Startup** page.



8. In the **At Startup** dropdown list, select **Show Empty Environment**.

9. Click **OK**.

10. To close SSDT, on the **File** menu, select **Exit**.

*You will work with SSDT to create an Analysis Services Tabular Project in **Lab 02**.*

Installing Microsoft Office

In this task, you will install Microsoft Office. This tool is required to create PivotTable reports to help test the design of your Analysis Services tabular model.

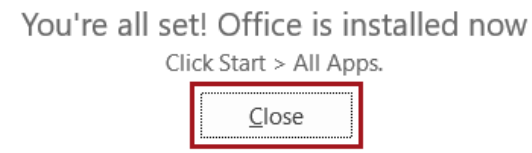
1. In Internet Explorer, navigate to http://aka.ms/dat225x-xls.

Tip: You can copy-and-paste the URL into the Remote Desktop window.

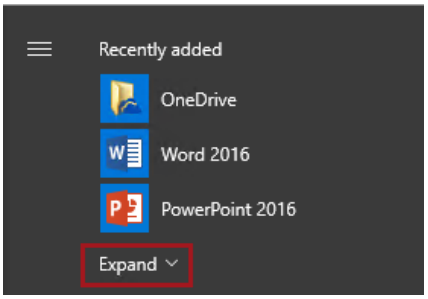
2. When prompted by Internet Explorer to run the setup file, click **Run**.

The installation usually takes 10-15 minutes to complete.

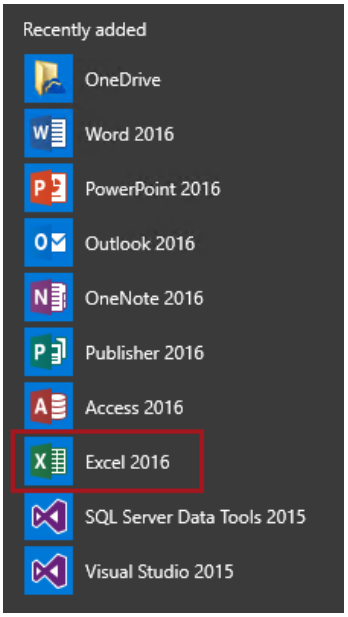
3. When the installation completes, click **Close**.



4. To launch Excel, at the bottom-left corner, click the **Windows** icon, and expand the items in the **Recently Added** section.



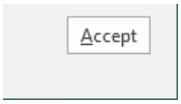
5. Select **Excel 2016**.



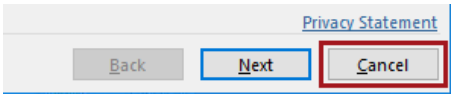
6. When Excel launches, to close the **Activate Office** window, click **X**.

A trial period is available for up to 30 days, during which you will have ample time to complete the labs for this course. Once the trial period expires, you will have the option to purchase an Office 365 subscription.

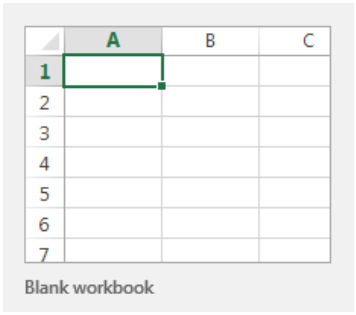
7. In the **First Things First** window, if you agree to the Microsoft Office License Agreement, click **Accept**.



8. In the **Microsoft Office Activation Wizard** window, click **Cancel**.



9. To create a blank workbook, select the **Blank Workbook** template.



10. Notice the yellow warning banner.

11. To hide the banner, at the far right, click **X**.

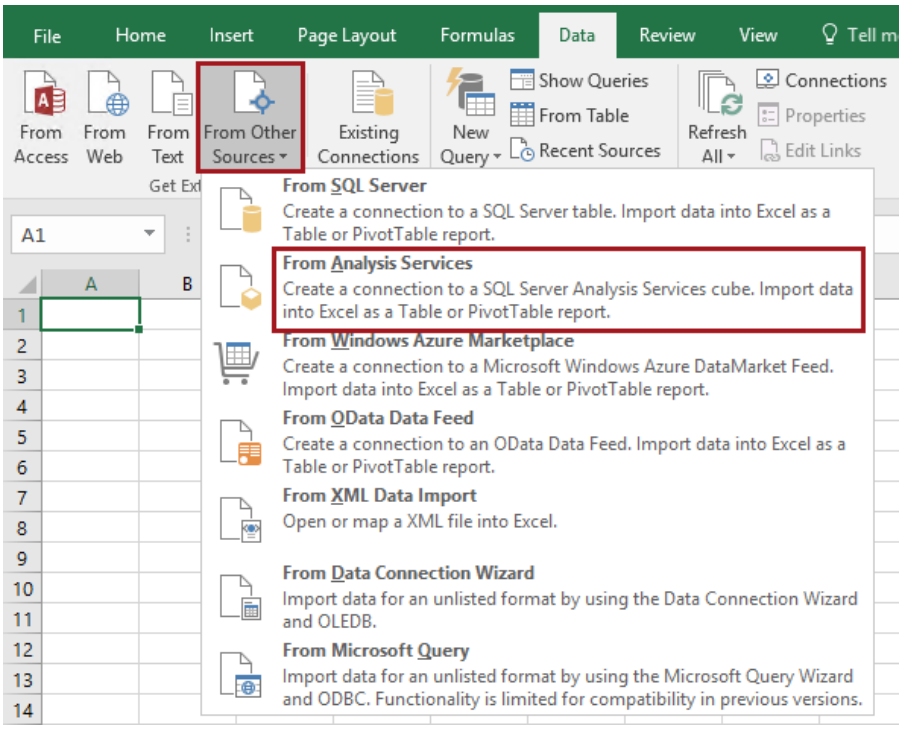
Exercise 3: Exploring the Lab Solution

In this exercise, you will explore the lab solution by connecting to the data model in Excel, and creating a PivotTable report.

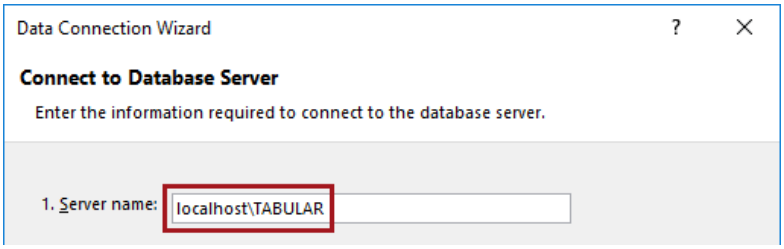
Exploring the Lab Solution

In this task, you will explore the lab solution by connecting to the data model in Excel, and creating a PivotTable report.

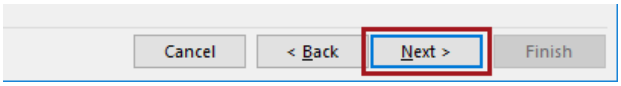
1. In Excel, on the **Data** ribbon, in the **Get External Data** group, click **From Other Sources**, and then select **From Analysis Services**.



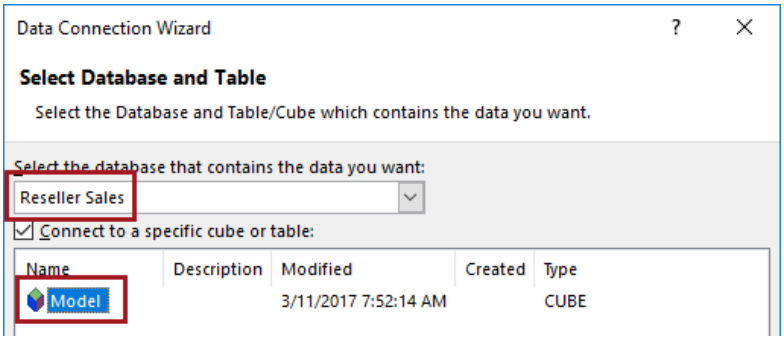
2. In the **Data Connection Wizard** window, in the **Server Name** box, enter **localhost\TABULAR**.



3. Click **Next**.

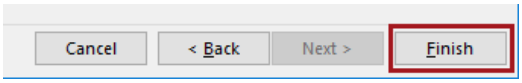


4. At the **Select Database and Table** step, in the dropdown list, notice that the **Reseller Sales** database is selected, as is the model named **Model**.

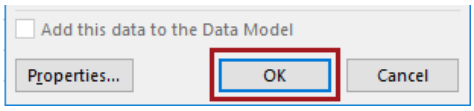


5. Click **Next**.

6. At the **Save Data Connection File and Finish** step, to connect to the model, click **Finish**.



7. In the **Import Data** window, notice that the **PivotTable Report** option is selected, and then click **OK**.

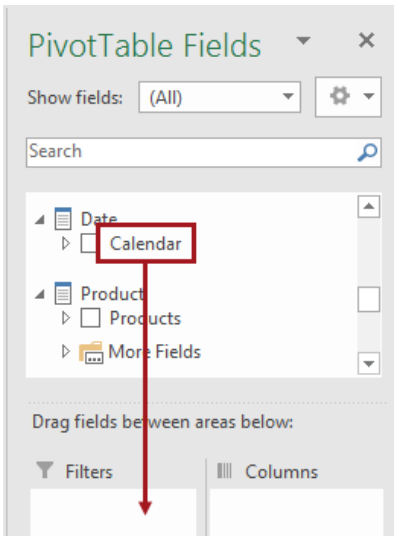


8. Notice the **PivotTable Fields** pane at the right.

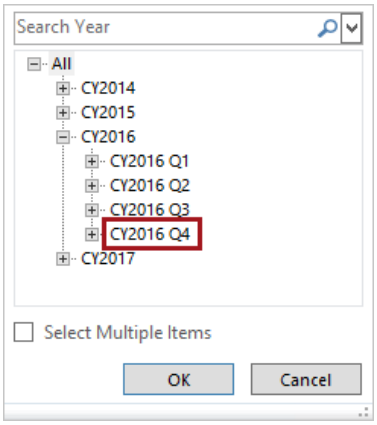
   This pane surfaces the interface of the model.

9. In the **PivotTable Fields** pane, scroll down to locate the **Date** table.

10. From inside the **Date** table, drag the **Calendar** hierarchy to the **Filters** drop zone.

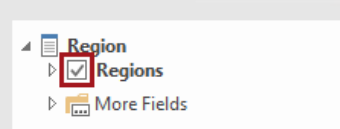


11. In the **Calendar** PivotTable filter (cell **B1**), click the down-arrow, expand the **All | CY2016** members, and then select the **CY2016 Q4** member.



12. Click **OK**.

13. In the **PivotTable Fields** pane, from inside the **Region** table, check the **Regions** hierarchy to add it to the **Rows** drop zone.



14. In the **PivotTable Fields** pane, in this order, select the following fields.

Table	Field
Sales	Sales
Target	Target
Target	Variance
Target	Variance %
Sales	Profit %
Sales	Distinct Products

15. Verify that the PivotTable report looks like the following.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	**Row Labels**	**Sales**	**Target**	**Variance**	**Variance %**	**Profit %**	**Distinct Products**
4	⊞Europe	$2,300,279.97	$2,425,000.00	($124,720.03)	-5.14 %	0.36 %	147
5	⊞NA	$200,894.23	$170,000.00	$30,894.23	18.17 %	1.19 %	101
6	⊞North America	$6,051,229.01	$5,900,000.00	$151,229.01	2.56 %	-0.70 %	149
7	⊞Pacific	$385,157.65		$385,157.65		-1.19 %	91
8	**Grand Total**	**$8,937,560.86**	**$8,495,000.00**	**$442,560.86**	**5.21 %**	**-0.40 %**	**149**

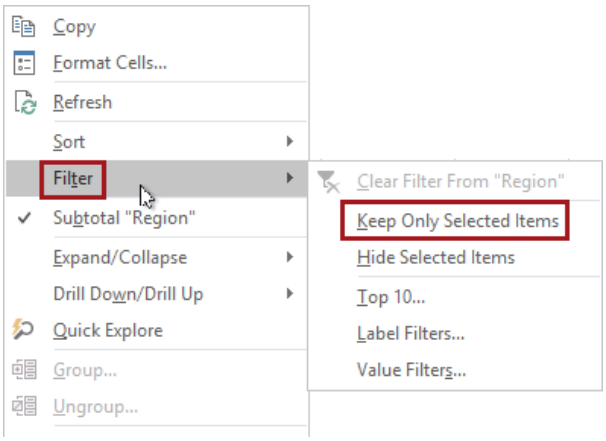
16. In cell **A6**, expand the **North America** member to reveal the countries.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	**Row Labels**	**Sales**	**Target**	**Variance**	**Variance %**	**Profit %**	**Distinct Products**
4	⊞**Europe**	**$2,300,279.97**	**$2,425,000.00**	**($124,720.03)**	**-5.14 %**	**0.36 %**	**147**
5	⊞**NA**	**$200,894.23**	**$170,000.00**	**$30,894.23**	**18.17 %**	**1.19 %**	**101**
6	⊟**North America**	**$6,051,229.01**	**$5,900,000.00**	**$151,229.01**	**2.56 %**	**-0.70 %**	**149**
7	⊞Canada	$1,058,864.46	$1,000,000.00	$58,864.46	5.89 %	-1.04 %	149
8	⊞United States	$4,992,364.54	$4,900,000.00	$92,364.54	1.88 %	-0.63 %	148
9	⊞**Pacific**	**$385,157.65**		**$385,157.65**		**-1.19 %**	**91**
10	**Grand Total**	**$8,937,560.86**	**$8,495,000.00**	**$442,560.86**	**5.21 %**	**-0.40 %**	**149**

17. In cell **A8**, expand the **United States** member to reveal the regions.

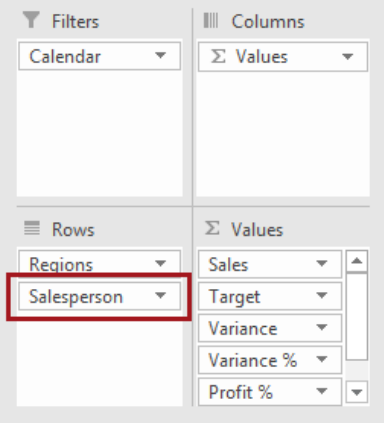
	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	**Row Labels**	**Sales**	**Target**	**Variance**	**Variance %**	**Profit %**	**Distinct Products**
4	⊞ **Europe**	**$2,300,279.97**	**$2,425,000.00**	**($124,720.03)**	**-5.14 %**	**0.36 %**	**147**
5	⊞ **NA**	**$200,894.23**	**$170,000.00**	**$30,894.23**	**18.17 %**	**1.19 %**	**101**
6	⊟ **North America**	**$6,051,229.01**	**$5,900,000.00**	**$151,229.01**	**2.56 %**	**-0.70 %**	**149**
7	⊞ **Canada**	**$1,058,864.46**	**$1,000,000.00**	**$58,864.46**	**5.89 %**	**-1.04 %**	**149**
8	⊟ **United States**	**$4,992,364.54**	**$4,900,000.00**	**$92,364.54**	**1.88 %**	**-0.63 %**	**148**
9	Central	$762,002.76	$800,000.00	($37,997.24)	-4.75 %	-0.50 %	142
10	Northeast	$809,121.84	$750,000.00	$59,121.84	7.88 %	-0.48 %	135
11	Northwest	$1,193,395.54	$1,350,000.00	($156,604.46)	-11.60 %	-0.29 %	145
12	Southeast	$605,254.60	$600,000.00	$5,254.60	0.88 %	-0.14 %	141
13	Southwest	$1,622,589.81	$1,400,000.00	$222,589.81	15.90 %	-1.18 %	146
14	⊞ **Pacific**	**$385,157.65**		**$385,157.65**		**-1.19 %**	**91**
15	**Grand Total**	**$8,937,560.86**	**$8,495,000.00**	**$442,560.86**	**5.21 %**	**-0.40 %**	**149**

18. To focus on one region, in cell **A11**, right-click the **Northwest** member, and then select **Filter | Keep Only Selected Items**.



19. Ensure that the PivotTable report is still in focus (i.e. at least one cell of the PivotTable is selected).

20. In the **PivotTable Fields** pane, from the **Salesperson** table, drag the **Salesperson** field into the **Rows** drop zone, below the **Regions** hierarchy.



21. Verify that the PivotTable report now displays salespeople within the **Northwest** region.

	A	B	C	D	E	F	G
1	Calendar	CY2016 Q4					
2							
3	**Row Labels**	**Sales**	**Target**	**Variance**	**Variance %**	**Profit %**	**Distinct Products**
4	**North America**	**$1,193,395.54**	**$1,350,000.00**	**($156,604.46)**	**-11.60 %**	**-0.29 %**	**145**
5	**United States**	**$1,193,395.54**	**$1,350,000.00**	**($156,604.46)**	**-11.60 %**	**-0.29 %**	**145**
6	Northwest	$1,193,395.54	$1,350,000.00	($156,604.46)	-11.60 %	-0.29 %	145
7	David Campbell	$380,814.59	$300,000.00	$80,814.59	26.94 %	1.28 %	131
8	Pamela Ansman-Wolfe	$362,722.07	$600,000.00	($237,277.93)	-39.55 %	1.63 %	105
9	Tete Mensa-Annan	$449,858.88	$450,000.00	($141.12)	-0.03 %	-3.16 %	124
10	**Grand Total**	**$1,193,395.54**	**$1,350,000.00**	**($156,604.46)**	**-11.60 %**	**-0.29 %**	**145**

22. In cell **B1**, filter by **CY2016 Q3**.

Lab Check – *You will need these answers for the module quiz – write them down!*

Lab 01 ► Exploring the Lab Solution

What exact sales amount was achieved by salesperson **Pamela Ansman-Wolfe** in **CY2016 Q3**? _____

How many distinct products did **Tete Mensa-Annan** sell in **CY2016 Q3**? _____

Commented [CR1]: $287,360.76

Commented [PM2]: 93

23. To close Excel, at the top-right corner, click **X**.

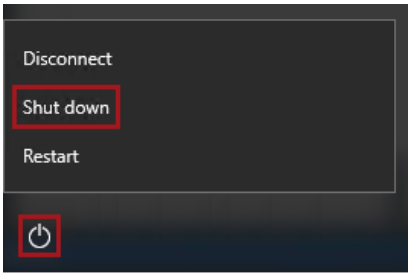
You have now completed the lab. In the next lab you will commence the development of a Tabular Project.

If you are not immediately continuing with the next lab, you should complete the ***Finishing Up*** *exercise to shut down and stop the VM.*

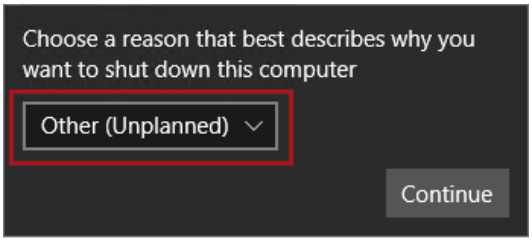
Finishing Up

In this exercise, you will shut down and stop the VM.

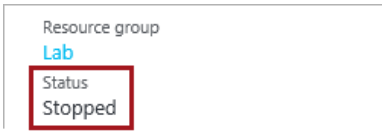
1. Close all open applications.
2. Press the **Windows** key, and then in the **Start** page, located at the bottom-left, click the **Power** button, and then select **Shut Down**.



3. When prompted to choose a reason, to accept the default.



4. Click **Continue**.
5. In the **Azure Portal** Web browser page, wait until the status of the VM updates to **Stopped**.

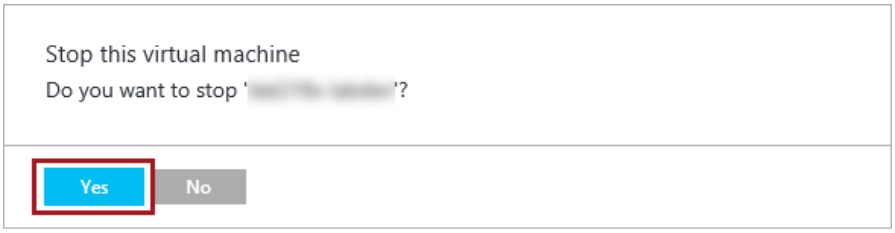


In this state, however, the VM is still billable.

6. Optionally, to deallocate the VM, click **Stop**.

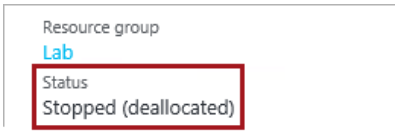
   Deallocation will take some minutes to complete, and also extends the time required to restart the VM. Consider deallocating the VM if you want to reduce costs, or if you choose to complete the next lab after an extended period.

7. When prompted to stop the VM, click **Yes**.



   The deallocation can take several minutes to complete.

8. Verify that the VM status updates to **Stopped (Deallocated)**.



   In this state, the VM is now not billable—except for a relatively smaller storage cost.

   Note that a deallocated VM will likely acquire a different IP address the next time it is started.

9. Sign out of the **Azure Portal**.